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Piracy case settled

Defendants admit to unauthorized copying, agree to reimburse vendor

By Peter Bartolik
CW Staff

ARLINGTON, Va. — The Association of Data Processing Service Organizations, Inc. announced here last week an out-of-court cash settlement in which American Brands, Inc. and its subsidiary admitted to unauthorized software duplication by the subsidiary.

A lawsuit filed earlier this year by Adapso, in conjunction with Micropro International Corp. [CW, Jan. 21], alleged that the Chicago-based subsidiary, Wilson Jones Co., had engaged in the unauthorized reproduction and distribution of three Micropro products — Wordstar, Mailmerge and Spellstar.

A joint statement agreed to by the parties in the litigation announced that "some software products have in the past been improperly duplicated by some [Wilson Jones] personnel, although such duplication was without the knowledge or acquiescence of [American Brands] or its executives."

See SETTLE page 10

NCR user wins $5.8 million suit

By Jeffry Beeler
CW West Coast Bureau

SAN LUIS OBISPO, Calif. — A Superior Court jury here has awarded $5.8 million to a Southern California businessman after finding that NCR Corp. had misrepresented the capabilities of a system the vendor sold him in 1977.

The award stems from a six-year lawsuit in which Alex Madonna accused NCR of selling him a system that lacked the appropriate mass storage to meet his construction company's information processing needs.

NCR's attorney, Robert Wendt, accused the jury of "allowing NCR's wealth to bias its verdict" and promised to file a posttrial motion for reversal of the court's decision. If the motion is rejected, the defendant will appeal, he said.

The award is the largest granted in a misrepresentation case involving a computer vendor, exceeding the $2.6 million NCR paid a California dry cleaner [CW, Nov. 1, 1982] after being found guilty of willful fraud and misrepresentation.

See MADONNA page 12

Ramis II enhanced for production applications

By John Desmond
CW Staff

WASHINGTON, D.C. — In a series of product announcements here, Martin Marietta Data Systems last week enhanced the performance of its Ramis II fourth-generation language in production applications. It also extended the product's reporting capabilities to users of AT&T's Unix System V and IBM Personal Computers.

Martin Marietta also announced products intended to merge Ramis II with the UFO applications development system originated by Oxford Software Corp., which Martin Marietta acquired in January.

The company announced the following:

■ A System Building Executive component for Ramis II. A successor to the Ramis II Executive, SBX was designed to meet the performance requirements of major production applications while maintaining the nonprocedural programming aspects of Ramis II. SBX offers 10 times the performance of the Ramis II Executive, a spokesman said. SBX is a compiled system, said to generate more compact code than Ramis II, which is interpretive.

■ An optional intelligent editor component of SBX, dubbed Smartedit. Smartedit is for use in development and maintenance environments to improve productivity for applications developers and experienced end users. With the editor, Ramis II users can develop, modify, test and store Ramis II requests and SBX procedures within the Ramis II environment.

■ A Cobol-based applications development software product, designated Cobol/Extended Environment. Cobol/XE is an Ansi Cobol-based CICS applications development system that currently supports Cobol programming in IBM DOS and OS/CICS environments. Support in more operating environments is planned. Cobol/XE, the successor to UFO/Cobol, is said to improve efficiency of programmers writing on-line

See RAMIS page 6

TOP OF THE NEWS

To appeal or not to appeal? That was the question for MCI in the wake of a jury's $38 million award to the company in its antitrust suit against AT&T. **Page 2.**

■

Uncertain tariffs and a desire to gain network control were among the reasons cited by some users for trading in private-line networks. **Page 4.**

■

Mounting a challenge. AT&T has high hopes for taking on IBM in Big Blue's backyard, but users and analysts aren't as optimistic. **Page 8.**

■

Kodak unwrapped an AT&T Unix-based electronic publishing system said to automate all aspects of in-office publishing. **Page 10.**

■

Diamond in the rough. Digital Research's Gem Draw graphics package is being warmly received by early users, who praise its Apple Macintosh-like traits. **Page 37.**

FYI

Users key in on-line debugging

By Charles Babcock
CW New York Bureau

NEW YORK — As the complexity of software packages grows, so does the reliance on hot-line troubleshooting. But effective use of hot lines requires well-informed, well-prepared users as well as vendor expertise, according to hot-line managers.

To help handle the growing volume of calls, some software vendors are putting their troubleshooting services on-line, creating data banks of previously solved problems.

At Management Science America, Inc. in Atlanta, where calls come in at a rate of 400 to 500 a day, hot-line troubleshooters do keyword searches for cases similar to the one a caller is describing, said Kenneth M. Schultz, manager of client services.

Cullinet Software, Inc. enters each of its calls into an on-line tracking system, which can also be used for keyword searches of previously described problems, said Gary L. Wright, director of corporate technology support for the Westwood, Mass.-based firm.

Martin Marietta Data Systems in Princeton, N.J., is scrutinizing the on-line tracking system at the offices of former Oxford Software Corp., a recent acquisition. Martin Marietta would like to implement a similar system for its 130 calls a day, said Sue Goldberg, manager of technical assistance for Martin Marietta's Ramis II.

There remains, however, no substitute for close, two-way communication, sometimes a difficult thing to achieve over the telephone, according to the hot-line managers.

See PROBLEMS page 14

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NEWSPAPER

MCI wins $38 million, may appeal

By Bryan Wilkins
CW Washington Bureau

CHICAGO — Although dissatisfied with the $37.8 million in damages awarded it by a jury last week, MCI Communications Corp. is undecided on whether to appeal the award in the retrial of its antitrust suit against AT&T.

Immediately following the verdict last Tuesday, MCI Chairman and Chief Executive Officer William McGowan said his company would appeal. But less than 24 hours later, McGowan was reconsidering that position, hinting that MCI would not want to jeopardize a separate but similar suit against AT&T that will go to trial within a year.

McGowan labeled the $37.8 million award, to be tripled under federal antitrust law to $113 million, insufficient to compensate for damages he claimed MCI had suffered. McGowan said the presiding judge had not instructed the jury sufficiently that the proof of six charges of AT&T's antitrust behavior had already been established in a lower court case — a finding upheld by an appeals court.

> *'We expected a lot more, we anticipated a lot more and the outcome was certainly not what we expected.'*
>
> **— Bert Roberts**
> **MCI Telecommunications Corp.**

In the trial that concluded last week, MCI argued unsuccessfully that it had suffered $5.8 billion in damages, including lost profits from postponing its Execunet business service.

AT&T said it had not decided whether it would appeal but indicated general satisfaction with the outcome. "We are pleased that the jury successfully grappled with the complex issues before it and was able to render a verdict in line with the evidence," the company said in a prepared statement.

The $113.3 million in trebled damages awarded MCI last week is far less than the $1.8 billion in damages, after trebling, awarded in 1980 when the case first was tried. MCI charged AT&T denied it the local connections needed to complete its calls. The charge was upheld by the jury in 1980, but the damages were remanded by a federal judge to the lower court for reconsideration.

AT&T now is liable to MCI for 31.5% of any damages amount, while six regional holding companies are responsible for the remaining amount. The seventh regional holding company, U.S. West, independently settled out of court with MCI for some $63 million in cash and other considerations, anticipating a higher award from the court in the retrial.

During the trial, presiding U.S. District Judge John F. Grady questioned the tactics of MCI in calculating the total "lost profits" it suffered. MCI did not break out the various components of residential and business service that were affected for the jury to make its own determination of what damages it had suffered.

AT&T argued that, at most, the damages incurred by MCI could not have exceeded $34 million, a figure the jury appeared to have followed.

The trial on the damages amount covers the period prior to 1975. MCI has filed a second antitrust suit in Washington, D.C., against AT&T alleging similar antitrust behavior for the period after 1975. That suit is scheduled to come to trial sometime next year.

Bert Roberts, president of MCI Telecommunications Corp., MCI's long-distance communications subsidiary, and a key witness in the trial, told *Computerworld* that while the company was surprised at the outcome of the jury's decision, it had not made any strategic plans in anticipation of a larger award.

"We've never run this company on anticipation that a jury would award us a large amount of money," Roberts said. "Obviously, we had asked for a lot more than we got. Based on our judgment, we expected a lot more, we anticipated a lot more and the outcome was certainly not what we expected.

"However, there was one clear issue to come out of the trial," Roberts added. "There was the jury's decision that none of the damages in this trial were related to Execunet [MCI's business service]. Those damages will be tried in the second antitrust trial, and you're going to see some big numbers talked about," Roberts said.

A spokesman for U.S. West, the regional holding company that had previously settled with MCI, said the company was "not at all unhappy" with its out-of-court settlement with MCI. He noted that the settlement also relieves the company of any potential liability that the other six Bell holding companies and AT&T may face as a result of the second round of antitrust charges still to be tried for the period from 1975 to the present.

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Switch to satellite net satisfies users' need for control

FIRST USER

By Paul Korzeniowski
CW Staff

Uncertain tariffs, problems stemming from working with a multitude of telephone companies and a desire to control their networks are the principal reasons why the first users of M/A Com, Inc.'s Integrated Satellite Business Network are trading in their private-line networks.

Wal-Mart Stores, Inc., based in Bentonville, Ark., and Southland Corp., located in Dallas, started looking for an alternative to their networks a year and a half ago. "When Ku-band transmission became available, satellite transmission became a cost-effective alternative to terrestrial transmission," said Robert L. Martin, vice-president of information systems at Wal-Mart.

The department store chain plans to connect its 750 stores and warehouses located in 20 states with a private, $16 million digital satellite network. A 9-meter earth station has been installed at Wal-Mart's Bentonville facility. It will be used for voice transmission between company locations and data transmission to and from the company's IBM 3081, 3083 or 4381 mainframes.

Other 1.8- or 2.4-meter stations will be placed at each Wal-Mart distributor or store. "The larger [2.4-meter] earth stations will be positioned where weather may hinder transmission or where stores are located at the edge of a footprint," Martin said. A footprint is the range of a satellite transmission.

The distributors house IBM 3033 or 4300 series mainframes; each store has one or two IBM Series/1 minicomputers. "Each earth station provides a bandwidth of up to 128K bit/sec.," Martin noted. He estimated that 56K bit/sec. will be used for data transmission, and the remaining bandwidth will be divided into 16K bit/sec. digitized voice trunks for a virtual private network.

The vice-president did not think echo delays inherent in satellite transmission would cause any problems. "There have been advancements in echo cancellation techniques that alleviate the problem of voice delay," Martin said. "However, there is still a slight delay."

The central earth station has been constructed and has been certified by the Federal Communications Commission. M/A Com will supply the earth stations, but Wal-Mart has not chosen a vendor to provide the satellite capacity. "We have narrowed the choice to three vendors," Martin said. "We will choose one by next month."

When the vendor is chosen, Wal-Mart will add two warehouses to the system. Full-scale implementation of the system will begin during the summer. Beginning in the fall, 50 stores per month will be added to the system until 750 locations are on the system in the first quarter of 1987.

New system, new applications

The new communications system will supply Wal-Mart with new applications. "Currently, we poll our warehouses three times a day," Martin said. "With the satellite network, we will be able to poll them more often. At first, the system will be underused, but we will require a wider bandwidth as we design more interactive applications."

In contrast, Southland initially will limit its satellite network to data transmission. "We are replacing our 100-line multidrop network with a satellite network," said William McMinn, manager of voice and data communications at Southland.

Southland operates more than 7,500 7-Eleven stores throughout the U.S. and Canada. The chain is managed by approximately 300 district offices equipped with IBM System/36 minicomputers.

At the hub of the satellite network is a 9-meter central earth station located in Dallas. "We tested an M/A Com earth station in January 1984 just to see if the system could transmit data to our Winter Haven, Fla., office," McMinn said.

When the test was successful, the company decided to link, by a satellite system, its district offices' hardware with IBM 3081 and Amdahl Corp. 5860 mainframes in Dallas. The $6 million satellite network will be used for 16 on-line applications, and a million transactions will be processed each day.

Southland, like Wal-Mart, has built its central station, has had it certified by the FCC and is negotiating with satellite vendors. The company will start adding offices to the network during the summer and plans to have it fully operational by June 1986.

May transfer voice net to satellite

When the data system is completed, Southland may transfer its voice network to the satellite system. "We have to test the voice capability to see if our users would be happy with the slight delay that accompanies satellite voice transmission," McMinn noted. "If the delay is minimal, we may add voice capability for all our district offices' earth stations. In the long term, we may place some earth stations at our stores and tie them into the network."

Video transmission may also be added. "We may want to transmit speeches from the president of the company to our district offices," McMinn said.

Even without the voice and video capabilities, the manager estimated that the satellite system would pay for itself in five years.

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WHODUNIT

Sortland Yard warns against "Raffles-type sort programs."

Call (201) 568-9700.

Ask for Inspector SyncSort!

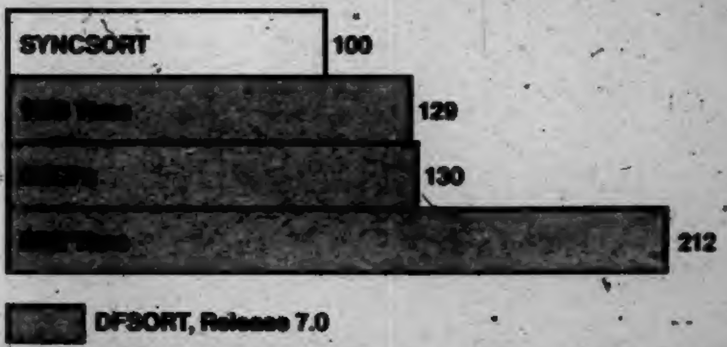
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied. "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

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Information Builders unveils VAX version of Focus

By John Gallant
CW Staff

NEW ORLEANS — Information Builders, Inc. last week introduced a Digital Equipment Corp. VAX/VMS version of Focus, its widely installed fourth-generation language.

Unveiled at the Dexpo '85 conference here, the VAX version of Focus makes the product available for mainframes, minicomputers and microcomputers. Focus also runs on IBM mainframes and Personal Computers. A spokesman said Focus applications and data are portable across those environments, and users can access and transfer data between computers using the Focus language.

The spokesman said the VAX version of Focus runs under DEC's VMS 4.0 operating system and is scheduled for general shipment in the fall. Focus for the VAX features the following: a report writer; data management and applications development tools; a screen manager; an editor; screen painter; the company's Talk facilities, Financial Modeling Language (FML) and Foccalc spreadsheet; and graphics and statistics capabilities.

The report writer allows reports and ad hoc information requests to be formulated using the Focus nonprocedural language, which features sort, calculation and formatting capabilities as well as on-line error correction and Help facilities. The report writer can process Focus data bases, any DEC RMS files or RDB data bases and other third-party files.

Focus' data management capabilities are based on a shared-relational data model, the spokesman said, with all transaction processing accomplished through English statements. For applications development, Focus allows users to write programs, design screens and perform validations and table look-ups through English statements.

The Fidel screen manager facilitates the development of data entry and display screens, and the editor and screen painter facility — dubbed Ted — was designed to accommodate development of I/O screens and transaction processing logic.

The Talk facilities include programs for data base creation — Filetalk; data modification — Automod; and reporting — Tabletalk. The FML was designed to handle the creation, calculation and presentation of financially oriented data. Foccalc is a 1,000- by 1,000-matrix electronic spreadsheet with facilities for automatic data import, spreadsheet population and consolidation and cross-machine model transfer.

Using the nonprocedural language, the graphics tools allow for the creation of connected point plots, histograms, bar and pie charts and scatter diagrams. Statistics facilities provide a set of functions and analyses, including cross-tabs, time-series and regression analysis.

The spokesman said the VAX version of Focus is priced on a sliding scale from the Microvax I to the VAX 8600 and Vaxclusters. The one-time license fee for the Microvax I is $6,000 and $52,000 for the VAX 8600. Monthly license prices start at $550 for the VAX-11/720.

Information Builders is located at 1250 Broadway, New York, N.Y. 10001.

RAMIS

from page 1

transaction processing applications.

■ UFO/Ramis II Pathway, a further effort to integrate Ramis II with UFO. The product allows UFO users to generate reports from Vsam files maintained by UFO using Ramis II's fourth-generation syntax.

■ Versions of the Ramis II report writers for IBM PC-DOS and Unix System V environments, dubbed PC/Reporter and Unix/Reporter. PC/Reporter allows personal computer users with any sequential or comma-delimited Ascii files to generate reports using Ramis II's syntax. The product runs on any IBM Personal Computer, Personal Computer XT or AT equipped with two floppy disks and at least 512K bytes of memory. Unix/Reporter allows generation of reports from Unix flat files running on any micro, supermini or mainframe.

■ Enhancements to the Ramlink micro-mainframe link product, which so far has not been delivered in production quantities. The enhancements include support for Digital Consulting Associates, Inc.'s Irma and Forte Data Systems' Forte communications boards. The Ramlink enhancements are scheduled for availability this month as part of Ramis Release 85.2.

Martin Marietta also announced that an updated Data Base Manager (DBM) for Ramis II, which will allow for concurrent updating of the data base, is scheduled for fourth-quarter delivery. The company admitted that technical problems have pushed back delivery to that date.

SBX reportedly is a full-function programming language that provides structured programming facilities and supports screen- or line-oriented communications with terminal users. Marketing Vice-President Frank Fish said SBX was designed to improve the response time and reliability of interpretive languages such as Ramis II, which he said are not adequate for all users. Scheduled for availability this month, SBX will be provided for no charge as part of the Ramis II maintenance program. Migration to SBX from Ramis II Executive is not required, but migration aids are available.

Smartedit features include the use of templates to provide a structured outline of frequently used statements, full screen editing, a split screen, on-line Help and operation on procedures from Ramis II SBX libraries or on CMS and TSO system files. Scheduled for availability this month, Smartedit costs from $2,250 to $4,500.

Cobol/XE allows any Cobol programmer to write on-line programs under CICS or CMS as if they were batch programs. In addition to CICS/VS, Cobol/XE allows programmers to develop CICS applications under VM/CMS. With the product's screen painting facility, programmers can design screen layouts on a 3270 or Personal Computer XT/370 screen without writing code. Prices for Cobol/XE, which runs on IBM mainframes, are $15,000 for the VM/CMS version, $24,000 for the DOS/CICS version and $33,000 for the OS/CICS version. The product is available now.

UFO/Ramis II Pathway is a free component to users with both Ramis II and UFO. Deliveries of Pathway are scheduled for this month.

Ramis II Release 85.2 will also extend Ramlink support to CICS under DOS/VSE, CICS, MVS and Martin Marietta's Atlas under DOS/VSE. Ramlink also allows for bidirectional transfer of data from Ramis II data bases, Vsam and Isam files, Software AG's Adabas, Cincom Systems, Inc.'s Total, IBM's IMS and DL/1 data bases and Cullinet Software, Inc.'s IDMS.

Both PC/Reporter and Unix/Reporter are reportedly scheduled for third-quarter availability. On single-user machines, PC/Reporter costs $795, while the Unix/Reporter costs $995.

More information is available from Martin Marietta, P.O. Box 2392, Princeton, N.J. 08540.

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Altos extends supermicro line with multiuser system

By Kathleen Sullivan
CW West Coast Bureau

SAN JOSE, Calif. — Altos Computer Systems, Inc. is slated to extend its lineup of supermicrocomputers today with the Altos 2086, a multiuser system based on Intel Corp.'s 80286 microprocessor.

The Altos 2086, which runs Microsoft Corp.'s Xenix 3.0 operating system, can support up to 20 users, the company said. The new system is said to be software compatible with the IBM Personal Computer AT. It also reportedly can read and write IBM Personal Computer AT diskettes and run most software written for the Personal Computer AT under Xenix.

The Altos 2086 is said to feature a modular, multiple-board design. In a 20-user configuration, the system includes a CPU board, a random-access memory (RAM) board, two file processor subsystem boards and two serial communications boards. Two additional board slots are available for expanding the system, the company said.

The Altos 2086's CPU board is said to include an 80286 microprocessor running at 8 MHz with no wait states. The CPU board contains 4K bytes of high-speed RAM cache memory. This cache memory can temporarily hold portions of main memory, allowing the microprocessor to gain faster access to data and instructions, the company said.

The Altos 2086's RAM board can accommodate up to 8M bytes of RAM, using 2M- or 4M-byte boards, according to the vendor.

At the center of the Altos 2086 is a two-board file processor subsystem. One board reportedly contains storage device controllers. A second board, which contains an Intel 8086 microprocessor running at 8 MHz, controls file access, managing four direct memory access channels.

In a standard configuration, the system includes a 1.2M-byte floppy disk drive, a 60M-byte streaming tape drive and a 63M-byte (formatted) hard disk drive. Users can expand the system by installing Altos' hard disk drive modules, which include power supplies.

The Altos 2086 can accommodate up to three hard disk drives for total storage of 189M bytes.

Each serial communications board for the Altos 2086 is said to include an Intel 8086 microprocessor running at 8 MHz. Each board has a total of 10 ports. Up to two ports can support synchronous protocols, while one port can be software selected to operate Altos' local-area network, known as Worknet, the company said.

The standard serial communications board is said to include 32K bytes of RAM. Altos is also offering a 128K-byte RAM board that will support X.25 or IBM's Systems Network Architecture (SNA) protocol software.

Each Altos 2086 will be shipped with user and field service diagnostics, the company said. The Altos 2086 is also said to feature remote diagnostics capability.

According to Altos, the system will support IBM 3270 and 3780 bisynchronous and 3270 SNA/Synchronous Data Link Control communication for mainframe communications.

In a 20-user configuration, which includes 2M bytes of RAM, a 63M-byte hard disk drive, a 1.2M-byte floppy disk drive, a 60M-byte tape drive and an Altos terminal with a monochrome display, the Altos 2086 will sell for $19,990.

More information is available from Altos, 2641 Orchard Pkwy., San Jose, Calif. 95134.

FCC to revise equal access

WASHINGTON, D.C. — The Federal Communications Commission last Friday was expected to revise its equal access implementation rules for the seven regional holding companies. The revisions would require the divested Bell operating companies to divide default long-distance traffic among all competitive long-distance carriers, not just route it to AT&T.

This plan, which has already been adopted by the companies that comprise U.S. West, one of the regional holding companies, has received the endorsement of the U.S. Department of Justice [CW, April 22].

The original terms of the AT&T divestiture and the FCC implementation guidelines required that default traffic be routed to AT&T from customers that have not yet selected a long-distance carrier in areas where equal access has already been implemented.

Under the U.S. West plan, customers are twice asked to fill out ballots for their carrier preference. If they do not select one, they are ultimately assigned to a carrier according to a percentage allocation formula that reflects the ballots filed in the phone exchange that is being converted to equal access.

The FCC last week was also expected to make other changes in the equal access implementation rules in an effort to make them more equitable, according to the FCC staff.

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AT&T challenge to IBM: Much talk, little action

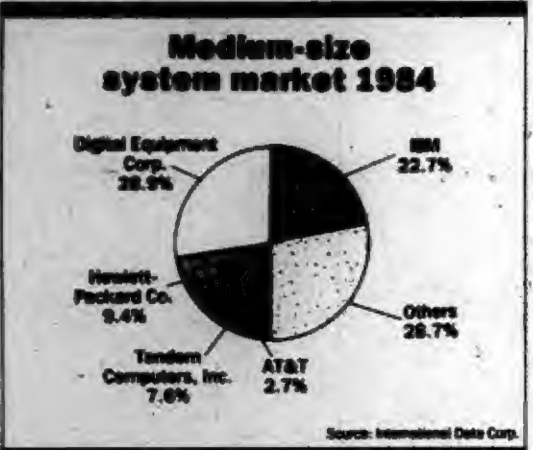
By Paul Korzeniowski
CW Staff

King Kong vs. Godzilla.

It was generally felt last year that the data processing world would be rocked by a battle royal between IBM (King Kong) and AT&T (Godzilla). Freed from its regulatory chains Jan. 1, 1984, AT&T has possessed the financial and technical muscle needed to loosen IBM's stranglehold on the computer industry.

Since that date, AT&T has introduced three computer lines: a 3B line of multiuser Unix systems in March 1984; the AT&T 6300, an IBM Personal Computer-compatible microcomputer, in June 1984; and the Unix PC in March 1985.

Medium-size system market 1984



Source: International Data Corp.

To date, no AT&T computer product line has challenged the market leaders. As a result, a number of predictions have been tempered, and some computer industry interpreters are beginning to doubt that the communications giant will ever pose a Godzilla-like challenge to the industry's King Kong.

"Certainly, AT&T's performance thus far has been disappointing," observed Gwen Peterson, director of business computer system industry service at Dataquest, Inc., a market research firm in San Jose, Calif. "The only business sector that has made volume purchases of AT&T products is [that of the] former Bell operating companies. Because of AT&T's assets and the technical achievements at Bell Laboratories, many people expected AT&T to quickly sell a lot of computers.

"Expectations were also great in the early 1970s when [Exxon Corp.], with a lot of cash, entered the high-tech field," she added. "Yet Exxon never sold many systems."

Exxon recently abandoned its computer sales and sold its office automation line to Harris Corp. [CW, March 4].

"AT&T will need a lot of time before it learns how to sell computer equipment," Peterson explained. "The company has already learned that selling computers in a competitive environment is much different [from] operating a monopoly."

Industry observers explained that a primary difference is marketing. In the face of little or no de facto competition, there is no pressing need to market a product intensely. When there is stiff competition, marketing often determines a product's success or failure.

AT&T's products have been technically sound, but the company has not formulated a coherent marketing plan, according to Richard Ross, director of industry services at the Gartner Group, Inc., a market research firm in Stamford, Conn. The communications giant appears to be marketing its products as competitors to IBM products.

"AT&T is not competing with companies like [Digital Equipment Corp.]," maintained James Sullivan, senior analyst at Yates Ventures, Inc., a Los Altos, Calif., market research firm. "DEC is too small. AT&T has the resources to compete with IBM. The communications company is used to being No. 1 and is striving to be No. 1 in the computer industry."

AT&T's success hinges on MIS managers' acceptance of its products. A sampling of MIS managers by *Computerworld* found few interested in AT&T's systems.

"AT&T's reputation works in a negative way," explained Steven Radice, director of information services at the Florida Federal Savings and Loan Association in St. Petersburg, Fla.

"When I think of AT&T, I think of a complex bureaucracy that is new in the computer field," Radice noted. "IBM is also a bureaucracy, but I know how to work with it. There is no reason for our company to be interested in AT&T products."

To garner interest, analysts suggested that AT&T must market its principal offering, Unix, and primary strength, an ability to integrate voice and data.

Often, product awareness does not translate into product sales. Although MIS managers were quite aware of Unix, few had considered purchasing it.

"I see no reason to move to Unix and be in the forefront of technology," Radice noted. "With our current investment in MVS training and software, Unix would have to offer us significant benefits for us to ever consider purchasing it."

Rather than substantial benefits, Unix offers a number of problems, according to some. "Unix does not have file-locking and security features found in other operating systems," Dataquest's Petersen explained.

Personal computer sales (units)

Product	1984	1985
IBM Personal Computer	880,000	1,050,000*
Apple Computer, Inc. Macintosh	275,000	420,000
AT&T 6300	33,000	70,000
AT&T Unix PC	—	18,000

* Includes anticipated IBM PC2

Source: Infocorp

Some of these deficiencies were overcome on the version that runs on the Unix PC. However, there is some question concerning how compatible

See AT&T page 9

An ideal AT&T?

You wake up tomorrow morning and your life has changed. You are in charge of AT&T's Information Systems division. Your job is to turn the communications company into a major player in the computer industry. What would you do?

Richard Ross, director of industry services at the Gartner Group, Inc., a market research firm in Stamford, Conn., had three suggestions. First, he would cut AT&T's work force by 25%. Next, he would revamp all factories so the company could truly become a low-cost producer.

"Also, I would drop out of the desktop market for the short term," he said. "AT&T is just not ready to really compete in that market. It should concentrate on the communications and network management markets, businesses that it is familiar with. AT&T would then be able to use that success to enter the desktop market."

Gwen Petersen, director of business computer system industry service at Dataquest, Inc., a San Jose, Calif., market research firm, suggested a directly opposite tack. "First, AT&T has to be successful in the desktop market," she said. "The corporation should concentrate on departmental microcomputers, systems that tie into a [private branch exchange] or other communications systems. That area — integrating voice and data — is where its advantages lie."

James Sullivan, senior analyst at Yates Ventures, Inc., a Los Altos, Calif., market research firm, would round out AT&T's product line. He recommended a microcomputer that runs AT&T Unix and Microsoft Corp.'s MS-DOS operating systems. "To an extent, the AT&T 6300 offers Unix and MS-DOS capabilities, but it's not full-featured," he stated. Other recommended products include a mainframe that runs Unix and a 6300-type machine with a $3,000 to $5,000 price tag.

— Paul Korzeniowski

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Unix, graphics attract corporate users to AT&T systems

By Paul Korzeniowski
CW Staff

Few are the large corporations that have embraced AT&T's computers. Those that have been lured to the AT&T camp have often been attracted by features like Unix or the graphics capabilities of AT&T's 6300 microcomputers, according to users interviewed recently.

The Maybelline Co. in Memphis, a division of Kenilworth, N.J.-based Schering-Plough Corp., is somewhat of a Unix pioneer among large corporations. While most large companies have shied away from the operating system, the maker of Maybelline cosmetics began working with Unix two years ago.

The move to Unix was made after a careful examination of other small system alternatives, including IBM's System/36 and 38, according to Richard Whatley, vice-president of systems planning at Maybelline. "We found that Unix systems offered more features than the System/36 or 38 offered," he said.

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> *'AT&T's salespeople have been very knowledgeable, and the systems have proven to be reliable.'*
>
> **— Richard Whatley**
> **Maybelline Co.**

At first, Unix applications were run on Tandy Corp. TRS-80/16B microcomputers. Last year, the division needed a more powerful piece of Unix hardware to power a new order entry application, according to Whatley. "Just as we were expanding our use of Unix, the [AT&T] 3B2 line was introduced," he said. "Since the hardware came from the inventors of the operating system, the 3B2 line seemed like a logical choice to us."

Whatley's division had been true to Big Blue, using an IBM 4381 mainframe as a departmental processor, a number of IBM Personal Computers and an IBM 3084 mainframe that ran corporate applications. The division has now purchased six 3B2s and several AT&T 6300 microcomputers.

Thus far, the Maybelline division has no regrets about its move to AT&T. "AT&T's support has been excellent," Whatley said. "If there is ever a problem, we have an 800 number to call. AT&T's salespeople have been very knowledgeable, and the systems have proven to be reliable. AT&T's support has been better than IBM's support,"

Last year, Charter Medical Corp. of Macon, Ga., was looking for a medium-size, multiuser, multitasking system to run its purchase order system. "We examined a number of systems before choosing AT&T 3B2," Anne Mullendore, director of purchasing said. "The chief reason we chose an AT&T system was that the company promised to help us design our software."

The medical corporation's DP staff consists of 70 people working with IBM's MVS on an IBM 3083 mainframe and four people responsible for 3B2 applications. Today, the two systems work separately, but Mullendore predicted that soon they would be linked.

J. J. Kenney, Inc., a municipal securities firm in New York, wanted to integrate its Perkin-Elmer Corp. 3200 superminicomputer with personal computers. The company volunteered to be a beta site for the recently released AT&T Unix PC. "We liked the product's multitasking and windowing capabilities," a J. J. Kenney spokesman said.

Integrating micros and the supermini has proven helpful, but the integration is not complete. "We have to recompile personal computer programs so they will run on the larger system," the spokesman said.

Mediq Information Systems, Inc. in Pennsauken, N.J., needed powerful personal computer graphics capabilities for its radiology applications.

"The microcomputer had to support 64 shades of gray, which are needed to read certain X-rays," said William Adams Jr., the company's president. "The system can store digitized X-rays on a 3B2," Adams added. "The 3B2 is tied into an [AT&T] System 75 [private branch exchange], allowing a user to download the pictures to a 6300."

AT&T

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that version of Unix is with previous versions.

The gradual merging of voice and data functions may not prove beneficial to AT&T. "A number of companies have merged voice and data capabilities," Gartner's Ross maintained. "Telephone functions are being usurped by the data processing department, not vice versa."

For Godzilla to meet King Kong, these roadblocks have to be overcome. "AT&T will not be a major player in the computer industry for the next five years," Ross predicted. "It is questionable whether or not it will be a major player in 10 years."

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SETTLE from page 1

David Sturtevant, communications director for Adapso, a trade association representing 750 firms engaged in software and services, said the settlement was not forced by financial constraints and that Adapso had been willing to press the issue through a trial. However, legal communications provided to *Computerworld* indicated that Adapso had established a $10,000 budget for the case and was actively seeking a settlement.

Sturtevant declined to say how the alleged copying was discovered, but it was learned that Adapso had obtained internal Wilson Jones documents.

As part of the settlement, according to the statement, "American Brands and Wilson Jones share fully Adapso's and Micropro's conviction that software products should not be duplicated improperly, and they have agreed that appropriate procedures will be instituted to [ensure] against such improper duplication."

Adapso spokesman Sturtevant said Wilson Jones agreed to pay a cash settlement to Micropro, but he declined to specify the amount.

The suit, filed in Federal District Court in Chicago, had asked for damages of $225,000 and the return of any profits earned as a result of the alleged copying.

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> *A spokesman for American Brands, Inc. said steps will be taken to ensure its operations have 'a much higher level of awareness' about software protection issues.*

Bob Bukeyeser, spokesman for American Brands, a Fortune 100 conglomerate with revenue of $7 billion, said steps will be taken to ensure its operations have "a much higher level of awareness" about software protection issues. He said he was not aware of any disciplinary action taken as a result of the lawsuit.

Although the statement did not say whether or not Wilson Jones management was aware of the practice, Bukeyeser said that "at senior levels nobody knew of it, and nobody agreed with it." Wilson Jones sells office equipment and supplies and at one time operated a business computer division that held membership in Adapso from April 1968 to February 1984.

The suit was a dramatic highlight to a broader education campaign designed to make companies and institutions aware of the illegality and penalties of unauthorized software duplication. Adapso has mailed out materials and offered advice on how companies and others can institute antipiracy policies.

Since the campaign was announced in January, Sturtevant said, Adapso has received 4,700 responses to its mailings, and more than 100 companies have provided Adapso with copies of antipiracy policies that have been developed or implemented.

Kodak Unix-based publishing system out

ROCHESTER, N.Y. — Eastman Kodak Co. announced an AT&T Unix-based electronic publishing system — the company's first thrust into the office publishing market — and the development of an image management system.

The Kodak Ektaprint Electronic Publishing System (Keeps) is said to automate the composing, printing and publishing of near-typeset-quality documents that merge text, business graphics and images.

The most basic Keeps configuration includes a Sun Microsystems, Inc. stand-alone graphics workstation, 42M bytes of storage on a Winchester-type 5¼-in. hard disk and a Canon, Inc. LBP-CX laser printer. The system runs under the University of California at Berkeley Version 4.2 of the Unix operating system, the vendor said.

Options include a Sun Microsystems text controller for word processing, which can support up to eight Esprit Systems, Inc. on-line Ascii text entry terminals; an Imagitex, Inc. graphics scanner; a file server node; a 1,200 bit/sec. telephone data modem and a printer that interfaces directly with the text cluster computers or individual graphics workstations to provide ready access to proofs.

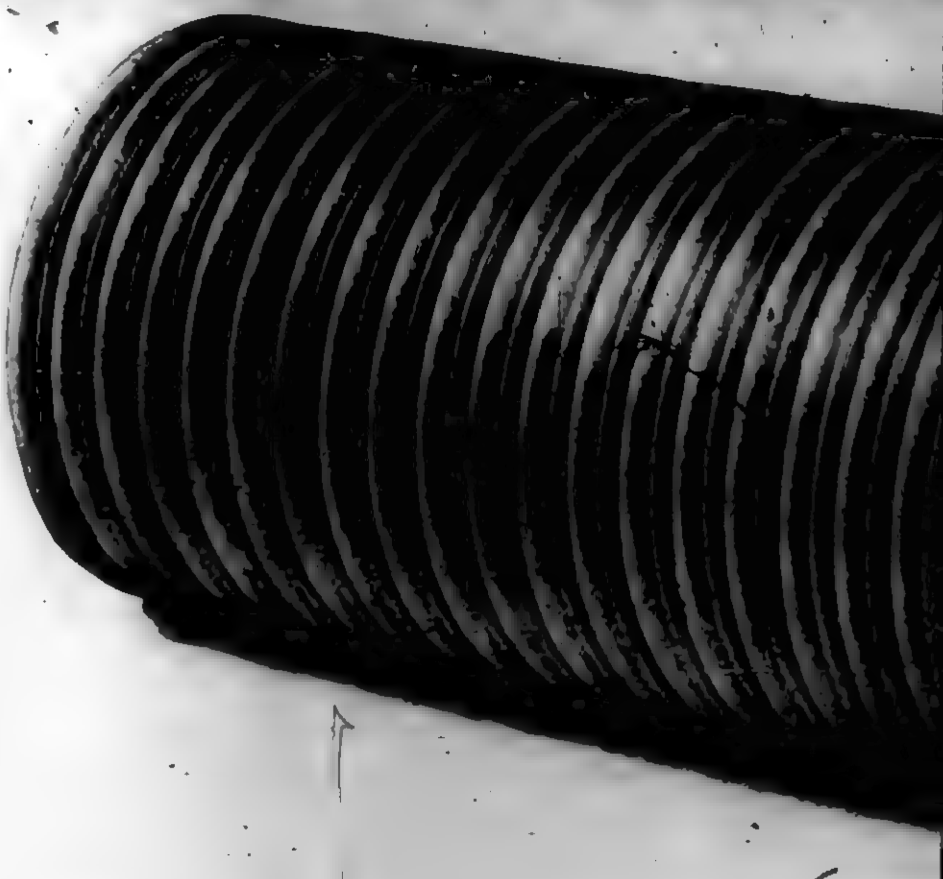
The system can allow file transfers from a customer's existing 7-bit Ascii word processing system or personal computer into the Keeps system, the vendor said. Users may change the type or size of fonts or other typographical elements as well as the size, proportion and position of graphics. Users may also preview how those changes will affect the document and how the document will look when printed out.

Software includes Interleaf, Inc.'s Workstation Publishing System for composition, Marc Software's Wordmarc word processing package and Kodak's proprietary software for linking the products and programs, the vendor said.

The system, the base configuration of which costs $50,000, is geared

See KODAK page 11

For fast relief



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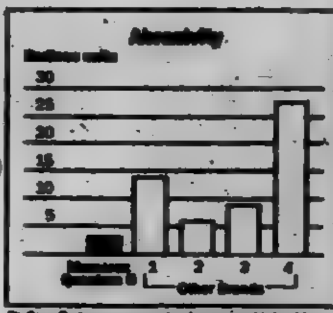

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Reagan tax reform proposal could raise hardware costs

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — President Reagan last week unveiled a major tax reform proposal that would slightly increase the cost of purchasing or leasing computer hardware, because the proposal would repeal the 10% investment tax credit for equipment.

James F. Benton, executive director of the Computer Dealers and Lessors Association (CDLA) here, confirmed that third-party lessors are likely to pass the increased cost from the loss of the tax credit along to customers. Likewise, users with tax liabilities who purchase hardware will lose that credit, thus increasing the after-tax cost of the computer by 10%, he said.

Explaining the tax reform proposal, Reagan said, "We are determined to cut back on special preferences that have too long favored some industries at the expense of others. We would repeal the investment tax credit and reform the depreciation system. Incentives for research and experimentation, however, would be preserved."

Reagan administration officials said repeal of the tax credit is needed to eliminate the investment bias in favor of equipment that qualifies for the credit and to eliminate the complex rules that define what is and what is not eligible for the credit.

Besides repeal of the investment tax credit, key provisions of the proposal include the following:

- The top corporate income tax rate would be reduced from 46% to 33%.
- The existing 25% tax credit for increased investments in research and development would be extended for an additional three years (until Dec. 31, 1988) and would be revised to target research that is likely to result in technological innovation.
- The maximum effective rate of taxation on capital gains would be 17.5%, compared with 20% under existing law.
- The accelerated depreciation system enacted in 1981 would be replaced with a Capital Cost Recovery System (CCRS) that is indexed for inflation. Computers, depreciated in five years under existing law, would be placed in Class 2 of CCRS, which provides cost recovery in five years at a rate of 44% in the first year and 44% of the remainder in each subsequent year.

The good news, CDLA's Benton said, is that the Reagan administration not only abandoned its previous plan to increase the depreciation on computers from five years to eight years, but it also revised the depreciation system so that roughly 79% of the investment can be depreciated in the first three years (assuming a 5% inflation rate).

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KODAK

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to office or in-plant environments within Fortune 500 companies, the vendor said. It will be marketed initially in Kodak's regional marketing centers, including New York; Washington, D.C.; Chicago; Houston; and Los Angeles and will be available nationwide in 1986, a spokesman said.

The Keeps system that is being marketed at this time includes Version 1 of the company's software. The system that will be available by the end of the year reportedly will include Version 3 of the software, which will add functions such as graphics scanning, scanned image editing and multicolumn capabilities.

Kodak also preannounced its Kodak Image Management System (Kims) that is under development. The system is said to convert passive microimage files into active records that users can annotate as required. The Kims system — which will cost in the neighborhood of $460,000 — will be targeted at businesses with large data processing and document record-keeping requirements, like insurance and engineering firms, financial institutions and government agencies.

> *The Kims system — which will cost in the neighborhood of $450,000 — will be targeted at businesses with large DP and document record-keeping requirements.*

The system, which will be based on one of Digital Equipment Corp.'s VAX series machines under DEC's VMS operating system, is part of a joint development effort between Kodak and DEC, a DEC spokesman said. In its final form, the system's components will be networked on a Decnet-style local-area network and will be able to access data from IBM mainframes, a Kodak spokesman added. The system's autoloader machine is said to store 250 microfilm cassettes, or 3½ million pages of microfilm.

More information is available from Eastman Kodak, Rochester, N.Y. 14650.

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MADONNA

from page 1

In its May 20 verdict, the jury agreed with Madonna's charge that NCR configured his Model 499 business system with a cassette tape unit that the vendor knew was insufficient in both capacity and access speed.

But in the same verdict, the jury also rejected Madonna's complaint against Lincoln Marini and Associates, Inc., a Fresno, Calif.-based program developer that was named as NCR's codefendant in the suit. When the plaintiff filed his legal action in May 1979, he accused Lincoln Marini of breaching its contractual obligations to tailor NCR's Construction Management System (CMS) package to Madonna's individual specifications.

The jury, however, absolved Lincoln Marini of any negligence in the case and blamed Madonna's own mismanagement for the programmer's failure to rewrite CMS' four application modules effectively, according to Wendt.

The jurors also accepted NCR's contention that the vendor "had, in fact, performed its contract with Madonna," Wendt said.

But in an accompanying decision that the defense lawyer labeled "inconsistent," the jury found the systems maker guilty of intentionally overstating the 499's technical capabilities, particularly those of its cassette unit.

"[NCR] didn't know or care whether the system was going to work for Madonna's construction company," according to the plaintiff's attorney, Marty Tangeman. "[NCR] decided a [cassette-equipped 499] was the right machine for my client because [it] had a software package for it, and [it] didn't have a package for any other machine. So [NCR] went ahead and sold it to him."

To support his charge, Tangeman cited NCR's alleged failure to analyze Madonna's systems requirements. "According to trial testimony, the first thing a vendor does before it configures a customer's machine is perform a systems analysis and survey the user's needs," he said. "Nothing of that sort was ever done in this case by NCR."

Evidence of NCR's alleged disregard for systems requirements is also present in the company's own internal sales documents, which suggest that cassette-based 499s are aimed at much smaller users than Madonna's firm, Tangeman said in court papers.

Such revelations apparently played a key role in convincing the jury that NCR had intentionally misrepresented the 499's capacity. Under California law, any business that knowingly deceives customers about its products or services becomes liable for punitive damages, which in NCR's case totaled $5.2 million.

In his complaint, Madonna portrayed his cassette-based 499 as a system so ill suited to its intended application that it reportedly prevented him from producing any job-cost reports for all of 1978. "For a construction company, job-costing reports are an essential management tool," Tangeman explained. "They're the only way a contractor can tell where he's having problems with a construction project and what he should do to correct them."

Even after 1978, when the reports finally became available, the system's storage capacity remained so restricted that it was unable to hold all the job-cost information Madonna needed to run his business effectively, Tangeman said.

Between 1978 and 1982, the absence of reliable job-cost data reportedly saddled Madonna's once-profitable firm with $7 million in losses, the defendant claimed.

Half a million in damages

Although Madonna sought restitution for the full amount, "the jury could pinpoint only half a million dollars in direct damages," said Tom Beisman, a Los Angeles-based consultant who closely followed the case.

Even so, NCR attorney Wendt termed the judgment "a clear example of a jury gone amok. We feel this type of punitive damage is becoming all too common in California and is beginning to hurt the business community."

Wendt also blamed Madonna's claimed business losses on the user's own mismanagement, rather than on the purported shortcomings in NCR's system, and disputed allegations that the 499's cassette module was too small for the construction company's volume.

REFORM

from page 11

Several of the provisions are more favorable to high-technology industries than the proposal made by the U.S. Department of the Treasury last year. For example, the Treasury Department plan would have taxed all capital gains as ordinary income, indexed for inflation, but that proposal was strongly opposed by venture capitalists and electronics firms.

William G. Moore Jr., chairman of the American Electronics Association, said the group will work aggressively for passage of the legislation and was particularly pleased by the capital gains tax cut and the R&D tax credit provisions.

Charlotte LeGates, spokeswoman for the Computer and Business Equipment Manufacturers Association (Cbema), said Cbema members had mixed reactions to the Reagan plan. On one hand, she said, they endorse the general concept of tax reform to reduce their high effective tax rates and support retention of the R&D tax credit. On the other hand, she said, they are very troubled by a complex provision that provides for the transition from the existing depreciation schedules to the new CCRS, which, she said, may increase taxes for the computer industry.

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Microrim implements user suggestions in Rbase upgrade

FIRST USER

By Paul Korzeniowski
CW Staff

The early users of Microrim, Inc.'s Rbase 5000, a data base management package that runs on the IBM Personal Computer, feel like proud parents. The users had worked extensively with Rbase 4000 and helped to conceive the new package.

"It didn't take me long to get Rbase 5000 up and running," noted Catherine Curtis, vice-president of research at Issaquah Group, Inc., a consulting and software firm in Orange, Calif. "I had sent Microrim a number of recommendations, and I wanted to see if they had been incorporated into the new product."

Curtis and other early users, all of whom received complimentary copies of the package, reported that most of their recommendations had been included in the new product. The package kept basic Rbase 4000 commands and functions but added a number of features.

Some new features centered on Rbase 5000's integrated report writer, which sold separately with Rbase 4000.

> 'A user can still customize the program, but he won't be able to change portions of the code that shouldn't be changed.'
>
> — Catherine Curtis
> Issaquah Group, Inc.

"With Rbase 4000, a user could only access one field in a report through a Lookup function," Curtis said. "With 5000, a user can access two or more fields and can combine a number of fields in a report."

Tom Mahon, industrial engineer at Construction Engineering Research Laboratories Corp. in Champaign, Ill., added that he is now better able to qualify data. For example, he can specify records with dates after January 1, 1985. "We can work with up to 10 qualifiers," he said. "Frequently, we use six or seven qualifiers."

John Harris, senior systems analyst at the personal computer support center for the city of Seattle, remarked that the report writer now supports subtotals and has made it easy for a user to set page formats.

Other enhancements consist of the package's ability to work with numbers. "There are extensive breaking and subtotal functions that allow you to develop accounting applications," Curtis claimed. "I would never use Rbase 4000 for an accounting application."

The experienced users have worked with Rbase 5000 to develop stand-alone applications for both themselves and end users. "We have 750 rifle range training facilities," noted Mahon whose company furnishes consulting services for the U.S. Army Corps of Engineers. "We have written a number of applications to schedule training times, track ammunition and automate other administrative functions."

Seattle's Harris wrote applications to track health organization clients, consultant services used by various departments and the status of a number of city contracts.

Issaquah's Curtis claimed that Rbase 5000 features enhanced applications development capabilities. "After you have written a program, you can designate certain portions of the code so a user cannot alter them," she said. "A user can still customize the program, but he won't be able to change portions of the code that shouldn't be changed. This feature is a valuable tool for an MIS manager who wants to retain some control over an application."

In addition to being a powerful tool for applications developers, early users said the package was simple enough for novices. Rbase 5000 features Application Express, which generates an application from a user's menu-driven input. "Novices seem to be comfortable with words like Select, so Rbase's command language is much clearer than that of other data base packages," Seattle's Harris said.

The users had worked with other data base management packages before deciding to use Rbase. "I worked with [Ashton-Tate's] Dbase II and found that it was unreliable," Curtis said. "There were a lot of bugs in the product." Harris added, "It would take 20 minutes for Dbase II to run an application that would run in a few minutes with Rbase."

Since many of their suggestions had already been incorporated into Rbase 5000, users cited few needed enhancements. "It would be helpful if Microrim's Clout (a natural language interface) was more closely integrated with Rbase 5000," Curtis concluded. "If it were, a developer could write applications that work with an English interface. Now, Clout can only be used to query a data base."

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Life on the hot line provides long-distance debugging

Most problems solved in 15 to 20 minutes

By Charles Babcock
CW New York Bureau

The phone rings.

'Hello, John? That bug was supposed to have been cleaned up in that version. Let me check engineering.'

It rings again, almost immediately.

'What version are you using, 83.1? Uh-huh. That's a known thing. There's a way to turn that off.'

So goes another day in the life of hot-line specialist Patricia O'Brien, one of 12 technical assistants at the Princeton, N.J., offices of Martin Marietta Data Systems. O'Brien answers hot-line calls on Martin Marietta's Ramis II, a data base management system, report generator and fourth-generation language package. As a specialist on how the software interfaces with IBM's IMS product, she gets some of the toughest calls.

"Sometimes, people are upset when they call in, but most are pretty reasonable," O'Brien said in a recent interview at her office. In fact, once, when she resolved a particularly nettlesome problem, the caller sent her a bunch of roses.

Another Martin Marietta technical assistant, Irving B. Kantor, appeared unflappable as he listened for several minutes to a caller's problem.

"'Define' is already active because you activated it before you went through the files," he advised the caller.

Most calls are handled on the spot in a 15- or 20-minute consultation. A few, said Sue Goldberg, the Martin Marietta hot-line manager, can take most of an afternoon.

The hot-line technical assistants have a full library of reference manuals to back up their hunches on what may be wrong in a user's environment, and they frequently refer to the monthly engineering bulletins that are sent out to users advising them of special conditions and potential bugs.

Quick response helps

But there is no substitute for the knowledge in their heads or at their fingertips. It is the immediacy of their responses that helps convince callers that there is help at the other end of the hot line, Goldberg said.

Goldberg, 40, is a six-year veteran of manning hot lines, and when the traffic is heavy at Martin Marietta, she sets aside whatever she is doing and picks up the phone herself.

After identifying one caller's problem, she counseled, "I don't think we can zap it [do a quick change to the program code over the phone]. That's a problem that's been in the system for many releases."

A concern Goldberg shares with other hot-line managers is that "it's tough to talk to people only when they have a problem," she said.

"You can't expect a person to answer a phone eight hours a day. You lose empathy because you're not talking face to face," said Kenneth M. Schultz, manager of client services at Management Science America, Inc. in Atlanta.

Once, Goldberg recalled, she believed she was not making any headway on solving a problem with a caller and asked if she could talk to his systems programmer. "I am the systems programmer," he told her.

Such incidents underline the difficulty of long-distance dealings and "make you feel about this tall," Goldberg said, indicating a small amount with her hand.

On the other hand, some callers whom she has helped before, knowing her fondness for chocolate, include a one-pound bag of M&Ms when they send her a program dump.

In looking for people to staff the Martin Marietta hot line, Goldberg said, she looks for complementary personalities, and users frequently deal with the technical assistant of their choice.

Some assistants come out of other support roles in the firm, and some have programming backgrounds. But if an applicant tells Goldberg he loves to sit at a terminal and write code, "you know you've got the wrong person," she said. "You must be able to listen to people."

PROBLEMS

from page 1

"We asked one caller to copy the diskette he was using and send it to us. He went straight to the Xerox machine and copied it," Schultz said.

Troubleshooting is as much identifying the problem as it is finding the fix, Wright said. "It's kind of a mutual process. We are probing for information that the client may not feel is useful, but we have to put the pieces of the puzzle together," he said.

Frequently, the caller thinks he has encountered a bug in the software, and all three managers acknowledged that no major software package goes out bug-free. But "almost every environment is unique in some sense. The hardware or disk drives will be different," Wright said. Changes in the operating system, releases of the software or flaws in the way the package is installed can all lead to unexpected kinks, he said.

> *There remains no substitute for close, two-way communication.*

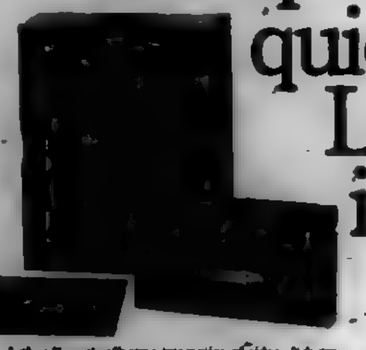
Although problems vary with the product, the three managers agreed to a large extent on the things a caller should be prepared to tell a hot-line troubleshooter. These include the following:

- What release of the product is being used? An eight-year-old package like Martin Marietta's Ramis II, with a fourth-generation language, data base management system and other components, has averaged two releases a year. Each has its modifications and idiosyncracies, and these are logged in bulletins and reference manuals, Goldberg said.
- What operating system is it running under? What version of the operating system and compiler is being used? Complicated software packages can have different idiosyncracies under different operating systems, Schultz said.
- If you are getting an error message, what is it? What is the exact wording? What is its number? Is it a message from the program or from the operating system?
- What part of the package are you using? A frequent cause of a program not doing what it is expected to do is the user following directions for one component while working in another, the three managers noted.
- How much memory are you using? If you are running a big application program, has it worked before? "Something that works with 10,000 records may not work with 100,000," Goldberg said.

Even after these questions have been answered, it can still be difficult to isolate the problem. In that case, all three vendors either ask to log on to the user's system through their own terminals and modems or try to simulate the problem on their own system.

At MSA, troubleshooters can duplicate problems under two different operating systems running on an IBM 3081 or 3033 mainframe, Schultz said.

A last resort is to ask the user to dump the program to the printer and send a printout to the troubleshooter.



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Private-sector computer crime bill faces fire at hearing

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Rep. William J. Hughes (D-N.J.), chairman of the U.S. House Subcommittee on Crime, is plowing ahead with new computer crime legislation covering the private sector. But at a recent hearing, he faced criticism from the U.S. Department of Justice about specific provisions of his bill.

Taking the first step in the legislative process, Hughes chaired a May 23 hearing on his bill (H.R. 1001), which would create felony and misdemeanor offenses for computer crimes that produce illegal gains of $5,000 or more in one year and that affect interstate commerce.

Hughes said the U.S. government and the private sector have a dual responsibility in the area of computer crime. "Industry has to develop 'locks' to protect the intangible property in computer systems, and, when a federal interest is involved, the federal government has to provide the laws to prosecute those who break those locks and enter the systems," he said.

Hughes said the bill would restore provisions stripped from his comprehensive computer crime bill last year. In the closing days of the 1984 session, Congress enacted the Computer Fraud and Abuse Act to cover U.S. government computers and certain financial data bases [CW, Oct. 15].

At the hearing, Deputy Assistant Attorney General John C. Keeney said the Justice Department supports the goal but not the specific language of the Hughes bill. For example, Keeney said, the $5,000 financial gain requirement would hamper federal prosecutors because the amount of any financial gain may be difficult to prove.

Hughes responded that the $5,000 threshold was used to trigger federal jurisdiction, leaving lesser crimes to state and local authorities. Hughes said he would "take a second look" at the financial threshold.

Keeney urged that the computer fraud offense be rewritten so that it tracks the well-established mail fraud and wire fraud statutes and not require prosecutors to prove the defendant lacked authorization or that the offense affected interstate commerce.

Hughes

In a more conciliatory tone, Keeney said these and other suggested changes were technical modifications intended to make computer crimes easier to prosecute.

A representative of the Association of Data Processing Service Organizations, Inc. (Adapso) generally supported the Hughes bill but opposed the $5,000 threshold.

"While we understand the reasons for the dollar threshold, such a stated limitation may send the wrong message to 'hackers' and truly professional criminals . . . [by] implying that low-dollar computer crimes are tolerable," testified Adapso member P. Michael Nugent, government affairs counsel for Electronic Data Systems Corp. and representative of Adapso at the hearing.

George M. Minot, senior vice-president of Compuserve, Inc., testified on behalf of the Videotex Industry Association that the Hughes bill should be broadened to include such acts as password theft and attempted computer crimes.

Representatives of the American Civil Liberties Union and the American Society of Newspaper Editors expressed concern that the Computer Fraud and Abuse Act of 1984 may inhibit government whistle-blowers from disclosing computer-stored information about fraud and abuse in federal programs. The law makes it illegal to gain unauthorized access to information stored in a government computer and then disclose the information.

Meet to examine optical memory

TOKYO — Alan E. Bell, optical media researcher at the IBM Research Laboratory in San Jose, Calif., will be the keynote speaker at "The First International Conference in Japan on Optical Memory Technology," on Oct. 2-4 at the Keidanren Kaikan here.

Bell's address on "The Status of Reversible Optical Storage" will discuss both magneto-optic and phase-change technologies.

Seventeen speakers from around the world will discuss various aspects of optical memory technology. The conference is geared to technical, marketing and planning people in vendor and end-user organizations.

The conference fees are $715.50 before Sept. 1 and $795 after that date. The bound copy of the proceedings of the conference will cost $295.

More information is available from Technology Opportunity Conference, P.O. Box 14817, San Francisco, Calif. 94114.

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Why key DP/MIS managers are keeping RCA Cylix a secret.

WASHINGTON UPDATE
CW Washington Bureau

Board charges Treasury with failure to seek bids

WASHINGTON, D.C. — A federal appeals board recently ruled that the U.S. Department of the Treasury violated federal law last year when it tried to buy a $4.2 million package of IBM hardware without seeking competitive bids.

The ruling was issued by the General Services Administration's (GSA) Board of Contract Appeals, which settles disputes concerning government computer contracts.

In December the Treasury Department's Financial Management Service sought to buy an IBM 3081 mainframe, 16 IBM 3380 disk drives and eight IBM 3420 tape drives from the Federal Home Loan Mortgage Corp. (Freddie Mac), a government-chartered corporation. Treasury Department officials classified Freddie Mac as a federal agency, and thus could acquire the used hardware as an interagency transfer without seeking other bids.

Amdahl Corp. of Sunnyvale, Calif., which sought to sell its plug-compatible hardware to the Treasury Department, protested the arrangement on grounds that federal procurement regulations require "maximum practicable competition."

In a May 16 decision by the appeals board, Administrative Law Judge Cyrus E. Phillips IV said Freddie Mac is not a federal agency, and thus the Treasury Department should have sought more bids. Phillips also revoked GSA's authorization for the Treasury Department to purchase a computer.

Bomb blast at Berkeley injures student; suspects, motive lacking

BERKELEY, Calif. — Investigators say they have no leads, suspects or possible motives for a booby trap bomb explosion in a University of California computer terminal room here May 15.

The explosion, the second such incident in three years in the same building, seriously injured the University of California electrical engineering graduate student who accidentally set it off. John Hauser, 26, of Richmond, Calif., suffered the loss of three fingers and sustained potentially permanent damage to his right eye when he ignited the bomb by opening the plastic box that housed it. He remains hospitalized in good condition.

"We think this was intended to maim or kill somebody, but other than that, we have no motive," said Sgt. Calvin Handy of the University of California at Berkeley Police Department. The campus police department, a fully authorized municipal force, is working with the San Francisco office of the Federal Bureau of Investigation on the case.

The bomb exploded in a room that housed four terminals linked with one of the Electrical Engineering and Computer Science Department's Digital Equipment Corp. VAX-11/750 minicomputers. Hauser had been working on an IBM Personal Computer for approximately four hours when he decided to open the package at about 1:30 p.m., according to Ruth Toby, the academic department's office manager.

The bomb was contained in a 3- by 6-in. plastic box with a three-ring binder attached to it by a rubber band. Toby said the box had been in the room for several days, and a maintenance employee, assuming it belonged to a student, had placed it on a table next to the IBM micro.

Electrical engineering Prof. Diogenes J. Angelakos suffered less serious hand injuries July 2, 1982, when a bomb exploded in a lounge area on a different floor of the same building that was the site of the most recent incident. Police are investigating a possible connection between the two events.

Congress lifts daily log rule for home micro tax write-offs

WASHINGTON, D.C. — The U.S. Congress recently enacted legislation repealing the strict record-keeping requirements for making business tax deductions for home computers, a provision enacted last year.

In the Tax Reform Act of 1984, Congress required daily logs to show that a microcomputer is used for business purposes more than 50% of the time in order to qualify for business depreciation and tax-credit benefits [CW, July 2]. But legislators and their constituents considered the log-keeping rules for computers and those for automobiles burdensome.

The repeal legislation deletes the word "contemporaneous" from the record-keeping rules and reverts back to pre-1984 tax law. However, beginning in 1986, taxpayers must have "adequate records or sufficient evidence corroborating their own statements" to substantiate deductions or credits, according to the legislative report.

Bulletin board holds status of licenses to U.S. exporters

WASHINGTON, D.C. — U.S. exporters who need to check the status of the Pentagon's review of their export license applications can obtain that information via an electronic bulletin board, officials said recently.

The Export License Status Advisor (Elisa) contains dual-use export license applications that the Department of Defense has received since April 19, as well as general messages about export licensing matters. The department reviews certain high-technology exports destined for Soviet bloc countries.

Elisa is updated daily and requires first-time callers to assign themselves a password that will be required for all later system uses.

NBS invites applications for robotics research grants

WASHINGTON, D.C. — The National Bureau of Standards' (NBS) Center for Manufacturing Engineering recently invited researchers to apply for financial grants for research on robotics and factory communications systems.

NBS officials said grants can be awarded for research in real-time control of robots and workstations, sensory systems, factory floor communications networks, distributed data management on the factory floor, robot metrology, robot vision and sensory modeling, application of expert systems and artificial intelligence to automated manufacturing systems, software engineering tools and quality control issues.

More information can be obtained from Philip Nanzetta, Automated Manufacturing Engineering Facility, Room B-12, Metrology Building, NBS, Gaithersburg, Md. 20899.

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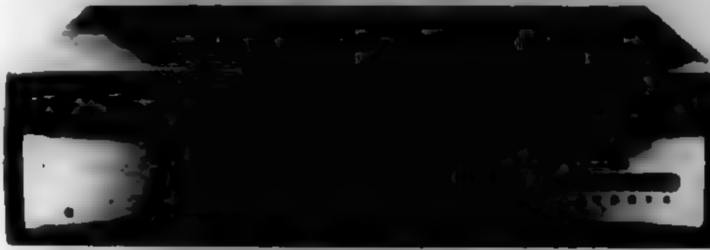

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DSS use ranging from modeling to integrating software

By Maura McEnaney
CW Staff

WASHINGTON, D.C. — Users' perceptions of appropriate decision support systems (DSS) range from completely integrated software functions to generic modeling structures.

That was the view of attendees at a seminar on DSS held here recently.

When Union Gas Ltd. was involved in a bitter takeover battle earlier this year, the Chatam, Ont.-based utility company used a 15-year-old financial modeling package to supply top management with crucial information about the takeover.

Today, Michael Blain, coordinator for user services at Union Gas, wants to give end users at his company easy access to corporate data information so that they can use retrieval tools and more up-to-date modeling packages to make business decisions.

At the DSS seminar, sponsored by Digital Consulting Associates, Inc. here, Blain said he was looking beyond modeling packages, considering the implementation of fourth-generation languages and data base management systems at his company.

"I don't think the definition of DSS has really changed much," he said. "Maybe it's just that there are new ways of supporting decisions other than modeling."

Union Gas is currently using an IBM 3081 for decision support and applications development functions, he explained. Currently, the company uses IBM's APL language, ADRS and Informatics General Corp.'s Answer/DB to create mainframe applications for data retrieval and modeling. Union Gas' supply division uses decision support tools to monitor gas levels, forecast sales, run analyses and produce reports and documents for federal reporting requirements, Blain said.

At American Express International Banking, Assistant Vice-President Henry Mariotti said DSS would enable his end users to do various forms of financial modeling. Because it deals only in very high-dollar volume international transactions, the bank's technology needs are not as great as those of a retail bank, Mariotti explained. Recent conversions of international applications from a Honeywell, Inc. DPS 6 mainframe overseas to an IBM 4300 in the bank's New York office has prompted Mariotti to pursue end-user tools such as fourth-generation languages.

For other users at the seminar, the concept of an integrated system that can provide decision support, graphics and data management capabilities is too futuristic.

"We've got to move slowly to bridge the [technology] gap at the company," said Fred Kimball, business systems manager at American Optical Co. in Southbridge, Mass. The safety products and ophthalmologic company purchased an IBM 4381 in December and is just beginning some homegrown attempts to give end users information, Kimball said. Workers at American Optical only recently discovered they could access reports via overnight batch processing. And although that may be considered slow in more automated companies, "it's months sooner than [workers] thought they could get it," he said.

American Optical would consider generic DSS before it approached any kind of integrated solutions, according to Kimball. "There's so much that needs to be done; we've got to crawl before we can walk."

ASM disclaims VDT hazards

CLEVELAND — Add the Association for Systems Management (ASM) to the list of groups rejecting claims that potential health hazards are associated with VDT use.

The ASM, an organization of systems and data processing personnel, recently announced its conclusion that VDTs "pose no known health hazard to workers despite claims of possible adverse effects [associated with] long-term usage."

The association, which represents approximately 9,500 members, said it based its statement on results from research conducted over the past several years by scientists in the U.S., Canada and the UK.

Improper lighting or uncorrected eye problems can be the source of visual difficulties often associated with the use of VDTs, according to the ASM.

Similar statements refuting the possible dangers of VDT use have been issued by the National Institute for Occupational Safety and Health and the American Academy of Ophthalmology, the ASM said.

Nevertheless, 9 to 5, the National Association of Working Women and the Service Employees International Union are among several groups that have criticized VDT use, maintaining that precautions must be taken before concrete evidence on the safety of the machines is available.

Legislation regulating VDT use was filed in more than two dozen states this year. Two states — California and New Mexico — recently adopted purchasing guidelines for state agencies that are acquiring VDTs.

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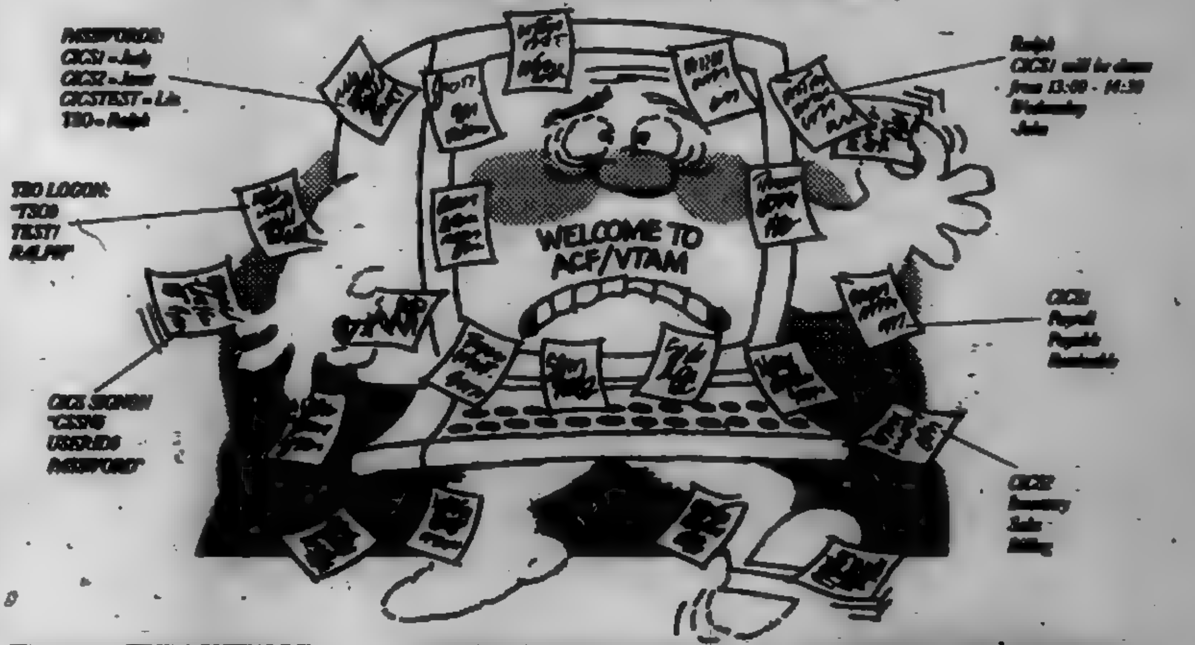

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DSS playing larger part in end-user productivity

By Maura McEnaney
CW Staff

WASHINGTON, D.C. — While they continue to play an important role in developing business modeling applications, decision support systems (DSS) today are increasingly being considered as end-user productivity tools, attendees at a recent seminar here were told.

"DSS is a critical subset of end-user computing," John Wark, director of systems software for Walker Interactive Products, Inc. said at a Digital Consulting Associates, Inc. seminar on DSS.

Wark, who conducted the seminar, defined DSS as "interactive systems that allow non-computer professionals to solve unstructured problems." Those problems, he said, can exist anywhere in the corporate structure, permitting DSS to be used in a variety of areas, including inventory control, production scheduling, tax planning, payroll analysis or production planning.

"DSS is no longer a modeling domain reserved for a set of specialists," Wark said. "Everybody realizes there is a need to implement effectiveness in decision making." That effectiveness will come when the end user works with DSS applications through the support of the information center, Wark said.

Aiding the decision maker

Today's DSS are aimed at aiding, not replacing, the decision maker, Wark said. "We can't identify the decisions we are trying to make without [the help of] humans," he said. DSS today must be easy to use, incorporate modeling analysis and take advantage of query and retrieval tools such as fourth-generation languages.

"Whether it is the marketing manager or the chairman of the board, there is a large need to meet the day-to-day needs of organizations," Wark said. Information reporting functions are essential for those day-to-day operations, according to Wark.

Programmer-oriented high-level languages and structured methods for developing applications will help but will not eliminate the problem of applications backlog and high end-user demand.

DSS technologies today incorporate data retrieval functions, data base management, analytical tools, forecast modeling, reporting and graphics functions, according to Wark. "The thrust in the marketplace is integrated technologies," he said.

Vendors that once supplied strictly modeling tools are being forced to provide data management capabilities in their products, while data management products are having modeling added as a capability, Wark explained.

Communication functions, or the ability of the program to convey results to the user, are crucial for DSS programs, he said. "The communication aspect of DSS is often overlooked. If you can't effectively communicate the [program] results, you are going to find it very difficult to get [managers] to support the decision."

More important, Wark said, are the "people issues" involved with DSS implementation.

Implementing DSS means a new relationship between data processing and the end user, who can now do modeling without the help of MIS. It also means potential conflicts among end users who are accustomed to informal information sharing.

Approaching the user with a service-oriented attitude is the best method for calming some hostilities, according to Wark. Relationships between working groups must also be formalized, he explained. Workers must get out of the user areas to discuss their working relationships, he said.

DP facilities listing out

NEW YORK — Computer Management Research, Inc. has announced the release of its "Mid-Atlantic States Directory of Computer Installations," which lists information about data processing departments in Pennsylvania, Virginia, Maryland, the District of Columbia, West Virginia and Delaware.

The 320-page directory includes company, division, address, type of industry, main telephone number, key data processing personnel, type of hardware, type of applications running, future purchasing plans and number of data processing employees at more than 16,000 installations. The manual contains 133 cross-references.

The book costs $295. Another directory, announced in January, lists New York, New Jersey and Connecticut installations and costs $370.

Computer Management Research is located at 20 Waterside Plaza, New York, N.Y. 10010.

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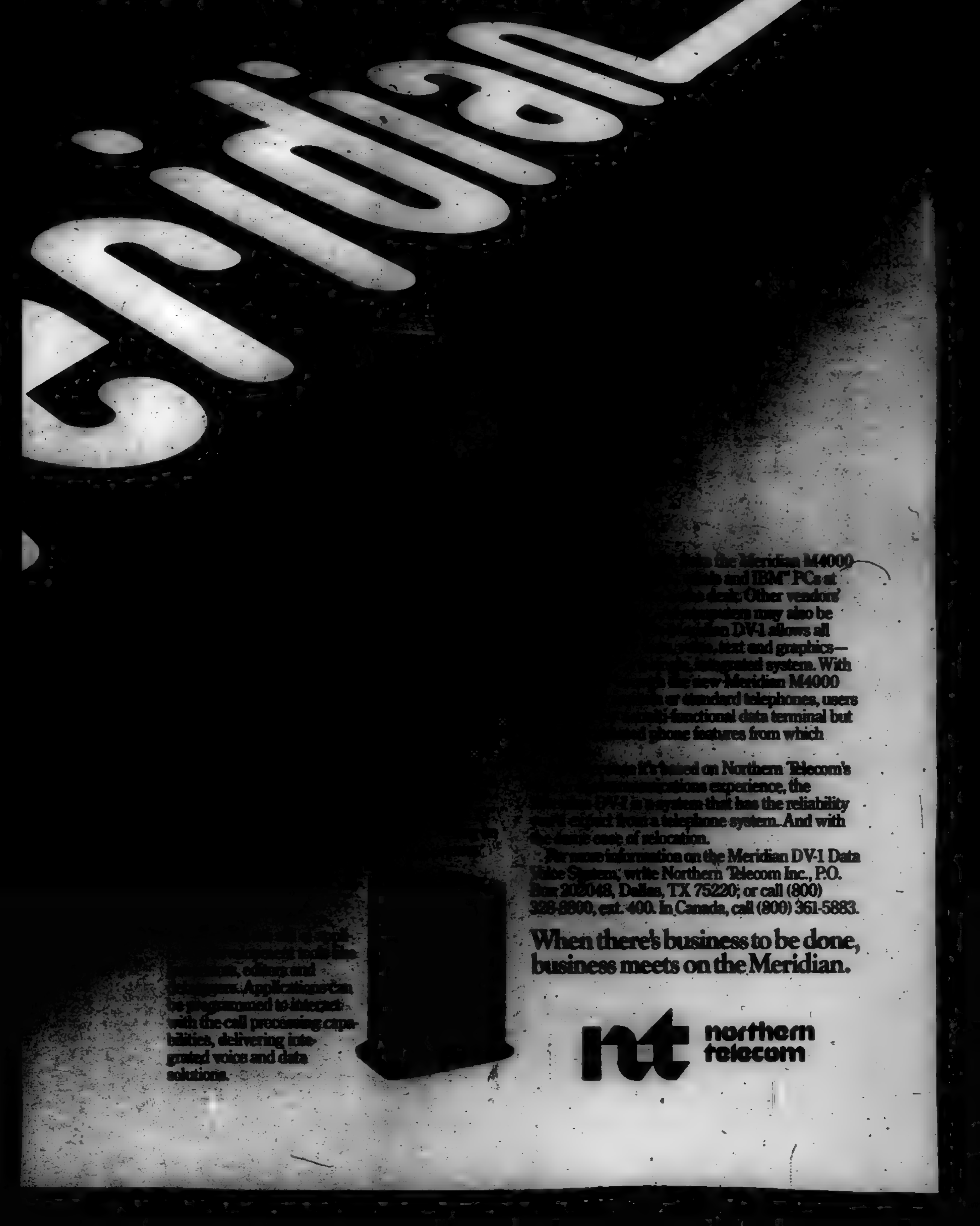

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NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

SYDNEY — IBM raised more questions about its strategy for dealing with AT&T's Unix than it answered at the recent Unixworld Expo '85 conference held here recently. Lief-Erik Kristiansen, a project leader for IBM's IX/370 version of Unix, confirmed IBM's support of AT&T's System V, Release 1 of Unix.

Kristiansen also noted that IX/370 was not a replacement for any existing IBM operating systems but rather an option that enables the vendor to offer IBM products to the growing Unix user community. Conference attendees were left confused by IBM's seemingly independent foray into the Unix arena.

CHINA

BEIJING — Tianjin Computer Corp. announced that it will begin mass-producing 16-bit microcomputers here under the terms of a recently signed agreement between General Robotics Corp. and the Coordinating Committee for International Security Export Control in Paris.

JAPAN

TOKYO — Toshiba Ltd. has acquired 20% of Ing. C. Olivetti & Co.'s subsidiary here. The terms of the agreement cover different areas of cooperation, including the availability of Toshiba products for sale by Olivetti Co. of Japan's worldwide organization.

Under the agreement, Toshiba will help Olivetti sell its product line in Japan.

Meanwhile, Ing. C. Olivetti has purchased 49% of Start Computer Center GmbH of Munich, West Germany. Olivetti's interest in the computer retailer is said to be part of its strategy to become active in the retail form of distribution. The Italian company has already invested in other computer store franchises in the U.S., the UK and Italy.

■

TOKYO — NEC Corp. has introduced an Intel Corp. 80286-based machine here, signaling the beginning of what is expected to be a wave of IBM Personal Computer AT clones here. The PC 98XA machine is part of the vendor's PC 9800 series and works with both CP/M 3.1 and MS-DOS 3.1, NEC claimed. NEC's PC 98XA has a screen resolution of 1,120 by 750 pixels and a standard main memory of 256K bytes, expandable to 768K bytes. The system uses 5¼-in. floppy disks with 1M-byte capacity. The NEC machine is reportedly IBM Personal Computer XT compatible.

■

TOKYO — Fujitsu Ltd. has announced an expert software system called Eshell, which runs on its Facom M series of mainframes, S-3000 series of superminicomputers and Alpha and Lisp processors. Eshell is said to be a simplified program language for users unfamiliar with artificial intelligence or inference systems.

■

TOKYO — Japan's Ministry of International Trade and Industry (Miti) will reportedly form an industry information center to develop protocol standards for microcomputer communications. Miti is presently recommending the business protocol standard, which is based on layers of the International Standards Organization's Open Systems Interconnect model. At the same time, however, Japan's Ministry of Post and Telecommunications here has embraced a different protocol.

WEST GERMANY

HAMBURG — A shortage of qualified personnel is the most pressing problem for DP managers here.

According to Heinz Streicher of the consulting firm SCS GmbH, which conducted a poll on the subject, this situation will not improve in the foreseeable future. Finding experienced analysts and DP managers presents the biggest problem, Streicher said, and most companies (58%) wind up promoting people to these slots from within the organization. The policy in 80% of West German DP departments is to encourage continued education and training for their employees.

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CALENDAR

WEEK OF JUNE 30

JULY 2-6, SINGAPORE — Compata '85: Fourth International Exhibition on Computer and Information Processing Technology for Asia. Contact: ITF PTE Ltd., Suite 12-03, One Maritime Square, World Trade Center, Singapore 0409.

JULY 3-7, PARSIPPANY, N.J. — CICS Command-Level. Contact: Chubb Institute, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 5-6, NEW YORK — IMS Recovery and Restart. Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001

WEEK OF JULY 7

JULY 8, PARSIPPANY, N.J. — Introduction to the Personal Computer and Personal Computer Software for General Business Audiences. Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 8-9, BOSTON — Successful Teleconferencing Systems. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 8-9, WASHINGTON, D.C. — International Arms and Technology Transfer. Contact: Technology Marketing Society of America Seminars, c/o Technology Training Corp., Department IATT, P.O. Box 3608, Torrance, Calif. 90510.

JULY 8-10, PARSIPPANY, N.J. — Job Control Language. Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 8-10, BALTIMORE — CICS Command-Level Programming. Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

JULY 8-19, CHICAGO — Pick Operating System Workshops and Seminars. Contact: Jonathan E. Sisk, JES & Associates, Inc., P.O. Box 19274, Irvine, Calif. 92713.

JULY 9-10, SAN FRANCISCO — Data Communications II: Digital Communications Systems. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 9-10, PARSIPPANY, N.J. — Introduction to DOS for General Business Audiences. Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054

JULY 9-11, SAN FRANCISCO — Telecommunications Management. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 10-12, SAN FRANCISCO — Local-Area Networks for the IBM World. Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

JULY 10-13, LAS VEGAS — The 60th Annual Convention and Trade Show of the National Office Machine Dealers Association (Nomda). Contact: Matt Kaufman, Nomda, 810 Lively Blvd., Wood Dale, Ill. 60191.

JULY 11-13, TAIPEI, TAIWAN — Asia-Pacific Regional Information and Micrographic Management Congress. Contact: International Information Management Congress, P.O. Box 34404, Bethesda, Md. 20817.

JULY 11-12, DOOR COUNTY, WIS. — First Annual Midwest Summer Computer Conference. Contact: Technology Consulting Corp., P.O. Box 43, Sister Bay, Wis. 54234.

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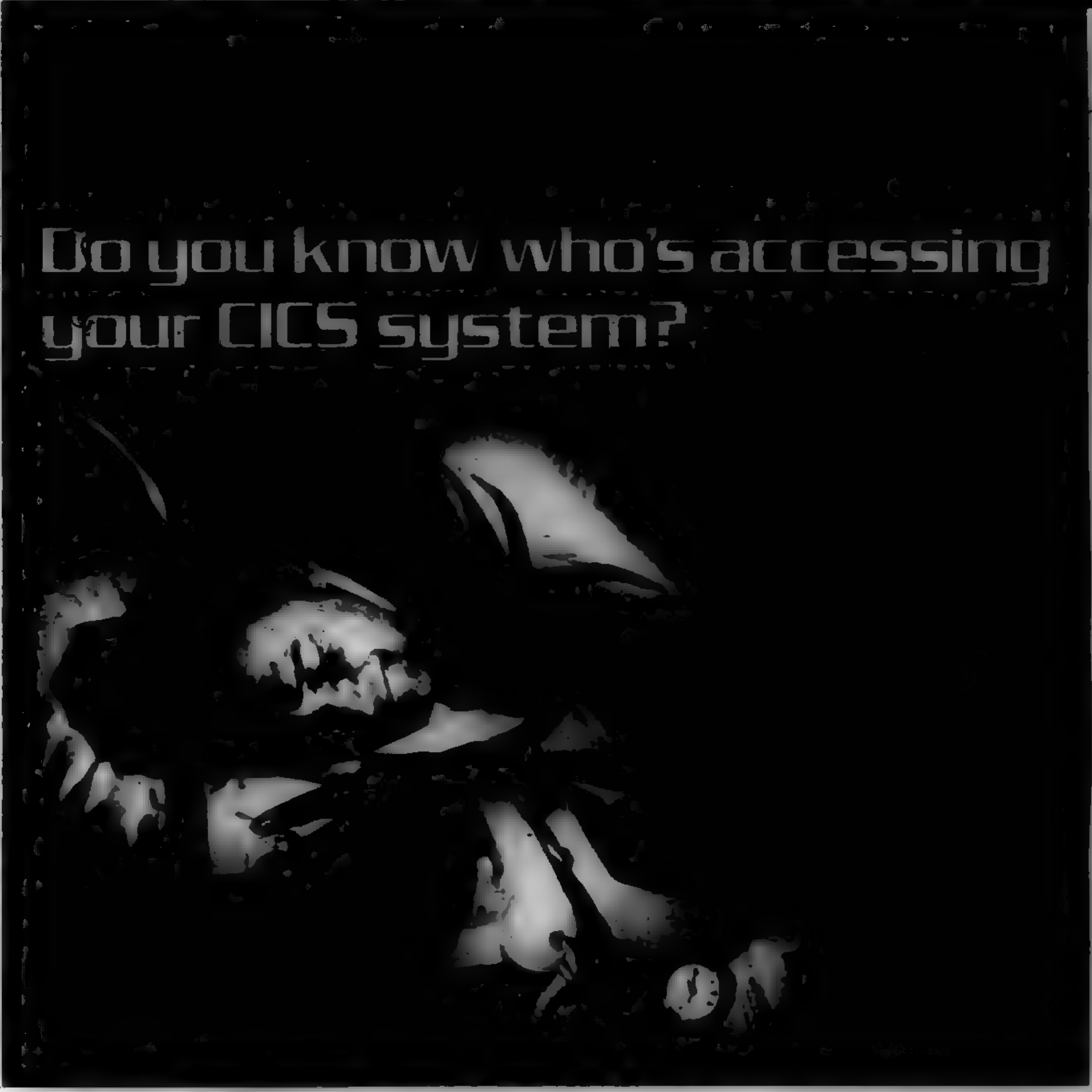
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EDITORIAL

Different breed moves into MIS

It sounds good: Chief Information Officer. CIO. It's the last step, the top of the heap, everything you've worked and sweated for all these years.

But it's probably not for you.

If you're a traditional DP manager from a traditional DP track, the job of CIO will probably go to someone else — someone with a broad business background — and that's hard to take. Here's a job that in many cases hasn't even been defined yet, except to say that it deals with the strategic, corporate use of DP, and people like the high-level task force that designed the job at FMC Corp. in Chicago [CW, May 13] are saying it shouldn't go to a DP manager.

Why not?

Most of the reasons have to do with the role the CIO plays in the corporation. The CIO is often a job created by demand at the top, by a recognition of the need for information about the company's business to be handled as a profit item in a strategic manner and on a companywide basis.

The CIO is a different breed, looking at the MIS department's information product as just that, a product, and at the company's information resources as just that, resources. His role revolves around strategic planning and standards setting for companywide information systems.

William Synnott, CIO at The First National Bank of Boston, described in a recent interview [CW, May 13] three major roles a CIO must be able to play:

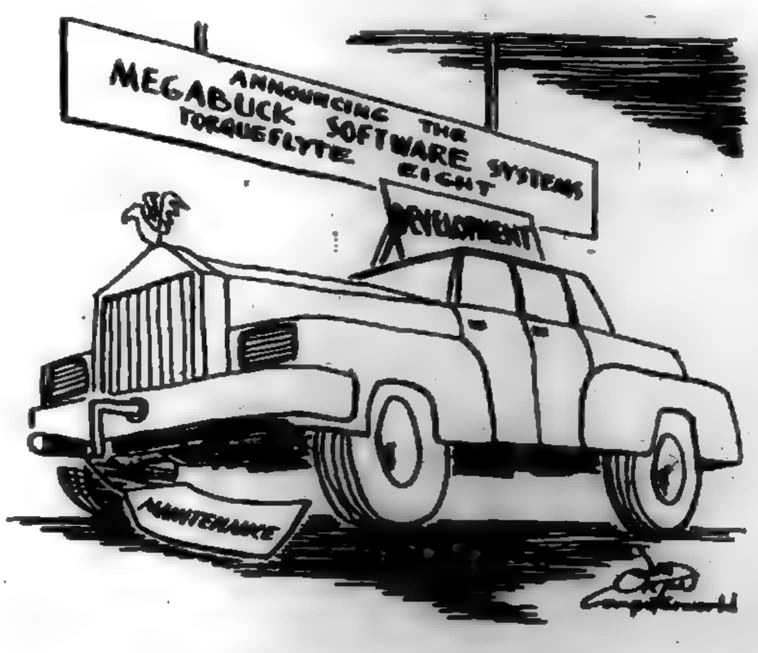
- **Businessman.** The CIO must have a thorough, detailed understanding of the company's business.
- **Manager.** The CIO must possess generalist management skills and must be able to manage any number of activities.
- **Technician.** The CIO must be able to use technology as a trade tool.

What are DP managers to do in this situation? First and foremost, they must concentrate on business. Not the information business — that should be a given — but the company's business. All the business information that flows through their department is a possible resource — a possible profit item if managed correctly.

But learning about business is not an easy task. Advanced business degrees are not the answer to every question. Synnott advised, "The only way to learn your own business is to be in the business." This may require what Synnott referred to as a change in alliance: a move away from involvement with finance and accounting to involvement with strategic planning, marketing and product management efforts within the company.

The CIO must also look for the opportunity. Technology can drive change in more ways than one. The job of CIO often is created when a company's information resources are fairly well distributed throughout the company's infrastructure — when there are goodly numbers of minis and micros in use, crying for a strategic plan to optimize their use. In such a case, the question "How?" has already been answered; the tools have been passed out. But the strategic question of "What to do?" remains unanswered in many cases, waiting for a CIO to set the course.

For today's DP manager, the job of CIO is a step up, a change for the better. But it demands corresponding changes from that manager — changes in orientation, in management style, in perspective.



LETTERS

Musician robot not the source of art

I was fascinated by the column "Robot pipes technology into the beaux arts" [CW, April 29] and by the account of the robot Wasubot and its organ performance. I believe that performance to be an incredible technological achievement.

However, I disagree that the Wasubot robot was used to create art. The art had already been created when the score was put to the paper. If Wasubot had done more than storing "the pattern of play in an output buffer" and then executing that pattern, I would be more inclined to agree that it created art.

If the robot had done something such as search a repertoire for other scores (patterns of play) and use them to make a new arrangement, then I would grant that art was created. Would it be correct to say that a person creates art when reading Hemingway?

Upon reflection, what Wasubot did was no different from the mechanical task of screwing lug nuts on a car with a programmed set of instructions, only its task was much more complex. The aspect that inspires awe is that Wasubot — a nonhuman pile of wires, motors and metal cases — produced a thing of beauty heretofore only associated with humans. We are used to having robots produce things like stampings or spot welds, but something as aesthetic as music is amazing.

With the advances in expert systems, consider the possibilities. Perhaps we could be looking at another Mozart.

Scott Gardner
Somerset, N.J.

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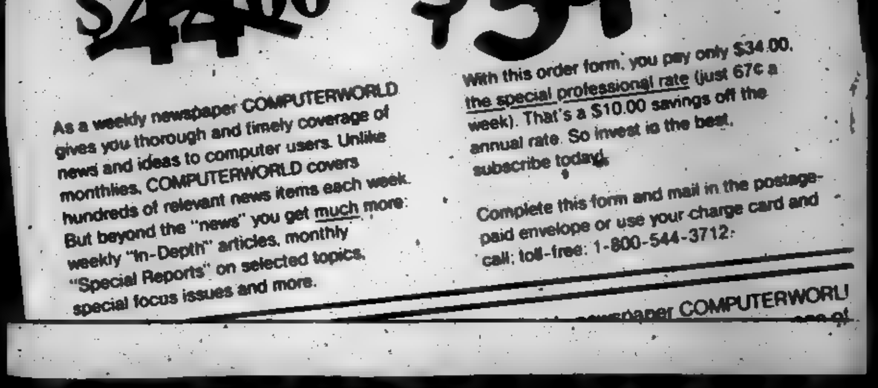

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- 10 Manufacturer (other than computer)
- 20 Finance/Insurance/Real Estate
- 30 Medicine/Law/Education
- 40 Wholesale/Retail Trade
- 50 Business Service (except DP)
- 60 Government—State/Federal/Local
- 65 Public Utility/Communication Systems/Transportation
- 70 Mining/Construction/Petroleum/Refining
- 75 Other User ____________

Vendors

- 80 Manufacturer of Computers, Computer-related Systems or Peripherals
- 85 Computer Service Bureau/Software/Planning/Consulting
- 90 Computer/Peripheral Dealer/Distributor/Retailer
- 95 Other Vendor ____________

2. **OCCUPATION/FUNCTION (Circle One)**

- 11 President/Owner/Partner/General Manager
- 12 VP/Assistant VP
- 13 Treasurer/Controller/Financial Officer
- 21 Director/Manager/Supervisor DP/MIS Services
- 22 Director/Manager of Operations/Planning/Administrative Services
- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 33 OA/WP Director/Manager/Supervisor
- 38 Data Comm Network/Systems Mgmt
- 41 Engr/Scientific/R&D/Tech Mgmt
- 51 Mfg Sales Reps/Sales/Marketing Mgmt
- 60 Consulting Mgmt
- 70 Medical/Legal/Accounting Mgmt
- 80 Educator/Journalist/Librarian/Student
- 90 Other ____________

3. **COMPUTER INVOLVEMENT (Circle all that apply)**

Types of equipment with which you are personally involved either as user, vendor or consultant

- A. Mainframes/Superminis
- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems

3310-01

VIEWPOINT

Micro saturation heightens need for control

THE DATA CENTER
John P. Murray

With the relative low cost and simplicity of microcomputers, people outside the information processing department are virtually stampeding to use them. Clients are able to do a great deal of their work independently when they want it and are often enamored with the concept of being freed from what they consider the unnecessary constraints and restrictions placed upon them by information processing. "Do your own thing without the annoyance of information processing red tape" is the current cry in many client departments.

The preceding paragraph is by no means "news." We are all aware of the burgeoning aspects of the micro culture. The benefits inherent in this growth, to clients as well as to information processing, are considerable. However, another aspect of this situation should make those of us with experience pause, and that aspect is control.

A faction that knows more than they understand about what they propose appears to be developing in some organizations. This is not a new phenomenon; clients have been quite able in the past to point out flaws in design and development work, often unhindered by any reasonable degree of knowledge.

I recall a presentation made by an MIS manager to a group of senior executives on the status of various development projects. As the manager began to discuss a proposed accounts receivable package installation whose completion was estimated at eight man months, a newly hired executive interrupted the presentation. "I don't know anything about data processing," he said, "but I'm certain I could get an outside consultant and install that system in one man month or less." Such assertions are irritating but, at least in the above context, harmless. Although these clients may believe they can do a better job, they are usually not in a position to act. Such situations are common; it is easy to criticize knowing that you won't be asked to show results.

However, a somewhat different case arises when micros are the arena. Many clients are currently euphoric with being released from the shackles of MIS. Early and rather simplistic success encourages these people to strike out for more dramatic results. The plea becomes, "Let's put it in the personal computer." Doing so may be a great idea, but the problem involves making sure installation is done correctly and that adequate control, including documentation, is also installed and maintained.

Poorly written micro programs lethal

Ill-conceived and carelessly written programs without adequate controls are potentially just as lethal on a micro as they are on a mainframe. In fact, the programs may be more serious, if only because they are brought into production more quickly and may find their way into the mainstream of the organization sooner than more conventional systems.

Many have learned that strong, effective controls must be established and enforced throughout the information processing function. This is necessary to build a strong environment and maintain a consistently high level of accuracy and service. Of course, in some installations this concern with control has never been implemented, and the lack of that concern is evident. These installations have high levels of reruns, most of the work is carried on in a panic mode, and the accuracy of much of the input data, and therefore the information produced, is suspect. The cause — or at least a significant contribution to the cause — of such results can be traced to a lack of fundamental control.

It makes no difference how fast work can be produced or how easily answers may be obtained. The serious problem is that often times, because the work was produced on a micro, it is automatically considered valid. The feeling is that because "old Charley" did the work himself (and who knows more about that area than old Charley) it must be correct. The possibility that old Charley may have made invalid assumptions, used bad data or made errors in the program are ignored.

Micro control a difficult task

Any attempt to provide and enforce some type of control and structure on micro users presents a difficult and, perhaps in many organizations, impossible task. But some effort should be devoted at least to raise the issue and attempt to get senior management to consider the organization's needs in this area. The politics of this issue can be significant, yet someone needs to point out the value of adequate controls and the need for a reasonable level of constraint.

The consequences of everyone being able to "go their own way," use the data they want and disregard or change data that they think should be altered or not included because of some personal bias or because they desire to achieve a given result will become apparent someday. It is hoped the realization doesn't occur because of some incident that creates serious and far-reaching consequences for the entire organization.

The information processing department should work with micro users to help them expand their capabilities and to assure senior management that there is at least an awareness of the necessity for reasonable controls and that people are adequately concerned about the issue.

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Basic design-phase flaws hinder system development

READER'S PLATFORM
Bo Sanden

When mainframe software systems are constructed, an overall design phase usually precedes detailed design and programming. In the microprocessor world, we still seem to believe that our systems are so small and simple that overall design is not necessary.

However, with today's microcomputers and their communications capabilities, a micro-based system can be as complicated as a mainframe system. Still, management often refuses to see the need for qualified system design. Consequently, few people develop the necessary skills.

I manage a group that has taken over a distributed real-time banking system based on micros. We are responsible for the continuing installation of new nodes in the network for maintenance and further development. New functions are added when banking regulations change and as user needs warrant.

The old system was an on-line, data-entry application with a table showing what fields were to be entered as part of each transaction. There were a limited number of transactions types, each with an entry in the table. For each field, a validation routine was specified. It would, for example, validate the check digit of an account number or see if a date field contained the proper banking day.

The new application uses the data base interactively. If, for example, a check is received, the balance of the account is consulted before the transaction can continue. The transaction is executed in a branch office computer, but the balance record resides at a regional center, so the validation routine exchanges messages with the regional center computer. The data is used for further validations and finally updated and sent back to the regional center.

Thus the validation routines are no longer independent but tied together by an intricate set of variables, and when a certain condition is detected in one validation, a flag is set and then tested in other validation routines. One validation routine may be used for similar fields in different transactions. The actions vary slightly, so the routines contain direct tests on the transaction code.

From the old application we have inherited a main loop that interprets the field table and handles one field at a time for the current transaction type. In our application, this procedure depends rather heavily on the transaction type and can involve voucher printing, passbook printing and updating of certain accumulators. This is controlled by means of a set of special-action flags defined for each transaction type and also via direct tests of transaction code.

To further complicate the new application, two types of terminals have been introduced: teller terminals, which handle only a set of pure financial transactions, and administrative terminals used exclusively for another set, including opening of new accounts. The financial transactions have positive transaction codes and the administrative ones have negative codes.

The system is working well but is barely maintainable. We can still introduce a new transaction type or modify an old one, but other changes are extremely complicated. One teller transaction receives cash and documents and credits the total to a checking account. At one point we were asked to make a similar transaction available at the administrative terminal. It took months to find all the tests that had to be changed in a dozen different validation routines and in the main loop.

The direct cost in man months is not the greatest problem. Because each major change affects so many modules, we can handle only one or two in parallel. Otherwise the programmers would interfere with each other's changes. Furthermore, while a new release with a major change is being prepared, we have to issue subreleases with minor changes and error corrections, which also have to be included in the major releases. All of this severely restricts the possibility for us to develop the system further.

Our application has outgrown the simple table model on which it was based. Probably the behavior of each transaction should have been modeled as a subprogram, which in turn would call subroutines for the common field types.

Design work is creative and is therefore difficult to plan and manage. People in the fast-moving world of micros do not want to spend the necessary time on the intellectual design effort. Ironically, the lack of basic system design in our case turned out to be the most important money issue in the long run. Maybe the system will have to be prematurely abandoned when vital modifications can no longer be made at reasonable speed and cost. $

Sanden is in charge of a distributed systems project at Philips Data Systems in Monterrey, Mexico.

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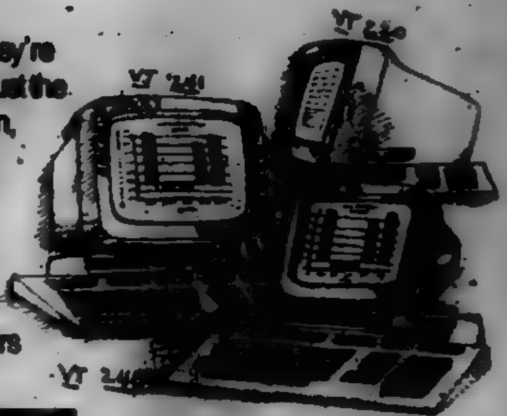

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SOFTWARE & SERVICES

‘Not for sale’ tool meets Xerox’s needs

By John Desmond
CW Staff

EL SEGUNDO, Calif. — An internally developed system used to track customer service problems at Software AG has become the software of choice for Xerox Corp.'s printing services division — even though it was not a marketed product.

The Xerox printing division implemented Software AG's On-Line Customer Support System (OLCSS) in April after deciding to purchase Software AG's Adabas data base management system, Natural fourth-generation programming language and Com-Plete teleprocessing monitor. It was during the DBMS selection process that the printing division personnel learned of Software AG's in-house application, which the Reston, Va.-based firm then customized for Xerox's use. The OLCSS currently helps Xerox manage several thousand field engineers and laser printer customers.

Xerox's decision to modernize its manual customer tracking system was based on upper management's commitment to improve customer service, according to Ken David-Adeleye, a Xerox customer support consultant who shepherded the OLCSS project. Xerox maintained the manual system of tracking customer service problems based on data supplied by field service engineers and not directly from customers, David-Adeleye said. But "the corporate commitment was that we would speak to customers directly," he said.

After deciding he needed an integrated system to manage information, David-Adeleye concluded a DBMS was a must. "Being somewhat naive, I took a wide view of things," he said. He looked at more than 100 DBMS products, eventually narrowing them to 32, including systems from Cullinet Software, Inc., Applied Data Research, Inc., Cincom Systems, Inc. and Information Builders, Inc. From his background as a systems programmer with

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- Dialogic Systems unveiled three products for its Dialogic/One mainframe application development system/36
- Plexus Computers offered an enhanced version of AT&T's Unix System V for its line of supermicrocomputers/31
- Release 2.0 of its VMSecure IBM VM-based security software is out from VM Software/31
- Apollo Computer announced the Domain/Dialogue system to aid in the development of custom, menu-driven graphics interfaces/36

LU6.2: Behind the hype

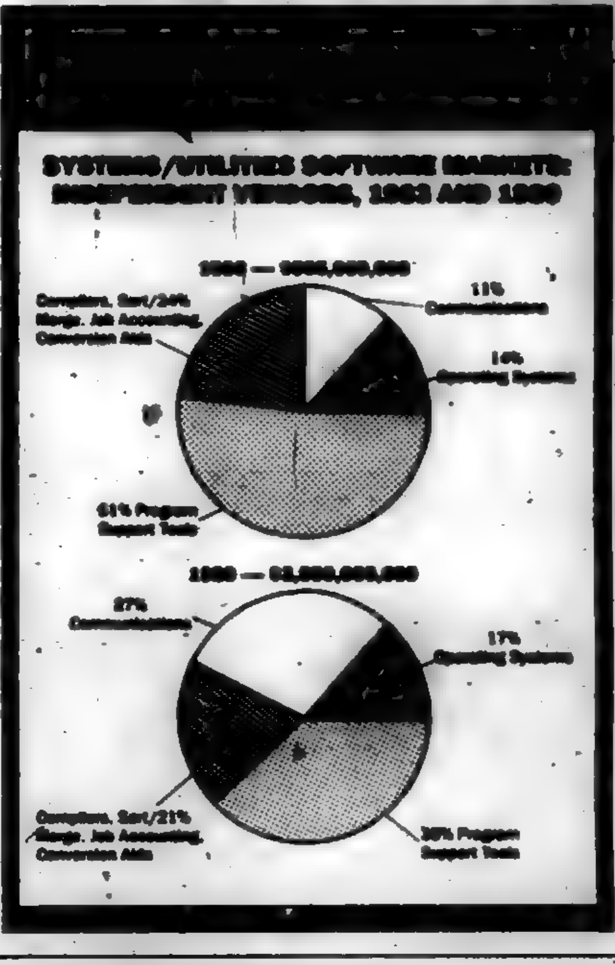
SOFTALK
John Gallant
CW Senior Editor

Mercifully, a natural immune reaction protects one from becoming infected by the hype that pervades the software world. Common sense and skepticism rush to dispatch the industry-generated adjectives and hyperbole that threaten to overwhelm users.

If terms like "state of the art," "leading edge," "artificial intelligence based" and "revolutionary" were to vanish overnight from product literature and advertising, a collective sigh of relief would be exhaled by users and observers everywhere.

Most people have adopted a cautious, wait-and-see attitude toward new products and technologies. Software package A

See LU6.2 page 34



Execucom packages bow

AUSTIN, Texas — Execucom Systems Corp., developer of the Interactive Financial Planning System (IFPS) decision support system (DSS), has introduced a presentation graphics package and a version of IFPS for the Apple Computer, Inc. Macintosh.

According to a spokesman, the Impressionist graphics system, which runs on processors ranging from mainframes to microcomputers, and the Mindsight Macintosh version of IFPS will be unveiled for the first time during Execucom's June users group meeting. The products are scheduled for shipment during June and July.

Impressionist runs on IBM mainframes and Personal Computers, including the Personal Com-

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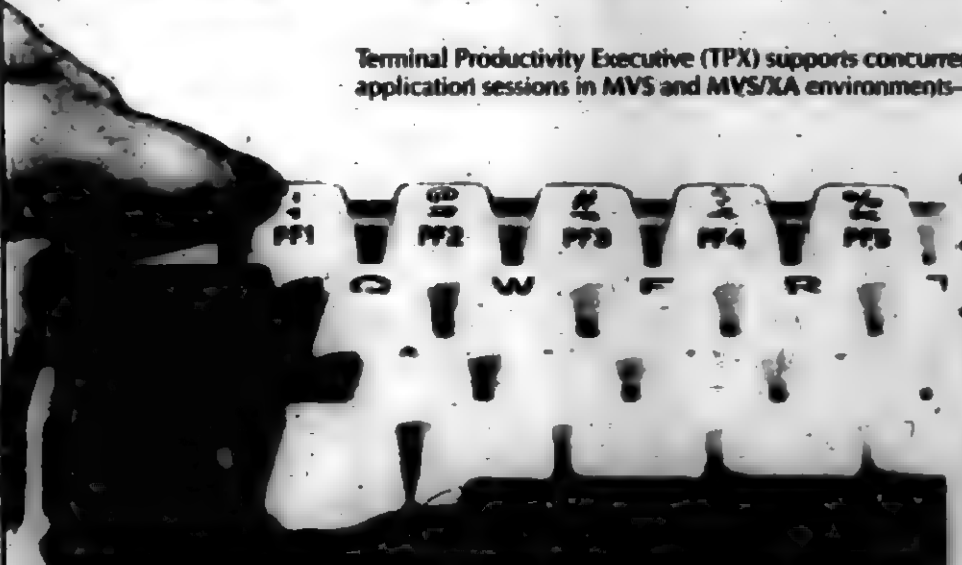

TPX Increases Productivity For Terminal/Network Users

Terminal Productivity Executive (TPX) supports concurrent access to unlimited application sessions in MVS and MVS/XA environments—at the touch of a finger.

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Dialogic Systems adds application development tools

NEW YORK — Dialogic Systems Corp. has announced three products in the Dialogic/One application development system for IBM MVS/TSO/ISPF environments, including a remote-connect version that enhances the productivity of remotely located programmers.

Also announced were the Dialogic Cobol Editor for the editing and maintenance of Cobol programs and the Dialogic VTS/MA program for facilitating multiple concurrent TSO/CICS/IMS sessions for programmers in IBM shops.

Dialogic/One is composed of the Dialogic/10 Midframe Computer and associated software. The Midframe incorporates parallel Motorola, Inc. 68010 and 68000 microprocessors and a 400M-byte disk drive. The hardware is used to off-load the host and speed response time for applications developers. The announcements enhance existing features of the Dialogic/One Cobol applications development system.

According to a spokesman, the Dialogic/One remote-connect version works by off-loading interactive tasks onto a separate machine. The Dialogic Midframe is placed between the mainframe and IBM 3270 terminal cluster controllers. The ability of programmers to access data directly from the Midframe results in consistent subsecond response time.

Two models of the remote-connect version are scheduled for availability in the fourth quarter. Model 4 can handle up to 9,600 transactions per hour with 64 active users, while the Model 6 handles up to 14,400 transactions per hour with 96 active users. Prices range from $198,000 to $300,000.

The Dialogic Cobol Editor is said to reduce the number of mainframe compiles required. The product features many characteristics of a Cobol compiler, including dynamic syntax checking and a dynamic cross-reference facility. It also features a zoom capability and enhanced window manipulation. It is priced at $7,000 and is available now.

The Dialogic Virtual Terminal Session/Multiple Access (VTS/MA) is a window to the IBM MVS operating system that supports concurrent Dialogic activities. In addition to its editing capabilities, the programmer can execute TSO, IMS or CICS programs, commands or computer-intensive compilations on the host.

The Dialogic VTS/MA is said to extend the programmers' Dialogic session, releasing the terminal for other tasks while concurrently processing submitted work on the host. The VTS/MA program is a field-upgradable option, scheduled to be available in the third quarter for $10,800.

Dialogic Systems is located at 1335 Bordeaux Drive, Sunnyvale, Calif. 94089.

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IBM-compatible communications software debuts

CUPERTINO, Calif. — Motorola/Four-Phase Systems, Inc. has introduced micro-to-mainframe communications software that allows IBM Personal Computers and terminals with asynchronous communications capabilities to communicate with IBM mainframes through Motorola/Four-Phase's Series 4000 and 5000 minicomputers.

With MFE-Central, a Motorola/Four-Phase mini can function as a personal computer controller node. MFE-Central supports up to 16 micros or a combination of micros and asynchronous terminals that can be located remotely or locally.

MFE-Central allows personal computers to access the Series 4000 or 5000 via asynchronous protocols and exit the system through Motorola/Four-Phase protocols. By using MFE-Central as a micro-to-mainframe link, information can be downloaded from the mainframe and used on the micro.

MFE-Central costs $2,000. Network site licensing costs $40,000.

Motorola/Four-Phase Systems is located at 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.

Instar creates escrow group

MALDEN, Mass. — Instar, Inc. has announced the formation of the Software Escrow Security Division to act as an escrow agent in administering software licensing agreements between developers and users.

Software Escrow Security will control access to source material as well as monitor update releases. Source codes will be stored in climate-controlled vaults at a data security facility in the East. All users pay an initial $200 for the service, which costs $300 per product source code stored per year on average.

Instar's Software Escrow Security Division can be reached at P.O. Box 0, 49 Clinton St., Malden, Mass. 02148.

Plexus offers supermicros Unix System 5 enhancement

SAN JOSE, Calif. — Plexus Computers, Inc. has announced an enhanced version of AT&T's Unix System 5, Release 2, for its line of supermicrocomputers.

Sys5.2 succeeds the company's Sys5 and offers a scatter-memory technique that permits programs to be written to memory in noncontiguous blocks, a spokesman said. The technique reportedly reduces disk swaps while permitting more and larger processes to reside in-memory at one time.

Sys5.2 also offers a virtual protocol machine feature that is said to permit the downloading and uploading of files to IBM and compatible mainframes.

Sys5.2 has been extended to include the Plexus Network Operating System, which is said to provide Ethernet-based networking among Plexus machines.

Users reportedly can transport object code from Sys5 to Sys5.2 without modification.

Sys5.2 costs $[illegible] for a 16-user system and $[illegible] for a 32-user system.

More information on Sys 5.2 is available from Plexus Computers, located at 3833 N. First St., San Jose, Calif. 95134.

EXECUCOM

from page 29

puter AT and XT, and minicomputers from Digital Equipment Corp. and Prime Computer, Inc.

The product is said to generate a variety of graphics formats, including charts, diagrams and text images. It features a graphics editor and can be used with digitizers to create and modify images, the vendor said.

Impressionist, a high-resolution system, can be used to create slides, hard-copy plots and transparencies using a variety of output devices. It interfaces directly to Execucom's IFPS/Personal, the IBM Personal Computer version of IFPS. The micro version is priced at $995, the mini version at $30,000 and the mainframe version at $40,000.

The Mindsight Macintosh version of IFPS is said to provide modeling, data management, goal-seeking and "what-if" capabilities and graphics and reporting tools. It uses Macintosh features such as icons, windows, pull-down menus, dialogue boxes and the mouse interface, the vendor said.

Mindsight reportedly can perform automatic solution of simultaneous equations, logical consolidation of models and data by variable name and financial, statistical and mathematical functions and subroutines. It is said to provide a full screen editor for creating and modifying models and data and an editor for entering, editing and calculating data.

Mindsight requires a Macintosh with 512K bytes of random-access memory and a second disk drive. It costs $595.

Execucom Systems is located at 3410 Far West Blvd., Austin, Texas 78731.

Availability of IBM IPDT announced

WHITE PLAINS, N.Y. — IBM has announced the availability of its Integrated Processing of Data and Text (IPDT) package. The package runs in IBM MVS and DOS/VSE environments.

IPDT allows IBM CICS users to access services provided by IBM's Distributed Office Support System and Personal Services/370 software, according to IBM. IPDT also reportedly can be used to create standard letters and forms and to compose documents from stored and keyed text.

IPDT for MVS (CICS/VS) is scheduled to begin shipping immediately. Shipments of IPDT for MVS (IMS/VS) are scheduled to begin in September IBM said.

The one-time charge for IPDT for MVS is $4,550 and for DOS/VSE is $4,564.

IBM is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

VMSecure gets system upgrade

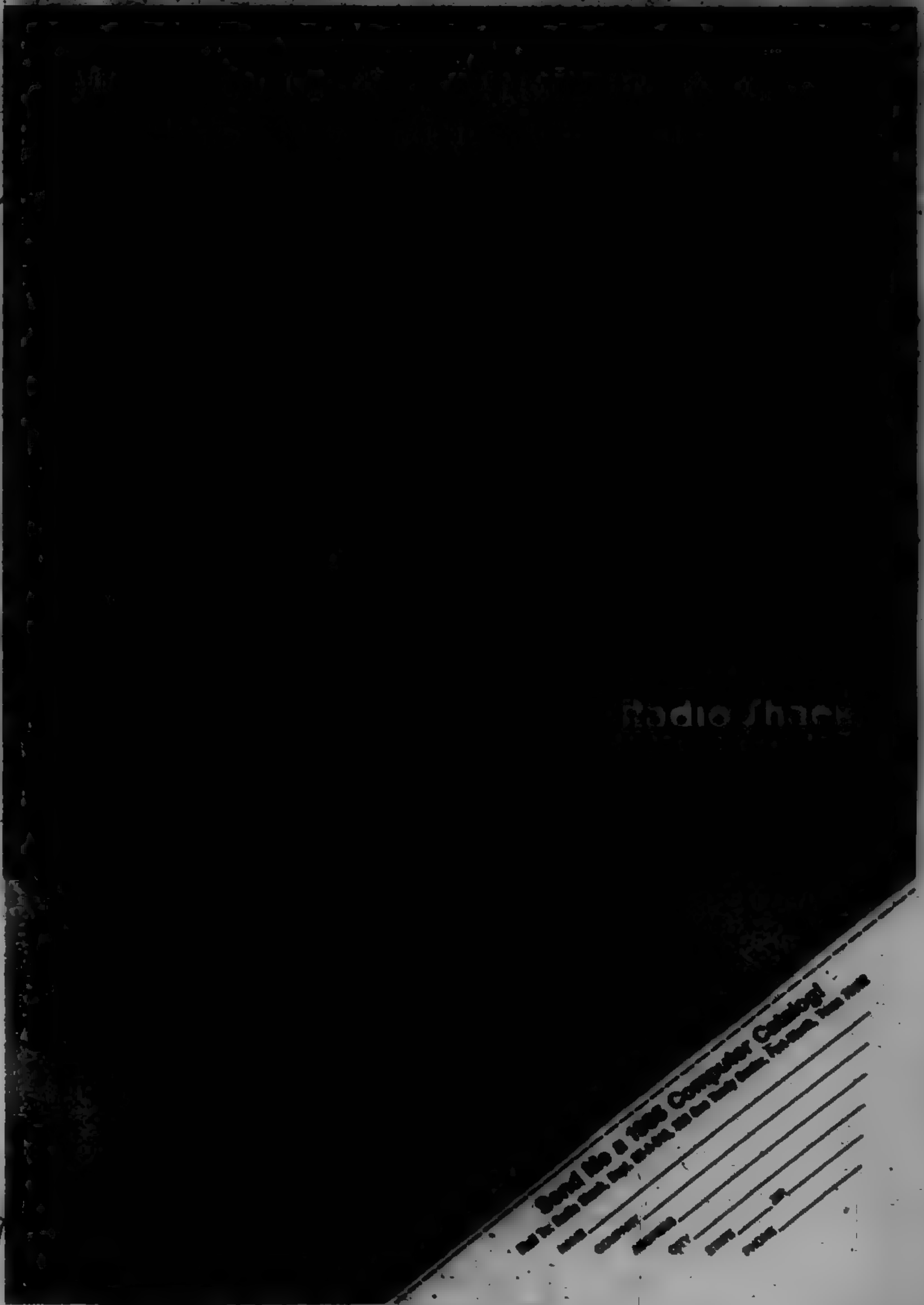
VIENNA, Va. — VM Software, Inc. has annouced Release 2.0 of its VMSecure security system for IBM mainframes running under the VM operating system.

VMSecure 2.0 includes enhancements to its resource access control, user directory and disk space management capabilities. Users reportedly can now establish rules to indicate how their virtual machines and mini disks can be accessed by other users, while group managers can establish rules for individual identifications.

Other enhancements include a display of the date, time and terminal address of the last terminal session begun; a command-level report that lists attempts to log on, link, autolog spool and tag; and a report of activity in the virtual machine.

VMSecure 2.0 costs $14,000.

VM Software is located at Suite 355, 2070 Chain Bridge Road, Vienna, Va. 22180.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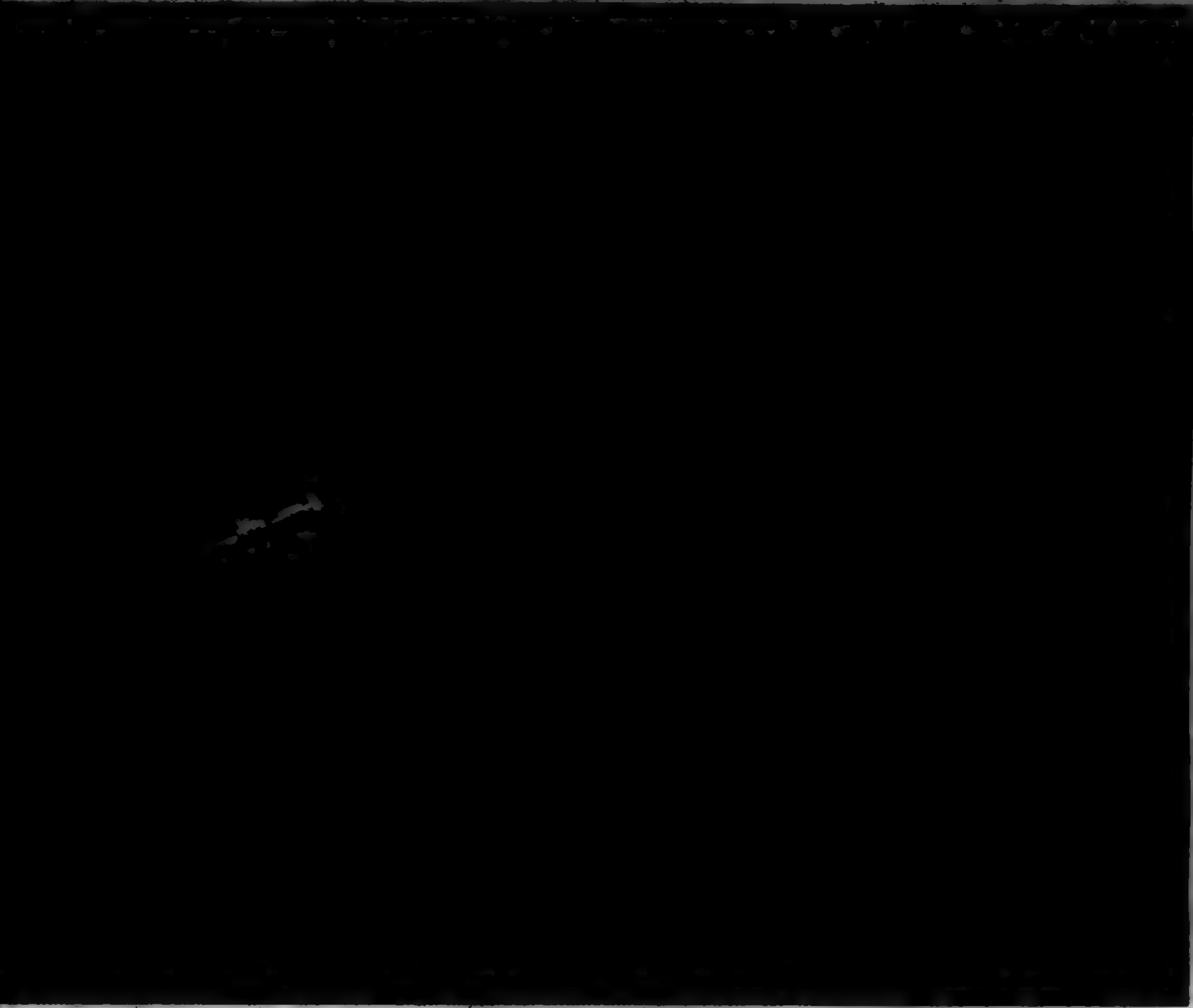

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SNA

from page 29

may actually represent a significant technological improvement over existing products. But users, analysts and consultants are likely simply to nod politely and suspend judgment until first-hand observation and experience supply them with the information needed to form an intelligent opinion.

No one wants to err on the side of overzealousness today. Even if the technology is highly advanced, the reaction of the populace may still be ho hum in nature. One tends to become jaded by the rapid pace of technology.

So when one encounters a consensus that a certain technology is truly revolutionary, one ought to sit up and take notice. Such is the case with IBM's 1982 Systems Network Architecture (SNA) enhancement called Logical Unit Type 6.2 (LU6.2) or Advanced Program-to-Program Communication [CW, May 27].

Never mind that you don't understand the workings of SNA. Like the fabled esoteric formula for Coca-Cola, probably only a handful of people really know what all the layers, Logical and Physical Units and protocols of SNA mean. If you were one of those people, you would likely be in a different profession — and probably a more lucrative one at that.

IBM

The gist of what anyone needs to know to understand the significance of LU6.2 can be summed up in just a couple of sentences. According to Robert Sundstrom, manager of communications systems architecture within IBM's SNA Group in Raleigh, Va., two software systems that support the LU6.2 protocol would be able to communicate as equals — that is, send and receive data on a peer-to-peer basis — within a network regardless of the type of host systems supporting them. When fully implemented, the hardware would become transparent to the communicating applications.

Ignoring the sophisticated technology at work and the expertise involved in bringing that technology to the fore, it is as simple as that. Now consider for a moment what that means. Processors of all shapes and sizes could conceivably be linked via software. Need some mainframe general ledger data to slip into your micro spreadsheet? No problem. Just issue the proper data base call and there it is.

The micro program would, ostensibly, be on an equal footing with the mainframe or minicomputer application and would be able to send or receive information as required. In the current SNA setup, one machine is forced to play a secondary role to another, the primary processor, which controls all network communications from above.

Not surprisingly, your immune system has gone into high gear and is rapidly bringing to bear all the skepticism and disbelief it can muster. Simple software-to-software communications? Sure, you have heard similar claims in the past.

LU6.2 considered technical advance

But without exception, users, analysts, vendors and even IBM itself said LU6.2 represents one of the most important technological advances to come about in years. When asked whether LU6.2 would revolutionize intermachine communications, Sundstrom — who, you must remember, works for a company with a reputation for being tight-lipped second only to that of certain monastic groups — replied, "Yes, definitely."

That is quite an endorsement coming from an organization that crafts its statements of direction carefully enough to make the directives of the College of Cardinals look slapdash.

What does LU6.2 mean for you today? Probably not a great deal. The protocol is only supported by a minority of IBM's products. IBM's Personal Computer offerings supporting LU6.2 are particularly weak. You will not be using Lotus Development Corp.'s 1-2-3 to tap casually into IBM's IMS tomorrow.

But the wheels are in motion. IBM, by its own admission, is carefully assessing which of its systems will be first to support the protocol, and other vendors are moving to embrace the real opportunity LU6.2 represents. This is not to say you should pack your immune system into a drawer. But don't be too quick to pass this technology off as just some more hype.

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XEROX

from page 29

experience in DBMS, David-Adeleye had a good grasp of technical details.

As David-Adeleye was narrowing down the DBMS choices, Xerox management decided the OLCSS should run on an IBM 4341 under MVS. Management also set an April 2, 1984, deadline for having the system up and running and serving customers. That gave David-Adeleye and two other members named to his team five months to decide on a system and get it in place.

"It was a major evaluation," he said. "One requirement was that the vendor provide extensive support. We're a planning organization, not a technical shop." David-Adeleye talked to customers of the vendors he had narrowed down and to senior executives in the vendor firms.

Vendor chosen

Based on what was said about Software AG, the technical aspects of its products and the company's commitment to provide the support Xerox needed to meet its deadline, Xerox chose Software AG as its vendor.

During the evaluation phase, David-Adeleye's description of the customer tracking system Xerox needed sounded more and more like Software AG's own system, dubbed Tsop, said Monte Hipple, Software AG senior account manager. David-Adeleye said Software AG's management was "a bit taken aback" by Xerox's interest in the internal program, but they agreed to customize it to meet Xerox's needs.

A major change to Tsop requested by Xerox was the addition of a mandatory key word structure. With the added function, a support specialist answering a hot line call from a customer is able to retrieve a standard solution to a problem. "It would have taken us at least a year to develop that functionality on our own," said Sharon Remer, a Xerox customer support consultant who joined the project team.

Time constraints

The Xerox OLCSS was brought up rapidly to meet the deadline. "The main problem was the time constraint," Remer said. Xerox's central DP division was hesitant at first to install the Com-Plete TP monitor, since they had just converted from Honeywell, Inc. hardware to IBM and were still on a learning curve, Remer said. "But we brought up Com-Plete with minimal support, and now the data center wants to use it for other things," Remer said.

CW PHOTO BY JOHN [illegible]

David-Adeleye, left, and Remer

Apollo introduces graphics interface building system

Domain/Dialogue designs, manages

CHELMSFORD, Mass. — Apollo Computer, Inc. has announced the Domain/Dialogue system for building custom menu-driven graphics interfaces.

Domain/Dialog runs under all Apollo operating systems, including Domain/IX, the company's implementation of AT&T's Unix.

According to a vendor spokesman, Domain/Dialogue includes the User Interface Design Kit for designing, testing and modifying user interfaces, and the User Interface Management System for displaying and managing the user interface.

The User Interface Design Kit provides a comprehensive set of building blocks, including switches, menus, icons, pop-ups, text input fields and scroll bars, which developers can use to customize interfaces.

Using the product's User Interface Description Language, designers specify the desired components and layout of an interface.

The kit also includes a Description Language Translator utility that builds the desired interface from specifications. The system is said to free applications developers from having to write code to create interfaces.

Interface management

The User Interface Management System displays, manages and maintains all aspects of the interface while a user application is running. The architecture of Domain/Dialogue allows for modification of user interfaces by separating interface software from the application. The feature lets users test and modify interface prototypes without affecting applications code.

The Domain/Dialogue User Interface Design Kit and User Interface Management System will be available on all Domain workstations within 60 days. The User Interface Management System will be included in the next release of all Apollo operating systems. The User Interface Design Kit, required by software developers, will be sold separately.

The Domain/Dialogue User Interface Design Kit costs $1,200 per node and $10,000 per site.

Apollo is located at 330 Billerica Road, Chelmsford, Mass. 01824.

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By: Robert T. Fertig
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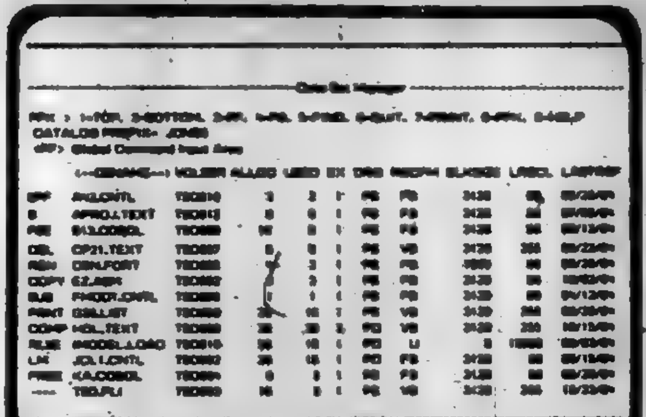

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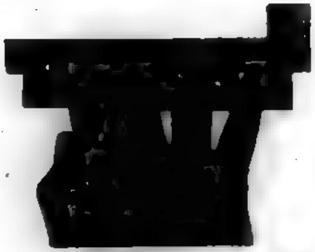
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Update

Finding and keeping DP/MIS professionals

By Glenn Rifkin
Update Editor

No single method has emerged as a sure way for recruiters to find the personnel they need. . . . And in an environment in which demand outweighs supply, employers find themselves in a tenuous position requiring creative, strategic thinking.

Choose a job you love, and you will never have to work a day in your life.

— Confucius

For DP and MIS professionals, the heat is on. Once an obscure, misunderstood function within the organization, "computer central" is now the focus of unblinking attention. As Fortune 1,000 firms turn the care and feeding of their precious information resources over to MIS, the DP and MIS executive is earning recognition and respect. Coupled with the fact that companies have come to realize that a quality DP worker is hard to find, the profession has prospered under the time-honored traditions of supply and demand.

Though colleges and computer training institutes continue to pour forth eager graduates and despite an industrywide slump among computer vendors, a great demand remains for high-quality, experienced DP professionals (see chart Update/4).

The issues surrounding the recruitment and motivation of quality employees are by no means restricted to DP and MIS. Volumes have been written on both hiring and management techniques in the general business setting. However, finding and keeping DP personnel does have its own special set of problems.

Companies, for example, are often restricted in their search for people by the specific hardware and software expertise they might be seeking and face the question of whether to choose machine experience or the overall quality of a candidate. Universities may produce excellent computer science graduates, but today's market often calls for a more well-rounded business education to complement the technical education.

The continuing shortage of manpower has put the seasoned DP worker in the driver's seat, and job-hopping and increased salary and benefit demands have often resulted. Since DP is a young profession populated by an inordinately large number of young people, there is a dearth of stability in the DP environment. Women have found their own set of problems surviving in the DP world (see story Update/11) and training DP and MIS managers requires special, far-sighted planning (see story Update/17).

In addition, as end-user computing becomes a de facto part of corporate life, DP and MIS professionals often need to acquire people skills to enhance their technical skills, a process often easier to talk about than implement. Also, studies have shown that social needs of DP professionals differ from the needs of other workers, often leading to conflict in the choice of career growth. For example, technical people in many cases simply do not make good managers and have no desire to be managers. Where, then, should they turn for advancement?

Though salary is an obvious motivator, technical people are generally more concerned with the technology and the task at hand. Their loyalty is often aimed at the profession instead of the organization, and companies face the prospect of losing good people if they cannot keep up to date with leading-edge technology.

Confronted with inflated DP turnover, organizations must find innovative ways to intertwine the DP staff further into corporate culture. Rather than have technical personnel feel isolated and unrecognized — viewed merely as an add-on service organization — companies must bring DP into the mainstream and clearly relate it to the corporate business.

Though the issues are complex, answers are being found.

Recruiting and hiring

"Plastics," advised the obtrusive family friend to a reluctant Benjamin in the 1967 film *The Graduate*. That, in a word, he insisted, was the future.

Were the same scene shot today, the advice might be "CICS" or "Unix" or "decision support." And the family friend would instead be the DP recruiter in critical need of staff. Ben would ignore this new advice as he did the old. But DP managers are hoping that other graduates will respond to the opportunities that await them in information systems.

Finding quality DP personnel is a real-world problem without easy celluloid solutions. Because of continuing shortages in a long list of DP and MIS occupations, recruiting and hiring quality candidates requires long-term planning and a commitment of resources. This must often be combined with nontraditional methods that buck practices on which personnel departments have relied for decades.

Entry-level workers are in constant demand. Even more prized by recruiters — and harder to find — are seasoned middle-level programmers, systems analysts, data base managers and operations personnel. "The schools are turning out a lot of computer science majors, so there are many good entry-level people," said Jane Hardy, a personnel specialist for the Gillette Co. in Boston. "And I'm always hearing about people at the DP manager level. What I'm missing are the ones in between, people with three to five years' experience who are doing well and making moves within their own company."

To that end, companies have turned toward such recruiting tools as executive search firms, job fairs and open houses, as well as intensified in-house training programs for employees from other disciplines looking to switch into DP. Though the "help wanted" sections of national publications continue to swell with calls for DP professionals of every

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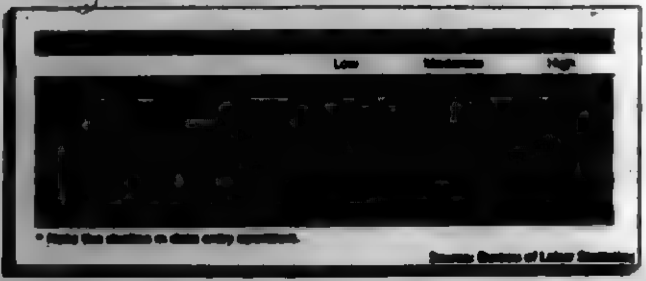
COVER ILLUSTRATION BY KAREN WATSON

Update



* Note the decline in data entry operators.

Source: Bureau of Labor Statistics

HIRE from UPDATE/3

discipline, personnel experts and DP managers are less inclined to rely on such advertising. Arthur Simonian, director of information systems for Pratt & Whitney Aircraft Group in East Hartford, Conn., said, "We don't believe this is the way to get high-quality people in this business."

No single method has emerged as a sure way for recruiters to find the personnel they need. Organizations have implemented an array of hiring strategies that fill specific needs.

The search for a top-level MIS manager, for example, will take on a vastly different appearance from the search for a dozen entry-level programmers. And in an environment in which demand outweighs supply, employers find themselves in a tenuous position requiring creative, strategic thinking.

On campus

College students are as aware of trends in the "help wanted" pages as anyone, which helps explain the rush for computer science degrees on the nation's campuses. At MIT, in fact, the computer science department is overstocked, according to Robert K. Weatherall, director of career services and preprofessional advising.

"It's becoming more and more obvious that data is playing an immensely influential role in organizations," Weatherall said. "Students here are looking for creative opportunities to shape the way a corporation works. They want to have an impact. They look at someone like John Reed [the new chairman of Citicorp], who rose through the MIS ranks, and dream of similar paths."

Despite the plethora of data institutes and six-month crash courses in programming, recruiters remain committed to college graduates as the No. 1 source of entry-level help.

Pratt & Whitney's Simonian pointed out that the supply lines of recruits "are critical to us." In that vein, his group has worked with personnel to package a "first class" recruiting program that blankets 80 colleges in the Northeast and several others around the rest of the country. "Our predominant hiring source is the college campus," he said.

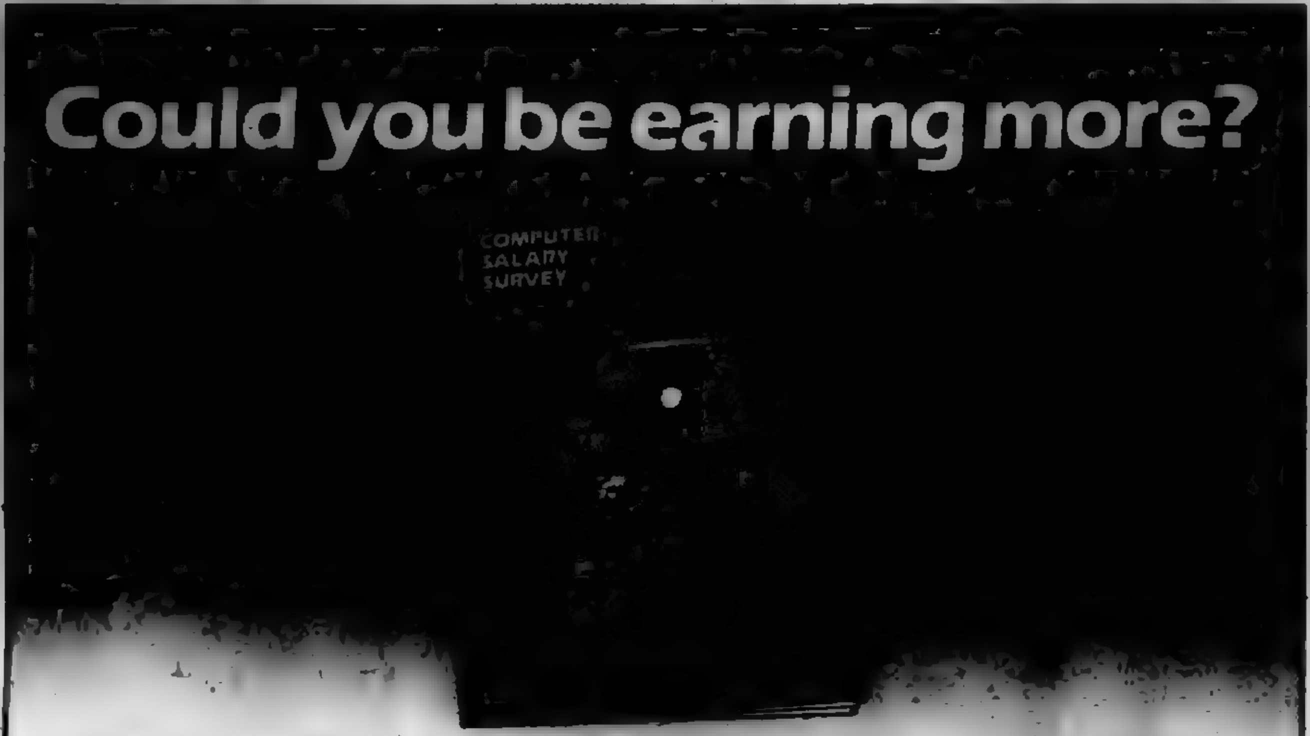
According to Simonian, the key to success in college recruiting has been the practice of assigning DP staff members and managers to visit campuses themselves, either with a personnel representative or alone. These DP-to-college relationships, he said, are not simply one-time visits but formal, ongoing commitments.

"In this way, we keep the school abreast of the kind of work we are doing, which in many cases is leading edge or very advanced work. The students are very interested in that," Simonian said.

Though he was hesitant to single out any particular university as a resource, Simonian pointed out that geographical location is a key factor.

"Georgia Tech may be a wonderful school but not for recruiting in the Northeast," he said. In fact, Pratt & Whitney recently opened a plant in Columbus, Ga., and for two years beforehand, company recruiters visited campuses in Georgia and Florida sowing the seeds for future hiring.

"Finding the right people is tough," Simonian admit-



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Update

ted. "Given the fact that we have a well-organized program, we do it successfully. Without it, recruiting would be very difficult."

Ironically, as the computer science and electrical engineering departments have filled to overflowing, the profile for success in DP and MIS has shifted. According to Michael Lawson, director of the master's program in MIS at Boston University's School of Management, "In talking with business leaders and other academics, there seemed to be an increasing need for people who had both the technical information systems skills and managerial skills."

In the past two or three years, universities have begun to respond to this need by offering increased numbers of MIS courses within MBA programs. IBM, in fact, acknowledged this need by recently awarding $27 million in cash and equipment to 13 universities in order to help improve graduate instruction and research in MIS.

At Boston University, Lawson has taken it one step further and set up a graduate degree program specifically for MIS. Just finishing its second full year, the program has been enthusiastically received both by corporations, which have readily hired its graduates, and students, who recognize "a large and improving career path."

The one-year program provides technical information geared specifically to solving managerial problems. Students are required to form four-person work teams, which are assigned to Boston-area companies for seven-month internships. These students work on an information systems project set up by the company. "They are part of a real systems problem," Lawson said. "It gives them the flavor of how a corporation really behaves."

As the Boston University program grows, demand for graduates increases. Lawson has spotted no particular regional trends in recruiting; students are finding positions across the country and even internationally. He has discovered that corporate recruiters are looking for a mixed bag of talent.

"One of the problems is that everyone has a different notion of what MIS means to them," he explained. "Many recruiters, when they say 'information systems,' are really looking for programmers."

While admitting that there is a continuing high demand for programmers, Lawson described his program as addressing the next level: systems analysts or people who can analyze a business problem and work with both functional managers and technical managers to build a workable system.

"One of the big frustrations out there is that the technology environment is changing so rapidly that it is very difficult to get a handle on things. There are fewer and fewer people who know what is really going on," Lawson said. "The other major frustration is the need to integrate the systems people with the rest of the organization. MIS is becoming an integral part of all functions of a business. For a group that has traditionally operated in a stand-alone environment, it can be a difficult transition."

It is clear that the profile for graduates has changed dramatically. Companies are opting for a more diverse educational background than computer science and in many cases would prefer accounting, finance or engineering majors with some computer experience over the pure computer science major. "The bottom line we look for is high quality," Simonian said. "If a student is a liberal arts major but can display high quality, we'll take him."

Computer training institutes

The television and radio airwaves choked with ads for local six- to 12-month courses that "could quite possibly change your life." Programming courses, in fact, have produced a flood of entry-level people who have found placement in large DP shops.

Though this type of program generally has acquired a good reputation with the industry, the drawback for many of the students is that they graduate from these institutes without college degrees and immediately face a dead-end career path. Without a college degree, growth beyond entry level is extremely limited.

Some institutes have addressed this problem by requiring college degrees before acceptance. The Cambridge Institute for Computer Programming (CICP), an intensive six-month program in Boston, is geared specifically to professionals seeking career changes. CICP supplies graduates to many Boston-area companies, such as Prime Computer, Inc.; Cullinet Software, Inc.; Fidelity Management and Research Corp.; John Hancock Mutual Life Insurance Co.; and New England Mutual Life Insurance Co.

According to Ted Scholl, vice-president of placement for CICP, 80% of the current class will find employment within 30 days of graduation.

"Our students tend to be more mature, in their late 20s or early 30s, and want a career change into DP," Scholl said. "Once they get into a company, they often will continue their education, perhaps going for an MBA with the company's support."

As Scholl pointed out, the requirements for programmers simply have changed in the past five years. Back then, he explained, there was such a demand that "anyone who could spell the word 'programmer' got hired." Today, there is a need for programmers with greater verbal and communications skills. The former teachers and liberal arts majors going through the training programs bring together the two needed disciplines.

The need for programmers remains strong, especially on the East and West coasts, Scholl said. Hardware ultimately dictates the market. For example, there is now a significant shortage of qualified IBM System/38 programmers, he said.

Though CICP graduates averaged starting salaries of just below $20,000 (compared with the low $30,000 range for college graduates with advanced degrees in MIS), most start in the mid-20s and have wide open paths for growth, Scholl pointed out.

"The short programs have been excellent for us," said Tim Billingsley, an employment interviewer with John Hancock. "The graduates are better trained than in universities. Our ideal candidate is someone with a college degree and a certificate from one of these programs. We just hired 20 people from CICP."

For some corporations, especially computer hardware and software makers, it has been expedient to forego searching for the perfect candidate and bring in generic computer science graduates for intensive in-house training programs. Doing so has a tendency, recruiters agreed, to produce increased loyalty to the organization as well as to create the model employee — one who was trained and molded not only in the particular job's function but in the corporate culture as well.

'OK, we want a four-year no-cut with a $250,000 signing bonus and a Trans Am fully loaded.'

In-house training has its drawbacks, however. Though training can be costly, a more crucial issue is time. It takes months for extensive or even basic training, and that can create problems for a DP department that needed help yesterday. In addition, the question of who does the training and how much input that person or group has in the hiring must be answered.

According to a recent Auerbach Publishers, Inc. report by Bruce Winrow on entry-level hiring, if an organization has a formal in-house training department, that department "must establish its role in the hiring process, and senior management must demonstrate its support of that role." Without input in the hiring process, the training department may face a no-win situation.

"Even when the training department must train less-than-ideal candidates, the trainers are held responsible for the new employee's performance. If the training department is judged by the perfor-

See HIRE UPDATE/6

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HIRE from UPDATE/5

mance of its trainees, the training manager should have some control over the quality of the candidates," Winrow said.

Despite the drawbacks, recruiting inexperienced entry-level people continues to offer a positive alternative for many organizations.

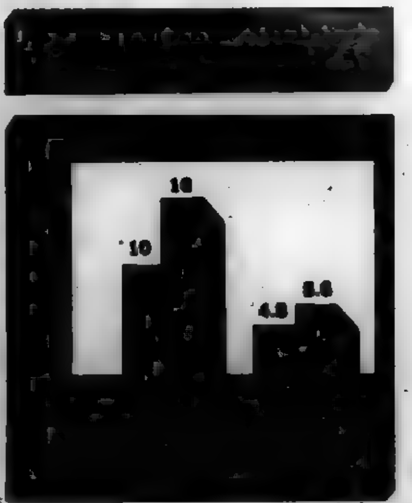
Management Science America, Inc. (MSA) in Atlanta, a leading software manufacturer, has been staffing its pool of software developers since 1979 with recent college graduates who are then entered into an intensive six-month training program. This year, according to Ken Millen, MSA's vice-president of personnel, the company has hired 150 students from 50 campuses to enter the program. MSA has hired more than 350 software developers in this fashion — about one-third of its employees — and the turnover rate among these employees is half of the company rate.

"We feel that these will be the key people in the company in five to seven years," Millen said. "It's an investment in the future."

At the Bank of America in San Francisco, the DP department, which numbers between 5,000 and 6,000 people, averages 400 openings during any given week, according to Gary Damiano, senior staffing specialist. Though many of those positions are for traditional Cobol programmers, the bank needs professionals with experience in the high-volume transaction utility called airlines control package/transaction processing function (ACP/TPF).

That technology, which until recently was relegated to the airline, hotel and car rental industries, is spreading to banks and financial services organizations, creating a huge demand for skilled people. Unfortunately, there are only about 3,000 technicians in the world with ACP/TPF expertise, Damiano said, and those who know it are demanding high salaries. To solve this problem, Bank of America is recruiting and training recent graduates in-house.

"It just makes sense to grow our own," Damiano said.



Update

The rapidly changing demands of high technology often do not afford corporations the time or luxury of bringing in and training needed DP personnel. According to Billingsley, the competitive nature of the business forces companies to forego in-house training for every position.

"Many companies have to stay at the leading edge, and they are willing to pay for it," he stated.

Finding experienced DP personnel with specific knowledge of particular systems is difficult and frustrating. Corporations have turned to executive search firms, in-house promotion and referrals and job fairs to enhance newspaper and radio advertising.

Lawson

According to Christine Suarez, a consultant programmer in Boulder, Colo., companies looking for the "perfect fit" of hardware or software experience are often forced to "bite the bullet and wait." In the Boulder area, she pointed out, there has been a recent and unusual glut of DP professionals because of layoffs at major employers like Storage Technology Corp.

"DP opportunities in Colorado have shifted," Suarez said. "They used to be dynamic, but there hasn't been any new development in the last couple of years."

The result, she said, is that companies are willing to wait and look longer for specific talents.

"Someone might have a good knowledge of the VS operating system but won't know CICS," she explained. "It's hard to find someone who has both, and it's tough to get the hard-core DP person to think about the people part of it — to hire someone with close enough skills who could adapt quickly."

Among the methods for finding potential experienced hires is the job fair or open house. Companies like Bank of America, with its 400 openings, find it both practical and expedient to hold open houses for prospective employees.

"We used to go strictly through agencies and advertising, but we're changing that," said Bank of America's Damiano. "We spent $2.5 million last year on agency fees, and we're not going to do that again. We can hold two open houses per year for $40,000 each and end up with 20 to 30 hires per open house."

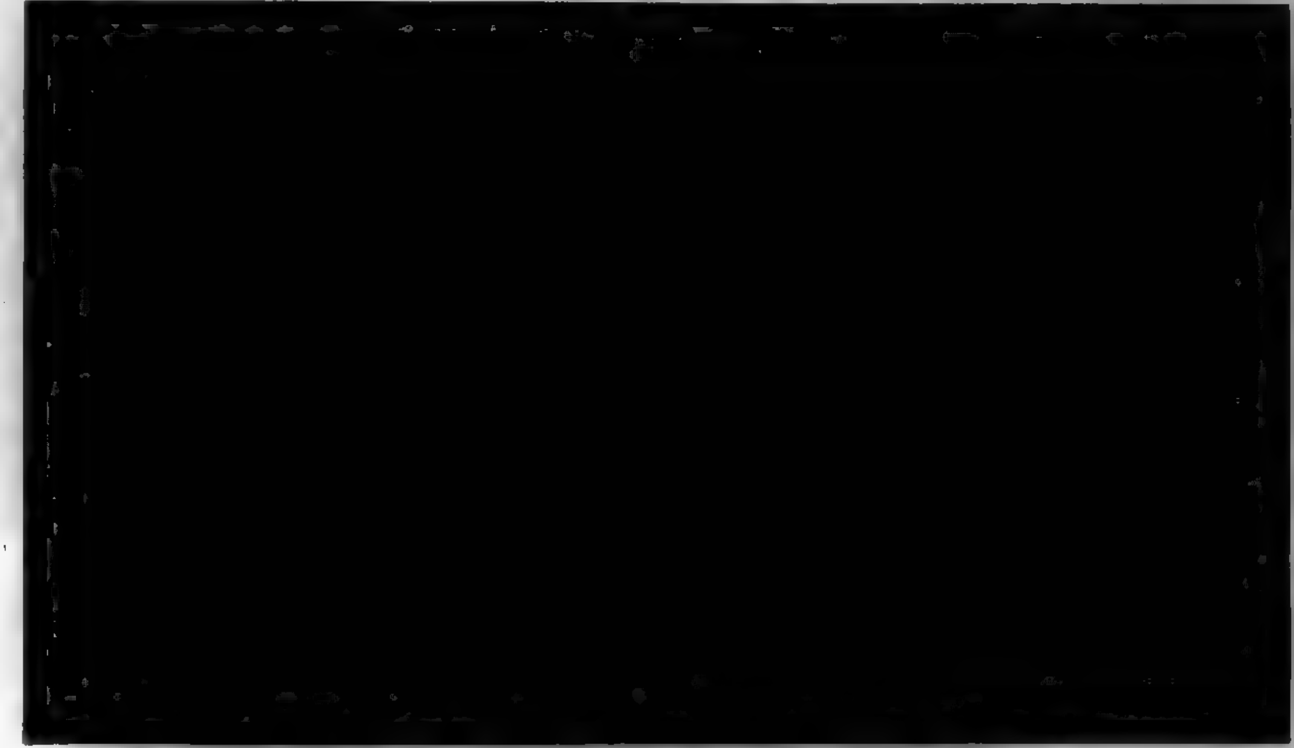
For an organization with a large number of open positions, an open house provides an excellent setting to match prospective candidates with the perfect job.

"We have 20 different units within the bank looking for different technologies," Damiano said. "The open house allows the candidate to come in and talk to the hiring managers. We do resume tracking and retrieval on all candidates to make sure that they are exposed to all the positions in which they might fit."

For companies with smaller scale needs than Bank of America, professional job fairs, in which dozens of local organizations set up booths, are increasingly popular.

According to David M. Callahan, head of Software Ca-

See HIRE UPDATE/10



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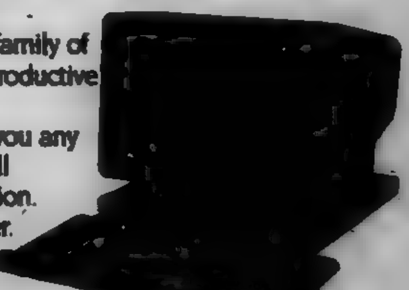

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Update

Finders, keepers

Though their disciplines are quite different, Robert Half and John Diebold have a few things in common. They both have, for example, several decades of experience in their respective fields, and each is sought after by the powerful and influential for advice and consultation.

In fact, both men have founded and fostered highly successful businesses that have become known and respected in this country and around the world. Though each has stepped back of late to package his insight in book form, both Half and Diebold continue to have a global perspective on their areas of expertise.

Half began his recruitment business with one office in New York in 1948. A certified public accountant, he saw early on the value of a professional recruiting firm that specialized in accounting. As his business thrived, he started to franchise offices and began to recruit heavily in the DP field. Today, as president of Robert Half International, Inc., he oversees 90 offices worldwide. He is the author of the best-selling book *The Robert Half Way to Get Hired in Today's Job Market* and the just-released *Robert Half On Hiring.*

Diebold is an internationally acknowledged leader in the fields of management and technology. He is also chairman and founder of the Diebold Group, Inc., a consulting firm that he established in 1954. Diebold gained international recognition with the publication of his book *Automation* in 1952 when he was just 26. For more than 30 years he has consulted with both industry and world leaders on computers and automation. Diebold's *Making the Future Work* was recently published by Simon & Schuster.

Computerworld Update Editor Glenn Rifkin met with Half at his Palm Beach, Fla., home to gain insight into ways to find quality DP and MIS professionals and with Diebold in his New York office on ways to keep them.

INTERVIEWS

What are some of the issues involved in DP hiring as opposed to general business hiring?
Half: DP is different. It has to do with the fact that DP is a young profession compared with law, accounting, medicine or engineering. And since the profession is very young, it employs mostly young people. Older people didn't get the basic training in school, so it's harder for the industry to absorb older people. However, the fact that there is a youth generation in DP lends itself to very high turnover. The young are more impetuous, quicker to make a change.

If DP shops are looking for stability, they should try to train older people, and they would not get that rapid turnover. Raise the age level, do something about it. Every time you walk into the DP department, you see a different face. It's very disturbing, very hard to get anything done.

How do you get the older people?
Half: The same way you get the younger people. It's a little harder, but they'll want the jobs more. You may have to do training, but you have to do training anyway. You can't get a programmer who can fit into an operation right out of a programming school. Most of the schools aren't all that good, so it's up to the company to train the individual.

If you get a person, say 40 or 50 years old, and train him or her, you've got someone who is more likely to stay. I'm not suggesting you don't hire younger people, but you need that balance. The balance doesn't exist [in DP]. It exists in all other professions but not in DP to a great extent.

Do you have a profile of the perfect DP employee?
Half: No, because it wouldn't do us any good. The perfect person for you would be completely different than for the company across the street. What does a profile mean? Nothing. What does a company want? Whatever they want, they're right. If we think they are wrong, we'll tell them. But they may be right, and we could be wrong.

Who does the hiring in DP?
Half: In hiring, in almost all cases — 95% to 100% — personnel does not do the hiring. They do the selecting. The DP manager does the hiring. And the person doing the hiring often absolutely wings it. They have no particular knowledge of personnel problems. They may not even be acquainted with the laws of the land having to do with [hiring] discrimination.

The DP candidate may not have a flamboyant personality, and the interview may not reveal anything other than that the person is technically competent. Is that enough?
Half: I developed a form called Hire. You rate the person's education, experience and other factors according to a predetermined standard. I rate innate ability and willingness to do the job as more important than anything else.

'If you ask individuals what motivates them, chances are, most won't say money. But wave some bucks, and chances are they're going to change.'

Robert Half

What I've done is given tremendous weight to those two factors, so that if a person rates well on education and experience but on willingness and innate ability rates poorly, he probably won't get the job.

That's a tough thing to catch in a short interview.
Half: Very tough. But that's the way, when you can do it, that you get really good people.

You feel that the person doing the hiring in DP is not qualified to handle that chore?
Half: He or she is full of prejudices — not race, religion or color — but other things, like size or height or a personality trait — flamboyant, conservative. And that same person on the top of that pyramid doing the hiring is winging it, and he is often wrong. And the main reason is that he is hiring someone too strong who immediately becomes unhappy.

Where are the best places to find good DP people — universities, computer schools, other DP shops?
Half: It depends on what we are looking for. All those places can be the best. If you are looking for a beginner, you should look in the environments you mentioned. If you are looking for heavy experience, it's got to come out of installations just like yours. There's not much point in hiring people to do DP at a higher level who don't know the first thing about your languages or your equipment.

Is that a major criterion for searchers — that people know the hardware or software they have?
Half: Yes, but they have to understand that there is some hardware and software closely enough related.

If you get too specific, you are dealing with such a narrow market that the probability of getting the right person is remote. Hopefully, you'd find if you had an IBM installation that certain Burroughs Corp. equipment might be close enough that the person working on Burroughs [machines] might move right in without too much training. Better to get the good person and train a little than just get someone who will be here today and gone tomorrow.

How do you counsel companies in the ways to look for people?
Half: We try to highlight the similarities between systems that the company has and systems the candidate has worked on. We also point out that when the candidate got his last job, he had the same problem and was able to make an adjustment. That would be evidence. Hiring in DP is tough. I would not want to be a DP manager and show up every week saying 'Who is gone today?'

When someone with three to five years experience is seeking a job change, what are the key issues?
Half: I still believe that money is the most important factor. If you asked, a candidate wouldn't put money first because it's not the nice thing to say.

But I believe money is the greatest motivator. And a company can probably save money by paying slightly more than market rates. They'll save money because they'll have less turnover. That automatically takes care of it.

Benefits help lock employees in as well — good corporate benefits, profit sharing, pension plans, good insurance. If somebody says 'Charlie's wife is in the hospital, but it's not covered by our plan,' that upsets people.

At higher levels of DP management, is money also the chief motivator?
Half: That's still my belief, in spite of what the studies show. When someone is on an interview show, and is asked 'Why did you write the book?' did you ever hear anyone say 'money'? They wrote it for some other reason. It's the same way if you ask individuals what motivates them the most. Chances are, most won't say money first. It's not the right thing to do. But wave some bucks in front of them, and chances are they're going to change.

What is your outlook in this area over the next five to 10 years?
Half: As time goes on, you will see more stability in DP. If the turnover rate is 40%, it will drop to 20%. It will be more normal. There has to be a settling-down period. If nothing else, the young will be getting older; their mentality will change. They will be more willing to stay put. That may be the single biggest change we'll see in time. ■

Update

In your latest book, you mentioned that the systems that American businesses will need to select, develop and motivate managers are going to demand some rethinking. What do you mean by that and how will it impact DP and MIS shops?

Diebold: If you want to make an unduly simplistic but nonetheless realistic characterization of American personnel policies, it would be fair pay for essentially average work. It is a kind of homogenization. The problem with that is that it doesn't allow for the exceptional. And as you get into a world in which the differences can be enormous in terms of the value of an exceptional person as opposed to somebody who is simply good, you get into discrepancy problems. [These problems] are very tough to solve under our existing personnel philosophies.

In the computer field, talent is viewed as capital but is not recognized by the accountants and personnel policies. This view tends to catapult people out of large organizations into start-ups and small organizations where there is a big premium put on talent.

Do you have any suggestions about how to deal with this?

Diebold: One approach is to try to provide more freedom for particularly gifted people. One could put in some exceptional rewards and allow for flexibility. The technology itself offers some solution in a sense that individuals can live in a rural community if they want and have a much better chance of participating in a variety of businesses than was true a decade ago. I think that will be more true as we move ahead. But it is a difficult problem to solve.

As information technology changes the terms of competition in more and more industries, one of the problems that we are being asked to focus on is: How does one bring together the knowledge of information technology computers and communications and use them most effectively? How do you bring that together with an understanding of the markets and of the business itself? If the technology allows you to have a completely different approach to what you sell, then you can't reasonably expect that that's going to be achieved by people who are oriented primarily toward a staff support function.

Yet data processing people tend to be more loyal to their profession than they are to the firm in which they are working because, in many cases, they are so isolated from the business itself.

Diebold: The premium now is much more on people who genuinely understand the nature of the industry they are in and how the industry will change.

As an organization as a whole, not just as an MIS organization, you need to find ways of getting much more of an entrepreneurial view of the business in the direction of the MIS department.

Isn't that somewhat idealistic, though, when you are talking about the programming and entry-level operators? How can one reasonably hope to get those people more involved in business when the nature of the job doesn't lend itself to that at all?

Diebold: It is a question of the direction of it. The need to be innovative and creative and to carry on with this much broader global perspective that's now required still does not get rid of the routine jobs that they have come to do very well. So the way the MIS department measures itself has got to change because it is too easy to say that we are doing a job better than we did before in the traditional terms and not in the new terms.

What are the key factors in motivating data processing people?

Diebold: One of the key things is to allow them to see that the work they do is actually being used and is helping to change things. One of the more effective means of motivating good people is to give them the opportunity to see that they are actually playing an important role in the organization. All too frequently there is not enough done in high management in terms of letting people really understand how important their role is.

It was clear from the responses to a survey we did a couple of years ago that it was not money that was the prime motivator at all. It was the sense of doing a responsible job, of being rewarded for assuming greater responsibility. There is much more focus on someone getting a richer life out of their work. Companies that put good human resource policies in place earlier on in the tight labor market are at an advantage now. And others that treated DP and MIS people as simply expense items must opt to change their work style and culture.

So recognition is really the key factor.

Diebold: Recognition, responsibility and the opportunity for creativity.

Are companies starting to realize this?

Diebold: Yes. For example, Traveler's Insurance Co. now has 9,000 personal computers, and they are increasing that number at a very high rate.

Everybody in the traditional part of the organization is aware that the MIS activity is a major factor in changing their competitiveness. That provides good psychic income to the MIS organization.

What about the opportunities outside of DP and MIS that were traditionally off limits?

Diebold: You see that the user departments have a lot of action going on and have a lot of need for MIS skill, some of which is being provided by training themselves, but some of which is being provided by support from MIS and some by actual personnel trades. You therefore have a change going on in the kind of personnel that you need in a large MIS operation.

The role of the MIS organization is changing dramatically and it is becoming more of a policy-setting organization, and the kind of people you need in the MIS operation are changing as a result.

With turnover being down, as our studies have shown, in some cases attrition is not taking care of the shift that is needed. Normally you would be able to orchestrate that kind of a change over a couple of years because people would leave of their own volition. That isn't always the case any longer.

So now you have to retrain those who are already there?

Diebold: Yes, and the question is whether people do or don't have an interest in doing the new tasks. There is a great premium on people going into MIS who, while in it, get a much broader business orientation and much more management orientation. The opportunities are enormous if they have that.

You mentioned that turnover is going down and yet job-hopping is still one of the major problems in this field.

Diebold: As I said, it is much less of a problem today than has been the case for a long time in the industry. The rates are really very far down.

To what do you attribute that?

Diebold: It's due to the fact that it's no longer a new industry. For a long time the computer field was really a very new industry growing at an explosive rate, and you had very few people who knew about it. It is very hard to imagine someone graduating from business school today without having a full understanding of computers. A typical business school graduate is likely to be a well-qualified user at this stage, so you have an enormous increase in supply. The supply of people who are computer literate is 20-odd million people. A few years ago, it was less than three million.

And yet, I am still hearing people reporting great shortages in DP talent.

Diebold: I am not saying that it has gone away completely. But it is very different type of problem.

What are the figures on turnover?

Diebold: In the '81 through '82 time frame, we were looking at a 15% to 20% attrition rate. In major metropolitan areas it was much higher. Now it is down to around 5%.

What that means is that, roughly every 18 months to two years, you could expect half the people in the department to be new. And now we look at that happening say, every five years. So, a lot of the people you have working for you now will still be with you in the future.

The climate, though, has changed, in the sense that more and more people are coming into the market. The number of new openings is less, so the opportunity for each job seeker to find something new has decreased, and there is, I think, a growing prejudice against job-hoppers in the field. Our clients in general have become a lot more selective about who they hire.

DP professionals have been typecast as lone wolf types with low social interaction. How will this person have to adapt to fit into the organization of the future?

Diebold: For exceptionally gifted people, there is a very real premium on creativity, and organizations are willing to tolerate a considerable amount of eccentricity for that. On the other hand, all the forces are moving toward a person having much more of an understanding of the human being in business.

Also, the mainstreaming of computer knowledge in society now is clearly going to change that perspective. There is a much larger pool of people who are going into computers. They are not the same self-selective bunch who, by temperament, like working alone.

For awhile, a lot of the more entrepreneurial and outgoing sorts really ended up going into more entrepreneurial companies. As the expansion that we have seen over the last five years with the electronic industry slows, we may see more of those innovative people going back into some of the corporations. ■

HIRE from UPDATE/7

reer Link, which sponsors 50 "Softfairs" in cities around the country, every company that participates averages 3½ hires per fair.

The format, Callahan explained, is advantageous to both the recruiter and job seeker. To gain entry to Softfair, a prospect must have at least two years' experience in some software-oriented discipline that is DP and/or MIS related. In surveys of attendees, the average experience is actually closer to eight years, Callahan said.

The fair setting allows recruiters to meet an average of two people per minute if they desire.

For attendees, the job fair offers an opportunity to shop around and see what is available without making dozens of phone calls or knocking on doors. It gives recruiters and prospects a chance to meet face-to-face rather than through the mail, Callahan stated.

"Most people feel this is a less threatening environment for job hunting," he said.

John Hancock's Billingsley, who must hire up to 100 entry-level people per year, is a firm believer in job fairs. "You find more good people at a job fair than through an agency, and it saves the company a lot of money as well," he declared.

The drawback to a fair, of course, is that dozens of corporations are on hand, and most are looking for the same qualifications. In the software arena, people with experience in data base management systems, IBM's IMS or data communications are in high demand, Billingsley said.

"We're competing with five or six groups here that are looking for exactly what we are," he acknowledged. "If an applicant is good, he or she could come out of a single fair with five or six offers."

Though job fairs and open houses have proved to be highly effective in volume hiring, the tools for filling specific experienced positions under tight deadlines are limited.

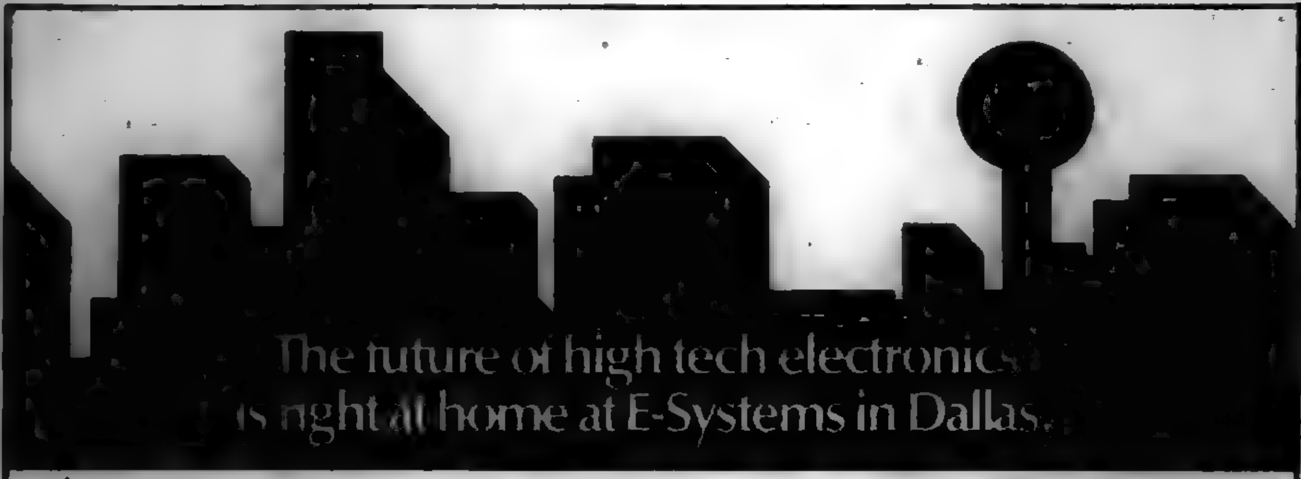
Some enlightened DP organizations have started formalized internal employee referral services, which have proven highly effective. DP personnel tend to have a strong sense of the employment market through professional associations and loyalty to the technology.

They often know of a friend or professional colleague seeking a job change long before anyone else, and recruiters agree that this resource is worth cultivating.

Experienced DP personnel, realizing the value of their services, have turned increasingly to professional placement firms to find new opportunities (see story Update/6). Corporations faced with the prospect of paying large sums to the search firm (generally a percentage of the candidate's salary) are reluctant to use placement agencies if it can be avoided.

Gillette's Hardy acknowledged that she uses agencies

See HIRE UPDATE/14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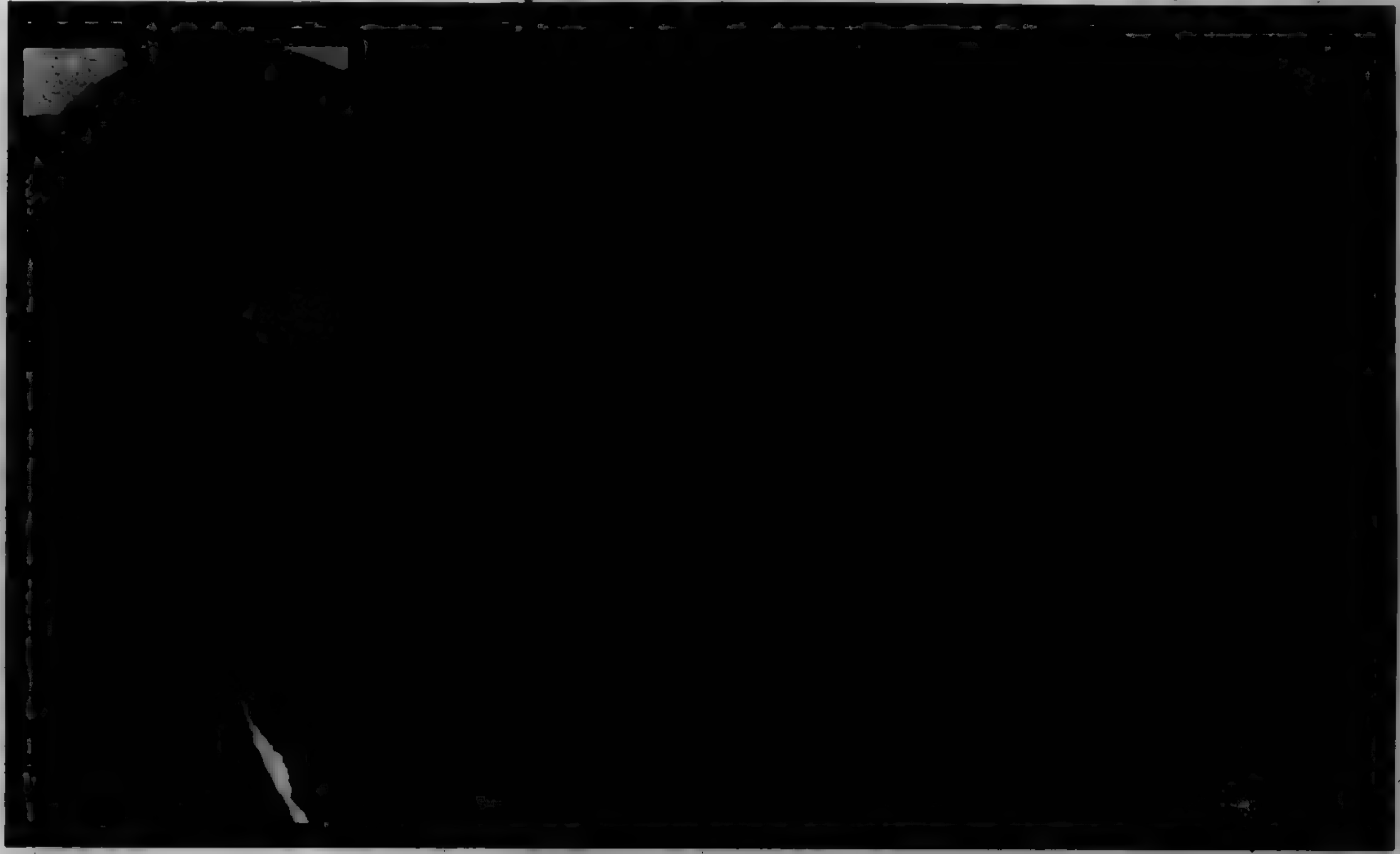

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HIRE

from UPDATE/10

to fill a majority of open positions but tries to avoid that route for entry-level slots. Under a time crunch, however, a headhunter may, in fact, be the most effective recruiting tool outside of internal promotions, she said.

Looking in-house

Most corporations are required to seek internal candidates for open positions, and this method for filling both entry-level and upper-level spots is essential for both finding and retaining quality people.

At Eastern Airlines, Inc.'s Miami Computer Center, Joe Rodriguez, the center's director, works closely with Anthony Labay, an Eastern personnel manager, to fill needed positions. Though Labay uses a wide range of methods for recruitment, the company's policy is to promote from within when possible.

For entry-level positions, Eastern employees, particularly in the operations area, can make the switch into DP by passing an entry-level test. They are then given extensive on-the-job training.

Some corporations understand that the loss of a key technical person can devastate the DP organization, and so they institute formal succession planning programs.

Succession planning can be as simple as designating successors to each management position, or it can encompass detailed career planning proposals and the ripple effect those will have on the entire organization.

Succession planning not only works as a logical and less disruptive means of replacing key personnel but is also a motivating tool for lower level employees anxious to know where their career path is heading.

Though hiring from within is a preferred method of finding DP staff, it has drawbacks. With the ever-changing face of technology, refusal to look outside will inevitably create a stagnant atmosphere.

"You need new blood, new experience coming in," said Eastern's Rodriguez. "Training someone in-house tends to make that person focus on just the particular system they are working on. Soon you find your overall expertise is dropping. So you need experienced people from the outside."

Finding the right people is only half the battle. Hiring them is the trick. Knowing they are in strong demand has created a buyers' market for DP and MIS professionals. A qualified computer professional might be courted by several offers. It will take more than a competitive salary to attract him.

Conger

Even corporate recruiters in need are quick to point out that they avoid job-hoppers. "I know the market is mobile," said Noreen P. Reilly, an employment representative with Shawmut Bank of Boston, "but I don't want someone who has had three jobs in two years."

As it becomes increasingly difficult to find both experience and stability, corporate DP and MIS shops are learning from both internal personnel and outside placement services what factors draw the best people.

The determining factors may well be the following:

- Geographic location.
- Nature of the work.
- Nature of the business.
- Chance for advancement.
- State of the technology.
- Corporate culture.

Recruiters said that large cities tend to be obvious magnets, and supply and demand in urban centers remains high. Programmer gluts have appeared in isolated cases, such as Houston, where problems in the local oil business have hurt many professions. But hiring on a regional basis continues to be strong (see chart Update/5).

The high-tech belts in Northern California, Massachusetts, Texas and North Carolina are also excellent spawning grounds for computer talent. But drawing that talent away to more remote areas takes both money and a combination of several of the above-stated characteristics.

Salary, most experts concurred, has to be competitive. Once that issue is addressed, the job itself is of greater influence. "When people work here, they know they are building skills that will make them very valuable," Simonian said.

Being at the leading edge of technology is also an essential recruiting tool. The major vendors like IBM, Digital Equipment Corp., Hewlett-Packard Co., Cullinet and others have little trouble attracting high-quality technical people who would rather help create the latest bells and whistles than maintain a five-year-old system.

Such high-tech industries as aerospace or electronics, which are utilizing the latest technologies, are also hotbeds for DP staff. And as technology begins to affect the Fortune 500 companies as never before, other conservative industries such as banking have changed.

"Five years ago, when banking was a regulated industry, it was the last place college graduates wanted to go," Bank of America's Damiano explained. "Now banking has changed dramatically and is as high-tech as any business in the country. If someone can come into Bank of America and make the system work, they can do it anywhere in the world. Our systems are immense, and that is a hell of a selling point."

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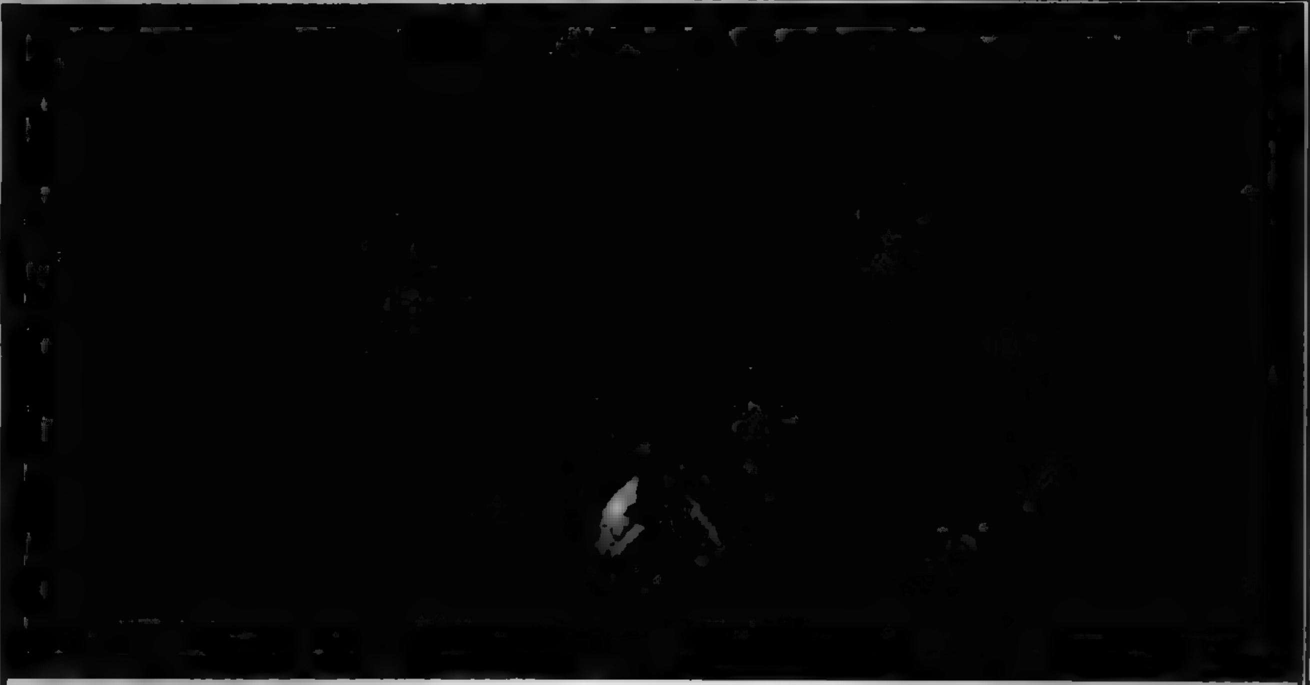

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Update

Keeping the good ones

Finding high-quality DP and MIS staff is one (not-so-easy) thing. Keeping those same people happy, motivated and in-house is another. DP and MIS departments must cope with the reality that supply does not meet demand and that, coupled with a spate of complicating factors inherent to the profession, has made retention one tough task.

In a field where the turnover rate has reached 20% or higher for some organizations in recent years, the cause for alarm is real. Management has grown tired of peering into the DP shop on any given morning and seeing unfamiliar faces. With new interest in the issues surrounding retention of DP and MIS staffs, corporations have started bringing stability to these technical staffs, and evidence of this enlightenment is beginning to surface.

In a 1984 study called "MIS and Telecommunications Budgets and Key Indicators," the Diebold Group, Inc. found that turnover in MIS departments of major corporations had dropped to 5.6%, by far the lowest point in the five years that the study has been done.

According to J. Daniel Couger, professor of computer and management science at the University of Colorado, the Fortune 500 has seriously begun to address the issues surrounding motivation of the DP staff. In the past 10 years, he noted, managers have recognized that technology is not the sole answer to keeping people happy. "For the first time in our industry — and I've been in it for 25 years — managers seem to be more interested in the holistic approach, looking at behavorial issues as well as technical issues," Couger said.

Despite this upturn, much remains to be done. The often-heard comment that DP professionals have more loyalty to the profession than to their employers continues to ring true in many cases, and an increased effort is being focused on changing that.

Motivation value

Motivated employees are like diamonds: They are rare and in demand. Though it can't be quantified, the difference in productivity between a motivated and a complacent employee is dramatic, and countless studies and books have been written about better ways to turn on the help. According to the best-selling book *In Search of Excellence* by Thomas J. Peters and Robert H. Waterman Jr., "Researchers studying motivation find that the prime factor is simply the self-perception among motivated subjects that they are in fact doing well."

In DP, that self-perception is often difficult to attain. Data processing, for example, is often cited as the scapegoat for internal problems and has also been called unapproachable by the user community. If management accepts this, DP staff members can become frustrated with the company.

[illegible]

Reasons	Total %
[illegible]	[illegible]
Compensation	15 - 3
[illegible]	[illegible]
Challenges elsewhere	6 - 12
[illegible]	[illegible]
Location	3 -
[illegible]	[illegible]
Competition	2 -
[illegible]	[illegible]

In a report for Auerbach Publishers, Inc. titled "Motivating DP Personnel," Frank Stanley of the Computer Task Group, Inc. wrote, "Using motivation techniques from the managerial level on down can significantly improve employee morale and self-image, which is reflected in their attitude and work. As a result, the department may be perceived more positively within the organization."

Among the key factors generally agreed upon as motivators for data processing and MIS staff are recognition, challenging work, growth paths, access to state-of-the-art technology, salary and communication. As Stanley pointed out, motivation can dramatically reduce employee attrition.

Why they leave

Just as salary is generally not the key factor in recruiting, it is also not the most important motivator for keeping employees. In DP and MIS, according to Couger, the most important motivator is unquestionably the work itself. Madeline Weiss, a Washington, D.C.-based management consultant, recalled a top systems analyst who turned down a lucrative job offer and said, "I've done that job. I wanted something different and new." An unchallenged employee is soon to be an ex-employee.

See HIRE UPDATE/16

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HIRE from UPDATE/15

Experts point to other reasons for turnover. It is up to management to pay close attention to the needs and desires of the individual, noted Glenn Young, vice-president of Walter Ulrich, Inc., a Houston consulting firm. Management must provide the proper tools to do the job. "Without the right tools, people get frustrated and then leave," Young said.

Pratt & Whitney's Simonian added, "The major reason you lose people is that your objectives are no longer compatible. That can take many forms. A person may simply not want to live in the area any longer, or there might be a personal problem."

Lifestyle changes, Simonian pointed out, are among the leading culprits behind attrition with the predominantly young population in many DP shops. "As life objectives take shape, there is usually a logical reason for someone to leave," Simonian said. "And we are happy to mutually part ways in that situation."

Unfortunately, not every parting is so harmonious. Executive search firms have little trouble enticing potential candidates, especially mid- and upper level employees, to consider switching jobs. Top salaries are attention getters, but there is often underlying discontent for that employee which, if addressed, could have warded off the headhunter.

"My feeling is that people basically hate change, and many won't leave a job just for money," said Barbara Durant, assistant vice-president of wholesale banking support at Manufacturers Hanover Trust Co. in New York. "More people leave when they are unhappy. You can't stop headhunters, but you can work hard to keep people happy."

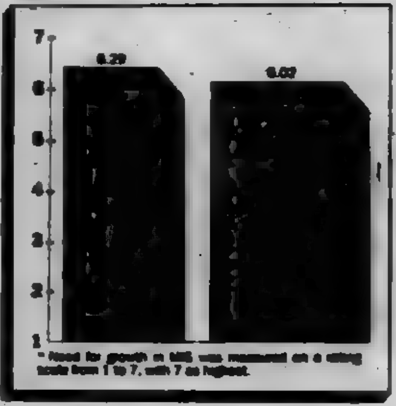
Core job descriptions

In 1978, Couger and his colleague at the University of Colorado, Robert J. Zawacki, released a major study on the motivation of analysts, programmers and operations personnel. The study extended the work of Frederick Herzberg, a pioneer in behavioral science in the workplace, to address the DP and MIS professions. Couger and Zawacki's research has continued since 1978 and has focused on several other key occupations within the profession, drawing on a data base of more than 10,000 DP and MIS employees.

Couger and Zawacki found that, not unlike the situation in any other occupation, the five core job dimensions are task significance — the impact of the work on others; skill variety — the degree of different talents required; autonomy — the freedom for the individual to determine job outcome; task identity — doing a job from beginning to end with a visible outcome; and feedback from the job. These factors, rather than salary, determined the contentedness and motivation of an employee.

The researchers discovered, however, that DP and MIS people had more acute needs in two particular areas than workers in other fields. The first area has been called growth needs strength and refers to the need for challenge and growth in a job. "Of the 500 occupations looked at previously, people in [the DP and MIS fields] have by far the highest need for growth in all job types," Couger stated.

The second area of note is called social needs strength and refers to interaction with fellow employees. "The need for social interaction is much less for people in our field," Couger said. "Many of the jobs in the field are the kind that can be done alone, and the profession has attracted people who work well alone."



* Need for growth in MIS was measured on a rating scale from 1 to 7, with 7 as highest.

By isolating these two characteristics, the study provides insight into some basic problems in retaining good DP people. "Most people need a sense of achievement, but it is more true in DP," Weiss explained. "It's [peculiar] to the breed. To grow professionally in this industry you have to learn new systems and keep abreast of rapid change. The DP person doesn't care what the environment is like — he'll work in the basement — but he wants continual challenge."

Providing a challenge for staff does not require bringing in the latest technological marvel, however. Fortune 500 companies generally don't have the inclination to purchase leading-edge toys simply to keep DP staff content. Instead, challenge and growth take other forms.

At Eastern Airlines' Miami headquarters, the computer center is responsible for a long list of dynamic areas of computing for the airline, including office automation, microcomputers, MIS and a host of applications development projects.

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FIRST PAN PACIFIC COMPUTER CONFERENCE / CW COMMUNICATIONS

Management training can cut high rates of turnover

By Frank J. Stanley
Special to CW

Perhaps no individual within data processing has as much impact on the retention of good people as the DP manager. Ironically, the development of effective managers is usually ignored.

Missing from the managerial ranks of data processing are individuals who are suited to the role and individuals who are trained to carry out the role. In more cases than not, DP managers come from the ranks of the technical staff (programmers and analysts) and, at least initially, are little more than programmers and analysts with the title of manager.

While their understanding, acceptance and development in this role eventually occurs, it usually happens only through the efforts of that great teacher — experience. The unfortunate aspect of this type of management training, however, is the cost of the education. This cost in terms of stress, mental anguish, loss of personnel and actual dollars can be enormous and, as such, should be avoided if at all possible. While experience cannot and should not be avoided, better preparation of new managers to deal with those experiences will help to ensure better control of the outcomes and positive results. This can only be accomplished through effective management training.

Effective management training for data processing does not mean spending two days at a seminar nor does it consist of simply working alongside another manager for a week to learn the ropes. To be effective, training must consist of a series of educational encounters over a period of time that are specifically oriented toward the individual business and the skills that the manager must exercise.

An educational program has three purposes:

- It should assist in the selection of managers.
- It should provide for training in management skills.
- It should ensure continued reinforcement of those skills.

In addition, the program should provide feedback so that it can be self-correcting and continuously up to date.

The position of manager of systems or manager of programming is dramatically different from that of a systems analyst or programmer.

The differences are illustrated in the chart below, which lists various aspects of an individual's job as seen by a programmer/analyst as opposed to those same aspects as seen by a manager.

It is easy to see that major differences exist, and that many aspects of a manager's job are not necessarily skills that technical staff members have developed in the course of their careers. Perhaps the biggest and most difficult difference to overcome is that a manager is a facilitator not a doer. Managers are not measured by the output that they themselves produce but rather by the productive effort of the staff for which they are responsible.

[illegible]	[illegible]	[illegible]
Functions	Programming/ analysis, design	Planning, organizing, coordinating, controlling
[illegible]	[illegible]	[illegible]
Orientation	Specific tasks	Coordination of overall activity
[illegible]	[illegible]	[illegible]
Skills used	Technical/logical	Interpersonal — creative problem solving
[illegible]	[illegible]	[illegible]
Organizational commitment	Not required	Necessary
[illegible]	[illegible]	[illegible]

Typically, the first time a crisis arises, a new manager solves the problem by digging in and doing the work himself. In the short run this produces the necessary results, but over the long term it does not provide the manager with the opportunity to learn to manage nor does it encourage the growth, achievement and motivation necessary for a staff to be effective.

Working in a new area of responsibility can be uncomfortable when an individual is given new duties without adequate training. The helping hand and familiarity that training provides can mean the difference between avoiding and dreading new duties and eagerly undertaking them.

Stanley

Candidate selection is the first part of the training program and should be taken as seriously as the recruitment of employees. A management development program cannot be effective when applied to people without management potential. While there will always be a subjective aspect to this process, a certain degree of risk can be eliminated by developing selection criteria and a ranking method. The selection criteria should consist of qualities and attributes that are deemed important for the specific position within the specific organization and might include the following:

- Knowledge of the job. Does the person know his current job well, and is he aware of how it fits into the larger picture?
- Past performance. Has the person demonstrated qualities in his current position that indicate an ability to handle new duties?
- Desire. Does the individual want to be a manager? A person who accepts the position of manager but has no real desire for it will never become a really exceptional manager.
- Personality traits. Does the individual display the personality traits that are desirable in managers and tend to indicate potential success? These traits can be measured with a variety of psychological tests that are extremely accurate. The difficulty lies in determining which traits are important indicators of success.

A method of measuring developing skills that is used successfully in some firms is an internship program. This requires potential managers to spend part of their time in training and management activities while retaining their technical responsibilities. This gives the organization an opportunity to measure how well an individual is making the transition. It also allows the employee to determine his own feelings about the position and to back out gracefully if he does not feel that his career lies in the management area.

As more and more people pass through management training, the selection criteria can be refined based upon the success of those involved. A personality profile can be developed from successful managers that will help provide a better match for future candidates.

The training program

If a firm is going to invest in its future managers and hopes to provide valuable, useful education, then a lot of care must go into the selection, development and scheduling of training sessions. The needs of each organization will vary somewhat due to the nature of its business, but several rules and guidelines can be applied to most management development programs.

Business/administrative skills. A manager must know about the business that he is in; knowing Cobol, IMS and how to design systems may be a good background, but a manager's job extends beyond data processing and embraces the functions of the business.

It would be ludicrous to send an employee to an outside professional training session on performance evaluation or recruiting only to find that the policies advocated were at odds with the company's existing policies. Training sessions put on by in-house personnel are superior since they generally provide useful examples to which the potential manager can easily relate.

Interpersonal skills. There are a variety of managing skills essential to success that do not specifically relate to DP. These skills include the ability to communicate, listen, motivate, delegate, think creatively, solve problems and make decisions. In some respects, these are the most important managerial skills because these are people skills, and dealing with people is the essence of management. Because these skills are of general nature, training can be provided either in-house, if expertise exists, or at professional seminars. Outside training for these types of skills can be beneficial as valuable insights and fresh approaches can be learned.

Continue to reinforce. Education should not stop once a formal training course is completed. Rather than following a rigid curriculum, a trained manager should spend a certain amount of time advancing his management education.

Practice. No one should be expected to attend a comprehensive management course and then be able to perform effectively; much of what is presented in a lengthy course gets lost in the sheer volume of material. An effective format for training consists of a series of training sessions, each oriented toward a specific skill spread out over a period of time. Sessions should be intensive, interactive and include examples and role playing.

Technical training. To manage a DP staff effectively and to play a part in making crucial decisions, a manager must maintain some degree of proficiency in the technical areas. This usually is not a problem when someone is initially promoted, as they are likely coming from the technical ranks where their skills are sharp. But as time goes by and the hardware and software environment changes, a manager may find himself getting technically out of date.

A successful management training program is hard work. The results, however, are worth the effort. By ensuring that the correct people are selected and that they are aware of their roles and prepared for them, an organization is ensuring the success of both its managers and all the individuals who work for them. ■

Stanley is systems engineering manager for the Computer Task Group, Inc., a management consulting firm in Independence, Ohio.

Update

HIRE

from UPDATE/16

Addressing these issues, according to Eastern's Rodrigues, is what provides the challenge. "If you try to keep up with the latest technology today, you won't get any work done," he said. "We try to give people the opportunity to move internally. Say an applications programmer has his sights set on being a technical programmer; we try to be flexible in transferring people to keep them happy in what they are doing."

Cross-training in various technical disciplines can help avoid task or applications specialization in which an employee gets pigeonholed. Calling on a particular employee to repeat the same task continuously not only can lead to boredom but also can limit that person's scope of knowledge. As Stanley stated, "Cross-application work not only provides employees with fresh areas of interest but also provides valuable cross-training to safeguard the organization."

Corporate planners and managers are also discovering a more obvious route: get DP more involved in the business of the organization. DP and MIS personnel have long felt that their group was simply an add-on service wing of the business that could just as well provide its function to company A as to company B.

"It's up to the companies to work hard to make DP [employees a] part of the business and not just hired hands with a technical specialty," said Randy Nord, vice-president of Kurt Salman & Associates, a Princeton, N.J., consulting firm.

At Pratt & Whitney, a continuing effort is being made to do just that. According to Simonian, "We are here to produce high-quality, low-cost [airplane] engines on time. That is our product." The MIS group is as much a part of that enterprise as anyone is, he said, and its activities are measured in terms of how well it impacts on the company's product.

"It's amazing that people think they have to create phony leading-edge projects so they can fool around with the technology," Simonian said. "We don't do that here. We are dealing with applied technology, but it is in a real environment. It's incredible how much more stimulation comes from that than from a contrived situation."

Low social needs

The second characteristic that emerged from the Couger/Zawacki study — low social needs among DP and MIS professionals — has had an equally strong impact on retaining good people. As end-user computing spreads, the DP professional's role has changed, and the need for interactive grace has become acute. In addition, lack of good communication skills has become somewhat inbred in DP environments and has been the source of many attrition problems.

'The major reason you lose people is that your objectives are no longer compatible. That can take many forms.'
— Arthur Simonian
Pratt & Whitney Aircraft Group

As Couger pointed out, managers and supervisors who came up through the ranks continue to have the same lone-wolf mentality as they did when they were programmers and analysts. Thus, they are less likely to spend time with their employees providing guidance and feedback, and, in turn, the employees are not inclined to knock on a supervisor's door to ask for it.

These same employees, however, with high growth needs strength, are goal-oriented and want very much to know about their progress. These conflicting needs and the resulting lack of communication between employee and manager lead to frustration and, often, resignation.

As Stanley noted, "recognition of effort makes employees feel that their work is important and worthwhile. *An employee will never mistake lack of criticism for recognition.*"

Recognition comes in many forms. A simple pat on the back or announcement of a job well done at a staff meeting — both just common-sense practices for enlightened managers — can work wonders. "Little things mean a whole lot," Nord said. "It's important to recognize what DP is contributing to the business."

At Eastern Airlines, employees who do outstanding work are given free passes for flights. Cash bonuses, if available, are excellent motivators but have the drawback of instilling jealousy and discontent among co-workers.

Involving employees in joint planning for the organization instills a stronger commitment on the part of the employee to make those plans work. Giving employees more responsibility, stretching their capabilities and saying, "I know you can do it," provides extremely positive feed-

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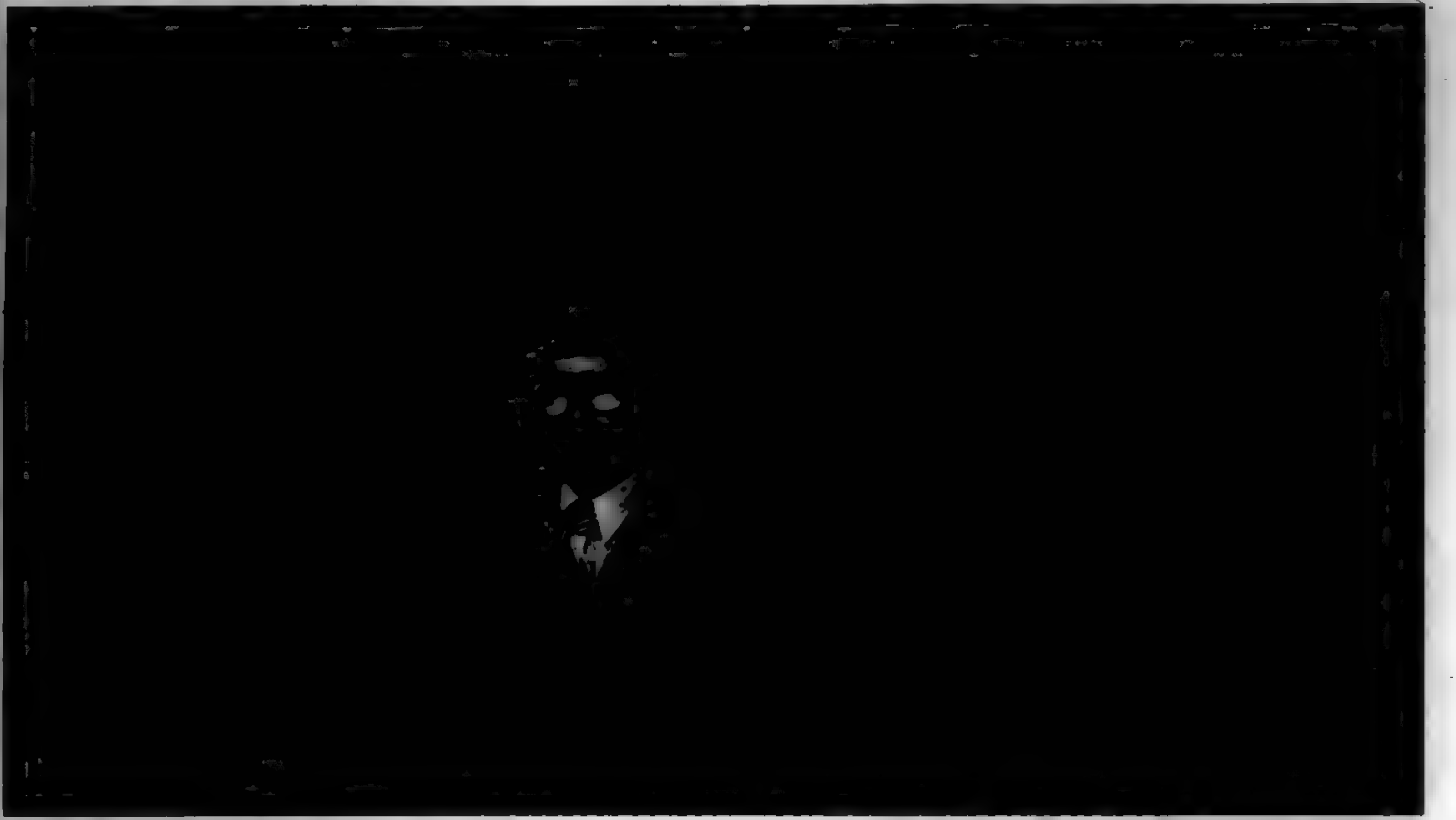

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back and recognition of talent.

"If management creates an expectation of success for an employee, it is a very powerful tool," Weiss said.

For DP and MIS employees, another major frustration is lack of communication. Couger's study, in fact, indicated a universal feeling among DP professionals that their supervisors are poor in providing feedback on performance. The supervisors, in turn, were unaware that their staffs felt that way. "People love to be informed," Durant said. At United Technologies Corp., of which Pratt & Whitney is a part, all middle- and upper level managers are required to take specialized training programs for strengthening communication skills.

"People today want to be communicated with," Pratt & Whitney's Simonian said. "Even with our training, it is still a large problem. It's not adequate to give people a directive and leave. The two-way communication trail is the largest single obstacle we constantly fight to overcome."

To that end, the company has specific policies regarding supervisory ratios (they are kept as low as possible) and the amount of interaction required between supervisors and employees. Managers are encouraged to meet regularly in small groups to discuss needs and frustrations, and there are formal appraisal programs for feedback on performance and status. "We work at it very hard, but it needs constant attention," Simonian said. "It's like growing grass — the minute you turn your back, you've got weeds."

> 'If management creates an expectation of success for an employee, it is a very powerful tool.'
>
> — *Madeline Weiss consultant*

For managers of MIS and DP, the pressure to understand the needs of employees and to communicate that understanding is greater than ever. "People change and the manager must be a good diagnostician to understand those changes," Weiss said. "Dollars may be critical to someone at [age] 23 but won't mean the same at 35. The manager has to see what really turns on that person. The bottom line is there is a strong need to be respected."

Training, the Computer Task Group's Stanley noted, is usually given a great deal of lip service but actually given low priority in most organizations (see story Update/17). For the DP and MIS environment, training in behavioral techniques and management issues must, in fact, become a high priority as that environment continues to change. Taking a technical person and reorienting him to the realities of the modern business world is a difficult task. But the companies seeing the greatest progress in retaining good computer professionals are the ones that have addressed these issues. "In shortsighted organizations, interpersonal training doesn't happen," Weiss said. "It's always on the back burner."

Management must also be cognizant of which people are interested in expanding their interpersonal skills and which people aren't. It should be clear, Weiss noted, if a systems programmer simply doesn't want to get involved with end users. Those people, she stated, should not be pushed into it. For others who want to expand their horizons, the company should provide the training.

These changes, of course, do not come easily. Weiss suggested training in the form of workshops and outside consultants. The use of role-playing, for example, often provides good results. Weiss recalled a mid-level manager who was having problems at home with his child. In the workshop, he took on the role of a systems analyst and came across as gruff and menacing. Unlike in his work and home environments, he saw clearly what was amiss. "These changes don't often come naturally," Weiss said. "People have to adapt."

Weiss

Acquiring these skills will pay off not only for the DP or MIS employee in his current position but will also provide a solid foundation for the step up into management. Unfortunately, up to now that route has been littered with casualties. As Walter Ulrich's Young said, the attempt to turn a techie into a manager is where the "Peter Principle [the theory that eventually a good worker will rise to his level of incompetence] really shines through. Taking a good technician and turning him into a bad manager really hurts at both ends."

Dual career tracks

Unfortunately, the time-honored business practice of rewarding outstanding employees with promotion into management has been particularly damaging in DP and MIS. Companies have recently begun to examine the possibilities of dual career tracks for technical employees. Though many have looked into it, few have implemented the plan. One that has, with success, is Eastern Airlines.

Eastern, according to Rodriguez and Labay, had suffered serious turnover problems with DP and MIS during the past several years as deregulation rocked the airline industry. DP employees at Eastern, fearing for their jobs, left in droves.

Having survived the storm, Eastern has recently turned its business problems around, and stability is beginning to return. With it has come an aggressive reshaping of many corporate policies; among them was the institution of a professional grading structure for DP employees. This track takes programming and technical people out of the main management salary structure and creates an alternative in which competent technical people can be promoted and given pay increases without becoming managers.

Rodriguez, left, and Labay

"Your used to get up to the top of the technical level and there was only one way to go — into management," Rodriguez said. "If you had a fantastic technical individual, the only way to go up was to become a project leader or manager. Now that person can go just as high on the professional side."

According to Labay, this innovation has attracted quality staff back to Eastern. "We now have the salaries to entice people, and the professional salary structure gives advancement potential to those who don't want to be managers."

For those who do express interest in management, it is essential that their progress be carefully mapped out and monitored. Couger and Zawacki, in one of their studies, monitored the project leader position and discovered that there was a high level of dissatisfaction among these people. The cause, they found, was that young, first-time managers could not handle the pressure of reporting to two people — their own technical manager and the manager for the specific project.

"One [manager] rates them on their on-the-job performance and the other [manager] actually gives salary increases," Couger explained. "If you put a first-time manager in that situation, it creates a very awkward and difficult situation. It ought to be the second job in management."

Among the many technical occupations within DP and MIS, the one most prone to unhappiness and turnover is the systems maintenance person. Unlike applications and technical development, which are considered the leading-edge, glamour positions, maintenance has earned a reputation as a second-class, less-challenging job. Indeed, in Stanley's report on motivating DP personnel, he cautions against letting maintenance programming become someone's sole job function.

In a recent study of maintenance personnel, Couger found that managers were looking for ways to enhance maintenance tasks. "One company changed the name from maintenance to retrofit engineering," he laughed. "They figured if they changed the name, people would be more interested. That lasted about five minutes."

The interest in the field is motivated by economics, he said. Maintenance makes up 50% of the typical DP budget and is forecast to be 60% within five years.

Durant, in charge of maintenance programming at Manufacturers Hanover Trust, has taken effective steps to keep her people happy. She acknowledged that it is more of a challenge to keep maintenance people motivated, but she has had great success in this area by following some basic rules.

Durant keeps her staff of 45 productive and motivated "with a lot of TLC." She makes sure that she knows everyone by name, takes people to lunch, organizes after-hours activities and generally "fights for technology." Durant also encourages people to write letters of thanks for her staff's efforts and pushes management to recognize the quality work that is being done.

"My job is sales," Durant stated. "I have to generate work for my people. I do that by building a reputation for high standards, which attracts good people." Durant also pays close attention to the needs of her employees. She has the flexibility, she noted, to move people from one project to another if she senses they are getting bored. She also keeps an eye out for new technology and fights to remain state of the art.

"I have incredible respect for what my people do," she said. "It's a real challenge going into other people's code and figuring out what is happening with little or no documentation. There's incredible pressure to respond."

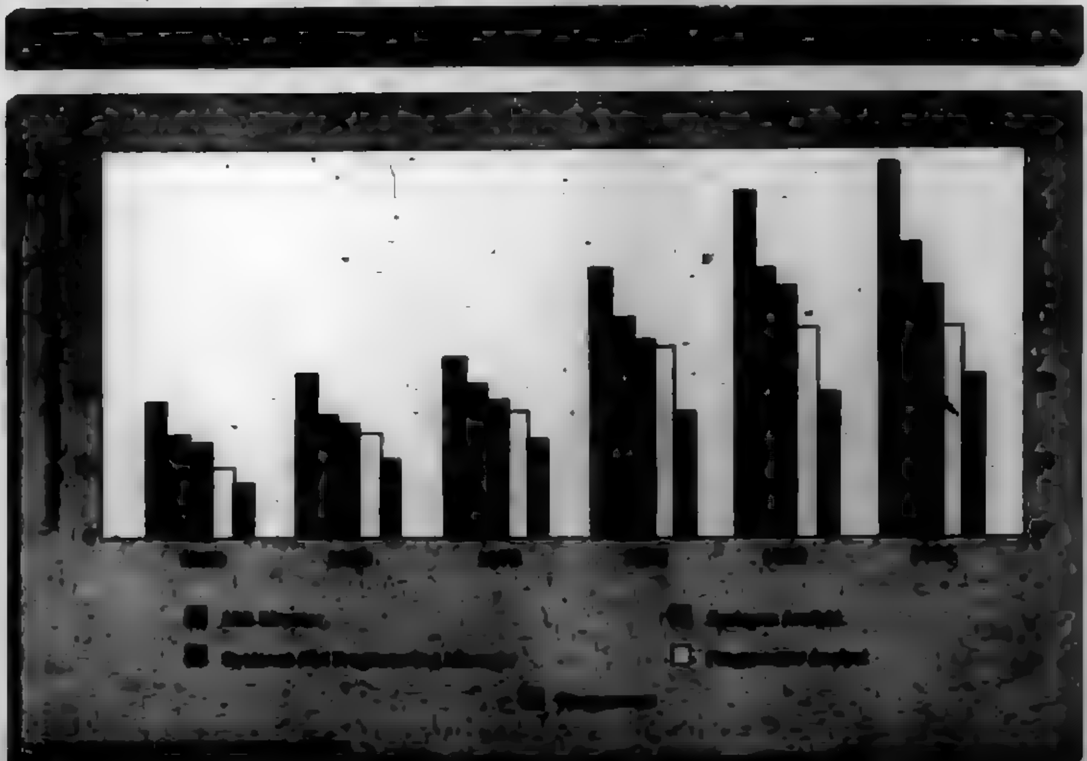
Ironically, Durant finds that some people get into maintenance because it provides a smoother path into management, unlike in development, where there tend to be many high-level people. She has also helped establish other career paths for those who eschew leadership and want to remain on the technical side of things.

Despite the innovative techniques companies have initiated, finding and keeping the DP and MIS staff continues to cause concern in corporate America. Companies facing increasing labor costs in all occupations have instituted flexible hours, increased benefits packages, telecommuting policies and many other innovative options to keep their staffs happy and intact.

For DP employees, the difficulties are even greater. Computer professionals continue to hold a social reference point for equity and fairness outside of the company. They are less interested in comparing salaries with, say, those of accountants within the company than with fellow DP professionals in other companies. This makes it difficult for managers to make sure their policies appear fair and equitable to the DP and MIS departments.

When supply reaches demand in the field, things will get better, Nord predicted. "It's still a relatively new profession, and there are a lot of people working in it who are not all that good," he explained. "And we haven't learned all we need to know about training and developing a good staff. It'll be a long time before supply reaches demand, and there's a way to go before it all settles down."

In the meantime, enlightened leadership can clearly make a difference. "If you keep talking to your people, you'll know when they are getting unhappy," Durant concluded. "Nothing replaces good management." ■



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LEAVE

from UPDATE/20

stall and operate a system of employee development that can be managed so that the majority of the higher level job openings are filled by promotion from within. This can be accomplished through a series of promotions that will ultimately lead to new people being brought in at the lower levels of the department.

The method is to develop what might be termed a pipeline process. This entails a continuous employee development effort at all levels of the department. Under this process, people are encouraged to prepare themselves for higher level jobs, either in their section or in another section. These people are given first consideration for positions as they open up.

The pipeline concept requires that as people reach the higher levels of the department, they must make career decisions. The further up in the organization one moves, the less available become opportunities to continue advancing. As people reach higher levels, they must either accept and make peace with the fact that their future advancement opportunities are limited or move on to something else.

Making peace does not mean that these employees should go into semiretirement while still employed. It means they should be willing to accept and adjust to the reality that as one moves up the organizational ladder, opportunities to continue to advance become increasingly scarce. Even though further upward movement may be blocked, given the appropriate environment, it will still be possible for people to find new challenges and develop new skills.

This can be accomplished through lateral movement to a different area within the department. Opportunities outside the DP/MIS department, which offer new challenges if not advancement, may also be available.

Disgruntled employees who stay on board but are unable to make peace with limited prospects for advancement, tend to have a deleterious effect on everyone. In such circumstances, employees who at one time were productive and dedicated can become a detriment. Once people become unhappy with the organization, for whatever reason, it is in the best interest of everyone if they find employment elsewhere. Again, some turnover is welcome.

Some people, aware that they probably have reached the highest level they can within the organization, will choose to leave. This should be viewed, provided appropriate employee development work is in process, as a positive circumstance for everyone concerned.

> **Once people become unhappy with the organization, for whatever reason, it is in the best interest of everyone if they find employment elsewhere.**

The particular employee will have obtained a variety of skills and knowledge. The organization will have obtained the services of a very good employee. If the process is handled correctly, the parting should be amicable and should work to enhance the reputation of the organization.

Those who remain will also benefit. If the development strategy is correctly built, several promotions can be effected as a result of the departure of one senior-level person. The promotion of someone from within the department to this position from the next lower level can develop a cascade effect where a number of promotions can be realized within the department.

Clearly, the building of a pipeline development process requires strong departmental management commitment. ■

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WOMEN from UPDATE/11

This DP director felt especially battered because she had left a major Fortune 500 company after 14 years (during which time she had earned a master's in business administration) and took a DP planning job with a media/entertainment company. After nine months, that company went on the skids, and she was laid off with six months severance pay, few professional contacts and little sense of how to go about looking for another job.

Executive recruiters did not offer much solace. She wanted to stay in New York but didn't have the financial services background recruiters were all looking for.

"I'd look at the interviewer's face. His jaw would just drop open when I told him what I'd been making," she recalled. She also remembered the pain of hearing that a man 10 years younger got the job in question at almost the salary she was asking. "I think there are a lot of doors closed to women. I experienced a lot of discrimination while looking," she said about her job search.

Up against the wall

The problem is not the $50,000 or $60,000 wall, countered Chick Bisberg, a senior consultant with Halbrecht & Co., which specializes in placing systems professionals. "Feeling they're at a wall at $50,000 or $60,000 is the direct result of a lack of previous career planning," Bisberg said about DP professionals who feel trapped. "They're overpriced, making no technical contribution." They might also have "topped out" their careers, he said.

DP professionals aiming for annual salaries of $60,000 and above must buttress their backgrounds, Bisberg said. If they have a computer science degree, add a master's degree in business administration; if their background is in business, pursue technical expertise, he said. Personal computers have been a good technical entry point, but those opportunities are already drying up.

There is little bright news for women or men who have topped out. "It's a rude awakening," Bisberg said. To move on often requires major sacrifices in dollars and geography and retraining and rethinking of career directions.

> **In today's favorable DP economy, if a man and a woman are vying for the same job and the woman has stronger experience and commands a higher salary, the employer will hire the woman.**
>
> *— Chick Bisberg*
> *Halbrecht & Co.*

Overall, in today's favorable DP economy — at least from a recruiting standpoint — Bisberg finds that if a man and a woman are vying for the same job and the woman has stronger experience and commands a higher salary, the employer will hire the woman.

Likewise, "while more women today are getting promotions, fewer women are being promoted simply because they're women," he observed.

In fact, many women have found favorable niches for themselves in DP-related fields, according to research by Cognos Associates, a non-profit research group in Los Altos, Calif., which studies women in the electronics industry. "Women whom we talk to express a high degree of satisfaction working in electronics — higher than in other industries," reported Judith K. Larsen, coauthor of *Silicon Valley Fever* and a social researcher on the impact of technology.

Good news, bad news

"Electronics is still expanding so rapidly, there are more job opportunities," Larsen explained.

The bad news, however, continues to be salary. Studies have shown that women continue to earn less money than men who are in comparable DP positions.

The good news is that opportunities for women continue to improve, especially for women breaking into the new, hot technologies such as telecommunications, artificial intelligence or fourth-generation programming languages. Entry-level professionals must position themselves now for these areas of expertise, Bisberg said.

Four years ago, the hot technology was personal computing, and Margaret Levine, who received her computer science degree from Yale University, found herself less interested in how the computer worked and more interested in what people were doing with machines.

After joining the MIS department at Columbia Pictures in New York, Levine was put in charge of purchasing personal computers. Though she has since left Columbia, she contends that working with micros opens opportunities to women, especially as personal computer applications and word processing, a traditionally female field, come together. ■

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Software Career Link (SCL), sponsors of SoftFair, the highly successful series of nationwide job fairs for software and data processing professionals, has introduced a new, resume matching service called SoftView.

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"SoftView is a very easy, effective, and inexpensive means of sourcing." - Vincent

The service has been in development and testing for the last several months, with only a handful of local client companies participating. Now that all development work has been completed, SCL director Paul Vincent expects SoftView to generate a great deal of interest among companies and applicants alike.

"SoftView is a very easy, effective, and inexpensive means of sourcing," Vincent said. "For a modest annual subscription fee of $9,000, a company can receive hundreds of resumes over the course of the year which match its hiring requirements. And, with our guarantee of a minimum of six hires during the year, that means an incredibly low cost per hire of $1500.

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In fact, a company can hire as many as 12 through the service at no additional cost, thus further reducing the cost per hire to $750. Client companies are protected through SoftView's exclusive money back guarantee. At present, companies who subscribe to SoftView also receive free attendance at a SoftFair in the city of their choice.

"For an applicant," Vincent added, "SoftView is even simpler. All he or she has to do is submit a resume and, assuming it indicates software or data processing experience, his or her credentials will then be entered into our database and subsequently matched with our client companies -- in complete confidence, of course. We have a built-in screening device that protects an employee's job search from being known by his or her present employer."

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HUNT from UPDATE/5

ers and employment agencies. These people, Gaines said, tend to be guarded and distrustful and won't return phone calls.

Among the current hot disciplines are telecommunications, network management, product development and systems software.

"It's hard to find people who can balance technical issues with management abilities," Gaines said. "That's our biggest problem. Almost all our searches are geared not to technicians but to those who can initiate and carry out the goals of the business. But we can't have someone with just management skill; they must have the technical skills as well."

The searches tend to be national in scope and focus on major urban areas where the best and the brightest are usually entrenched. Gaines finds it difficult to entice people from vendor organizations into user jobs. "Users are not as associated with innovation and new products," he explained. "But then again, innovation and drive don't necessarily lead to good management skills."

The key factor in tapping a candidate, Gaines pointed out, is whether that person is looking for a job or the search firm is creating the impetus for a move. "When we reach a person who is not looking, we need to create the motivation for switching," he said. Though salary is important, the determining factors lie elsewhere. A bigger, more important job with less constraints of corporate bureaucracy and an environment more attuned to innovation are major selling points.

"We don't want salary to be the prime motivator, although the opportunity for substantial increase may be there," Gaines said.

Gaines also avoids job-hoppers and 20-year veterans, feeling that extremes at either end are negative attributes.

Once he has found his candidates, Gaines begins the lengthy process of assessment and invites them in for interviews. "I try to determine the true quality level; how strong are they really?" he said. "How are their leadership and management skills? What are their goals? Are those goals compatible with the goals of the company? Is their style synergistic with the company, or will they create conflict? What is the depth and breadth of their knowledge?"

Gaines keeps in constant contact with the client company, giving progress reports and arranging follow-up interviews. Once he has sent the candidate to the client, Gaines does not step out of the process.

"We try to bring closeness to the match," Gaines explained about his recruits. "In more than 90% of the cases, the people we provide thrive in their new jobs. They establish long-term relationships." ■

IN DEPTH

Executive Interview

Al Smith
Atlantic Richfield

CW PHOTO BY GEORGE HARRAR

By George Harrar
Features Director

Al Smith is the manager of Corporate Units Information Services, the systems provider to Atlantic Richfield Co.'s headquarters in downtown Los Angeles.

Arco's annual revenues declined only slightly in 1984 to $24.6 billion. But net income plunged from $1.5 billion to $567 million, mainly because of excess crude oil and refining capacity worldwide. The nation's sixth largest oil company is retrenching by divesting unrelated businesses. The massive restructuring will take two years.

Pushing office automation isn't easy anywhere these days, but it's particularly tough in a company with its mind on oil. That's Al Smith's job. He was interviewed in his 21st-floor office in the "Arco building."

What is the priority of office automation in a giant oil company such as yours?

It's mixed. Obviously, when you have different operating companies, there are different priorities. We in corporate started as early as 1979 to begin to look at office automation and personal computers — we actually bought our first personal computer in 1978 or 1979.

From which company?

It was an Apple, as a matter of fact, just to see what it could do. We put Ethernet on this floor in 1980, and now we have expanded it to several other floors. So we've been working with Xerox Stars and some 860s. Now we've added personal computers to the network.

Which personal computers?

IBM.

They work on Ethernet?

Yes, there's a new board and a new system and we've been testing it for several months. Now it's up and running. We haven't done a lot of integration with it, but we're starting to use the services available on the network.

Getting IBM Personal Computers to work on Ethernet is a challenge.

It has worked, but as I say, we haven't tried to do every little service that you can do. It seems to function.

Are these ATs or XTs?

XTs, basically. We haven't tried to put the AT on Ethernet. We think it will work. I think there are several ways we could do that. But we don't have a lot of ATs yet, anyway.

What services are available through Ethernet?

We can do messaging from the different floors and some mail services. We can transfer documents — we do a lot of that.

> **"I believed early on that we're going to work a lot differently as we put more workstations on people's desks."**

IN DEPTH/INTERVIEW: AL SMITH

PROFILE

ATLANTIC RICHFIELD

Corporate headquarters - Los Angeles
Annual revenue(1984) - $24.6 billion
Number of employees - 39,000
Main business - Petroleum refining
Mainframes - IBM 3030 and 3080 series

How many floors are linked by Ethernet?

Arco occupies about 30 of the 50 floors in the tower here. Four or five floors are wired up. We communicate data back and forth between our employee relations people and my staff.

Will you expand to more floors?

As the need arises. One of the reasons we did this was to learn about local-area networks and the impact of office automation. It was our belief early on — my belief, anyway — that we're going to work a lot differently as we put more workstations of one kind or another on people's desks. We've learned a lot from the pilots we've done.

What have you learned?

One is that relationships change between people. For example, just in our case on this floor, the secretary is no longer the font of all knowledge. Documents get prepared without the secretary even seeing them in many cases, including multiple distribution. A lot of our people are now beginning to use these things in lieu of yellow pads. They just don't write anymore. They're creating on the terminals. We've seen a lot of synergy and creativity; we're seeing things done much more effectively.

One of the things we noticed in our employee relations pilot was that the decision cycles come down radically. An employee relations manager would, in years past, ask for some statistical data in graphics form; it would take several weeks to gather the data and pull it all together. Now, basically, with various spreadsheets and graphics packages, they can pull this together in two, three or four hours quite often, and that becomes the accepted norm. Now if it takes longer, that causes an issue. The cycle that people plan to produce documents, the way in which they expect things to happen, becomes compacted.

Some of the benefits of office automation that you mention are intangible.

No question about it.

How do you prove your case financially?

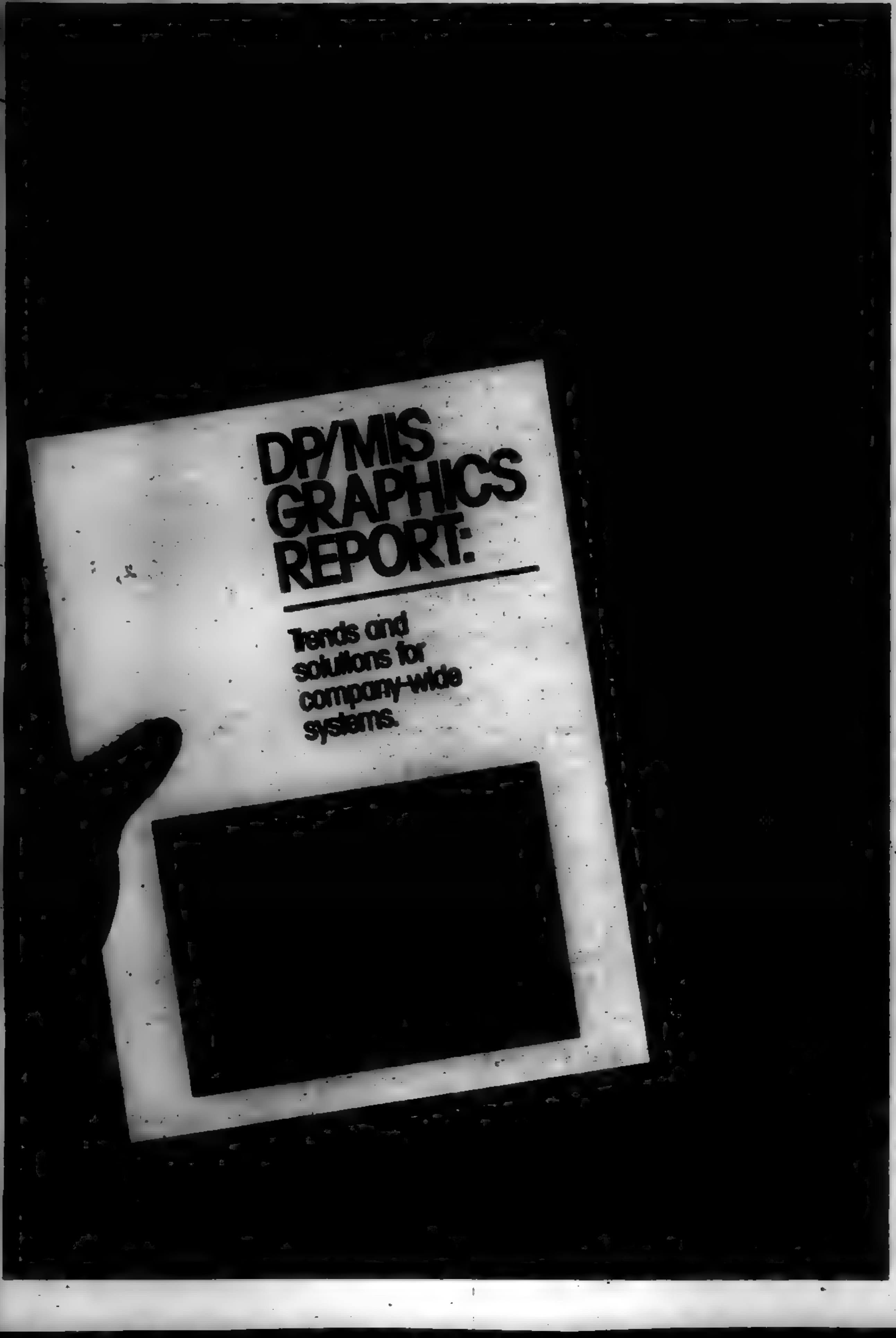
With great difficulty. We have had several office automation pilots that clearly demonstrated return on investment — a very large return in the 30% range — where we've been able to calculate the before-and-after costs of running the function and demonstrate that it paid. We have had some other projects where there are clearly intangibles. We can't extrapolate from one to the other and say, therefore, that everyone will save X amount of money.

Tell me about a pilot project that failed.

Let me think about that. We had one years back where we put in some equipment — I'd really rather not get specific about equipment, because it sounds like I'm panning someone, and I'm not. We put it in, and it really didn't do what we wanted it to do. We learned a lot about how people receive things — it was basically a clerical and secretarial pilot, a predecessor to the Xerox Ethernet. We learned a lot about what we did want because of what we couldn't get with this.

Ethernet and Xerox don't have the strongest reputation in office automation. What has been your experience with the two, the company and the network?

I think we have done good things with their products. They have worked hard to support us. We think they



are beginning, maybe, to improve on what they can do with the network, and we're pleased with that. There are many things we've wanted that we haven't been able to get. That's partly because Xerox has been restructuring, and there have been a lot of changes. From a service and support standpoint, it has been acceptable.

In retrospect . . .

Oh, I still think it was an excellent decision, absolutely. I have no doubts about that. There aren't many games in town, from a local-area network standpoint. When the [Xerox] Star existed in 1979 and 1980, there just wasn't anything else on the marketplace like it. It is tremendously powerful and easy to use. We went into it with the idea that we would learn a lot.

We're not trying to proliferate it everywhere, though our ultimate goal is that probably by the end of the decade maybe 75% to 80% of our people will have a workstation on their desks. In one form or another, we're probably at about 40% or 45% already.

If power and ease of use are the benefits of the Star, what are the drawbacks you have identified?

The Star is not quite as fast as it should be — everyone knows that. For some people, it's just more machine than anybody needs. There are so many things you can do with it, some people just don't need that much. There have been no major drawbacks. The thing just runs and runs. We don't often have any hardware problems. We'd like a little more software.

What software do you lack?

We want more integrated software to allow the office to function together. The big problem there is that until we get enough workstations on people's desks, it doesn't matter — you're not going to do calendaring and vast electronic mail. Those things aren't much value if you can't get to the people you need. We feel we have to build up that mass before we can do things like calendaring automatically and get total use of electronic mail.

Ultimately, what I'm looking for is a more integrated set of software that allows all these functions to tie together almost anything you could do in the office from an administrative or document or general-function standpoint.

> ”
>
> *Ultimately, what I'm looking for is a more integrated set of software that allows all these functions to tie together almost anything you could do in the office.*

Does that software exist, even outside of Star and Ethernet?

I don't really think so. I don't think anyone has done it yet.

Is any vendor close to offering this total solution?

No, and we're talking to a lot of different people. I'm sure it's going to happen. People are coming along, but I don't think anyone's there yet. Maybe we're always going to be ahead of where the vendors are, so it's hard to say that end users are totally satisfied. I'm not trying to throw rocks, because it's a very difficult world we live in today. The vendors are trying to change, and we're trying to change. It's tough.

What percentage of the workers now have terminals on their desks?

We have roughly 27,000 white-collar workers — that doesn't include factory, plant or oil field staff — and we have about 9,000 workstations in one form or another. That includes IBM 3270 dumb terminals, in many cases. But still, they have a workstation of some kind. Many of those 3270s are for engineers, and they use them for real functions. So about one-third have something. There are about 1,900 people just in corporate and about 700 workstations.

Have the operating companies made the choice to go with Ethernet and Xerox?

No, actually, nobody else in the operating companies has a local-area network. There are several IBM Professional Office Systems.

Are you considered a test site for the operating companies?

We share a lot of what we learn. We meet four or five times a year. My boss, the vice-president of Administration and Technology, chairs [the meetings]. We bring my peers together. We look at overall policy. We also have a planning council and communications and research councils at various levels meet and share information. We have a reasonable communication. I don't think we're totally duplicating efforts.

Do you have a specific, written multiyear plan at corporate headquarters for introducing or spreading office automation?

We do. We did a strategic, long-range plan, but it's at a fairly general level. It's not down to device by device and when we're going to put them in, but [it tells] the areas where users want us to put devices in. We're moving rather cautiously right now, primarily because of economic hard times. We're taking a hard look at when the right time to do this will

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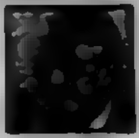

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be. We think in the long run it will be cost-effective. We have to prove our case thoroughly.

We continue to do pilots. For example, we have a project that will go in this year that is a combined look: from an office planning standpoint, from a communications viewpoint and from a systems standpoint. The three disciplines are working together to do a pilot with our employee relations people. We're expanding a pilot we did with them to put a workstation on everyone's desk in that unit and to give them more function. It will be a combination, using Ethernet and access to mainframes.

What specific applications are driving office automation?

Spreadsheets are obviously one. Then there's word processing. Graphics is the third area. Many people will say, "If I can have a spreadsheet and a terminal or a personal computer — wow, I can do this and thus and so." They really can cost-justify any number of things. But it's all the other things that they didn't think they were going to do that make the difference.

For example, our employee relations representative now mails all of her messages back and forth with my secretary. We don't make phone calls, at least not very often. When we put in the network, we never put it in with the idea that the two floors could talk together, though we recognized that they could. We've eliminated a lot of the time lag on things that we never thought about.

When employees on one of the floors not served by Ethernet ask for a stand-alone personal computer, is it your concern that whatever micro they get will eventually be able to work on the network?

Yes, we have an approved vendor list for hardware and software.

What models do you recommend?

Basically we're an IBM organization, and we have IBM. We have Xerox here at corporate. There are some Macintoshes growing throughout the corporation. Some of the operating companies have purchased Wang equipment. The basic three for corporate are Hewlett-Packard Co., IBM and Xerox right now. We're giving some consideration to Apple. We have approved Macintoshes for special situations.

It's a tough job to hook up that assortment of micros.

It is, but the IBM Personal Computer will work on Ethernet.

Is that a recent phenomenon?

We just really put it up in our last release in February. We've actually communicated between HP devices and Ethernet. We don't do a lot with it yet, but we could. It's technically feasible. We're not sure that's the ultimate network we'll have. I don't know what network we'll finally end up with. We're trying to piece the things together slowly.

One of the advantages we have in the corporate area that you wouldn't get in an operating company is that there is not a great need for finance to talk to public affairs. They do have some dialogue, but they don't use a lot of the same data, they don't do a lot of cross-communications, so there's no great need for sharing. We try to make everything SNA-compatible and IBM-compatible. That's one of our prime criteria. A vendor either is, or is going to be, IBM-compatible. Of course, everyone claims they're going to be, and they all are, to varying degrees.

Because you have IBM Personal Computers running on Ethernet now, does that mean you will purchase fewer Stars?

It depends on the functionality. We'll buy what we think is the right device for an individual's set of requirements. When people come to us — and most people come to us rather than make a decision on their own — and say, "Gee, I'd like to get a device. Here's what I think I need to do with it," you go through requirements analysis just like you do for any other system.

You have to understand if they want to do word processing or something else. And then you work out what's the best fit.

Does the president of Arco have a micro on his desk?

No, but there are personal computers for each of his three administrative staff. We now tie them together. They use them for his itinerary, his mailing list, all kinds of things, plus word processing. There are several other executives, including the chairman's office, where we're piloting [personal computers]. Ultimately, we'll probably tie them together, but we haven't attempted that yet.

Does that help make your case for OA elsewhere in the company, to show the president what computers can do?

I haven't seen a noticeable impact yet. Ultimately, will it? Probably. But short-term, there hasn't been a great impact, because it's not that noticeable. You'd have to publicize it. But they feel they're getting a lot of benefits out of it.

The one thing we have found is that once someone has a device on his desk, your chances of ever taking it away are extremely remote. There are some people who don't take to it, but not many.

What about your own use of computers?

I do everything verbally. I dictate everything. I don't type.

You don't know how to type or you don't like to?

I don't like to type. I can, but not very fast.

"Our engineers won't let you down. Even when our competitor's system does."

So you're a prime candidate for a speech recognition system.

Absolutely. That's the way I work. I dictate almost every memo of any size and all my speeches.

What are Arco's mainframe systems?

Our products companies have various 3080 systems, and Dallas is a very large center with a whole series of 3030s and 3080s — all the big mainframes. It's our main computing center for oil and gas, the seismic processing, engineering, all those things.

You would be a very interested observer of IBM's 3090 series?

Yes, very interested.

Do you need that power right now?

Undoubtedly we will, but we have no immediate plans to buy. I would anticipate that our marketing and our gas company would end up with 3090s in one form or another.

What systems do you have here at headquarters?

We have an HP 3000 that's really a decision support system for our finance people. Then we have some Four-Phase systems for public affairs.

We put it in many years ago and it runs and runs. We have links to IBM, lots of personal computers. I don't have a big mainframe back here, just because we find it more cost-effective to use the mainframe in an operating company here in Los Angeles. We have a number of IMS applications.

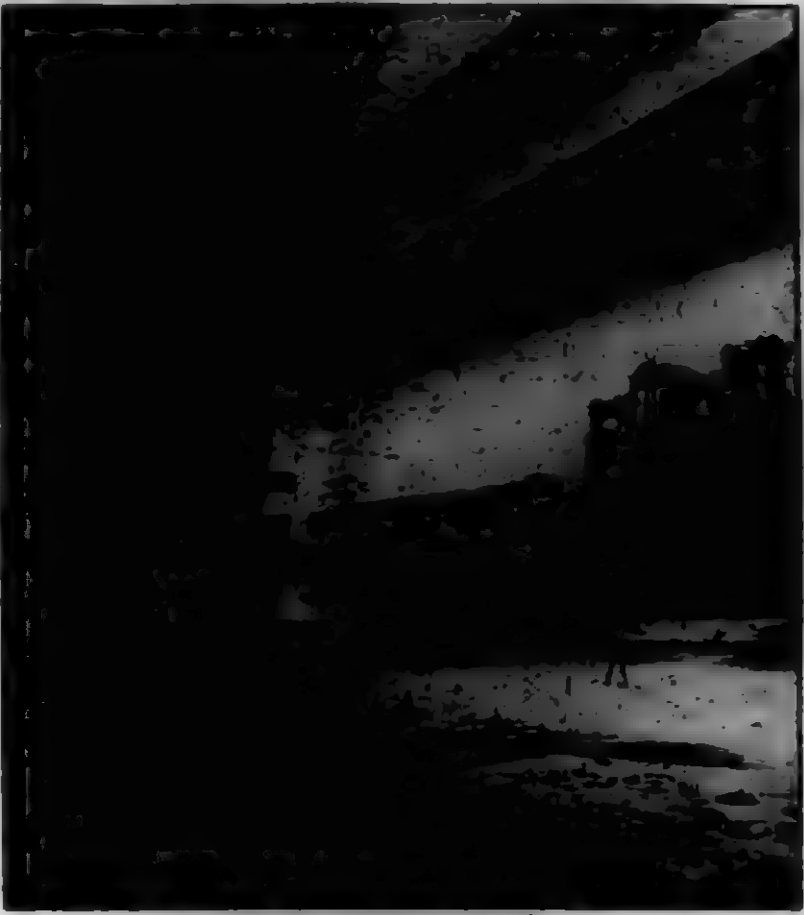
Do you personally interview and hire systems people?

Not as a rule. I do on some occasions, and I keep track of whom we hire.

For an entry-level person, do you prefer a computer science graduate or a liberal arts graduate you can train?

I just want very good people. The first thing I look for in my own hiring — I hire the managers — is that I want them to be good at communicating — I want bright, intelligent, outstanding people. That's the first thing I want.

At the corporate level, we don't have a lot of entry-level people, but we've had some computer science graduates and some MBA graduates, quite often with engineering backgrounds. I guess if I have a preference it's for MBAs with some other discipline in their background, but it's not an overwhelming preference. Talent is what counts, and quality, and you can get that a lot of ways.


Arco's Alaska Kuparuk pipeline

Are universities turning out the kinds of people you need for information systems?

We put most entry-level personnel through a training program. I think the colleges are doing a reasonable job; I think they could do a better job. The curriculum is getting better, more pragmatic.

The truth of the matter is that they teach them the basics, but what the real world is all about has to be taught on the job. I don't know if you'll ever git the colleges to do that, and maybe they shouldn't. I teach at UCLA myself off and on in the master's program.

What course do you teach?

Introduction to Information Services — basically, it's an overview of the whole field.

Is there a shift at Arco to end-user programming?

Oh yes, clearly that's going on throughout all the operating companies. A lot of students who don't have science degrees — MBAs and other students — come in expecting to have the tools at their fingertips. I'm firmly convinced that in some time frame, let's say five to 10 years, people are going to expect to have a workstation on their desks like they now expect a telephone. I don't think we're too far from it. And I believe it will be a workstation integrated with the telephone.

Has there been any corresponding easing of the load on data processing?

I would say in our development group in my organization, the demand is still there, and we have as many people working on it as we did. But we aren't growing as rapidly from a development standpoint. We're putting more resources into supporting end-user computing. For example, about 2½ years ago, I combined the pilot work we were doing in office automation into what I call professional computing support. It's a group dedicated to helping the end user. It supports our decision support system, office automation and workstations. If they want us to build a system, our systems development people do it in a more or less traditional way. But where we really impact those individuals is we teach them what we have to teach them. We'll help them if they need help, but if they can do it themselves, we encourage them.

Is that an information center?

In a sense it is, but it's more than that. An information center is just a label appended to an approach to giving people data that they can massage and inquire and use however they choose. That's not a great deal different than having a workstation with a spreadsheet — then you have to get some data or create the data. In most cases, the people in the information center don't do the work. They just get the data for you and you do the work as the end user. So I put all of those in a generic category that we call professional computing support — end-user computing, if you will. I just don't like the term. They're all driving to put tools on the desks of professionals so they can do their work. That's what we're after. When they want a system bigger than they can do, then they come to us and we build it.

How would you assess the position of Arco in terms of implementing and using leading-edge technology — an initiator, just behind the initiators, in the middle of the pack, far behind?

That's a tough question to answer. It varies by operating company, because it depends on the circumstances, both economic and size, and environment. We have some areas

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where we are clearly initiators and some where we are behind the initiators a little bit and some in the middle of the pack.

In what area is Arco clearly an initiator?

In Dallas, we were one of the first to put a Cray in to do seismic processing. We've been innovative in using Ethernet here. We jumped into the information center fairly quickly. We're somewhere between middle of the pack and right at the state of the art.

Is that where you would like to be?

Yes. We don't want to lose our competitive edge with respect to our own industry. But I think the technological impact of computing is somewhat different for the oil industry than it is for finance or the airlines industry. We have some very big technology decisions that have little to do with computers, such as how to drill for oil in the North Slope. So it's a combination of pure hard technology and computing technology. Now, the pipelines are automated, and our refineries are automated to a great extent. Data processing numbers for Atlantic Richfield are roughly $300 million a year. There are roughly 2,500 people in computing.

How does Arco get information from the oil field to the headquarters?

We were one of the first to put some kind of microcomputer in our drilling and production sites. For our seismic data, we actually take the shots and communicate the data to the main computer in Dallas.

Are expert systems used?

We're looking hard at expert systems, but nothing is in place right now. Are there opportunities? — Oh, yes, there's no question that there are opportunities. We have a couple of task forces looking at it.

Recent ads for Arco emphasize innovation. What part can information systems play?

We do play a big role in innovation. One of the ways is to give people end-user computing. If they use it more effectively, then it's clearly to the benefit of the corporation. Arco puts a lot of emphasis on more innovation, more productivity, from our president right down.

What previous positions have you held here?

I joined Arco 12 years ago as a systems consultant. After a couple of years there, I was promoted to managing the corporate and DP auditing function. I did that for 2½ years and then moved to this job.

What was your experience before Arco?

I have more than 26 years of experience — six years with the Computer Science Corp., a couple of years with General Electric when it was in the computer business and four or five years with an end-user organization before that. So I've been with a user and a vendor and a consultant, a little with everyone. I somewhat intended it that way, but who knows where your course is going to end up when you start out to do something?

I fell into computing when I got out of college. I have a bachelor's degree in economics with a minor in accounting, and I set out to get into the accounting field. But I got one job offer to get into systems before I got the job offer to get into accounting. Since I was young and needed money at the time, that's the one I ended up with. I have no regrets. I sort of knew what systems was. I had some friends in school who had gotten into it, so it wasn't a total accident on my part. But I didn't realize what it would mean to me in years to come. I've gone back to get a master's degree from USC in business management, and I've done a lot of doctoral work in management at USC.

As a systems consultant here, you weren't managing anyone, I assume.

I had been a manager at Computer Science Corp. I was first a manager when I was 25 — I managed a systems group about four years out of college, because there weren't a whole lot of folks around, so you moved up quickly if you could survive and do it. I've done a lot of management work and individual contributor roles over time. I prefer the management role.

What do you like about it?

I enjoy getting the job done through people and working with people — also the broader perspective the management role gives you. You have to look at the whole picture; you can't just worry about a project. Project work can be fun at times, but I prefer the management role.

How many people report directly to you?

Three people, right now. We're probably going to restructure, so it will be five.

And through them to you?

Right now, about 80 people.

If I were to talk to the three who report to you directly, what would they say about your style or philosophy of managing?

That's interesting. We just went through a survey recently and got some feedback on that. I guess they would say that I am a delegator, that I let them do the job. I trust people. I don't want any problems buried. I like to know what's going on, but I don't look over their shoulder every 30 seconds. We have a fairly participatory environment here. My basic philosophy is this: We can solve almost every technology problem there is one way or another. The real issue in business — and it is true in

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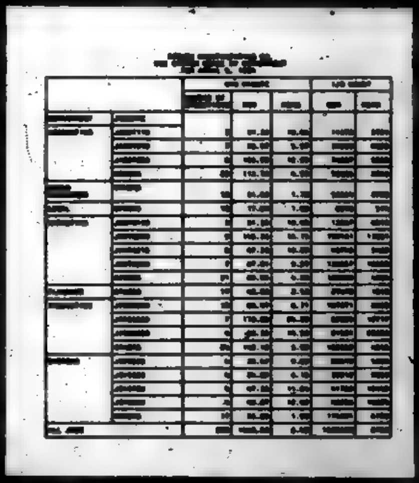

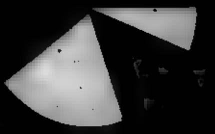

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IN DEPTH/INTERVIEW: AL SMITH

systems and every other discipline — is how well we communicate — for the staff and management, both written and every other way. That's the real key to being successful. So I work hard at trying to talk to the staff, talk to the management. I think we're successful, but they would have to tell you.

Are systems people particularly difficult to manage?

I don't think so. I've managed financial auditors and systems folks and some other types. The idea that systems people are different somehow is a bit of a myth. They are creative people and some can be difficult, but that's true in any field. It may have been more that way in years past than now, more prima donnas years ago than today.

Are there some very unique individuals? — yes.

What methodologies are used in systems development to get those unique, as well as more "average," people working together?

We use a form of traditional life-cycle methodology. We don't do anything particularly unique. We try to stress that it is a guideline and not a bible. You have to be careful with methodologies that you don't make them so rigid that people follow methodologies down the primrose path. The systems business is changing; we need to be more flexible about our methodologies.

On a $5,000 personal computer, you don't do a $75,000 requirements study to determine what you want to put on it. You just don't do that. You have to learn how to balance those things. That's not easy to do. The methodology is important. You've still got a document, you still have to follow a process. We try to do that. In each of the operating companies, we have some form of methodology; sometimes it's very structured.

What would you advise a systems person 25 or 30 years old about how to aim for your job?

That's a good question. I wish I knew the answer.

Do you wish you had that advice 20 years ago?

Well, I guess I set out to do more or less what I'm doing. It was my goal to continue to manage in this area, perhaps to do more general management. For a long time, I wanted to be a manager in some form or another. I think you have to have a variety of exposure and experience. You have to learn to communicate, learn to work with people — that's one of the critical variables if you want my job, because my job is meeting with people, coordinating and communicating at multiple levels.

Can someone really learn to communicate like that?

That's the "Are leaders born or made" question, I suppose. My view would be that you can learn, you can make your skills better, become a better communicator. You can't fake it. If you don't like people, that's going to come out. If you really want to work in the backroom and never see a human being, then you ought to be a systems programmer and put in operating systems. If someone has those kinds of characteristics, then they probably don't want or shouldn't want my job. That's a small percentage of the systems population.

Do most of your technical people want to rise to managerial positions?

Probably the majority would prefer to rise to a managerial position rather than to a senior technical guru. We do have a technical ladder. We're trying to make it stronger and better. It's not quite where I would like it to be yet.

What's at the top of the ladder?

We call it a "senior technical consultant." It's a grade-level equivalent to a manager who would report, if not to me, at least to the person who reports to me. We think we can get him another notch or two higher with a little effort.

Is that a recognition that there needs to be a way of keeping technical people happy and doing what they like?

That's right. I don't know what percentage, whether 60-40 or whatever, that would rather be generalist than technical. But there are some who just don't want to be managers. And we have to accommodate them to keep the talent.

You said one of your goals might be to move into general management. Does such a position exist within Arco where an information systems person can move?

We have had people move out to the finance area or general management, so there is some precedent. It is not widespread. Different companies have different primary paths. For a company like us, it tends to be the engineering side of the house.

Does data processing still have to shake the backroom image here?

I think in general that's true, and I suppose there is some of that here. In most large corporations, there is some truth in that. If you look at banking, it tends to have less of a backroom image than perhaps an oil or manufacturing company might have. That's very dependent on the company, function and business.

Is there a chief information officer at Arco?

No, there isn't. Probably the closest is the function my boss has — he's the vice-president of Administrative Services for the corporate group and also has the interface to the operating companies. I believe in the concept and think we'll probably evolve to it.

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IMAGE PROCESSING COMES TO THE OFFICE

By Elias Safdie

Image processing allows the user to capture, maintain, manipulate and distribute pictorial information in the same way as classical word processing and DP files.

The paperless office has proved elusive. Documents generated on a word processor can be corrected so easily that users may completely reprint a five-page memo to correct a spelling error on the first page, thus generating more paper rather than less.

A technology new to the office, however, could cut back the use of paper. Image processing — the digitizing of photographs, pictures and other pictorial material — will allow banks to verify signatures, insurance companies to process handwritten applications and law enforcement agencies to match fingerprints found at the scene of a crime with those already stored in their data bases.

Image processing is not a new technology. In the last decade, the space program has used it to beam down pictures of the heavens; the

military has used satellite-based image processing equipment for intelligence gathering; manufacturing systems use image processing for automatic fault detection.

Today, image processing is entering the office for two reasons: There is a need for it, and image processing equipment has gotten much less expensive because of advances in semiconductor technology.

Commercial market

Seven image processing systems are available now in the commercial marketplace. In the next 12 months, users will begin to see more sophisticated systems with great potential for easing office operations. Generally, the most popular of these systems will be multifunctional rather than dedicated and will consist of a minicomputer, large magnetic disk files, high-resolution terminals, scanners and printers.

> ”
>
> *Besides allowing users to incorporate pictorial information in office documents, image processing allows users to manage this information electronically.*

Because pictures convey more information more quickly and accurately than do words, it is especially important to use pictorial information in daily communications with colleagues and customers.

Consider the case of a sales proposal in which a system configuration must be described. It is much easier to simply insert a picture of the configuration (see Figure 1) than to attempt to describe all the pieces of equipment and their interrelationships.

Besides allowing users to incorporate pictorial information in office documents, image processing allows users to manage this information electronically. If one looks at a typical office environment, one sees a large number of documents that include pictorial information — signatures, logos, line drawings and handwritten notes.

As a result, most offices today maintain two sets of files. One set is electronic and holds word processing documents, spreadsheets, data base information and any other information that can be entered through a workstation keyboard. The other set of files is paper, because there has not been a mechanism for capturing and maintaining the pictorial information.

Image processing, however, would allow the user to employ minicomputer-based technologies to capture, maintain and distribute this nontextual information in the same manner as the classical word processing and DP files.

From an office perspective, image processing deals with the use of computer technology to acquire, manipulate, file and distribute pictorial information. Images can be obtained and entered into a computer system to generate an image. Once an image is digitized or generated, image processing allows the user to manipulate it.

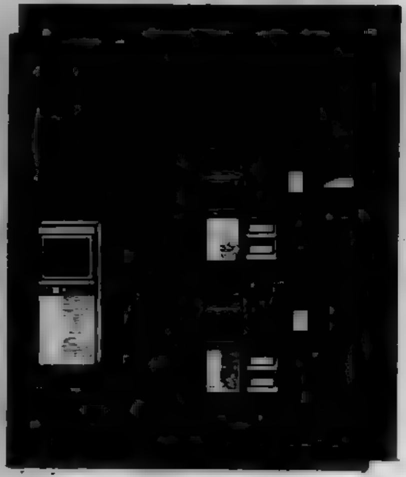


Figure 1

Users can manipulate an image by cropping it — removing unwanted portions to change the orientation —and zooming (blowing up) or shrinking the image to do page makeup.

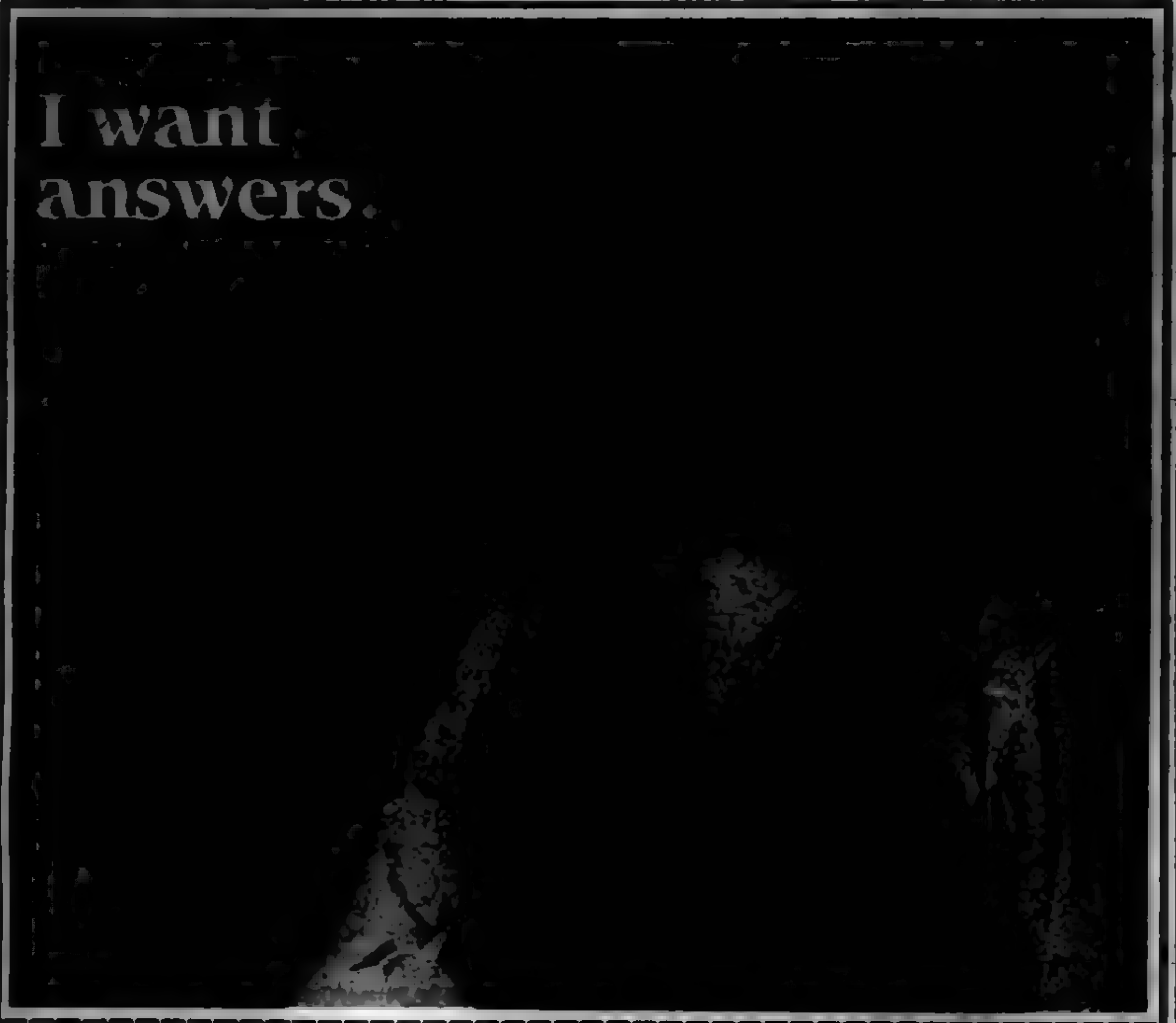
The zoom and shrink capabilities are especially important because they put the user in control of the document. Without these two capabilities, the user is constrained by the original size of the image. With them, the user can make the picture the desired size, place it in the desired location and combine it with text to convey a message.

Storage and retrieval

Storage and retrieval techniques are of paramount importance in the document management applications. With image processing, it is now possible to view images as a response to a data base query.

A real estate customer, for example, might want to see all the homes that are available in a certain district, in a particular price range and of a particular architecture. A data base containing all this information can be coupled with pictures of the homes and their floor plans, and within minutes the customer could see — without leaving the realtor's office — which homes are available that meet his search criteria.

Admittedly, one of the costlier aspects of image processing is the amount of data generated by the process. Figure 2 on ID/14 shows the relationship between resolution and number of bytes required to represent the image.



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Semiconductor manufacturers are now working on a compression chip that will meet the Consultative Committee on International Telephone and Telegraph Group IV standard for facsimile compression. This compression scheme is expected to yield faster, greater compression ratios on the order of 12:1 and better. This will make disk storage and telecommunication of images much more affordable than they are today, in some cases cutting those costs in half.

Distributing the image

The combination of minicomputer and image processing technologies allows the images that were digitized or generated to be electronically transmitted to remote sites.

For example, if a real estate broker does not have a house listed that suits a customer's needs but the realtor is part of a multiple listing service or belongs to a firm with several branch offices, he can search the branch offices' data bases.

The information within those data bases, including pictures of the homes they contain, can be transmitted to the real estate broker.

In essence, image processing in combination with telecommunications allows the user enhanced facsimile services — enhanced because the documents can be filed and retrieved at will and because minicomputer and telecommunications technologies offer better error detection and correction capabilities that help ensure the fidelity of the received image.

Figure 2

Two primary justifications exist for the use of image processing in the office: compound document applications and document management applications.

Compound documents integrate data, text and image information. These include, for example, sales proposals, which typically have illustrations of equipment or process flows; manufacturing change notices; engineering documentation; service manuals; and in-house training documents. In this class of applications, the objective is to use the image to convey information more efficiently.

When it comes to document management, classical transaction processing involves the storage and retrieval of data and/or text. Image-based transaction processing adds the dimension of pictorial information to classical transaction processing systems.

As mentioned earlier, many applications today involve two sets of files: an electronic file, which deals with alphanumeric information, and a set of paper files, which store the nontextual information. Banks, for example, have electronic files for account information and paper files for customer signatures. A bank using image processing, however, would not need the paper files to store customer signatures.

Why in the office?

Once a file is stored electronically, the user can enjoy a number of secondary advantages, among them the virtual elimination of the problems associated with manual filing. Users can employ the data base management facilities of minicomputer technology for rapid, accurate retrieval of the information. In the case of the bank, the signature could be accessed by keying in the customer's passbook number.

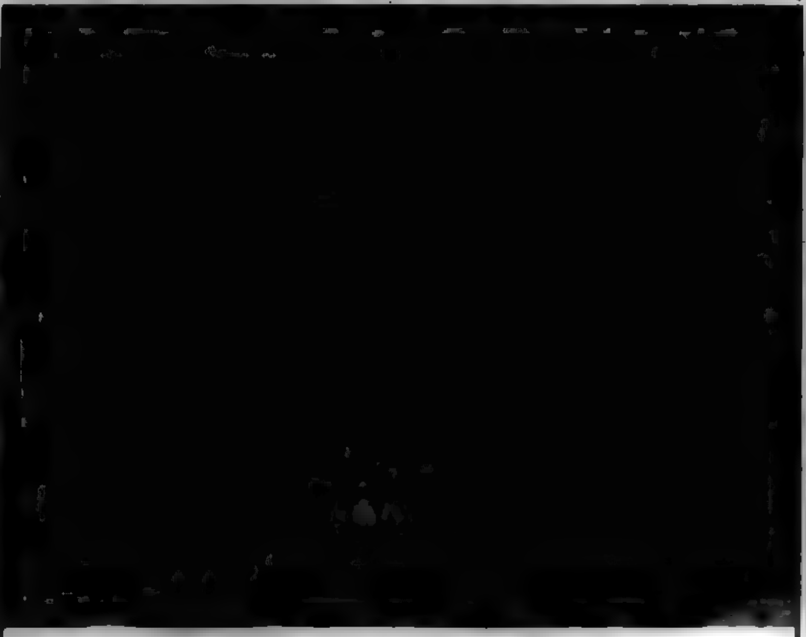
As a further example, consider an office that processes handwritten orders. There is often a need to refer to the original order, even after the data has been keyed in. Image processing would allow the user to go back to the source document either directly or by querying a data base if the user was unsure of the specific document required — no more lost files or misplaced files and no time lost in finding or re-creating the source document.

Example of benefits

Insurance companies provide a good example of the benefits to be derived from combining image processing with telecommunications. Studies have shown that the longer it takes to generate a policy from the time the application is submitted, the greater the likelihood that the customer will refuse the policy.

> ***Image processing in combination with telecommunications allows the user enhanced facsimile services.***

It therefore becomes important to minimize the time it takes to underwrite and generate a policy from a source document. Image processing can be used to eliminate two costly delays: mailing applications to central offices for underwriting and mailing back a completed application, including authorizing signatures. Such a use of image processing directly and dramatically affects a business's bottom line by promoting faster, more efficient and more exact communications among office workers.



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How image processing works

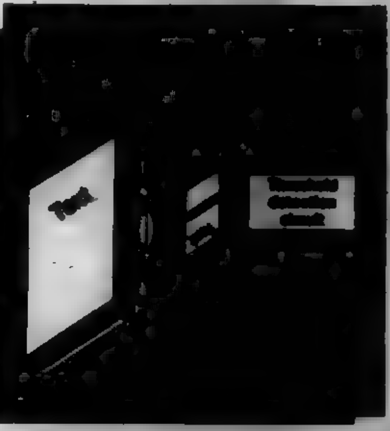
Images can be obtained and entered into the image processing system either by capturing an existing image or by generating an image using the system itself.

An already-existing image is captured by means of a digitizing camera, also known as a scanner. Most scanners on the market today use charge-coupled device (CCD) technology. Charge-coupled devices are light-sensitive semiconductors that generate electric charges in proportion to the intensity of light incident upon them.

The figure at right shows how the charge-coupled device is used to convert the image to pixels. A light source illuminates the source document. The reflected light is projected via a set of lenses onto a linear array of charge-coupled devices.

Each charge-coupled device is responsible for measuring the reflected light from a small area of the page. If there is no ink on that particular area, there is a lot of reflected light, which in turn causes the device to generate a large charge.

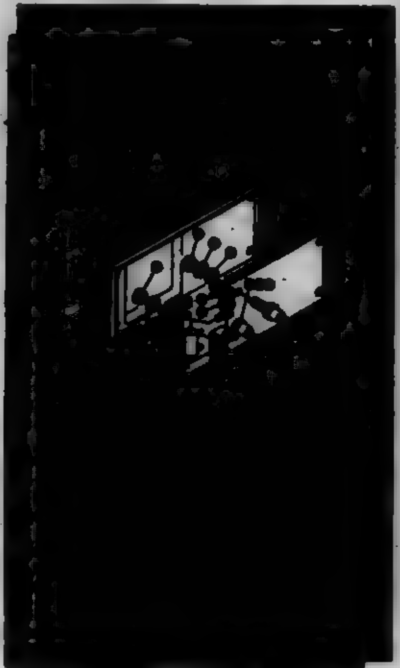
If there is ink on that area, the ink absorbs the light, causing little light to be incident on the charge-coupled device, which in turn will cause a smaller charge to be formed. The charge on each device is then measured to determine whether to illuminate a pixel on the video screen.

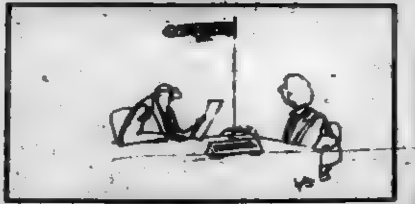


The result is shown in the figure below. The number of individual charge-coupled devices and the area that each one views together comprise the concept of resolution, or granularity of the resulting image.

As an example, if the desired resolution is 120 dot/in., one would need 1,020 charge-coupled device elements for an 8½-in.-wide document. Rather than replicating the 1,020 elements vertically as well, multiple scans are used. For an 11-in. document at 120 dot/in. resolution, it takes 1,320 scans to capture the entire document.

Generating images involves using the system to draw lines, circles, arcs and other geometric functions to create images. Font generation capabilities are also useful to annotate the images that are generated or captured. Often it is necessary to start with a digitized image (a logo, for example), add some machine-generated images to it and annotate the composite image with multiple fonts before inserting it into a document. Once the image is generated, the user can begin to manipulate it.





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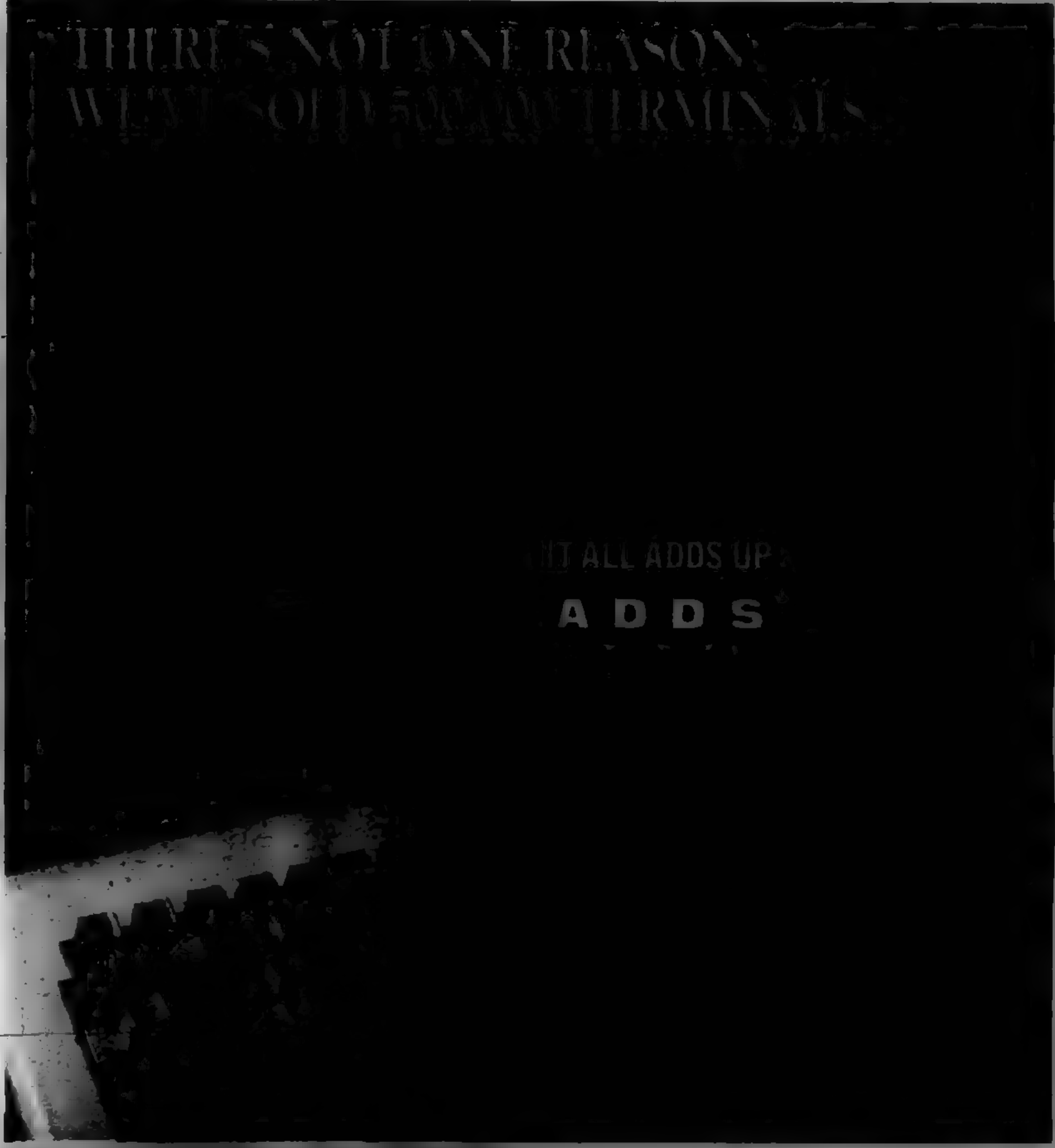

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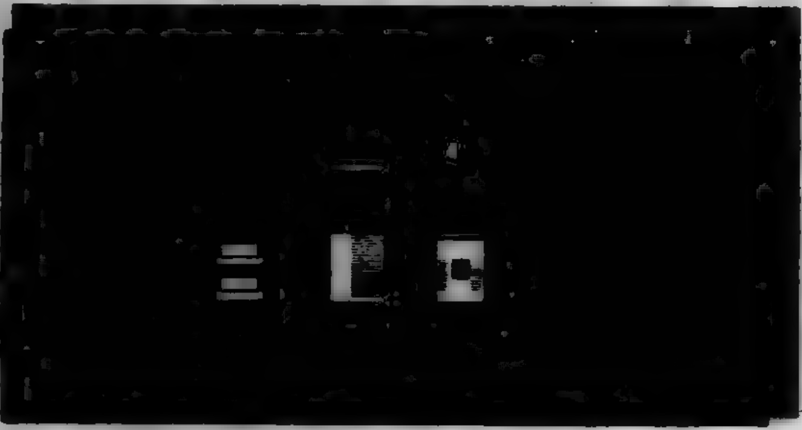
Image processing vs. micrographics



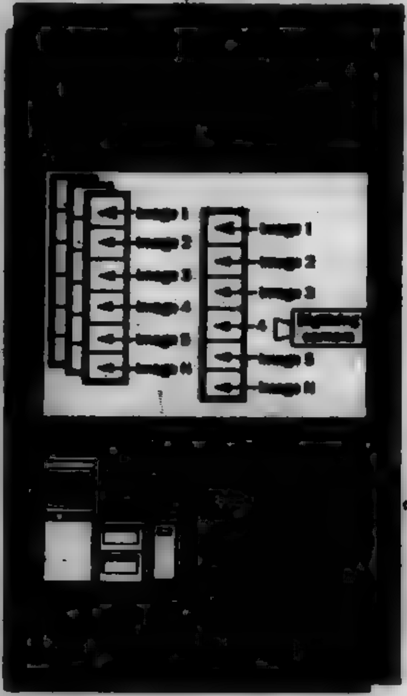
Some offices today use micrographics as a way of dealing with the paper problem. Micrographics is a generic term that includes any film-based optical storage in reduced form, such as microfilm, microfiche and 35mm aperture cards.

Some systems on the market combine the micrographics technology with minicomputer data base and file management to produce what are known as computer-assisted retrieval systems. These systems use the minicomputer file management to keep track of the location of each document in the computer-assisted retrieval system. Typically, two viewing screens are required — one for the alphanumeric interaction with the minicomputer ("I would like to see page 25 of the specifications for the lighting fixtures") and one on which the film-based image is displayed (see figure at left).

Other drawbacks

In addition to the need for two screens, there are also several other disadvantages to these systems:

- The user must be at the location of the film-based equipment to view the image.
- Only one user can view the image at a time.



- Hard copy involves expensive photosensitive paper.
- Transmission of documents is not possible.

Users who want to eliminate these disadvantages can replace the film projection mechanism with a digitizing camera and the alphanumeric terminal with an image terminal (see figure above).

The user can still query the data base for a particular document, and the computer-assisted retrieval unit will still retrieve the appropriate film. Instead of being projected onto a viewing screen, the film image will be digitized by a camera inside the unit. The advantages are the following:

- Only one terminal is required for both image viewing and interaction with the filing system.
- Once the image is digitized, multiple users may view the image simultaneously and the unit is free for another user to view another image.
- Users do not have to be at the film unit to view the documents.
- Hard copy is easier and cheaper to produce using dot matrix or nonimpact print technology.
- Documents can be communicated electronically.

About the author

Elias Safdie is responsible for image product marketing within Honeywell, Inc.'s Office Management Systems Division, based in Billerica, Mass. He holds several patents in CRT terminal design.

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MICROCOMPUTERS

Digital Research offers enhanced DOS version

By Eric Bender
CW Staff

MONTEREY, Calif. — Digital Research, Inc. has released Concurrent DOS 86 Version 4.1, an updated version of its Concurrent DOS operating system that supports high-end IBM-compatible machines, Microsoft Corp. MS-DOS 2.1 applications and Digital Research's Graphics Environment Manager (GEM) software.

A version of Digital Research's Concurrent PC DOS retail package based on the upgraded operating system is expected to ship today for $149. The software reportedly will permit microcomputers built around the Intel Corp. 8086 family to run multiple MS-DOS or Digital Research CP/M application programs simultaneously. Applications may take the full screen or run within windows, according to Digital Research.

In Fortune 1,000 companies, concurrency will prove particularly useful in acquiring large data bases, handling communications tasks and printing, said Michael Loftus, Digital Research's systems software marketing manager.

Multiuser operations reportedly also are supported, with up to four applications running on the system terminal and two additional serial terminals each running one application.

The operating system includes a character-based file manager aimed at helping users find their way among directories. Users can employ standard MS-DOS commands or load GEM applications if they want a graphics-based interface, Loftus said.

The DR Talk communications package, a card-file data base manager, a screen

See DOS page 49

Gem Draw receives praise for 'Macintosh-like' traits

By Kathleen Sullivan
CW West Coast Bureau

NEW YORK — In interviews with a group of early users, Gem Draw, a graphics package released by Digital Research, Inc. last month, gathered kudos for bringing "Macintosh-like" capabilities to the IBM Personal Computer.

"Gem Draw is what every Personal Computer lover would want if they have ever looked with envy at the [Apple Computer, Inc.] Macintosh and its graphics software and said, 'I wish I could do that on my Personal Computer,' " said Robert Kalipetes, an assistant vice-president in Citibank NA's New York office.

Kalipetes, who has been using Gem Draw to produce system flowcharts for Citibank, said he has tried other graphics packages. But none of them have measured up to Gem Draw, he said. Kalipetes said he even preferred Gem Draw over a program designed specifically for creating flowcharts.

Unlike the flowchart program, which gives users a limited number of sizes of flowchart symbols, Gem Draw allows users to create objects of any size, Kalipetes said.

Ben Knutson, a software design engineer in the engineering technology organization at Boeing Aerospace Co. in Seattle has been using Gem Draw to create charts for design review presentations. Recently, Knutson used Gem Draw to create a chart showing a network of personal computers for a U.S. Navy contract.

"I drew pictures of the terminals and showed how they would be networked together with a block diagram," Knutson said. "I was able to show exactly what the

See GEM page 49

SMALL TALK
Eric Bender
CW Senior Editor

Will DP join in AI parade?

Will many DP shops sit and watch the artificial intelligence parade march by and then begin a long and costly scramble to try and lead the parade — just as they did with minicomputers, word processors and personal computers?

Many people in the AI community say yes.

Data processing often "is deeply embedded and has a great deal of momentum and inertia," said Chet Rindfuss, an instructor in computing at Boeing Computer Services Co. in Seattle. AI proponents are "suddenly trotting into the corporation and saying, 'OK, guys, we have something that really works — where are the big bucks?' " he said.

If they don't get it from DP, they'll simply go elsewhere, he suggested.

Of two dozen major AI projects completed or under way at Arthur D. Little, Inc. (ADL) in Cambridge, Mass., "DP is intimately involved in only one," commented ADL consultant Dennis Barlow.

At some ADL clients headquarters, groups working with AI-based tools have their own box on the corporate organizational chart. "This is not so generic as word processing," Barlow noted, but it does promise large strategic advantages in many industries.

Large AI programs require massive computing resources, of course.

"A 3,000-rule system will grind to a halt except on the largest machines," another expert pointed out.

One prominent mainframe natural-language program "dims the lights when you run it," one MIS manager joked.

But as microcomputers become more powerful, and better low-end AI tools

See AI page 49

■ Sorcim/IUS Micro Software enhanced the Easyplus windowing environment and introduced an Easyplus network version/38
■ Unlimited Processing introduced an applications management software package that runs on 3Com and Novell local-area networks/42
■ Data Decisions announced a report on microcomputer communications products/46

INSIDE

Software/46

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Sorcim Easyplus gets upgrade, net version

SAN JOSE, Calif. — Sorcim/IUS Micro Software has enhanced Easyplus, a windowing environment that runs on an IBM Personal Computer, and announced Easyplus Network Manager, an Easyplus version that runs on 3Com Corp. local-area networks.

Easyplus 1.1 supplies up to 10 windows and enables a user to load a number of IBM Personal Computer packages into memory at one time and move from one application to another, according to Sorcim/IUS. The windows can occupy a full screen, overlap or be placed side by side. A user can transfer data between any two windows, and each window has its own Help facility. The product features Easykeys, which are 10 user-defined command keys that store up to 20 keystrokes. Easyplus can send output to a screen, printer, DOS file or any combination simultaneously.

Easyplus Network Manager features file- and record-locking capabilities and supplies password protection for each application. Easyplus runs on a Personal Computer with 256K bytes of random-access memory and IBM's PC-DOS 2.0.

Easyplus costs $149. A four-user version of Easyplus Network Manager sells for $395, and an eight-user version costs $595.

Sorcim/IUS is located at 2195 Fortune Drive, San Jose, Calif. 95131.

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AST offers adapter for IBM AT

IRVINE, Calif. — AST Research, Inc. has introduced an adapter board that allows an IBM Personal Computer AT running the PC Xenix operating system to support up to four users or devices.

The AST Fourport/XN adapter includes Xenix device driver software that is said to tell the operating system how to communicate with the AST board. The device driver can simultaneously support two boards, each with four ports, according to the vendor.

The board includes a diagnostic capability that reportedly will ensure that terminals and other peripherals connected to the Personal Computer AT are configured correctly. The diagnostic program can interactively request information from users to determine the proper setting for each port, the vendor said.

The AST Fourport/XN costs $495, including four RS-232 ports, the Xenix drivers and an installation utility.

AST Research is located at 2121 Alton Ave., Irvine, Calif. 92714.

Apricot micro bows

FREMONT, Calif. — Apricot, Inc. has introduced a $995 personal computer running the Microsoft Corp. MS-DOS operating system and reportedly offering 512K bytes of memory and a single, 720K-byte, 3½-in. diskette drive.

The Apricot F1 reportedly includes the Digital Research, Inc. GEM Desktop graphics interface, an icon-based user interface, infrared keyboard and mouse and color graphics capability. The machine can be linked with up to 32 other Apricot computers under the Apricot Point 32 network. The Apricot F1 is said to use the Intel Corp. 8086 microprocessor and will be available in June.

Apricot is located at 47173 Benicia St., Fremont, Calif. 94538.

WISHING WELL
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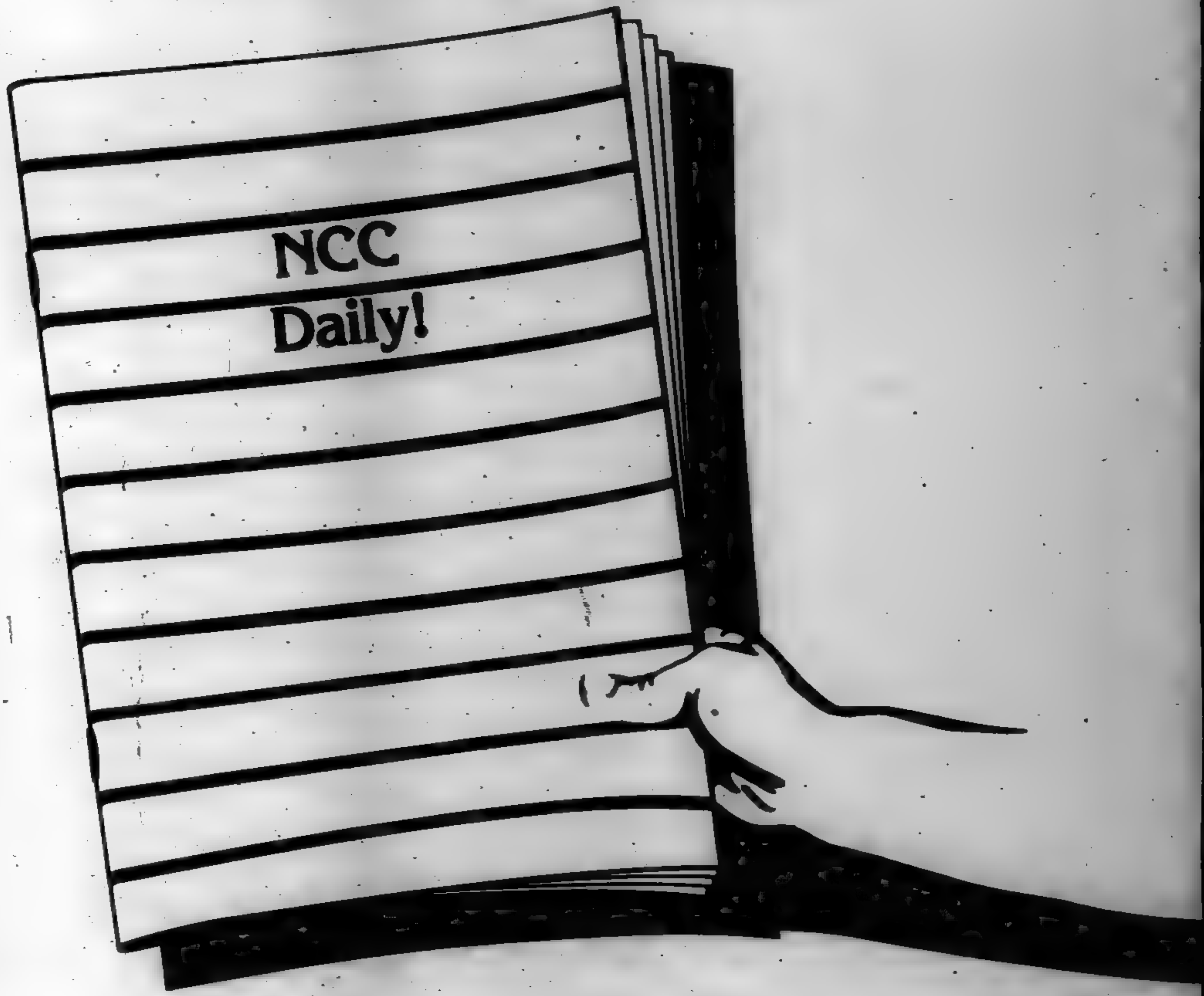
Announcing the NCC tour guide



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We'll also cover NCC in three special issues of Computerworld. The July 8th Preview issue. The July 15th Show issue. And the July 22nd Wrap-Up issue. Advertise in these issues and ensure your investment in NCC. And, just as importantly, you'll keep your name in front of more than 687,000 computer-involved professionals all during this eventful period.

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NCC Wrap-up	July 22	July 5

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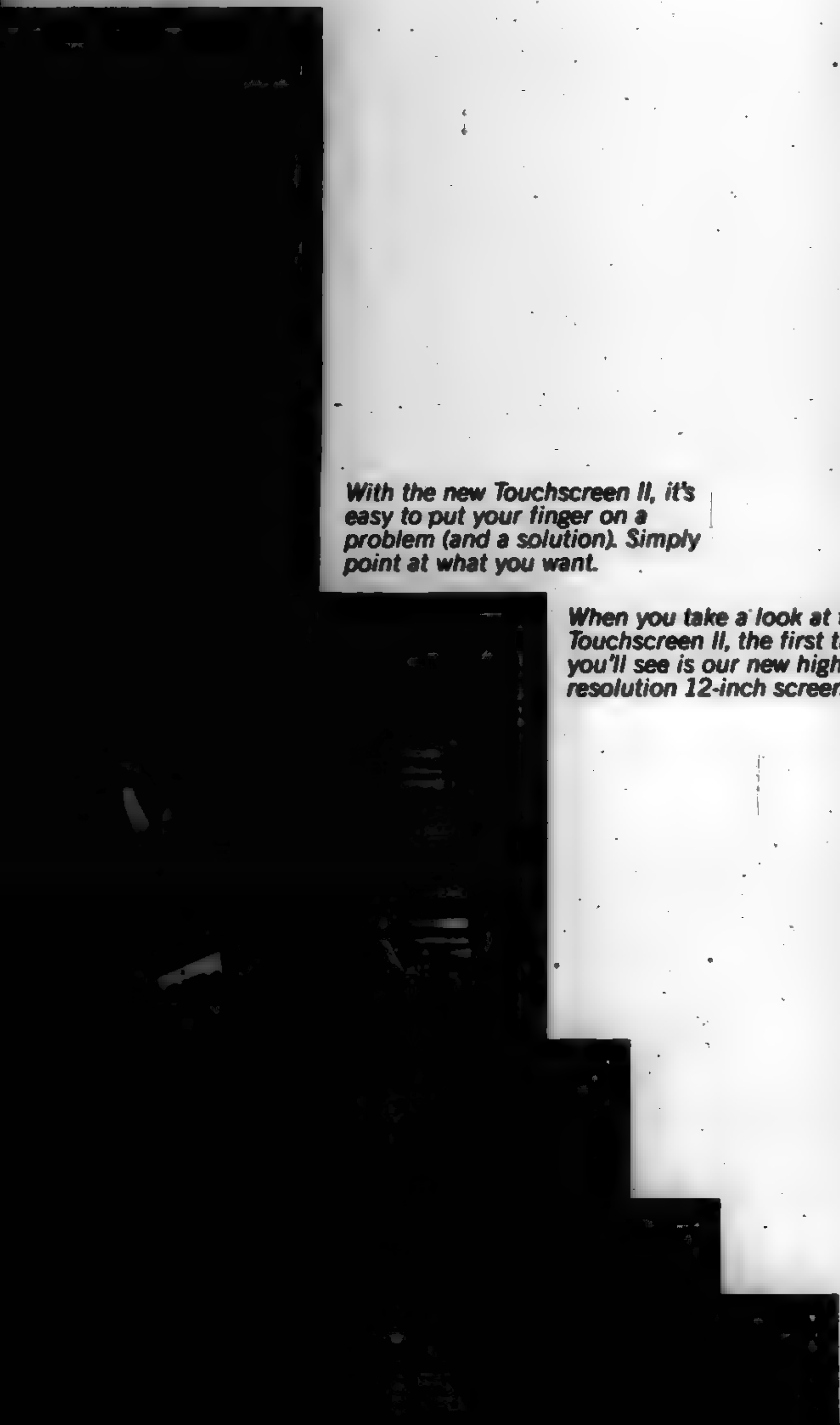

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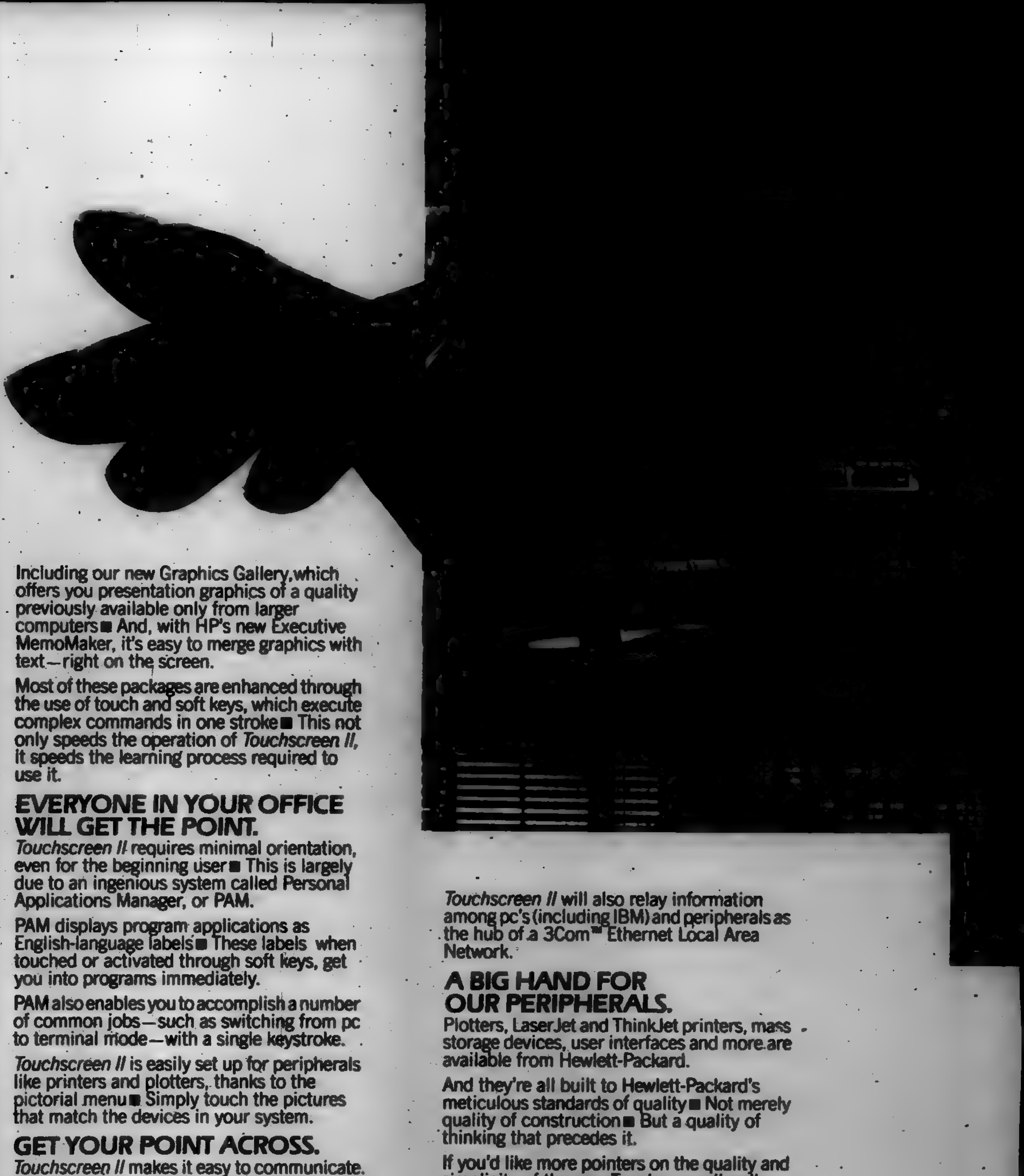

Including our new Graphics Gallery, which offers you presentation graphics of a quality previously available only from larger computers ■ And, with HP's new Executive MemoMaker, it's easy to merge graphics with text—right on the screen.

Most of these packages are enhanced through the use of touch and soft keys, which execute complex commands in one stroke ■ This not only speeds the operation of *Touchscreen II,* it speeds the learning process required to use it.

EVERYONE IN YOUR OFFICE WILL GET THE POINT.

Touchscreen II requires minimal orientation, even for the beginning user ■ This is largely due to an ingenious system called Personal Applications Manager, or PAM.

PAM displays program applications as English-language labels ■ These labels when touched or activated through soft keys, get you into programs immediately.

PAM also enables you to accomplish a number of common jobs—such as switching from pc to terminal mode—with a single keystroke.

Touchscreen II is easily set up for peripherals like printers and plotters, thanks to the pictorial menu ■ Simply touch the pictures that match the devices in your system.

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HEWLETT PACKARD

Team-Up offers manager for network applications

JACKSONVILLE, Fla. — Unlimited Processing, Inc. has unveiled Total Environment for Application Management from Unlimited Processing (Team-Up), an applications management package that runs on 3Com Corp. and Novell, Inc. local-area networks.

The product supports up to 32,000 applications, containing as many as 700,000 files, and tracks file existence, file names, server and file locations and user access authorization, the vendor said.

Team-Up also supplies application generation capabilities that enable a user to create data entry screens by entering information on a screen.

Team-Up reportedly enables a user to read, write, enter, update and delete records referenced in up to 255 data bases by pressing a single key. The package maintains free record space and index files so a user does not have to reindex or sort files.

A single-user version of Team-Up costs $795, and a multiuser version of the program for an unlimited number of users sells for $1,795.

Unlimited Processing is located in Suite 8, 8382 Baymeadows Road, Jacksonville, Fla. 32216.

Natural Microsystems adds telemarketing software

NATICK, Mass. — Natural Microsystems Corp. has introduced a voice information system software package that reportedly adds voice-based telemarketing capabilities to IBM Personal Computers or compatibles with 256K bytes of memory and a Winchester disk drive.

Watson Voice Information System (VIS) is used with Natural Microsystems' Watson integrated voice and data system. Watson converts voice signals into information that can be stored on a computer disk. The computer is then able to access voice files in the same method it accesses computerized data, according to the vendor.

Watson VIS allows companies to define a level of information that the caller can access by pressing a button on a Touch-Tone phone. The product can also be used to dial lists of phone numbers and conduct a dialogue for those who press Touch-Tone responses. Users can load up to 500 phone numbers from the disk to the Watson outgoing call file, a spokesman said.

The voice information system costs $296.

Natural Microsystems is located at 6 Mercer Road, Natick, Mass. 01760.

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Dataflex out for computers under Xenix

MIAMI — Data Access Corp. has released a version of its Dataflex Application Development Data Base for the IBM Personal Computer AT under PC Xenix and on the Molecular Computer Model 12 system under Xenix.

Dataflex, which costs $1,250, is an application development and relational data base management system. Applications created with Dataflex are said to support up to 250 data files with more than 16 million records per file.

The product reportedly includes command language for program development, applications generators for data entry screens and reports, a compiler and a multifile interactive query for creating reports, labels and data files from data base information.

The package requires a minimum of 384K bytes of memory.

More information can be obtained from Data Access, 8525 S.W. 129th Terrace, Miami, Fla. 33156.

Datran unveils modem card

LOS ANGELES — Datran Corp. has announced a Modem Accelerator card for the IBM Personal Computer, Personal Computer XT and AT that reportedly improves telecommunications speed.

The Modem Accelerator is said to be compatible with most modems and software capable of sending binary files. The product compresses English-language text and other Ascii data to allow files to be stored in less disk space, the vendor said.

The card is also said to function as a spelling checker, processing 500 word/sec., with a dictionary of 30,000 words and phrases.

The card reportedly compresses data at 20,000 bit/sec. and decompresses data at 60,000 bit/sec.

The card costs $795.

Datran is located at 10519 Lauriston Ave., Los Angeles, Calif. 90064.

SPECIAL REPORT

DBMS

In the June 24th Computerworld Special Report we'll examine Data Base Management Systems (DBMS). This will include discussions of: market trends; corporate uses for microcomputer data bases; the increased use of multiple data bases; vendors' efforts to integrate applications around a central DBMS; and various issues concerning the purchase and maintenance of corporate data bases — such as corporate data base security, and how to evaluate and select a DBMS.

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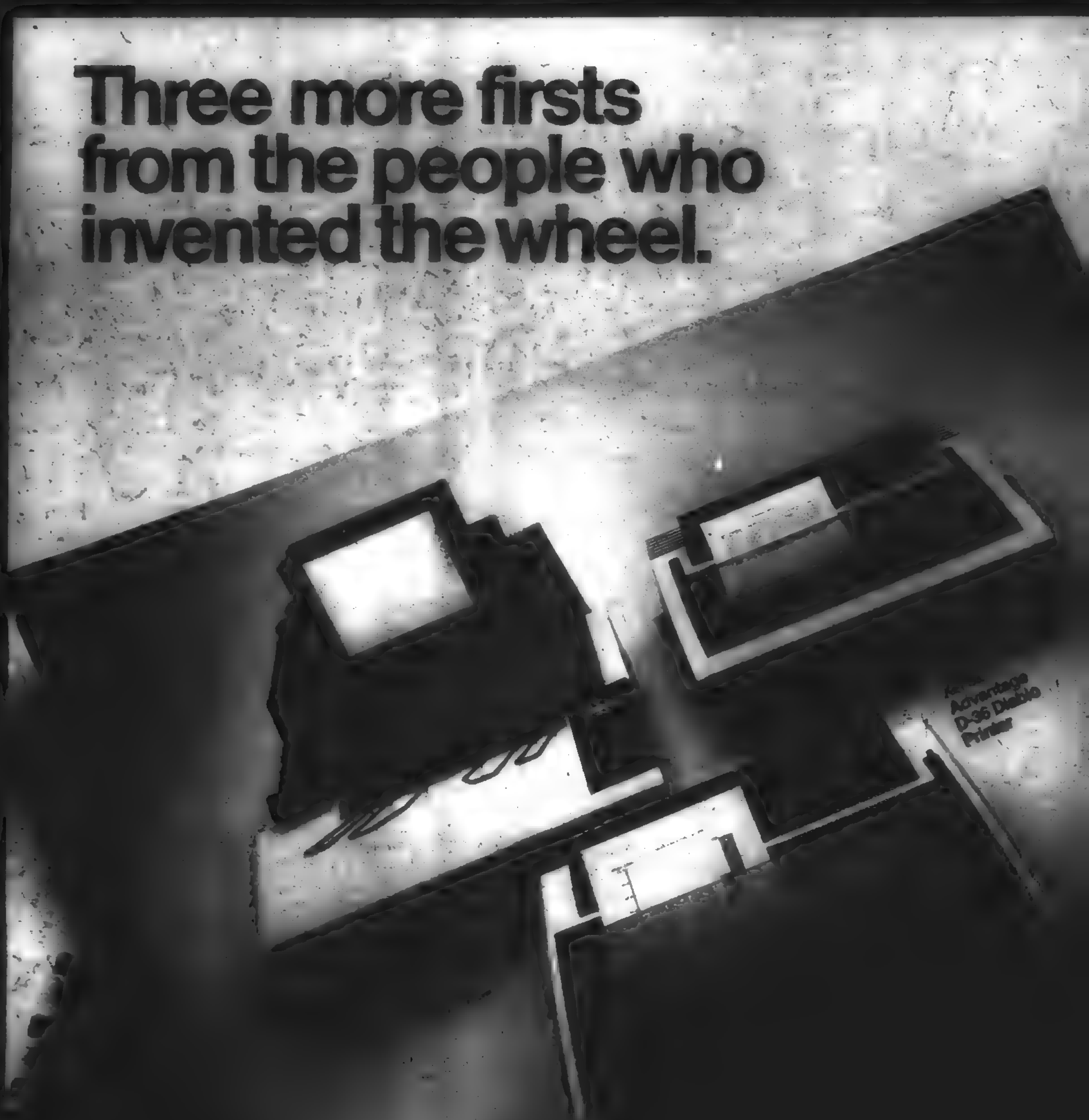
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Xerox Advantage D-36 Diablo Printer

XEROX

Migent's Ad-Lib applications generator for IBM micros bows

SCOTTSDALE, Ariz. — Migent Software, Inc. has announced it will release Ad-Lib, a $496 applications generator software product that incorporates relational data base management, file management and tables generation features, for IBM microcomputers and compatibles.

The vendor said Ad-Lib uses artificial intelligence techniques to allow end users to develop custom applications without programming because of a proprietary language for forms processing, called Formage, and a Micro Application Painter.

The forms-oriented software enables the user to paint the screen with a customized business form ready for data entry and automatically names and defines the fields.

Examples of applications include general ledger, payroll, amortization schedules, order entry forms, spreadsheets and accounts receivable, the company said.

Ad-Lib runs on the IBM Personal Computer, Personal Computer XT and compatibles with a minimum of 256K bytes of random-access memory. Ad-Lib will be released this summer.

Migent is located at Suite 203, 8300 N. Hayden Road, Scottsdale, Ariz. 85258.

Report evaluates micro communications offerings

CHERRY HILL, N.J. — Data Decisions, Inc. has announced "PC Communications," a three-volume report that covers a number of microcomputer communications products.

The report evaluates hardware and software products, including products that link microcomputers to mainframes, minicomputers, data services and other personal computers.

"PC Communications" is divided into five sections. Product evaluations list product strengths and weaknesses and group products into novice, experienced and technical user categories.

A rating summaries section lists Data Decisions' test results of similar products. The technical reports section examines and discusses issues such as security measures and vendor strategies.

The product profiles section groups similar products. The last section is a directory of vendors of micro communications products.

The report will be updated each month. A one-year subscription costs $800.

Data Decisions is located at 20 Brace Road, Cherry Hill, N.J. 08034.

SOFTWARE

■ Autodesk, Inc. has announced Version 2.1 of its Autocad drafting package, which runs under Microsoft Corp.'s MS-DOS and IBM's PC-DOS operating systems.

Version 2.1 features an increase in execution speed of up to 40%, optimized plotting of drawing and support for dot matrix and laser printers.

The visualization capability included in Advanced Drafting Extensions 3 (ADE 3) is a step toward providing three-dimensional capability for Autocad, a spokesman said.

Wire-frame drawings can be viewed and plotted and lines obscured by other objects in a 3-D drawing can be visually suppressed from displays and plots to provide a realistic 3-D image of solid objects.

ADE 3 also contains the ability to create and edit polylines — a series of connected-line or arc segments, or a combination of the two, that can have widths or line types associated with it — to provide for constructing, editing and dimensioning of smooth curves.

Autocad Version 2.1 has three configurations: The basic drafting package costs $1,000; Autocad with ADE 2 costs $2,000; and Autocad with ADE 2 and ADE 3 costs $2,500.

Autodesk, 2320 Marinship Way, Sausalito, Calif. 94965.

■ Dialogic Corp. has announced the Dialogic Voice Toolbox, a set of software tools that allows systems developers to create end-user voice systems for the IBM Personal Computer, Personal Computer XT and AT.

The Voice Toolbox consists of five modules. Vbase allows users to create, edit and manage a data base of words and phrases, Callstat monitors phone line status, Dialogic Intelligent Modem Emulator (Dime) can emulate Hayes Microcomputer Products, Inc. modems and Dostools can create an applications package using voice I/O. Sptools signal processing routines that allow the user to condition signals on a voice file.

Dime and Callstat require Dialogic's Dialog/2 and Dialog/3 voice systems. The entire Voice Toolbox is priced at $150. Individual modules cost $50 each.

Dialogic, 60 Baldwin Road, Parsippany, N.J., 07054.

See SOFTWARE page 47

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SOFTWARE

from page 46

■ **Lattice, Inc. has announced software that reportedly allows C language programmers to take advantage of the IBM Topview multitasking window environment.**

The Lattice Topview Toolbasket is said to be a library of more than 70 C functions to control window, cursor and pointer operations. It also reportedly includes printer control, cut-and-paste and debugging functions.

The product requires a minimum of 256K bytes of memory (with 512K bytes recommended) on the IBM Personal Computer, Personal Computer XT and AT.

Lattice Topview Toolbasket is priced at $250, and source code is available for an additional $250.

Lattice, P.O. Box 3072, Glen Ellyn, Ill. 60138.

■ **Modern Technologies International, Inc. has introduced a menu driver, file directory manager, file router and IBM PC-DOS interface utility for the IBM Personal Computer XT, AT and compatibles.**

The package, Hard Desk, reportedly provides the user with a set of English commands that can be addressed by function keys to integrate up to 10 software packages in a single menu system. The product requires 4K bytes of random-access memory and can access programs that reside in a combination of directories through a single menu. Function keys provide access to PC-DOS, on-line Help facilities, file routing and batch commands.

Hard Desk can be used with a number of applications packages, including Micropro International Corp.'s Wordstar, Microsoft Corp.'s Multiplan and Lotus Development Corp.'s 1-2-3. Hard Desk costs $95.

Modern Technologies International, Suite 302, 656 Bair Island Road, Redwood City, Calif. 94063.

■ **Softool Corp. has announced that its Fortran Programming Environment (FPE) is now available on the IBM Personal Computer, Personal Computer XT, AT and compatibles.**

Formerly available only on minicomputers and mainframes, FPE's programmer productivity tools include structured languages, a source code documenter, interface documenter, error detectors, libraries of prefabricated code, testing aides, tracing aids, optimizers and communications software. Called FPE/PC, it is said to enable programmers to compose portions of an application program from existing code and automates Fortran programming tasks.

FPE/PC allows the user to move Fortran applications from a mini or mainframe to the micro for development of micro applications and to off-load Fortran development work from a mainframe or mini to a micro.

FPT/PC is priced at $1,495.

Softool, 340 S. Kellogg Ave., Goleta, Calif. 93117.

■ **Thoughtware, Inc. has announced a knowledge-based software package said to help managers to manage people effectively.**

The Management Advantage package runs on the IBM Personal Computer, Personal Computer XT, AT and compatibles. It is said to contain advice distilled from practical management experience.

Management Advantage requires a minimum of 256K bytes of memory and IBM's PC-DOS 2.0 or higher.

The package costs $249.

Thoughtware, Suite 1000A, 2699 S. Bayshore Drive, Coconut Grove, Fla. 33133.

■ **Aurotech, Inc. has released an integrated security package for the Lotus Development Corp. 1-2-3 spreadsheet product running on IBM's Personal Computer, Personal Computer XT and AT.**

The package, Sheetguard, is said to permit only authorized users to share the 1-2-3 data.

Sheetguard is said to be activated whenever 1-2-3 is in operation. The program uses Aurotech's proprietary encryption method to scramble the data as it is being saved. The spreadsheet is retrieved by using a password.

The program costs $79.95.

Aurotech, Suite 100, 925 S. Niagara, Denver, Colo. 80224.

■ **Fox & Geller, Inc. released its Quickindex indexing software for users of Ashton-Tate's Dbase II and Dbase III packages on IBM Personal Computers and compatible systems.**

Quickindex is said to produce Dbase-compatible index files up to 10 times faster than Dbase does. A 2,000-record data base with a key size of 10 can be indexed in 1¼ minutes, the vendor said.

The package costs $69 for a copy-protected version and $99 for a non-protected version.

Fox & Geller, 604 Market St., Elmwood Park, N.J. 07407.

■ **The MacNeal-Schwendler Corp. has unwrapped an upgrade to its finite element analysis software package for the IBM Personal Computer XT, AT and compatibles.**

The MSC/Pal2 package is designed for use by mechanical engineers and designers in small and medium-size companies, the vendor said. It is an upgraded version of MSC/Pal that runs on the IBM Personal Computer.

The package adds elements including quadrilateral plates, shear panels and curved beams to mechanical systems. Other functions include additional applied load capabilities, enhanced graphics and the ability to handle larger, more accurate three-dimensional models, the vendor said.

Features include automatic nodal

Continued on page 48

folks. So you can forget about publishing reams of short memos. Its voice prompts guide you step by step. So there's no chance for miscommunication. Problems are solved. Decisions are moved along.

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Continued from page 47

resequencing, multiple-loading subcases, cylindrical and spherical coordinate systems and generation commands for handling element, node point and boundary condition.

The MSC/Pal2 package runs under IBM's PC-DOS 2.0 or higher and requires 512K bytes of memory, a floppy drive and a hard disk, a color graphics controller and a math coprocessor, the vendor said.

The package costs $1,995 and will be available in July.

MacNeal-Schwendler, 815 Colorado Blvd., Los Angeles, Calif. 90041.

■ Micro Data Base Systems, Inc. has announced a version of Knowledgeman, its integrated package, that runs on Novell, Inc.'s local-area network.

Knowledgeman's functions include a relational data base management package, a spreadsheet and a programming language. Optional modules include forms painting, graphics, text processing, report generator and support for a mouse.

The local-area network product version features protection of shared records or tables, automatic hold processing when a user is browsing through a table and automatic index updating for shared tables.

Other functions are automatic suspension and resumption of shared table modifications, choice between shared and local status for each table and the ability to modify a completed table's status and limit user Read or Write access of specific tables. Password security and data encryption are supported.

A 10-user version of the product costs $1,495.

Micro Data Base Systems, P.O. Box 248, Lafayette, Ind. 47902.

■ Enertronics Research, Inc. has announced a version of Energraphics, a graphics package that runs on Texas Instruments, Inc.'s Professional microcomputer.

The package reportedly works with nine fonts and produces pie charts, line charts and three-dimensional bar charts. A pie chart can be sliced into 15 portions, and the software can list each portion's percentage of the whole and can enlarge a portion. Line charts feature up to 10 lines per chart, up to 200 data points per line, scatter graphs, curve fitting, log scaling and up to four Y scales. Bar charts support up to 24 data ranges, 10 graphs per chart and horizontal or vertical plotting.

The package enables a user to define up to 2,280 symbols and store and recall them with one keystroke. It can input files from Lotus Development Corp.'s 1-2-3, Microsoft Corp.'s Multiplan and other packages that use Data Interchange Format files.

Energraphics costs $350. Plotter drivers are available for an additional $100.

Enertronics Research, Suite 207, 150 N. Meramec St., St. Louis, Mo. 63105.

■ PC Software Interest Group has announced Edit, a public domain word processing package that runs on an IBM Personal Computer.

With the package, a user can move a cursor by character, word, line, sentence, paragraph, screen or indentation. The product supports block saving, moving, insertion and deletion. Edit provides search forward or backward, global search and replace and conditional replace functions.

A user can set tabs, margins, page layout, headers, footers, page numbers, justification and spacing. Edit supplies Help screens that explain different options.

The product runs on an IBM Personal Computer with 128K bytes of random-access memory and IBM's PC-DOS 2.0 operating system.

Suggested donation for Edit is $25.

PC Software Interest Group, Suite J, 1030 E. Duane Road, Sunnyvale, Calif. 94086.

■ Software Research Associates has announced a version of its program testing software for Microfocus Ltd. Cobol programs written on the IBM Personal Computer.

Test Coverage Analysis Tool (Tcat/Cobol) is said to help the programmer identify which parts of the code remain untested.

Tcat/Cobol reportedly consists of a Cobol language instrumenter, a run-time program to collect test coverage data and write trace files and a coverage analyzer that produces the coverage numbers. The software also includes utilities for manipulation of trace files, a trace file archiving facility and on-line Help frames.

Tcat/Cobol requires an IBM Personal Computer running PC-DOS 2.0 or later and 64K bytes of memory.

The software costs $2,500 for a single CPU license and $9,000 for a license for all machines at one site.

Software Research Associates, 580 Market St., San Francisco, Calif. 94126.

■ Wordtech Systems, Inc. has unveiled a compiler that reportedly converts programs written in Ashton-Tate Dbase III to code that can run on any micro using Microsoft Corp. MS-DOS with 192K bytes of random-access memory (RAM).

Db III Compiler reportedly compiles programs written in the Dbase III language into a form that will execute without either Dbase III or Ashton-Tate's Runtime. The compiled program is said to be compatible with both Dbase II and Dbase III data files.

The product is said to eliminate the Dbase III system requirements for an IBM Personal Computer with 256K bytes of RAM.

Db III Compiler costs $750. The upgrade cost from Wordtech Db Compiler for Dbase III is $250.

Wordtech Systems, P.O. Box 1747, Orinda, Calif. 94563.

COMPAQ could have stopped here

GEM from page 37

network would look like."

Knutson said it is easy to find graphics packages for producing pie charts and bar charts but difficult to find programs that allow users to merge text and graphics. "That's what was so great about Apple's Macintosh and Lisa computers," said Knutson, who has also used the Lisa to produce charts.

Knutson said he "jumped at the chance to use Gem Draw" when it was introduced. Now, he recommends the program to fellow workers, he said.

Knutson likes the immediate feedback of Gem Draw, he said. Instead of having to wait for several weeks while a Boeing graphics group produced hand-drawn charts, Knutson can now create his own.

Equally important, he said, is the fact that the charts can be easily altered with Gem Draw. "And if you've ever worked with engineers, you know they like to make changes," he said jokingly.

Virginia Martin, a staff engineer in the data systems division at Hughes Aircraft Co. in Fullerton, Calif., said she wanted to be able to provide users with the same graphics capabilities as the Macintosh without buying Apple's computer. Hughes Aircraft has already settled on the IBM Personal Computer as its standard system, she said.

In addition, the company wanted a package that would work with IBM's enhanced graphics board and monochrome monitors. "We didn't want to have to replace all our monitors with color monitors," she explained. Gem Draw, she found, fit the firm's requirements.

Bert Trerise, a senior scientist in Hughes Aircraft's data systems division, is using Gem Draw to produce view graphs for overhead presentations. In general, he gave the package a positive review, saying it produced satisfactory graphics on his dot matrix printer. But the program does have some shortcomings, he said.

Trerise said he has encountered problems in trying to center a block of text within a box. Although the text will appear centered on the screen, it is not centered when it is printed out, he said. "It's a hit-or-miss process," Trerise said. "And I haven't figured out a rule of thumb that would let me get close the first time," he added.

According to a Digital Research spokesman, users will be able to center text within a box if they are working in the Portrait (vertical) mode. In Landscape (horizontal) mode, however, users will have to experiment with the output to gauge the center of the box.

Despite this problem, Trerise said he would encourage others to try Gem Draw. "In my usage, the fonts it produces on the printer are clear, just right for view graphs," he said.

As a whole, the users gave Digital Research high marks for Gem Draw's menu-driven installation procedure. No knowledge of IBM PC-DOS commands is required to install the program, they said.

The users had some suggestions for improving Gem Draw. Citibank's Kalipetes said he would like Digital Research to provide a set of flowchart symbols with the program. In addition, the users recommended that the firm increase the variety of fonts and provide the ability to rotate objects.

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AI from page 37

(such as Lisp and Prolog compilers) become available, personal computers are becoming subversive once again. They're beginning to join the AI parade as prototyping, development, delivery and training vehicles.

In one of the first steps, micros built around the Intel Corp. 80286 or Motorola, Inc. 68000 family may be perfectly appropriate for building and running small knowledge-based systems.

And, as in the case of early micro software packages, those knowledge-based systems will not necessarily be written by computer professionals.

Neil Pessall, an advisory scientist with Westinghouse Research and Development in Pittsburgh, has written several expert systems in conjunction with another materials specialist, using Texas Instruments, Inc.'s Personal Consultant software.

That approach "is a violation of the AI field," he acknowledged. But it has worked well, and he disagrees entirely with the theory that "expert systems should not be developed by experts."

DOS from page 37

editor and a print manager also are bundled in with the operating system.

Additionally, Digital Research is offering OEM versions of Concurrent DOS 86, which include local-area networking support provided by the company's DR Net. Digital Research intends to provide IBM PC Network compatibility by the year's end, Loftus said.

Concurrent DOS 86's multitasking design is said to feature a flexible, priority-driven architecture rather than a time-sliced CPU setup such as that provided by IBM's Topview operating environment. The software takes up 165K bytes of internal memory.

Concurrent PC DOS will be repriced at $295 in August, Digital Research said.

The product runs on the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatible systems. The software requires a minimum of 256K bytes of memory and two floppy disk drives; 512K bytes and a hard disk drive are recommended.

More information is available from Digital Research at Box DRI, 60 Garden Court, Monterey, Calif. 93942.

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Numbers add to net hassles

Anyone who has been frustrated by trying to bring up a new data line that does not work on the first try is aware of the resultant finger-pointing that occurs between the systems people, the modem supplier and the carrier. Multivendor networks and AT&T divestiture have made it much harder to pin the blame on one particular vendor.

For example, follow a byte of information leaving an IBM front-end processor through a T-Bar, Inc. matrix switch, which feeds an AT&T Information Systems modem connected to a Nynex Corp. line via an Arus Corp. bridge, to AT&T Communications long-haul facilities employing Rockwell International Corp. digital microwave equipment. From here, the byte travels to the Pacific Bell area, where a Paradyne Corp. modem-sharing unit is connected to a modem supporting an ADP Network Services, Inc. controller that emulates an IBM 3274 communications controller to support terminals from GTE Corp.'s Financial Services Division and Teletype Corp. printers.

This is not an academic concoction; it is a typical business network.

It is amazing that such a complex machine would work at all, but it does. The credit for this end-to-end compatibility goes to the integrity of the communications industry as a whole. But the communications manager is increasingly confronted with the challenging responsibility of making sure this multidimensional conundrum is reliable.

Network complexity can grow arithmetically and geometrically. As an example of the former, net complexity can

See MINOLI page 55

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

Network upgrades seen laying ground for ISDN

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — As a precursor to universal voice/data connectivity, the seven regional holding companies are rapidly installing metropolitan fiber-optic local loops and upgrading analog central office switches to digital.

The migration to these facilities is seen by analysts as preparation for Integrated Services Digital Network (ISDN), where customers will control their access to telephone utility for data, voice and image communications.

In 1984, the seven regional holding companies spent an average of $2 billion for basic network service improvements and have indicated plans to spend another $1 billion in 1985 in further network expansions and upgrades. Central to the telephone companies' strategies is keeping the largest revenue-producing customers on their networks and blocking any move to bypass.

In recent weeks, Bell Atlantic Corp., Nynex Corp., Ameritech and Bell South Corp. have all made announcements of services they call "links in the evolution to an ISDN." Some of these services are new features for its Centrex service.

Nynex, for example, recently introduced a family of Pathways services that will become available by the end of 1986 [CW, May 13]. Pathways includes Flexpath, a digital 1.5M bit/sec. or 64K bit/sec.

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- Data Switch has announced a new model in its family of fiber-optic channel extenders that can reach up to 5 km/54
- AT&T has announced a digital, switched video-conferencing system for local, metropolitan-area networks/54

Salary gains trail budgets

By Paul Korzeniowski
CW Staff

DALLAS — Salaries of communications professionals are not keeping pace with the more rapid increases in corporate communications budgets.

Communications managers interviewed here recently at Telecom '85, a show sponsored by the International Communications Association, reported that equipment and service costs were fueling budget increases but salaries were remaining stable or increasing at a much slower rate.

Managers said their budgets had grown 10% to 30% in each of the last two years. Equipment purchases were listed as the primary stimulant for budget increases.

Regarding salary increases, a communications manager at an insurance company in Bloomington, Ill., said his budget went up 30%, but salaries increased by 10%. The insurance company's salary increases were the highest mention by managers in-

See SALARY page 55

Nynex to build net for DEC

WHITE PLAINS, N.Y. — Nynex Business Information Systems Co. will build two fiber-optic networks for Digital Equipment Corp. in Massachusetts and New Hampshire to link 21 DEC offices.

Nynex reported that retaining DEC as a corporate customer was one of the key factors in the decision to offer the minicomputer maker an alternative to the network capabilities of the Nynex telephone companies.

The networks will span 80 miles, link DEC voice switches and provide high-bandwidth data transmission facilities. The 90M bit/sec. backbone network has a purchase value of $4.6 million and will include fiber-optic cable, terminating hardware and lightwave equipment.

The first phase of the project should be completed in two years, according to the company.

Nynex Business Information Systems is located on the Second Floor, 65 W. Red Oak Lane, White Plains, N.Y. 10604.

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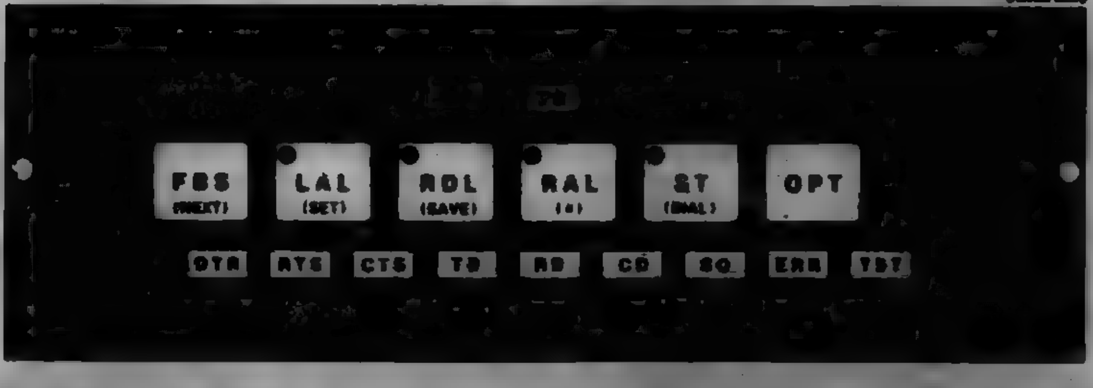

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AT&T's Vivid video teleconferencing system debuts

BERKELEY HEIGHTS, N.J. — AT&T has announced a digital switched video conferencing system for local, metropolitan-area networks.

The Vivid video teleconferencing system is said to offer broadcast-quality video service under customer control, enabling users to initate a video conference without operator assistance.

Vivid is said to provide voice communications and support data transmission at rates from 1,200 to 56K bit/sec., the vendor reported. Vivid will be provided over 200,000 miles of AT&T lightwave cable available in a number of locations throughout the U.S., although exact locations have not yet been disclosed.

The Vivid system includes the following:

- Digital Video Terminal, a coder/decoder that accepts video and analog data, such as facsimile and encodes, multiplexes and transmits the data in a DS3 signal at 45M bit/sec.
- A wide-band video switch, which is used to establish one-way, two-way, point-to-point or multipoint connections.
- A Customer Network Controller based on an AT&T 3B minicomputer that communicates to the switch and allows a customer to control a network.
- A Digital Switch Interface that converts a DS3 signal to a signal required at a switch.
- A Lightwave Video Interface, which is able to receive DS3 lightwave signals and converts them to electrical signals.
- A touch-sensitive control terminal for access to the video teleconferencing network.

The service should be available in the first quarter of 1986, and pricing is dependent on each installation.

AT&T is located at 1 Oak Way, Berkeley Heights, N.J. 07922.

Data Switch announces extenders

NORWALK, Conn. — Data Switch Corp. has announced a new model in its family of fiber-optic channel extenders.

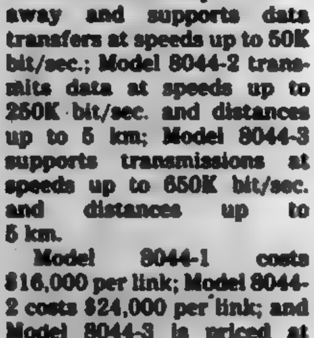
The Model 8044 attaches a peripheral control unit to an IBM mainframe at distances up to 5 km at speeds up to 650K bit/sec. Controllers normally have to be located within 400 ft of one another and transmit data at speeds up to 43K bit/sec., the company reported.

The product consists of two channel extension units: one for a channel on the mainframe and one that attaches to a remote unit. Model 8044 does not require modification to the computer's operating system, applications software or access method. The product can supply redundant power supplies, central remote control panel and systems controller.

There are three models of the product: Model 8044-1 can be attached up to 2 km away and supports data transfers at speeds up to 50K bit/sec.; Model 8044-2 transmits data at speeds up to 250K bit/sec. and distances up to 5 km; Model 8044-3 supports transmissions at speeds up to 650K bit/sec. and distances up to 5 km.

Model 8044-1 costs $16,000 per link; Model 8044-2 costs $24,000 per link; and Model 8044-3 is priced at $32,000 per link.

Data Switch is located at 444 Westport Ave., Norwalk, Conn. 06851.



"It says, 'Thanks for the memory dump.' "

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MINOLI

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follow the arithmetic sequence 1n, 2n, 3n and so on as modems are added to a network to support remote sites. It can also grow geometrically following the sequence, n, n squared, n cubed and so on, when directly addressable memory in a CPU grows with word length: 2^8 addresses, 2^{16} addresses, 2^{32} addresses and so forth.

Competition and divestiture have created an environment that exceeds both arithmetic and geometric complexity. We have been thrust into an exponentially complex world.

For example, there are 64 ways in which three vendors — A, B and C — can point the finger. These include the following: A says nothing, B says nothing, C says nothing; A says nothing, B says nothing, C says it's A's fault; A says nothing, B says it's A's fault, C says it's B's fault; A says it's B's and C's fault, B says it's C's fault, C says it's B's fault; A says it's B and C's fault, B says it's A and C's, C says it's A and B's fault . . .

You get the idea.

Few real-world networks would involve only three vendors. The network outlined at the top of this article specifies 14, and it is not unusual to have 20. In general, if there are n number of vendors, then there are "two to the power n times (n-1)" ways to point the finger.

Obviously, multivendor environments existed before divestiture. However, this situation has been aggravated by divestiture insofar that where once a single vendor provided end-to-end long-haul links, that same circuit must now be handled by four vendors: two local telephone companies, the long-haul carrier and the equipment supplier.

Given this, communications managers should strive to minimize the number of vendors involved with their networks. The orthodox (predivestiture) way a communications manager would approach network design would be to acquire the least expensive hardware solution, even if this meant comprising the "vendor-purity principle" by adding another vendor.

Prima facie, it would appear that the manager had done his job in minimizing network cost. In reality, however, the apparent savings would probably soon be lost in the meantime to repair equipment and associated business risks or lost revenue potential due to downtime.

Divestiture, with its intrinsic multivendor character, has accentuated the need to value reliability over apparent savings when implementing networks.

SALARY

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terviewed. "Salaries in my department have only slightly increased," said D. C. Augustin, director of telecommunications and network services at McDonnell Douglas Aerospace Information Services in St. Louis.

"Communications professionals' salaries have not kept pace with the additional skills required for the job," maintained Tony J. Gelardi of Computer Sciences in El Segundo, Calif. "But my department's salary increases have kept in line with those throughout the company."

This situation has created a problem for Gelardi. "There have been occasions where our company has served as a training ground," he said. "As soon as a person was fully trained, he went to work for another firm where he received more money."

Another area where salary levels hinder a manager is in hiring employees. All the managers claimed to have had problems finding communications professionals. "We looked for a new person for one year," explained Dennis E. Fielding, staff consultant at Harris Corp. in Melbourne, Fla. "We finally hired a college graduate who didn't have any experience."

Fielding did not, however, favor substantially increasing salaries to entice potential employees. "A manager can go out and buy an employee," he said, but "I doubt many managers want to get in a bidding war."

McDonnell Douglas' Augustin concluded, "Whenever there is an increasing demand in the market like there is today for telecommunications professionals, staffing can be a problem. Our turnover has been higher than I would like it to be, but there isn't much you can do when there just aren't enough qualified people."

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NETWORK

from page 53

direct I/O dialing link for private branch exchange users. The service is said to enable users to initiate service changes by sending channel signal data to the telephone company's central office digital switch. Touted features include simultaneous voice/data transmission and avoidance of analog or digital conversions.

Other features planned by Nynex include a digitized Centrex enhancement called Intellipath that is initially slated for the cities of Boston and New York, where a concentration of fiber-optic and digital-switch capacity is available.

Feature capabilities

Features will reportedly enable customers to initiate service changes such as the number of direct inward dialing trunks used, automatic route selection, trunk queuing and station moves. Other features will reportedly offer incoming call identification and integrated access with dynamic allocation enabling customer trunk control via computers located at the users' business offices. Nynex also said it will add data communications features such as packet switching and electronic mail.

According to Nynex, these Centrex upgrades "provide customers with ISDN capabilities while permitting them to retain all the Centrex advantages they now enjoy." The upgrades are referred to as the "building blocks to ISDN."

Another planned Nynex service designed to keep the large-volume data communications user loyal to the local telephone company is Switchway. Switchway is a switched, 56K bit/sec. service that will permit businesses to have access to a dedicated private line on an as-needed basis.

Nynex said that it has already completed construction of two fiber-optic circles around Manhattan and one around Boston. Nynex's total lightwave mileage presently has reached 57,000 miles.

University networks

As another example of the migration to ISDN, Bell Atlantic recently announced the installation of Centrex-based local-area networks for two universities. The service is implemented by placing voice/data multiplexers in the customer's office as well as in the telephone company's switch center, avoiding duplication of separate voice and data lines. Data rates are said to range from 9.6K bit/sec. to 19.2K bit/sec.

Bell Atlantic also reported that it spent $1.9 billion in 1984 on local-exchange network and switch upgrades, including 24,000 miles of fiber-optic lines, and plans to spend $2 billion in 1985 on adding 158 digital switches and another 34,000 miles of fiber.

A separate $20 million, 5,800-mile fiber-optic network for Washington, D.C., will be finished this year, which will be linked to a dedicated digital Centrex service for the White House. Bell Atlantic said an additional 41,000 miles of fiber will be laid down in 1986.

Attractiveness of Centrex to fade as choices expand

Despite optimistic views that Centrex enhancements are forerunners of an Integrated Services Digital Network (ISDN) environment, the official view of the Federal Communications Commission, which regulates Centrex as a basic service, is not so rosy.

An FCC official said the commission has tried to maintain an even hand in Centrex regulation, although it could have killed it when AT&T was divested.

The FCC official, who requested anonimity, said that Centrex lines will eventually be charged the full $6 per line per month access charge, just as regular business lines are now being assessed, and added that the attractiveness of the service will not be so apparent.

"We've refrained from killing it because the former Bell companies had so much investment stranded in the service," he said.

Improvements in local loops

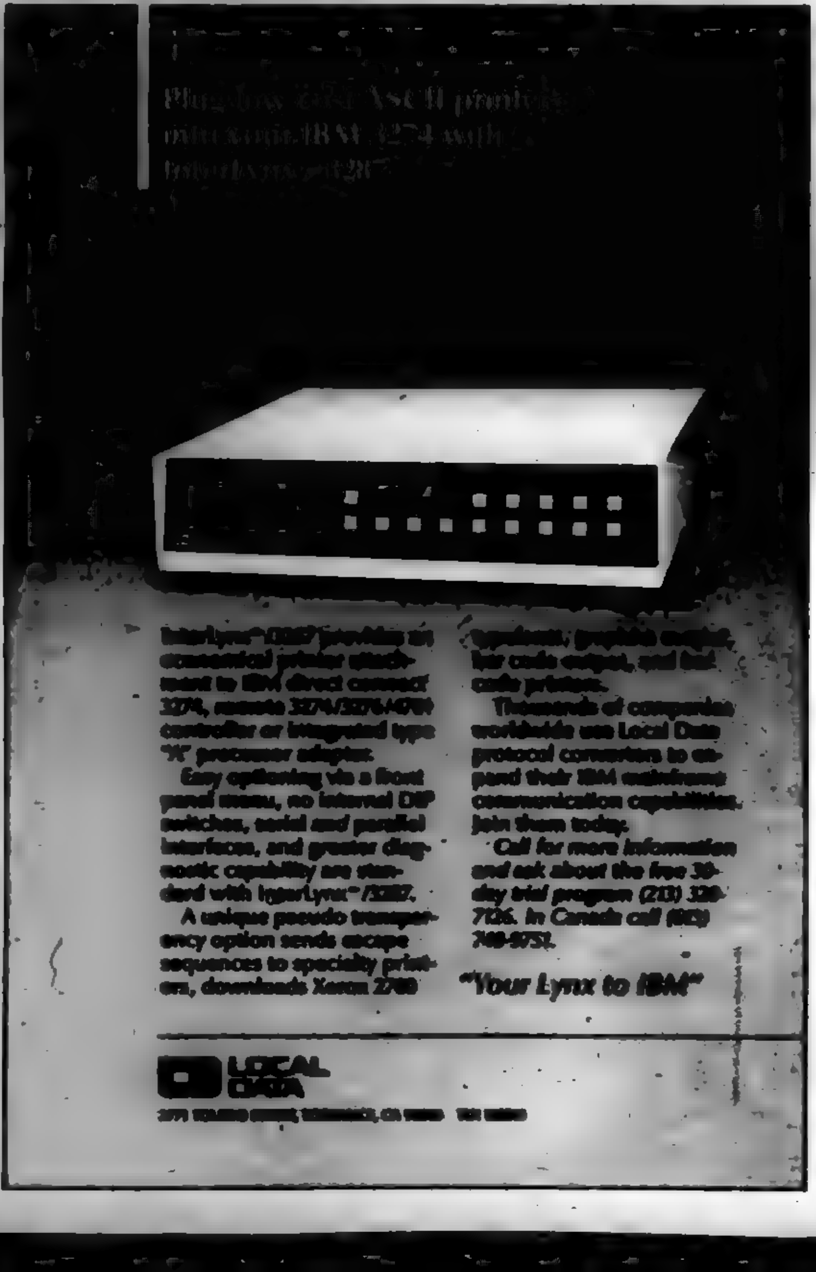
The official added that technological improvements in local-loop copper wire and the installation of fiber-optic capacity in cities where Centrex services are predominant could mean that a local loop will not be needed for every main station and would thus avoid the per-line access charge pricing system.

"As the cost of local access increases, fewer customer locations will be able to justify access lines into a private network," according to Perspective Telecommunications Group, a Franklin Lakes, N.J., research outfit. "Many of these locations will simply utilize a mix of public-switched services including Wats, MTS and other long-distance carriers. It is this area where the integration of local lines by ISDN and the resulting cost improvements may be the greatest benefit achieved."

Much of the Centrex development work came out of the AT&T Bell Laboratories facility that is dedicated to Bell Communications Research, which is the research arm of the seven Bell regional holding companies.

In a recent publication, the team leaders behind the Centrex work reported, "The ISDN design is consistent with the overall concept of Centrex, which is based on the switching and computing power of the central office."

— Bryan Wilkins



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SYSTEMS & PERIPHERALS

INSIDE

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Harris adds Unix-based supermini

MELBOURNE, Fla. — Harris Corp. has unveiled a 32-bit AT&T Unix-based supermini that uses Schottky bit-slice technology and is said to to perform in the 7 to 8 million instructions per second range.

The HCX-7 system is geared to the scientific and engineering user and is Harris' first machine to run Unix as its native operating system. It is priced from $225,000 and features the following:

- AT&T Unix System V, augmented with University of California at Berkeley Version 4.2 extensions.
- A set of 160 instructions pared down from a superset of most used instructions.
- Frequently used instructions — such as Call/Return — implemented in hardware, so that all instructions typically run in one machine cycle of 100 nsec.

A basic HCX-7 includes a CPU, 2M bytes of main memory, a console processor and terminal, an asynchronous controller, power supply and the operating system.

With the addition of 2M bytes of memory, a floating-point processor and an I/O expansion cabinet, the price starts at $275,000. Shipments will begin in July.

More information can be obtained from Harris, Computer Systems Division, 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

Disk drives not cure-all for storage backlogs

By Donna Raimondi
CW Staff

PATCHOGUE, N.Y. — Disk drives are being used as a Band-Aid for inefficient data management among users of IBM and compatible mainframes. Proof of this lies in the fact that in spite of a nearly 400% increase in capacity over the past few years, users are still buying disk drives at a breakneck pace. For example, IBM and IBM-compatible disk drive makers ship a total of roughly 70,000 new disk units each year.

Those were the conclusions of "The IBM Disk Report" prepared by Applied Management Services here, which noted that managers often fail to realize the economical solution to storage backlogs is to store information on existing disk drives more effectively. This can often be accomplished, the report said, by using disk management software packages.

A good disk management software package can help reorganize data fields, help to defer hardware purchases and reduce costly systems programming man-hours, the report said. Such a program can

See DISK page 58

CAD/CAM networking debuts

By Clinton Wilder
CW Staff

BEDFORD, Mass. — Computervision Corp. has unveiled a networking capability for its computer-aided design and manufacturing system that reportedly allows single-workstation users to access data from any point in a product design process.

The CDS II system represents the first complete workstation-to-host integration capability from Computervision, according to James R. Berrett, company president and chief executive officer.

CDS II, which will be available in mid-June, is said to allow individual engineers and project managers to access Computervision Cadds 4X and Cambridge Interactive Systems Ltd. Medusa design applications software. Berrett said that software includes approximately 400 applications packages for product design and manufacturing in mechanical, electronic and building construction fields.

Access to the software was previously

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A new blue suit is nice, but can IBM change its stripes?

HARD TALK
Tom Henkel
CW Senior Editor

When IBM unveiled its long-awaited Sierra line of mainframes in February, it took extra care to emphasize that the 3080 line of mainframes was not a fading product. The dead-even performance of the 3080 Model 200 and the 3084 Model QX and the nearly two-year delivery date for the top-end 3090 Model 400 were intended as unquestionable statements that IBM has no plans to turn its back on hundreds of 3080 users.

Clearly, IBM's immediate reason for keeping the 3080 series alive was to bolster shabby first-quarter (and probably second-quarter) financial results. But the underlying rationale for tossing an olive branch to 3080 users was to keep those top IBM customers happy.

This is the new IBM — the friendly computer company.

IBM has been falling all over itself recently trying to undo what many have perceived as a "we're IBM, who cares what you think" attitude. It seems that in the process of establishing itself as the top computer company in the world, IBM has also gained the reputation of being the most arrogant.

But with changing times has come new IBM leadership. The friendly trend has been steadily evolving since John Opel took over as chief executive officer. Now with John Akers in the top seat, the nice-guy trend appears not only to be continuing but also intensifying.

The new, friendly IBM is not bad. Actually, it is quite nice. IBM seems to be honestly trying to keep users, consultants and even the trade press informed on what is happening behind the hallowed blue walls. There was a time when IBM appeared to consider everything from its sacred product strategy down to the color of the tile in its executive men's rooms a secret. Now you can actually ask IBM a question and sometimes get a reasonable answer.

But there is still some doubt over whether anyone is really buying all this friendliness. People who have been dealing with IBM for

See NICE page 59

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* Based on room inventory of Hilton Hotel Corp., which does business in the U.S.A. Source: New York Times article, week of 4/1/85.

TURNKEY SYSTEMS

■ **Data Recording Systems, Inc. has unwrapped its Laserscribe/8415 plain paper printer that can be driven by raster image processors such as those offered by Monotype, Camex, Inc. and Raster Graphics, Inc.**

The 8415 — available only to OEMs — comes standard with software-selectable, dual-density resolutions of 800 by 800 dot/in. and 400 by 400 dot/in. A standard draft mode of 400 by 400 dot/in. is said to print an 8½- by 11-in. page in 4 seconds.

The Laserscribe/8415 costs $30,000 in single quantities at OEM pricing.

Data Recording Systems, 80 Ruland Road, Melville, N.Y. 11747.

■ **Scan-Optics, Inc. has announced the Reliareader 542 for machine reading of characters from full-size paper forms.**

The 542 scanner uses a custom-integrated circuit developed by the vendor. It will be available in five models. One model will recognize characters from 256 templates, while the top model can recognize characters from 1,280 templates. Each template may represent a single character, the vendor said.

The reading subsystem of a Reliareader 542 is capable of speeds up to 2,000 char./sec. using the company's proprietary parallel processors. The custom circuits are said to allow products to be packaged in smaller boxes than allowed by first-generation optical character recognition products.

The Reliareader 542 is said to use programmable recognition logic, which allows users to adjust to a mix of printing devices. The 542 can accommodate the company's Image Capture and Compression Unit, which permits digital images of documents to be captured and compressed while the machine is reading. The subsystem captures images of 8½- by 11-in. pages at a resolution of 200 dot/in. at speeds of up to 200 page/min.

Prices for the Reliareader 542, scheduled for fourth-quarter availability, begin at $350,000.

Scan-Optics, 22 Prestige Park, East Hartford, Conn. 06108.

DISK

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range in price from $3,000 to $23,000, and it should provide reports, file maintenance, disaster recovery, standards enforcement and archiving functions.

Increasing corporate demands for information have been raising the pressure on DP executives to provide users with more storage. The demands on DP executives are, in turn, putting more pressure on IBM and the plug-compatible manufacturers (PCM) to provide faster, higher capacity, cheaper, more compact and more flexible storage alternatives.

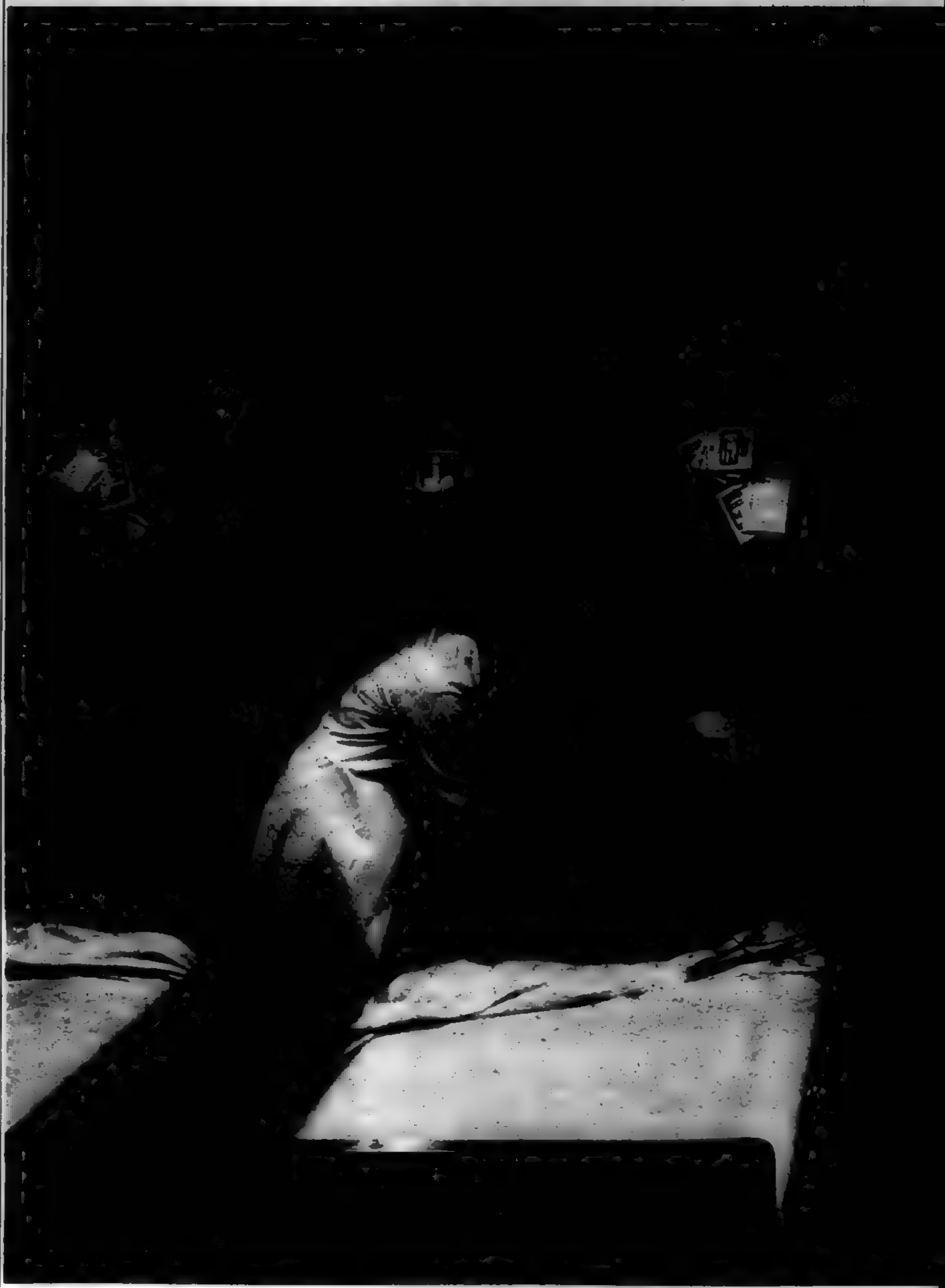
Large users are demanding drives — such as IBM's 3380 extended capability models — that will increase data storage capacity with smaller floor space increase requirements, the study said. Replacing older 3380 drives with these units can cost far less than constructing a facility to house more disk drive devices, it said.

IBM and the PCMs are transferring an increasing number of functions — such as encoding/decoding data, track and cylinder seeking, drive speed control, data buffering, diagnostics/maintenance — to the disk controller through the use of microprocessors, the report said. Putting these functions on the disk controller will generate a major increase in overall disk subsystem throughput, the report stated.

A shortage of data storage by the early 1990s could result from the current better than 50% annual million instructions per second growth rate of medium- to large-scale computer installations, the greater acceptance of IBM's MVS/XA operating system and the surge of personal computers poised to go on-line during the next few years, the report said.

Disk controllers, storage management software and specialized techniques, such as Winchester design and the thin-film process, must be enhanced if improved disks are to be managed and accessed efficiently.

The study — which costs $75 — is available from Applied Management Services, 180 E. Main St., Patchogue, New York 11772.



NICE

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years have gotten used to getting nonanswers and waking up to find that everything in their data centers has been rendered obsolete by IBM's latest product announcement.

Skepticism dies hard. When IBM rather suddenly starts being nice, the immediate reaction is to wonder, "What's up?" Crocodiles are said to appear to be smiling just before making it painfully clear that it's time for lunch, and you're it.

After all, why should IBM be nice? The company seems to be riding higher than ever. It has whipped the pants off virtually all its competitors and in the process managed to streamline its internal operations to churn out better products at a faster pace. If anything, this is a time when IBM could get away with being more arrogant than usual.

The reason rests in IBM's realization of a grim fact: it has become its toughest — and probably most ruthless — competitor. The products from smaller companies that are IBM-compatible, cost less and offer better performance aren't causing IBM its biggest problems. It's the continued rumors and speculation about how IBM will surpass its own products that spreads what one industry watcher is fond of calling "fear, uncertainty and doubt," among IBM users.

The 3080 series is a classic example. In anticipation of the Sierra, which turned out to be the 3090 series, most industry analysts were predicting the 3080 machines were about to join the ranks of the electronic dead. Consequently, in the two months prior to the 3090 announcement, 3080 sales almost came to a standstill. Even three months after the 3090 announcement and IBM's insistence that the 3080 is not on its way to the computer tar pits, IBM still is selling about half as many 3080s as it did a year ago. Even taking into consideration the recent overall slowdown in computer purchases, 3080 sales are still off.

Skepticism arises

Here's where the lingering skepticism comes into play. Historically, when IBM announced a line of mainframes, the old ones had about as much future as a crippled racehorse. IBM's claims that the 3080 is not dead are hard to swallow. The historical facts indicate otherwise. Then there are the rumors. Ever since the "Ivory Letters" on the 3090 Model 200 hit the streets, there have been persistent speculations that the system is a ruse — another 3081 Model D, if you will. The speculation goes that the "real," more powerful Model 200 will be announced when IBM is satisfied it has milked all it can out of the aging 3080s.

The theory of the bogus Model 200 is questionable. IBM appears set to deliver too many of the processors in late 1985 and early 1986 to pull off the old switcheroo in mid-delivery cycle. Remember, this is the new, friendly IBM.

But you can put money on the fact that if IBM has got a dual-processor 3090 Model 200 ready for high-volume shipments in the first quarter of 1986, there must be a uniprocessor version of the 3090 ready to be rolled out whenever IBM sees fit. If the Model 200 is, in fact, the real thing, the performance of the uniprocessor 3090 will wipe out much of the 3080 line.

So is IBM lying? Not really. There are two ways to look at IBM products: residual values and how a product fits into IBM's long-term product strategy. If you want to talk about residual values, the 3080 series is on its last strong drive. But in strategic terms, the machines appear to have some life left.

IBM seems to be promising it will not, at least for the next few years, dramatically change its large systems architecture in such a way that precludes 3080 series systems from taking advantage of the latest IBM software and operating system advances. That is not necessarily a promise that IBM will refrain from announcing systems which, from a price/performance standpoint, appear more attractive than the 3080s.

IBM, friendly or not, is and will remain in the business of making money. The latest trend toward being nice is nice. But don't take a few smiles to mean that the big blue giant has become gentle.

NET

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gained only through Computervision's high-end CDS 4000 computer-aided engineering and CAD/CAM minicomputer. Last week's announcement means that users of low-end workstations, such as the IBM Personal Computer AT, can access the capabilities of the host system.

The CDS II software also allows users of Digital Equipment Corp. VAX series minicomputers to tie into the CDS II network, the vendor said.

The price of the CDS II system is $10,000 per workstation, a company spokesman said.

Patchwork solution

CAD/CAM market analyst Peter Cohen of International Data Corp. in Framingham, Mass., called the Computervision product announcement a patchwork solution. "The ultimate solution will be to port the [Cadds 4X] software to run on all workstations," Cohen said. "But as a holding measure, the CDS II is a step in the right direction. It was very important for them to do something to integrate their hardware platforms. It's clearly the direction they have to go."

The company has seen its steadily eroding CAD/CAM market share result in sharp losses so far this year. The company reported an $18.8 million loss for the first quarter and has laid off 950 employees, the most drastic work-force reduction by any high-technology company outside the semiconductor industry [CW, April 15].

Although Berrett said the company expects to attract new users with the CDS II capability, Cohen believed the product will only help secure Computervision's installed base of customers.

"I suspect it won't be effective in attracting new customers, but it will keep their current client base satisfied until they develop something for fuller integration," he said. "The $10,000 price is a considerable addition to the base price of small workstations."

'Pent-up product appetite'

Berrett said the economic future of Computervision depends more on overall economic factors than on any product, including CDS II. "Our rebound depends on the rebound of the U.S. economy," he said. "We believe there is a pent-up appetite for our products, but our customers will decide at their board levels how much spending they can afford. We feel [the CDS II] clarifies for our sales force how to talk about our entire product line, and it gives us a system capability that we never had before."

Berrett said he could not predict near-term economic factors but that the company had no further layoffs planned.

Computervision is located at 15 Crosby Drive, Bedford, Mass. 01730.

TERMINALS

■ Paradyne Corp. has announced a workstation that is said to allow the centralized control of a data communications network from one console.

The Analysis workstation provides interactive access to network management information including problem detection and control of network software from a terminal. Host application systems such as IBM's NCCF and Network Problem Determination Application can be used, and the unit can be connected to a host IBM mainframe computer, the vendor said.

The basic unit, containing a terminal upgraded with communications facilities, Digital Research, Inc.'s Cdos operation system, two floppy diskettes with a total of 640K bytes of storage, 192K bytes of memory (upgradable to 640K bytes), the CRT and keyboard, costs $6,000.

Paradyne, P.O. Box 1347, 8550 Ulmerton Road, Largo, Fla. 34294.

■ GTE Telenet Communications Corp. has announced a network color graphics monitor for GTE Telenet public and private nets.

The Color Monitor is said to allow operations managers to view network operations in real time with color graphics. Operating parameters such as configuration, traffic levels and line performance appear in a variety of geometric shapes, numbers and lines. The unit costs $52,000.

GTE Telenet, 12490 Sunrise Valley Drive, Reston, Va. 22096.

SCIENCE/SCOPE

A new radar can map military targets with high resolution equal to that of infrared devices, even in rain and other bad weather. The Advanced Synthetic Aperture Radar System (ASARS-2), designed to complement electro-optic sensors, is flown on a U.S. Air Force TR-1 reconnaissance aircraft and provides real-time radar imagery to a ground station. ASARS-2 operates in all weather at ranges far exceeding the capabilities of infrared and other electro-optic devices, thanks to new state-of-the-art signal processing and other advances. The Air Force gave the system an excellent rating after it underwent strict operational performance tests as part of a "fly-before-buy" program. Hughes Aircraft Company is producing the system under a development and production contract. Eventually ASARS-2 is expected to be adapted for tactical aircraft and mobile tactical stations.

NASA's Project Galileo Probe, which will explore the planet Jupiter later this decade, must arrive at a precise angle if it is to carry out its measurements of the chemical composition and physical state of the Jovian atmosphere. The Hughes-built probe will arrive at 107,000 miles per hour, fast enough to travel between Los Angeles and Las Vegas in nine seconds. If the probe hits at too shallow an angle, it will skip off into space; too steep, it will be reduced to ashes. Even at the proper angle, the probe will encounter extremes never before faced by spacecraft. In less than two minutes, much of the forward heat shield will be eroded by temperatures of thousands of degrees. With atmospheric entry forces reaching 360 times the gravitational pull of Earth, the 742-pound probe will take on a weight equal to an empty DC-10 jetliner. Project Galileo is scheduled to be launched from the space shuttle in May 1986 and to arrive at Jupiter in August 1988.

Two versions of a new color image recorder, designed to provide the means to capture on film the precise color image from television monitors, have been introduced by Hughes. The high-fidelity TV recorders, Models CIR 100 and CIR 200, interface directly with a color display. They contain their own high-resolution, flat-face cathode-ray tubes, primary color filters, and controls for exposure and color. They record on either 35-mm or instant film with the high resolution, brightness, and color range necessary for scientific, medical, or other applications where accuracy is essential.

Lasers soon will be inspecting solder joints of fighter aircraft radars, thanks to new manufacturing technology being set in place at Hughes. Solder joints will be examined by a computerized technique using lasers and fiber optics, the glass threads that carry laser light transmissions. The process will free manufacturing personnel from tedious and time-consuming inspections of more than 36 million solder joints created in a single year's production. The project is part of an Industrial Modernization Incentive Program (IMIP) awarded by the U.S. Navy and Air Force. IMIP is a share-the-savings concept that will reduce costs of the F-14, F-15, and F/A-18 radar programs by more than $30 million, while improving the quality and reliability of the systems.

Hughes' Santa Barbara Research Center is seeking experienced engineers and scientists to further develop advanced IR focal plane technologies. We need custom integrated circuit designers, nuclear effects engineers, material scientists, semiconductor device scientists and process engineers, and IR system analysts. To learn how to become involved in this innovative technology, contact the Santa Barbara Research Center, Professional Employment, Dept. S3, 75 Coromar Drive, Goleta, CA 93117. Equal opportunity employer. U.S. citizenship required.

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HUGHES

COMPUTER INDUSTRY

Ungermann-Bass undaunted by losses

Foresees upward turn after first-quarter dip

COMPANY PROFILE

By Kathleen Burton
CW West Coast Bureau

SANTA CLARA, Calif. — Local-area network vendor Ungermann-Bass, Inc.'s long string of uninterrupted financial successes has finally ended.

After averaging 50% growth a year and gaining $33 million from an initial public offering in 1983, the firm experienced a first-quarter loss this year of approximately $500,000, and revenue declined 23% to $11.9 million, compared with $15.5 million for the previous quarter.

Ungermann-Bass claims to be the world's largest supplier of general-purpose local-area networks, with approximately a 30% share of a market estimated by Dataquest, Inc. at $125 million for 1984. However, a variety of factors are causing mounting problems.

The company's first-quarter downturn was caused by a combination of short- and long-term factors, according to Harvey Freeman, an analyst at Minneapolis-based Architecture Technology Corp., a communications consulting firm. According to Freeman, the loss resulted from technical problems with radio frequency modem products, which curtailed delivery of broadband network products; restricted shipments of personal computer networking products because of a software conversion to Microsoft Corp.'s MS Network, which Ungermann-Bass has adopted as a de facto standard; and the slowing of shipments of broadband networks, now half of Ungermann-Bass' business, as the product line was converted to Intel Corp.'s 16-bit 80186 microprocessor.

Ungermann

James Jordan, Ungermann-Bass' executive vice-president in charge of marketing and product development, agreed that these problems set the company back but said they have been resolved. The new software and personal computer interface units will be available in June, the transition to 16-bit microprocessors has been completed, and the difficulties with offshore radio frequency modem production have been overcome, he said, with Ungermann-Bass' radio frequency modem plant in Japan in full production. "We're back on track after an unexpectedly bad first quarter and expect 35% revenue growth for the remainder of 1985," he said.

Founded in 1979, the company's initial success was built on the Ethernet-based Net/One system, one of the first Ethernet systems that used very large-scale integration technology to reduce interface costs significantly. Introduced in 1980, Ungermann-Bass' Net/One general-purpose local-area network proved popular among end users of Digital

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- High technology has not produced high wages for women, according to a recent study that claimed women are relegated to clerical and low-level production jobs/64
- Wang may resort to layoffs in an effort to cut costs further/66
- DEC last week announced it had filed a patent infringement suit against a manufacturer of VAX-11/780- and VAX-11/785-compatible memory controllers, SBI interface boards and memory boards/76

Symbols indicate Apple lacks winning business strategies

"Work groups sharing a network need centralized storage for files and electronic mail. [Apple Computer, Inc.'s] file server will be just one of many file and disk servers on the market for the Macintosh Office."

— statement by Apple President John Sculley and Chairman Steven P. Jobs from Jan. 23 introduction of Macintosh Office

"Many people have asked when Apple will introduce a Macintosh that has a built-in hard disk, enlarged screen and the internal capacity to process very complex business applications. We already have such a Macintosh. It's called the Lisa 2/10 . . . we're changing its name to Macintosh XL — to communicate better that the XL is truly an extra-large Macintosh."

— comments by Mike Murray, director of marketing for Macintosh, at Jan. 23 introduction of Macintosh Office

ANALYSIS

By Peter Bartolik
CW Staff

Apple's Macintosh XL was the adult box that lent credence to Apple's insistence that the nifty little Macintosh was just "the first step in our larger plan to provide solutions needed by business."

Apple's file server was to be the "hub of the work group network," the machine providing multiuser data base and accounting functions. Rather than being in-

See APPLE page 75

Geisco to revise market target, cut staff by 400

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco) recently said it plans to revamp its business to target segmented markets and will lay off 400 marketing, sales and technical employees.

Walter Williams, Geisco's president, said the planned changes in the computer services company mirror the change in the market from a "generalized to a segmented business." Geisco, a subsidiary of General Electric Co., said it plans to outline further its reorganization on June 4.

"Geisco must more aggressively execute

See GEISCO page 74

Black hole in home micros?

INDUSTRY INSIGHT
Paul Korzeniowski
CW Senior Writer

Although I am loath to admit it, in many ways I fit the yuppie mold, with desires for a videocassette recorder and cable television, not because I need them, but rather because without them, I feel like I am missing something important.

I consider myself at the crest of the home computer buying wave, which will crash when droves of yuppies transform home computers into chic status symbols.

For a few years, I had contemplated buying a micro to write stories at home, and two months ago I decided that the time was right.

Home computer prices were falling. Systems were advertised for only several hundred dollars rather than a few thousand dollars. Therefore, I set out in earnest to purchase, not merely to price, a home computer.

My first stop was at an Apple Computer, Inc. dealer. I told the salesman that I wanted a WP package with a letter-quality printer and a $1,500 price tag. He showed me an Apple IIe and a dot matrix printer for $2,100. That was not exactly what I was looking for, so I repeated the request. He showed

See [illegible] page 72

TI president, CEO resigns after 32 years with firm

DALLAS — Texas Instruments, Inc. President and Chief Executive Officer J. Fred Bucy recently resigned after 32 years with the company and Executive Vice-President Jerry R. Junkins was been named to replace him.

Bucy, 56, said he was resigning to pursue other interests and to take advantage of TI's early retirement program, which allows employees to retire at 55.

Bucy also resigned from his seat on the board of directors and will continue to serve the board in an advisory capacity, according to the company.

TI is coming off one of the worst quarters in its history with earnings off 80% from the previous year [CW, April 29].

Chip market down

Hit especially hard by the slumping demand and product backlog in the random-access memory semiconductor marketplace, TI announced the layoff of 1,000 employees in April.

Junkins, 47, was most recently responsible for TI's government electronics, data systems and industrial controls divisions and for the company's internal information systems and services organization.

Junkins worked at TI since 1959 and was elected to the board of directors in 1984.

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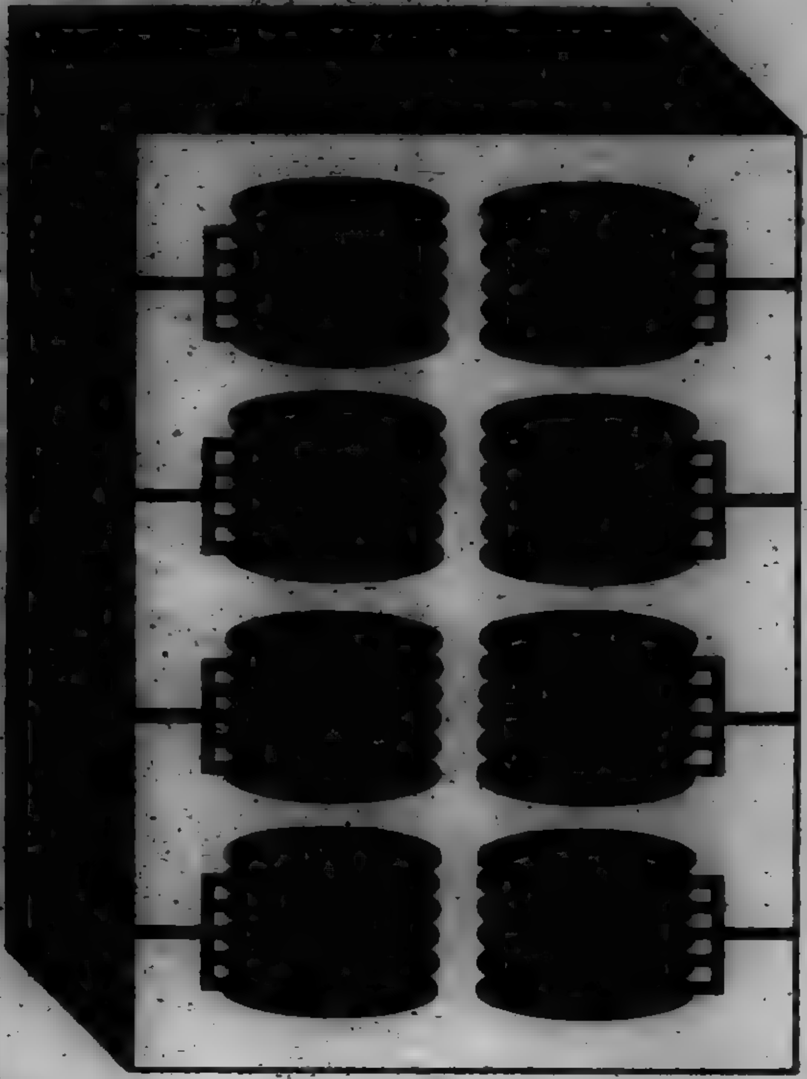

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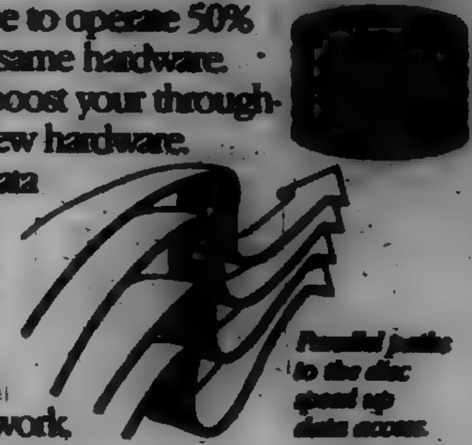

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TANDEMCOMPUTERS

Study: Women at low end of computer jobs spectrum

By Kathleen Burton
CW West Coast Bureau

PALO ALTO, Calif. — Computer-related occupations have failed to provide women either with sufficient opportunities for advancement or top-of-the-line salaries.

So said a national study released by Stanford University researchers. According to the study, men clearly held most of the high-paying occupations in computer-related industries, while women worked in the lower paying occupations in the industry.

The study, by Myra Strober, an economist and director of Stanford's Institute for Research on Educational Finance and Governance, "dispels the myth that high technology is automatically a great equalizer of occupational disparities between men and women," Strober wrote.

Held low-level jobs

Comparing 1970 and 1980 census data, the study found that most women in high-technology industries held clerical or low-level production jobs, while most men held production, managerial and professional-technical jobs.

"In the highest paid, highest prestige computer-related occupations, women are virtually absent," the report stated. "In 1970, women were only 2% of all engineers in the computer industry; in 1980, that number increased to only 5%," the study found.

And women computer scientists and systems analysts grew only 7% over the decade, even though these professions themselves more than doubled in size.

Results surprising

According to Carolyn L. Arnold, a graduate student at Stanford University who coauthored the study, the results were surprising, because there are now so many women getting degrees in mathematics and science. However, this disparity may be the result of a male-oriented "engineering culture that continues to bar women from the upper ranks of these professions," according to Arnold.

Another factor contributing to the results, Arnold said, is that the work pressures and long hours of professional jobs in technological industries may still be a barrier for women who are trying to balance their home and work lives.

There is a common misconception that computer-related industries are less stereotyped than older industries, allowing talented women open access to fast-track career paths and high salaries, asserted Sandra Kirkpatrick, assistant director of the Stanford institute.

Successful individuals

For some women, this is true, Kirkpatrick said. "There are always individual women who are making it in areas like the Silicon Valley, but nationally the aggregate is not doing very well," she said.

The Stanford study also found significant salary discrimination between men and women in computer-related occupations. Of the three high-technology professions that were studied — systems analysts, programmers and computer operators — women earned approximately 72% of the salaries of their male counterparts, Kirkpatrick said.

According to Kirkpatrick, men earn more than women largely because women are still working in lower paying, end-user industries, rather than in those professions that develop and manufacture the hardware and software.

The lower paying, end-user industries studied included banking, insurance and retailing, Kirkpatrick said.

In spite of the salary disparity, however, women continue to choose high-technology professions because "they are still optimistic about high technology opening doors for them," Kirkpatrick said.

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Layoffs loom over Wang for first time in 12 years

LOWELL, Mass. — For the first time in some 12 years, Wang Laboratories, Inc. may resort to layoffs as a means of reducing expenses. The office automation leader announced last week that as many as 100 employees may be dismissed in 30 days.

The layoffs will affect administrative staff workers at Wang's corporate headquarters here. The company has already transferred some staff workers into sales, support and maintenance positions.

Approximately 100 additional employees will be dismissed with severance pay if Wang is unable to find positions for them.

Wang had announced earlier that most of its production work force would be required to take its vacation time during a production shutdown this summer. The company is also curbing nondiscretionary spending.

Recovery effort follows 66% profit drop

Wang is trying to recover from the worst downturn in its successful history. Its profits fell 66% in the quarter ended March 31, the first earnings drop for Wang since 1975 and a marked contrast to its consistent 30% growth rates of the last several years.

Industry analysts said Wang has been hurt by both the overall slowdown in computer demand as well as a loss of office automation market share to IBM products such as the System/36. Wang is attempting to regain customers with an aggressive advertising campaign against IBM.

Wang, which employs 30,000 people worldwide, has not ruled out future layoffs as cost-cutting measures.

Prime files suit against repair firm

DENVER — Prime Computer, Inc. recently filed suit against a small, Colorado-based third-party software maintenance firm for allegedly infringing on Prime copyrights and misappropriating trade secrets.

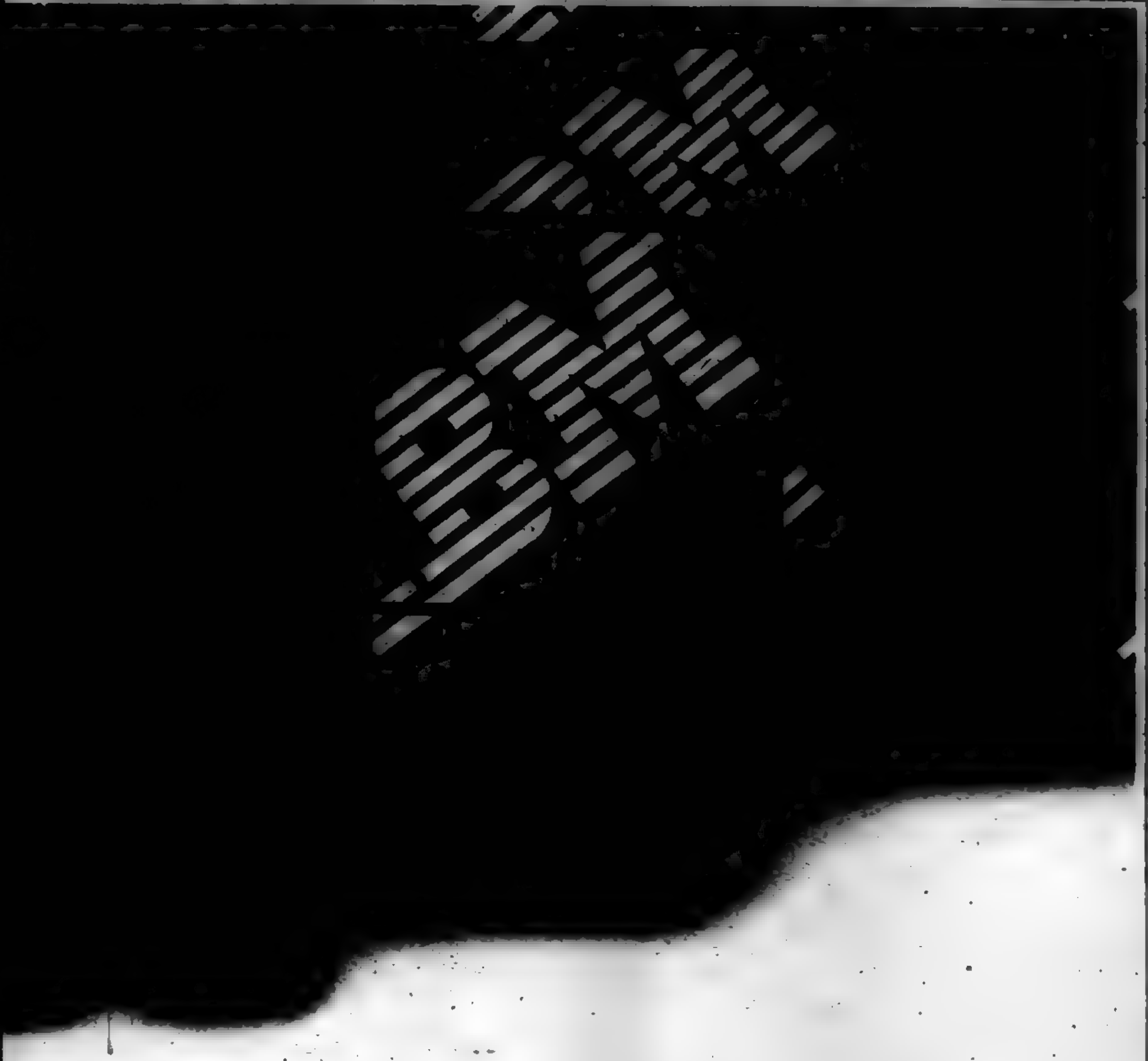
Prime is seeking a preliminary injunction against Tristan Dynamics, Inc. of Parker, Colo., that would require the defendant to deliver all Prime materials in its possession to the U.S. District Court here. The suit was filed May 17.

Tristan Dynamics is a privately held, 50-employee company that services users of Prime software systems. Tristan claims to have benefited from user dissatisfaction with Prime's policy of bundling maintenance contracts for its hardware and Primos operating system [CW, Oct. 15, 1984].

In the suit, Prime is also seeking to recover actual and multiple damages and to prevent permanently Tristan from using Prime materials in its maintenance business. Prime has charged that Tristan induced former Prime employees who went to work for Tristan to breach Prime's nondisclosure agreements and bring field engineering manuals and other proprietary materials relating to Prime software maintenance to Tristan.

A Prime spokesman said the litigation is "in accordance with Prime's ongoing effort to police vigorously and protect its proprietary information rights." Prime is headquartered in Natick, Mass.

Tristan Dynamics President Bill Sheppard declined to comment on the lawsuit.



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IBM net market entry force in Ungermann-Bass buildup

COMPANY PROFILE

Ungermann-Bass, Inc.'s decision to strengthen its product lines and technologies is strongly influenced by IBM's entry into the local-area network market.

Although IBM announced its PC Network for personal computers in August 1984, the network is only now reaching the market. And IBM's token-ring network, developed in cooperation with semiconductor manufacturers Texas Instruments, Inc. and Intel Corp., has yet to appear on the market.

Even though IBM's products have not yet reached the market, Big Blue's presence is strong, and the trend toward IBM compatibility is clear, according to Ungermann-Bass President and Chief Executive Officer Ralph Ungermann. The company will avoid competing directly with IBM but will align its products with IBM's and support IBM's token-ring standard, Ungermann said.

Vendor-independent solutions

According to Ungermann, IBM's approach to local-area networks will be to interconnect IBM equipment with token-ring and Systems Network Architecture technologies. Though Ungermann-Bass will support this, he said, it will continue developing vendor-independent solutions that will also allow users to take advantage of both Ethernet and broadband technologies.

William Krause, president of 3Com Corp., an Ungermann-Bass competitor based in Mountain View, Calif., said that IBM's entry into local-area network markets adds credibility to the local net concept.

"It also means IBM won't introduce distributed connection products because it doesn't want to cannibalize its existing mini and small mainframe products," Krause said.

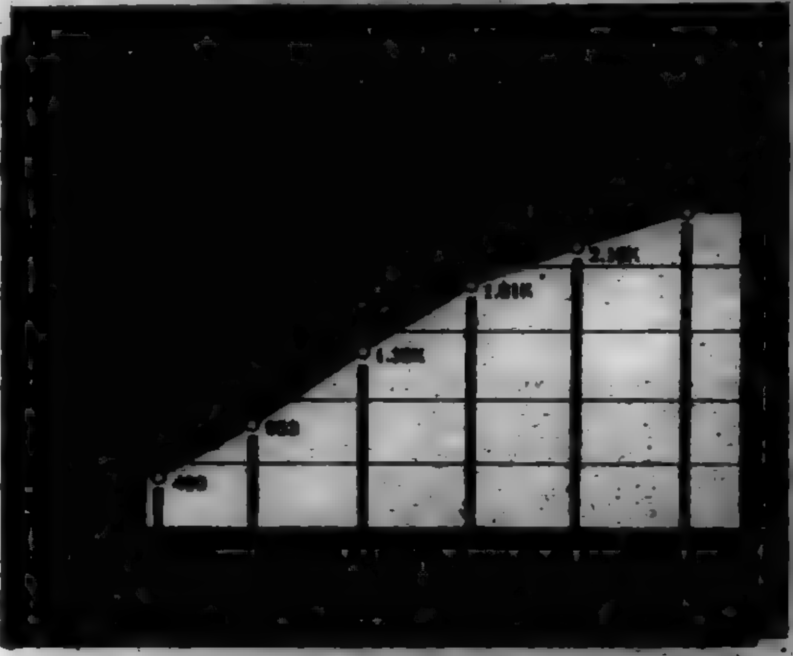
IBM net entry breeds uncertainty

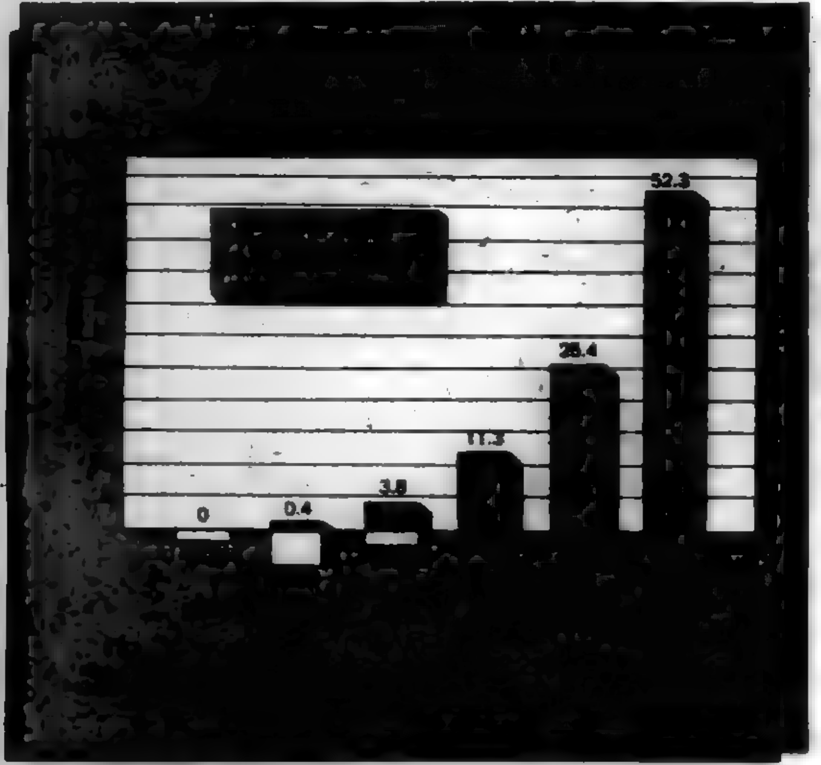
On the downside, however, IBM's foray into local-area nets breeds uncertainty, and customers will delay local-area network purchases to wait for IBM's future products, Krause said.

According to Karen Mulvaney, a local-area network specialist with New York-based L. F. Rothschild, Unterberg Towbin, there are enough weaknesses in the IBM product line to keep Ungermann-Bass viable, offering alternative but IBM-compatible solutions. "I don't think IBM has a master plan for local-area networks," Mulvaney added. "[It's] getting into a whole new marketplace, taking it one step at a time and learning [along the way]."

Early fears that IBM would dominate the local-area net market by establishing a single networking standard have disappeared, she said. "IBM may make one or two of its local-area networks a de facto standard, but more than that is not likely, as it would confuse the marketplace."

— Kathleen Burton





PROFILE

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Equipment Corp. systems seeking a cost-effective method of interconnecting mini and terminal bases.

"Ungermann-Bass was the only [local-area network] game in town in 1979," said Brian Jeffery, director of research for the Palo Alto, Calif.-based consulting firm International Technology Group, Inc. Systems vendors like DEC were slow to introduce their own products, and most of the other firms competing in this market failed to develop credibility, Jeffery said.

The company faces a new set of challenges this year, according to President and Chief Executive Officer Ralph Ungermann. These include an energized IBM, a predicted market shakeout and a horde of competitors moving into markets once dominated by Ungermann-Bass.

According to Ungermann, competitors in Ethernet products include Bridge Communications, Inc. in Mountain View, Calif., and Interlan, Inc. in Westford, Mass. Competitors in the personal computer area, Ungermann said, are IBM; Nestar Systems, Inc. in Palo Alto, Calif.; Corvus Systems, Inc. in San Jose, Calif.; and 3Com Corp. and Sytek, Inc., both in Mountain View, Calif. Also offering a threat in private branch exchange-based systems are IBM, AT&T and a

See PROFILE page 67

Net maker's focus: factories

Local-area network manufacturer Ungermann-Bass, Inc. is nothing if not ambitious.

With a joint venture with industry giant General Electric Co. under its belt, Ungermann-Bass will obtain a 100% market share in the emerging market for factory local-area network systems, according to Ralph Ungermann, company president and chief executive officer. A multimillion-dollar contract with General Motors Corp. to develop local-area networks for its assembly and fabrication plants lends credibility to this supposition, he said.

Davidson

The Yankee Group, a market research firm in Boston, predicted that the factory local network sector will grow from $50 million in 1984 to $1 billion by 1990.

Like many other vendors that have targeted this market, the Ungermann-Bass/GE joint venture, Industrial Network, Inc., is focusing on the Manufacturing Automation Protocol (MAP) standard, originally developed by GM in cooperation with a group of vendors including IBM, that is gaining wide support.

"Factory local-area networks are a huge market," Ungermann said. GM will spend $60 billion over the next five years to automate truck and bus assembly plants, much of this for net technology, he added.

The problem facing Ungermann-Bass, however, is that the MAP standard has already drawn a number of serious competitors, including Concord Data Systems, Inc., a Waltham, Mass.-based broadband local-area network vendor that was one of the original GM MAP program participants, and IBM itself, which plans to offer its own MAP-based system.

Ungermann-Bass remains confident it can beat the competition, however. With GE providing $6 million in funding and its token bus product expected by the second quarter, the company has an important technological edge, Ungermann-Bass officials said.

Ungermann-Bass' technical trump card is its proprietary very large-scale integrated technology, noted John Davidson, the company's vice-president of research. He said its token bus semiconductors will not be released into the marketplace, which means that Ungermann-Bass has a two-year lead time over other network vendors that must wait for token bus chips.

"Ungermann-Bass will never gain 100% of the factory local-area network market," said Brian Jeffery of Palo Alto, Calif.-based International Technology Group, Inc. He contended that most large-volume end users will want a multivendor approach to factory automation.

— Kathleen Burton

PROFILE

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variety of other PBX vendors.

Despite this mounting competition, Ungermann-Bass' strategy involves expanding its product lines and marketing organization to cover all segments of the local-area network market. In June the company expects to introduce a number of products, including a broadband-based token bus for the industrial automation market and network interface units that will connect IBM terminals and controllers. Also slated for introduction are a token-ring version of its Net/One product and an IBM-compatible token-ring interface device.

Jordan

Bracketing the local-area network market with a range of products is critical to Ungermann-Bass' long-term success, said John M. Davidson, the firm's vice-president of research. The company will continue to follow major market trends by adding products, Davidson said. "At the risk of spreading our technology too wide, we'll remain market driven. If a customer needs it, we'll put a new product into the lineup," he said. This foray into many different technologies is the key to success, letting the company win major contracts from large OEM vendors like Hewlett-Packard Co. and Xerox Corp., Davidson said.

This ambitious across-the-board game plan has drawn mixed reviews from analysts. "Ungermann-Bass does have a tendency to spread itself too thin. It should go deeper into specific [local-area network] segments," observed Karen Mulvaney, a local-area network specialist with New York-based L. F. Rothschild, Unterberg Towbin. This strategy is risky, Mulvaney said, because Ungermann-Bass' Ethernet-oriented competitors have breadth within individual local-area network sectors and are constantly introducing products. "Ungermann-Bass will have to run like crazy to keep up," she predicted. To do so, the company has targeted a hefty $12 million (approximately 15% of its 1985 revenue) to research and development projects this year, she said.

According to Paul Scherer, an analyst with Robertson Colman & Stephens, Inc., a San Francisco investment firm, Ungermann-Bass will survive a shakeout that, by decade's end, will reduce the field of general-purpose local-area network manufacturers from 60 to 20 vendors.

Ungermann-Bass has several strengths that will allow it to do this, Scherer said. It is the leader in the terminal connection segment of the market and is also investing heavily in the rapidly growing personal computer area, which now represents 10% of its revenue. And with an 1,100-unit installed base, the company is well positioned to gain more add-on clients that now account for 80% of its business, Scherer said. Additionally, the local-area network market as a whole will be helped by the emergence of protocol standards, Scherer added, with IBM's personal computer network and token-ring technology speeding this along.

Ungermann-Bass is also using third-party tie-ups to build up its market presence as it faces today's tough competition, Scherer said. It has a joint five-year marketing agreement with Codex Corp., a data communications vendor and member of Motorola, Inc.'s Information Systems Group, creating a valuable distribution channel. In 1984 it solidified a joint venture partnership with General Electric Co. to develop a factory floor local-area network. It also has OEM arrangements with industry heavyweights like HP, Xerox and Data General Corp.

In 1983 the company acquired the New York-based Amdax Corp., gaining Amdax's substantial broadband technology design and manufacturing expertise. The future will bring similar joint venture arrangements for the company. "We look at five companies a week with this in mind," Ungermann said, "but nothing is on our list right now."

> *'We're definitely not the same company we were six years ago. We started planning for this transition a year ago, right after the initial public offering.'*
>
> — James F. Jordan
> Ungermann-Bass

Ungermann-Bass is struggling to come to terms with what Jordan described as its "next-growth phase." "We passed the $50 million revenue mark last year. We're definitely not the same company we were six years ago," Jordan said.

The company was shaken last year by a series of management shifts that reorganized the marketing department and consolidated four separate engineering groups under Jordan's supervision.

The company was also rocked by the March departure of Charles Bass, board vice-chairman and cofounder, who left the company to pursue venture capital interests. However, according to Jordan, Bass' departure will not affect company strategy or product introductions because "we started planning for this transition a year ago, right after the initial public offering."

In spite of these changes, Ungermann-Bass has been working hard to keep its entrepreneurial spirit while it moves into a more mature growth phase, Jordan said. He cited the company's engineering groups in Massachusetts, Florida, California and Japan as examples. Because each group is developing a different local-area network technology, each is run as an independent venture, which enhances creativity, he said.

The company will rely increasingly on marketing to gain an all-important competitive edge, Ungermann said. Two factors that Ungermann hopes will differentiate Ungermann-Bass from the competition are service and support. "[Local-area] networks are relatively simple, but the critical thing for Fortune 1,000 customers is that they'll perform perfectly," he said. To provide increased service, Ungermann said, direct sales sites are now doubling as customer support groups, offering installation, technical training and on-site repair.

Ungermann-Bass has also moved recently to deal with what analysts call its biggest weakness: a lack of networking software. The company recently acquired 20% ownership of Linkware, Inc., a Boston-based software manufacturer. The two companies are working on several networking products scheduled to be introduced at the end of the quarter, Davidson said.

Network management software, also expected by the end of the second quarter, will be critically important, Davidson said. The software will diagnose hardware problems on computer equipment and "won't automatically blame problems on the network," according to Davidson.

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Datapoint profit loss exceeds predictions

SAN ANTONIO — Datapoint Corp. recently announced a loss of $28 million, or $1.40 per share, for the third quarter ended April 27. The company had previously said it expected a loss of $20 million, or $1 per share.

Edward P. Gistaro, president of Datapoint, said the loss reflected pretax charges of about $27 million for costs associated with work force reductions, office closings, equipment write-downs, of which $6 million was associated with the change in management control, and other charges. Partially offsetting the charges was an extraordinary after-tax gain of $1.9 million resulting from the repurchase of subordinated convertible debentures, the company said.

Revenue for the quarter was $125.5 million, compared with $156 million a year earlier. Operating losses amounted to $37.4 million.

Noting significant progress in restructuring the company, Gistaro said future operating costs have been cut by about $56 million, exceeding the earlier target of $40 million.

In the third quarter of 1984, Datapoint posted profits of $7.9 million, or 30 cents per share.

DG sues Loral after Mil-Spec buy

BOSTON — Data General Corp., an unsuccessful bidder for the Rolm Corp. Mil-Spec Computer Division earlier this year, has filed suit here against successful bidder Loral Corp.

DG, which has supplied its minicomputers to Mil-Spec to be ruggedized for military applications, is seeking to block the transfer of that technology to Loral. DG said the continuance of its relationship with Mil-Spec under the division's new ownership would violate "each and all of the license agreements" made between DG and Rolm for Mil-Spec business since 1969.

In the suit, filed in U.S. District Court here, DG said some of its license agreements for Rolm to market DG's Nova, Eclipse and Hawk computers are not assignable to a different vendor, while others require DG's written consent.

Loral is in the process of acquiring the Mil-Spec division for a reported $100 million. Rolm was required to sell Mil-Spec following IBM's acquisition of Rolm last year.

DEC alleges violation of patents

BOSTON — Digital Equipment Corp. last week filed suit against EMC Corp., a Natick, Mass.-based vendor of DEC-compatible memory controllers, interface boards and memory boards, for allegedly infringing upon DEC patents.

The suit, filed in U.S. District Court here, specifically seeks a permanent injunction to prevent EMC from making and selling VAX-11/780- and VAX-11/785-compatible memory controllers, Synchronous Backplane Interconnect (SBI) interface boards and memory boards. DEC is also seeking treble damages for profits it allegedly lost because of the sale of the compatible products.

The suit is the most recent of several patent infringement claims by DEC. The Maynard, Mass.-based minicomputer market leader is currently pursuing damages from System Industries, Inc. of Milpitas, Calif., for allegedly using proprietary information to make products compatible with SBI interconnects.

In the past, DEC has successfully won lawsuits against vendors for using patented information to make products compatible with DEC Massbus backplanes and RL disks.

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COMPUTER INDUSTRY

NICKELS AND DIMES

Decision Data Computer Corp. announced revenue for the first quarter ended Feb. 28 of $43 million, compared with $32.9 million in the same period one year earlier. Profits were $2.6 million, or 32 cents a share, compared with $1.7 million, or 21 cents per share, for the corresponding period last year.

■

Computer Technology International, Inc. reported revenue for its first fiscal quarter of $11.7 million, compared with $688,000 for the same period a year ago. Profits for the period ending Feb. 15 were $102,914, compared with $102,000 in the same period a year ago.

■

VLSI Technology, Inc. announced revenue for the first quarter of $18.6 million, compared with $14.2 million for the same period last year. Profits were $813,000, or 4 cents per share, compared with $1.3 million, or 7 cents per share, in the corresponding period a year earlier.

■

Valid Logic Systems, Inc. reported revenue for the first quarter ended March 31 of $15.7 million, compared with $9 million for the same quarter last year. Profits were $1.5 million, or 11 cents per share, compared with $1.2 million, or 9 cents per share, in the same period last year.

■

Intergraph Corp. announced revenue for the first quarter ended March 31 of $108.9 million, compared with $78.7 million one year ago. Profits were $14.3 million, or 55 cents per share, compared with $10.3 million, or 40 cents per share, in the same period one year ago.

■

Nashua Corp. reported profits for the first quarter ended March 29 of $4.1 million, or 86 cents per share, compared with $5.9 million, or $1.25 per share, in the same period a year ago. Revenue for the quarter totaled $147.7 million, compared with $152.8 million in the corresponding period one year ago.

■

Daisy Systems Corp. announced revenue for the second fiscal quarter ended March 31 of $29 million, compared with $15.7 million for the comparable quarter one year ago. Profits for the quarter were $4.7 million, or 27 cents per share, compared with $2.6 million, or 17 cents per share, in the same quarter a year ago.

■

The Reynolds & Reynolds Co. reported revenue for the second quarter ended March 31 of $82.5 million, compared with $72.3 million in the same period last year. Profits were $4.8 million, or $1.02 per share, compared with $4.2 million, or 88 cents per share, in the same period a year ago.

■

Applied Data Research, Inc. reported revenue for the first quarter of $34 million, compared with $21.5 million a year ago. Profits were $566,000, or 10 cents per share, compared with $332,000, or 6 cents per share, in the same quarter a year ago.

■

Timeplex, Inc. announced revenue for its third fiscal quarter ended March 31 of $34.6 million, compared with $17.7 million in the same quarter a year ago. Profits were $2.2 million, or 26 cents per share, compared with $1.6 million, or 19 cents per share, in the same period last year.

■

Cipher Data Products, Inc. reported revenue for the fiscal third quarter ended March 31 of $44.4 million, compared with $32.8 million in the same period one year ago. Profits were $4.3 million, or 30 cents per share, compared with $3.3 million, or 23 cents per share, in the comparable period last year.

■

Diebold, Inc. announced revenue for the first quarter of $111 million, compared with $118 million for the same period last year. Profits were $10.4 million, or 80 cents per share, compared with $13.9 million, or $1.07 per share, in the same quarter last year.

■

Standard Register Co. reported revenue for the first quarter of $100.6 million, compared with $101.4 million in the comparable period one year ago. Profits were $7.5 million, or $1.13 per share, compared with $5.6 million, or 85 cents per share, one year ago.

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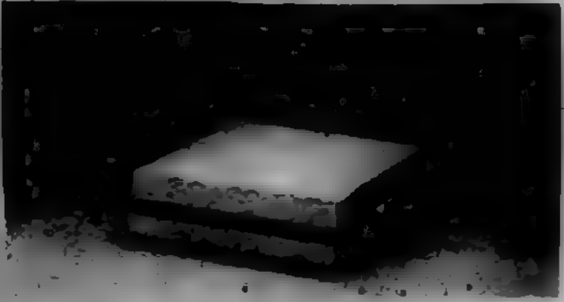

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HOME

from page 61

me a letter-quality printer and assured me that I would never find a complete system for $1,500.

So I left.

Next I journeyed to a Tandy Corp. store to look at Tandy's Model 1000. The IBM Personal Computer-compatible machine had a sales price of $1,100, which included software. My entrance interrupted a conversation between two salesmen. I waited until they finished before asking to look at a Model 1000. One salesman informed me that $2,300 would be needed to purchase a system with a letter-quality printer. I attempted to lower the sales price by stripping some components, such as taking 128K bytes of random-access memory rather than 256K bytes. The salesman handed me a brochure and told me I could find various prices in it.

So I left.

From Tandy I traveled to a store conducting a fire sale on Kaypro Corp. Model 2s, an 8-bit machine that ran Digital Research, Inc.'s CP/M operating system. Kaypro had previously announced an enhanced machine, the Model 2X. The company was left with a huge inventory of Model 2s, so its price had plummeted.

After I told a salesman what I was looking for, he tried to persuade me to purchase a Model 2X. He explained that for $1,000, I would get more software, two spreadsheets rather than one and a faster processor. Since I didn't even need one spreadsheet, the Model 2's lower price seemed like a much better feature.

My next stop was at a mass merchandiser that was supposedly carrying a Sanyo Business Systems Corp. system. A coworker had informed me that the $995 system ran most IBM software and included a functional word processing package. The machine sounded too good to be true, and it was: The store no longer carried it because the manufacturer had announced an enhanced model.

My search continued for a few more days as I visited or called a number of stores. At the end of the search, I was left with only one system, Kaypro 2, which met my needs and my price range.

The product included a number of shortcomings. First, Kaypro had abandoned the product and was pushing the enhanced model. Second, it would not surprise me if either Kaypro or the store selling its products soon went belly-up. Third, these days there is not much software being written for Digital Research's CP/M operating system. Despite these considerations, I bought the machine.

Gap in the market

My situation points to a gap in the market. For a few hundred dollars, one can purchase a system from Commodore Business Machines, Inc., but this type of system tends to be incomplete. As one adds in disk drives, software and other essentials, prices rapidly climb.

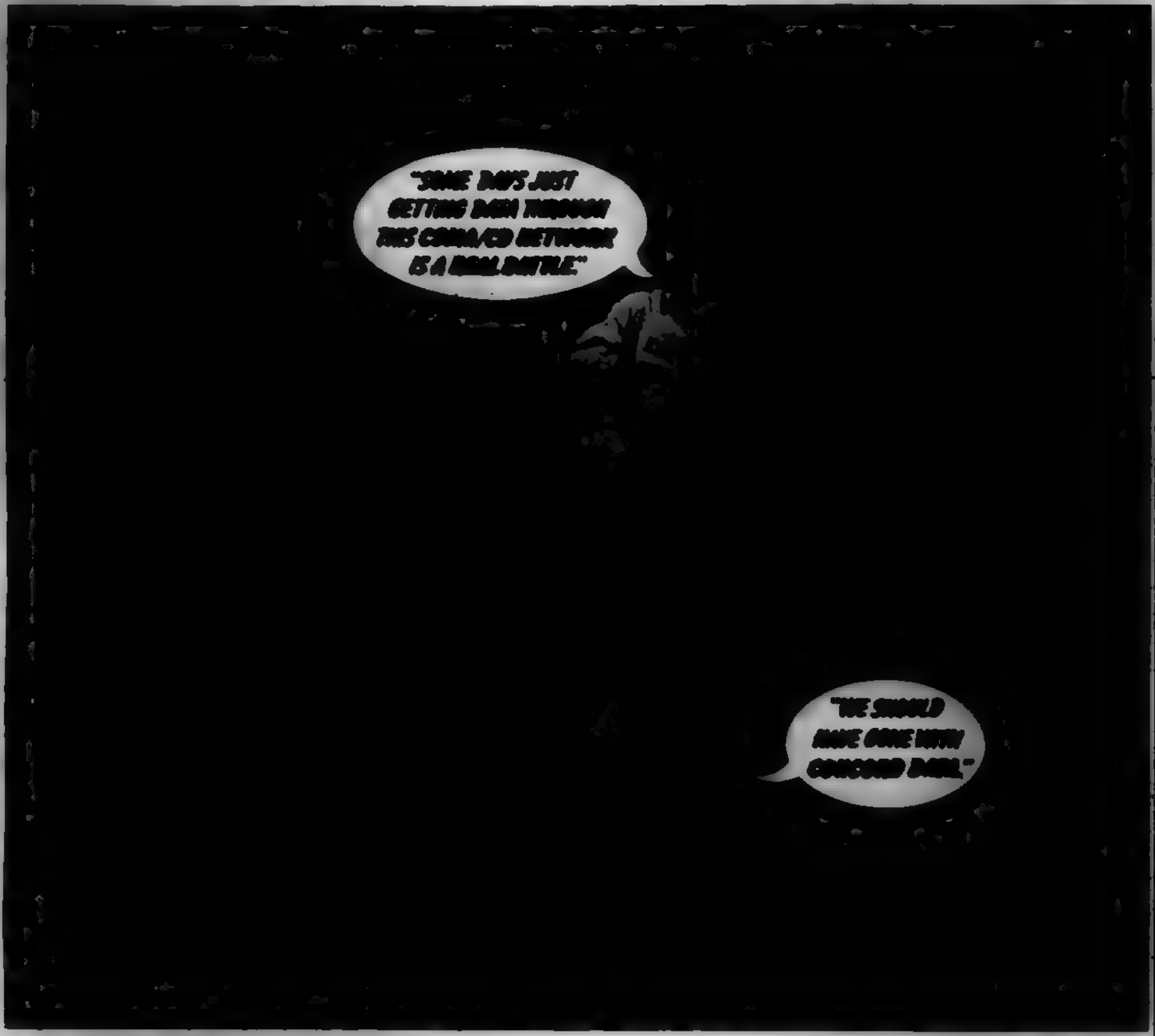
Prices for complete systems like the IBM Personal Computer start at $2,000. In between the two systems lies a black hole — and the bulk of the home market.

Without my prompting, at least four fellow employees told me they were also interested in purchasing a home computer and would spend about $1,500. They chose to wait until prices fall; I was the only one desperate enough to purchase a Kaypro.

There seems to be no logical reason why one can't find a complete system for $1,500. For $700, Coleco Industries, Inc. put together an almost complete system. Why can't another company put together a complete system for twice the price?

As I traveled to various stores the answer became clear. It lies in distribution channels: Retailers do not want to sell systems that cost less than $2,000, and manufacturers do not want to sell computers through mass merchandisers. Unless this problem is solved, home computer sales will remain sluggish.

"Sorry, we can't give you any money — our computer is down."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Alonzo Chappel. Battle of Bunker Hill. Courtesy The Bettmann Archive.

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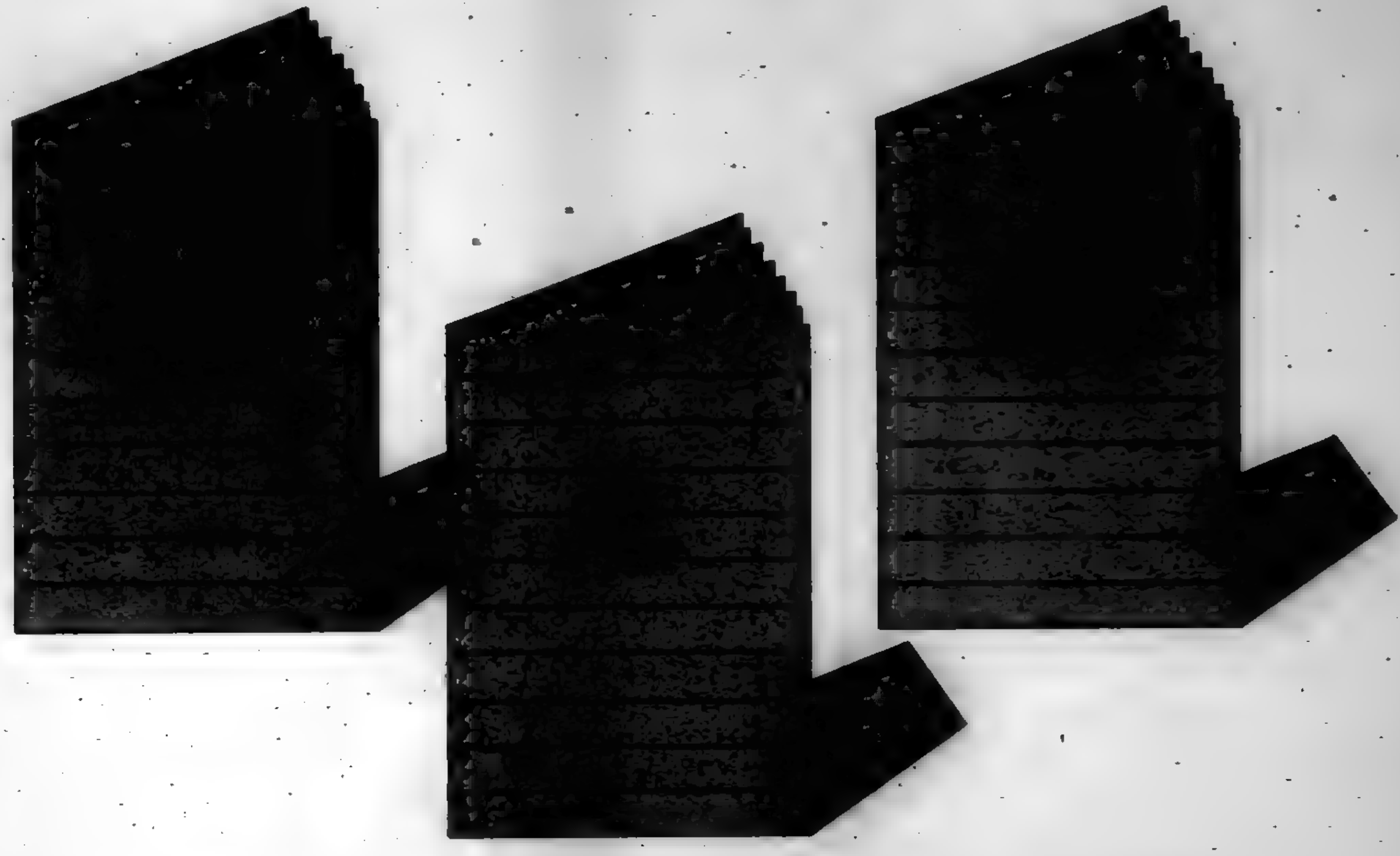

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EXECUTIVE CORNER

Pansophic Systems, Inc. has announced the following appointments: **David J. Eskra**, vice-chairman of the board of directors and chief executive officer, and **William G. Nelson IV**, president and chief operating officer.

■

Apple Computer, Inc. has announced the appointment of **David J. Barram** as vice-president and chief financial officer. In addition, Apple has announced that **Joseph F. Nevin** will join the company as the director of MIS.

■

C. Donald McCullough Jr. has joined Hogan Systems, Inc. as vice-president in charge of the company's new product management group.

■

Syntrex, Inc. has announced that **Alex Zakson** has joined Syntrex as vice-president of development. Prior to joining Syntrex, Zakson was vice-president of software development and MIS of the interactive products division at Harris Corp.

■

John E. Stearns has joined Data Card Corp. as vice-president of corporate technology and development.

Precision Methods, Inc. has announced the following promotions: **John D. Cooper**, president, and **Wendell Sinclair**, vice-chairman of the board of directors.

■

Anacomp, Inc. has announced that **Louis P. Ferrero** has been appointed chairman and chief executive officer, and **J. Mark Woods** has been appointed to the position of executive vice-president.

■

James V. Napier, president and chief executive officer of Continental Telecom, Inc., has announced he has accepted a job with HBO & Co. to become president and chief executive officer.

■

Arthur R. Braun has been appointed vice-president, engineering, of General Datacomm, Inc.

■

Tandem Computers, Inc. has announced the following appointments: **Thomas Lyman Chun** to the newly created post of vice-president of corporate projects and **Thomas J. Klitgaard** to vice-president, general counsel and corporate secretary.

■

William H. Munson has been named vice-president of software operations at Datamedia Corp.

■

H. H. Simeroth has been named vice-president, engineering, at MSI Data Corp.

See EXECS page 75

DEC exec joins Lisp

LOS ANGELES — Ward D. MacKenzie, former group vice-president of the OEM and business computer groups at Digital Equipment Corp., recently resigned to accept the post of chairman of the board and chief executive officer of Lisp Machines, Inc.

Lisp Machines founder F. Stephen Wyle, formerly chairman and chief executive officer of the company, was named vice-chairman. The appointment of MacKenzie to the position of chairman of the board and chief executive officer, Wyle said, "will allow me to concentrate on long-range business strategies as well as the entrepreneurial opportunities offered by the application of [the company's] technology in specific industry areas."

MacKenzie spent 18 years with DEC and was responsible for DEC's retargeting of its microcomputer products to vertical markets.

Named head of DEC's business computer group was John C. MacKeen, vice-president for OEM operations.

Computer brokerage firms merge

MEMPHIS — Ken Bouldin, president and chief executive officer of Economic Computer Sales, Inc. (Econocom), announced last month the merger of his company with ECS/CRS International, a company headquartered in Belgium.

The new company was named Econocom, the trade name used by Economic Computer Sales for 14 years. ECS/CRS was founded in 1973 by its current chairman, Jean-Louis Bouchard.

The two companies had conducted parallel corporate activities for the past 12 years, Bouldin said, and the merger possibilities had been considered for at least that long.

Both companies are engaged in sales and leasing of new and used computer equipment, brokerage of new and used computer equipment and additional services, including financing.

"We're very optimistic about the possibilities accompanying our entry into the global marketplace," Bouldin said. "Our combined strengths will make us a very formidable competitor in the international arena."

Company officials said they expect to have combined sales of $370 million this year and expect employment to grow from 427 employees worldwide to 700 by the end of the year.

GEISCO

from page 61

a strategy that is targeted to specific business thrusts," Williams said in a release detailing the layoff of Geisco personnel.

Last fall Geisco announced a wide array of business offerings designed to transform the company from a general-purpose computer processing business into a value-added communications enterprise.

In regard to its latest reorganization plan, Geisco said: "Specific application businesses that we will more aggressively target include office communications, automated clearinghouse services, supplier and dealer systems, international trade and a portfolio of electronic data interchange markets."

Damian Rinaldi, an analyst with International Data Corp. located in Framingham, Mass., said Geisco's moves are "consistent with the industry's efforts to restructure in the face of a stagnant market."

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EXECS

from page 74

Norm Jones and Ed Kaczorowski have joined Lam Research Corp. Jones, formerly of Intel Corp., will fill the newly created post of senior vice-president of process technology and marketing. Kaczorowski, formerly of Zylin Corp., will be director of electrical engineering.

■

Storage Technology Corp. has announced the following appointments: Robert G. Costain to the newly created post of corporate vice-president of strategic planning and Carl E. Vertuen Jr. to corporate treasurer.

■

Thomas M. Coccione has been appointed president and chief executive officer of Applied Computer Sciences, Inc. Prior to joining Applied Computer Sciences, Coccione worked for IBM and Management Science America, Inc.

■

Southern New England Telephone Co. announced the appointment of Walter H. Monteith Jr. to the position of chairman, president and chief executive officer, effective July 1. Alfred W. VanSinderen, current chairman, will retire from the company but will remain a director.

■

Data Group Corp. has appointed Alan F. Atkinson to the position of president and chief executive officer. Most recently Atkinson was vice-president of the small-computer marketing operations at Honeywell Information Systems. Prior to that he spent 16 years at IBM in a variety of management positions.

■

Image Peripherals, Inc. has announced the appointment of Louis G. Orsatti as president and chief executive officer. Most recently Orsatti has served as vice-president and general manager of the data terminal systems division of Datachecker/DTS, a wholly owned subsidiary of National Semiconductor Corp. He has also held positions at Mohawk Data Sciences Corp. and Univac, a division of Sperry Corp.

■

Edmund B. Fitzgerald has been named chairman of the board of Northern Telecom Ltd., succeeding Walter F. Light who is retiring after more than a decade at Northern Telecom. Fitzgerald will retain his current responsibilities as chief executive officer and president.

■

Raymond A. Gates has resigned as president and chief executive officer of Panasonic Co., a division of Matsushita Electric Corp. of America (Meca). Gates will continue to serve Meca as senior advisor. Kiyoshi Seki, president and chief executive officer of Meca will concurrently assume the position of president of Panasonic.

■

AVL has announced the appointment of Raymond V. Searl as president and chief executive officer.

■

Aardvark Systems and Programming, Inc. has announced the appointment of Howard Karvel as president. He succeeds Thomas E. O'Donahue, who becomes chairman.

APPLE

from page 61

troduced in October, the device has been delayed, if not killed.

Granted, the XL was simply a renamed Lisa filling an understudy role until a new star, still apparently in the wings, could step in. Likewise, Apple planned right from the start that third-party vendors would be developing their own versions of file servers for the Macintosh Office.

But in this business, unfortunately perhaps, symbols play a large role, and the scheduled retirement of the XL and apparent scrapping of the Apple file server have removed two key symbols from the Macintosh Office lineup.

Some other symbols to consider are the following: The Macintosh Office failed to make an appearance at OAC '85 earlier this year; and Apple said it will not attend the National Computer Conference this summer. The company, while dependent on dealer sales, didn't even make it to Comdex/Spring '85, the jewel in the crown of the dealer empire, although the company traditionally skips the spring confab in favor of the fall one.

Must contain expenses

In light of the company's recent projections that third-quarter profits will fall below the $10 million posted in the second quarter, it is obvious Apple must contain expenses. In retrospect, expensive ventures into Super Bowl advertising and single-advertiser issues of *Newsweek* were obviously too extravagant, although the decisions were made when projections for micro sales were still in the stratosphere.

Cost cutting is one thing — and all too often companies fail to make the hard decisions until it is too late — but Apple seems to be pulling the legs from under its campaign for the future: namely, becoming a large force in small- to medium-size companies and establishing a viable presence in the Fortune 1,000.

The company also recently indicated it is practically abandoning its direct national sales force. Although that sales force of some 60 people was abysmally small, it was yet another symbol of Apple's willingness to play in the big leagues.

By reigning in advertising, marketing and production, it can hunker down in its relatively debt-free harbor. But the trade-off is that it loses momentum. As Apple's sloop anchors to wait out the storm, the IBM battleship races ahead of the winds.

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Perhaps it is time for Apple and the rest of us to concede that, as unappealing as it may be, America's big business is wedded to Big Blue for better or worse. IBM effectively controls computing at that level through its unyielding dominance of data processing.

Whether or not Apple is willing to change its strategy yet again, the company must come to some decision about where it wants to go. On-again, off-again campaigns are the hallmarks of losers.

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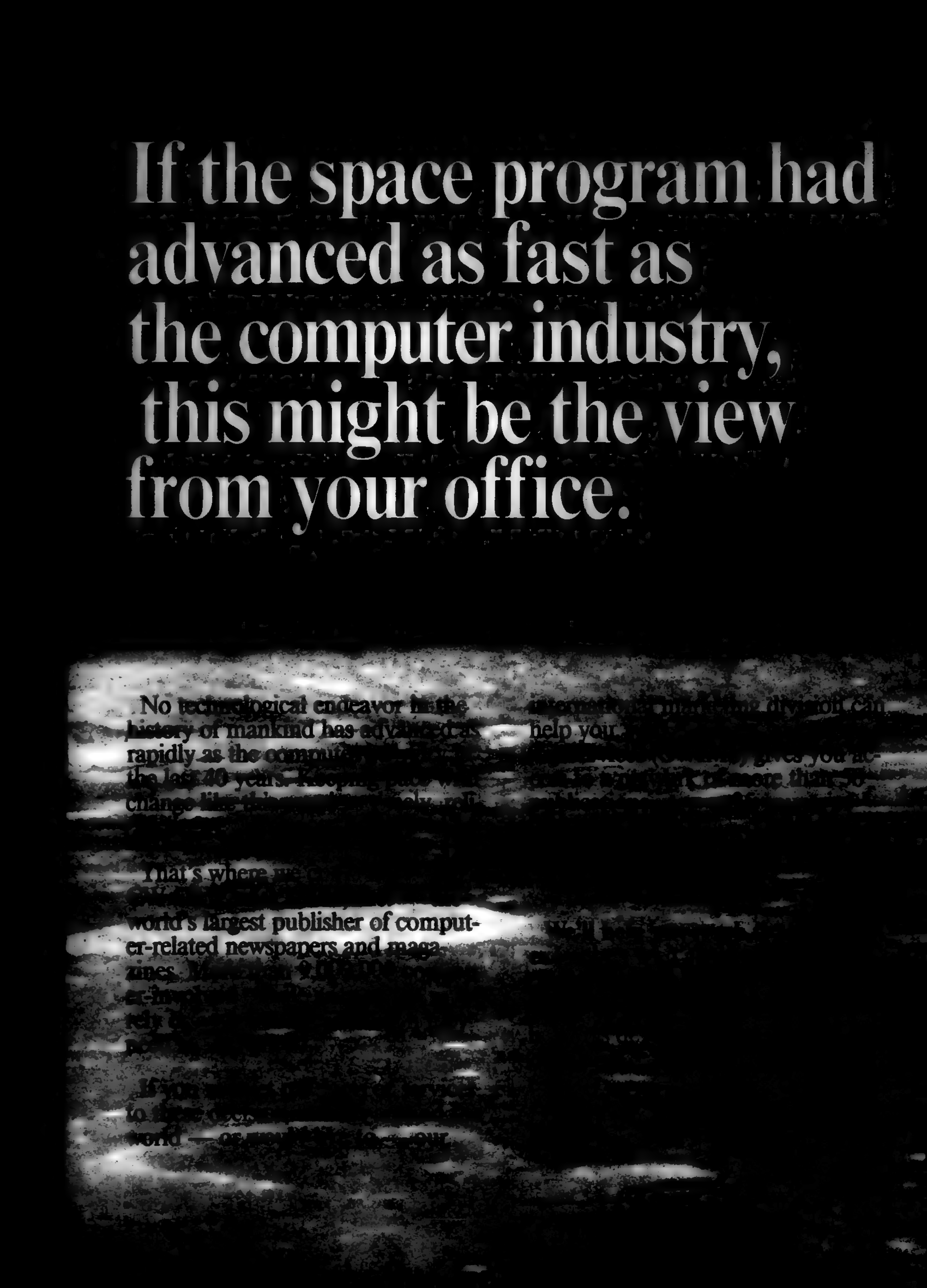

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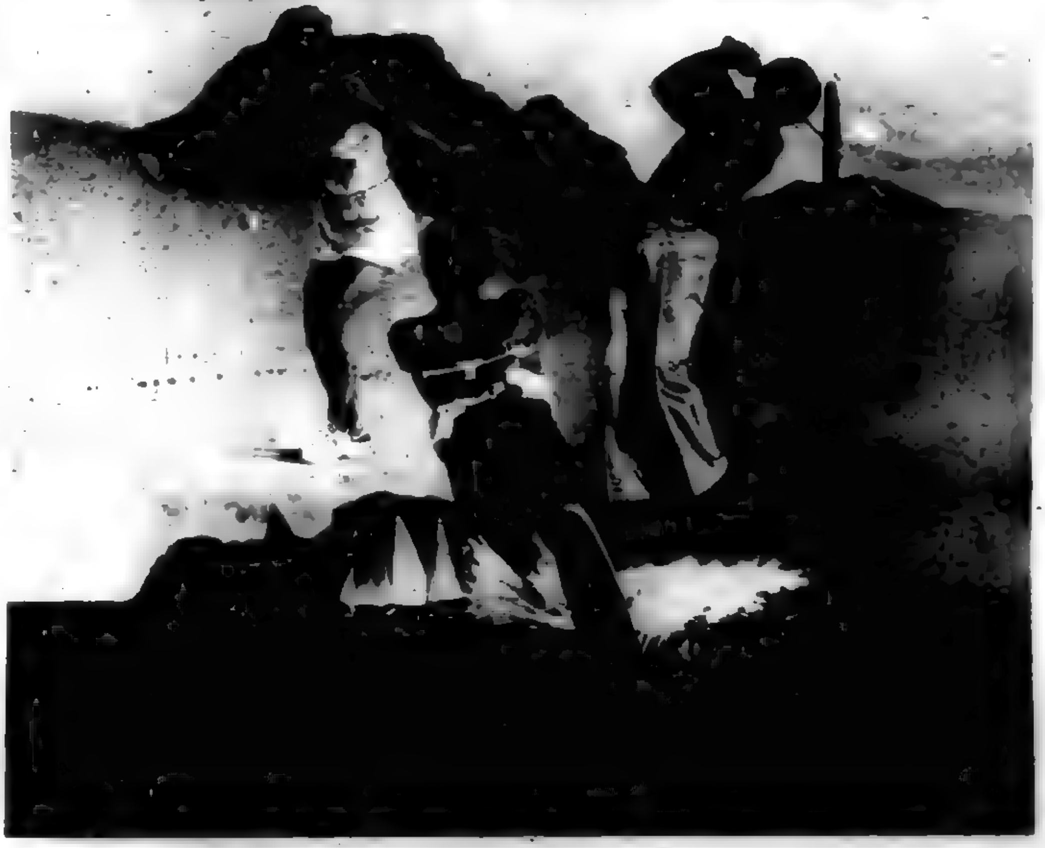

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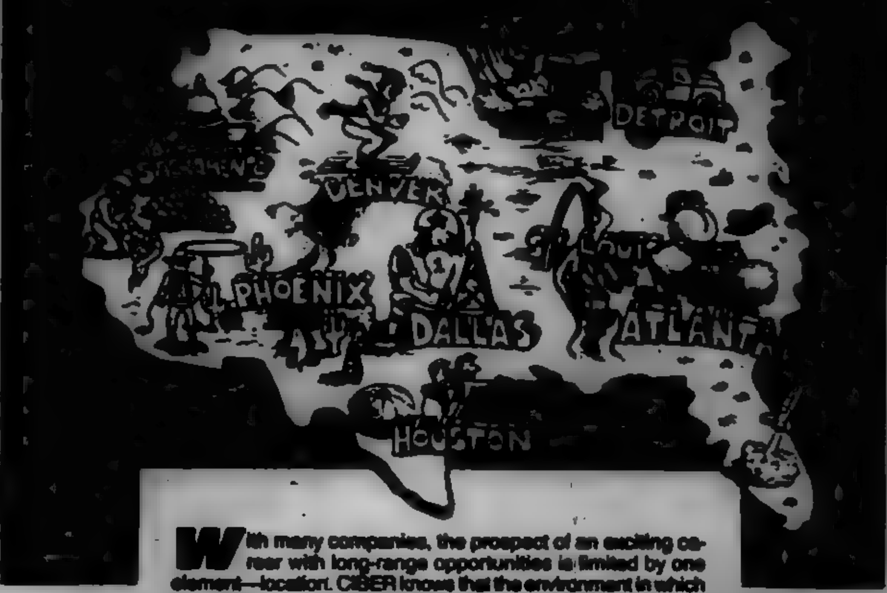

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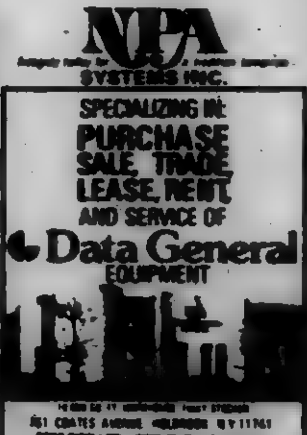

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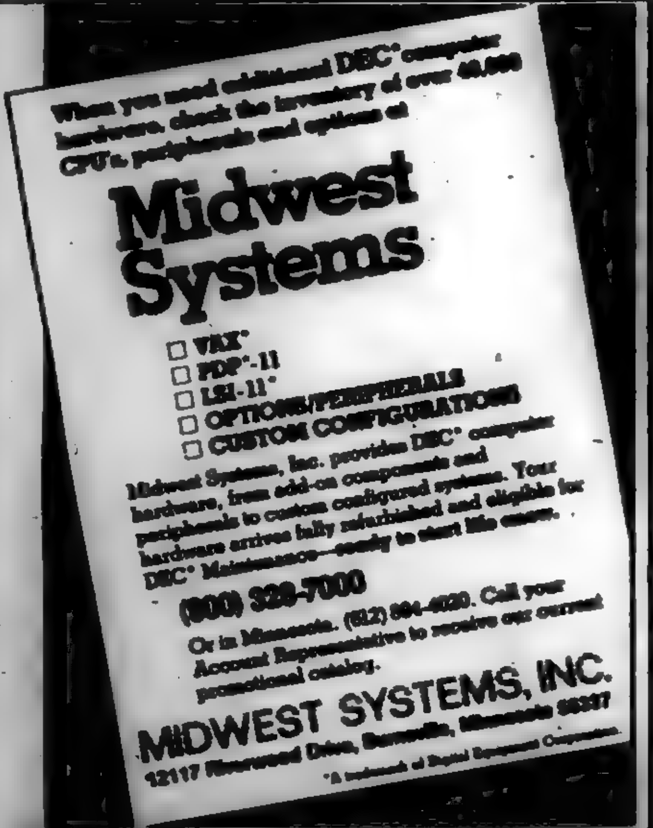

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Request for Proposal No. 1018, due Thursday, June 20, 1985, 2:30 p.m. for the sale of an Amdahl 470/V8-[illegible] mainframe for the MISSISSIPPI STATE COMPUTER CENTER.

Request for Proposal No. 1019, due Friday, June 14, 1985, 2:30 p.m. for the acquisition of a JES2 display facility package for the MISSISSIPPI STATE COMPUTER CENTER.

Request for Proposal No. 1020, due Friday, June 14, 1985, 2:30 p.m. for the acquisition of a protocol converter to allow for the connection of up to 64 ASCII devices to an AMDAHL 470/V8 CPU for the Office of Computing and Information Systems of the UNIVERSITY OF MISSISSIPPI.

Request for Proposal No. 1021, due Friday, June 14, 1985, 2:30 p.m. for the acquisition of a disk subsystem upgrade for a Wang VS-100 minicomputer system for the STATE BOARD OF HEALTH.

Request for Proposal No. 1022, due Monday, June 17, 1985, 2:30 p.m. for the acquisition of a 256KB memory kit to upgrade a TI 990 system for the MISSISSIPPI VOCATIONAL REHABILITATION FOR THE BLIND.

Request for Proposal No. 1023, due Friday, June 14, 1985, 2:30 p.m. for the acquisition of minicomputer system totally compatible with the CAD graphics software package from Silvar-Lisco, Inc. of Menlo Park, California for the Department of Electrical Engineering at MISSISSIPPI STATE UNIVERSITY.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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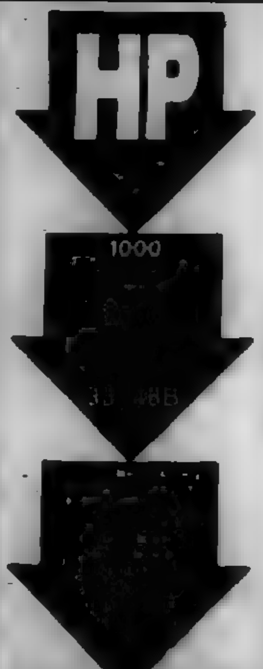

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4321	0.25	1	4381-3	[illegible]	8 to 32
4331-1	0.25	0.5 to 1	3083E	[illegible]	4 to 32
4331-11	0.30	1 to 2	3033N	4.[illegible]	[illegible] 16
4331-2	0.50	1 to 4	3083B	4.4	[illegible]
4341-9	0.52	1 to 4	3033LP	[illegible]	[illegible]
4361-3	0.70	2 to 4	[illegible]	[illegible]	[illegible]
4341-10	0.75	2 to 4	[illegible]	[illegible]	8 to 32
4341-1	0.88	2 to 4	[illegible]	[illegible]	8 to 32
4341-11	1.1	2 to 8	[illegible]	[illegible].5	8 to 32
4381-4	1.15	2 to 12	[illegible]	[illegible]	4 to 24
3031	1.2	2 to 8	[illegible]	[illegible]	8 to 32
4361-5	1.40	2 to 12	[illegible]	[illegible]	16 to 32
4341-2	1.5	2 to 16	[illegible]	11.[illegible]	16 to 48
4341-12	1.85	2 to 16	[illegible]	11.[illegible]	16 to 64
3031AP	2.0	2 to 8	[illegible]1K	14.0	16 to 48
4381-1	2.1	4 to 16	[illegible]	15.5	16 to 64
3032	2.5	2 to 6	[illegible]	26.6	32 to 96
4381-2	2.7	4 to 32	3084QX	28.7	32 to 128
3033S	2.9	4 to 16	3090-200	30.4	64 to 128
•3083CX	3.3	8 to 32	†3090-400	52.9	128 to 256

•First [illegible] †First installation 1987

AMDAHL

SYSTEMS	MIPS	MEGABYTES
470V/7	4.5	[illegible]
470V/8	5.5	[illegible]
470V/[illegible]	[illegible]	8 to 32
5840	[illegible]	16 to 64
5850	11.[illegible]	16 to 64
5860	14.[illegible]	16 to 64
5867	12.0	24 to 64
5868	[illegible].0	32 to 128
5870	25.6	16 to 64
5880	26.6	32 to 128

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AS-8043	5.2	8 to 32
AS/8053	6.5	8 to 32
AS-8063	8.4	16 to 32
AS-9040	7.2	8 to 48
AS-9050	9	8 to 48
AS-9060	11.2	16 to 64
AS-9070	16.2	16 to 64
AS-9080	20	16 to 64
†AS XL-60	28	32 to 256
†AS XL-80	50	64 to 256

†First installation 1985

The above information is intended as a guideline for computer users on relative computer system instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However, Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based on hardware/software configurations, and system manufacturers continually modify computer models as design improvements in hardware and software arise.

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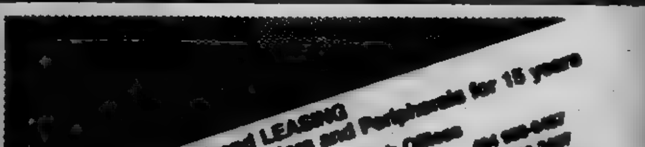

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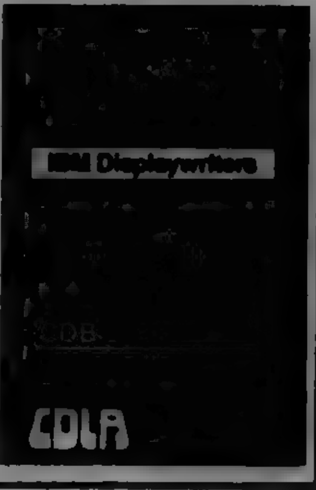

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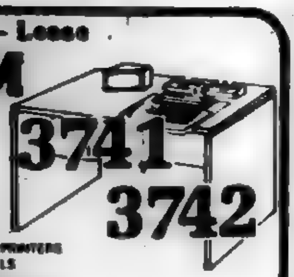

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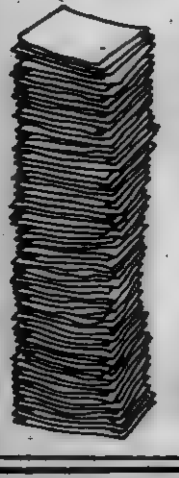

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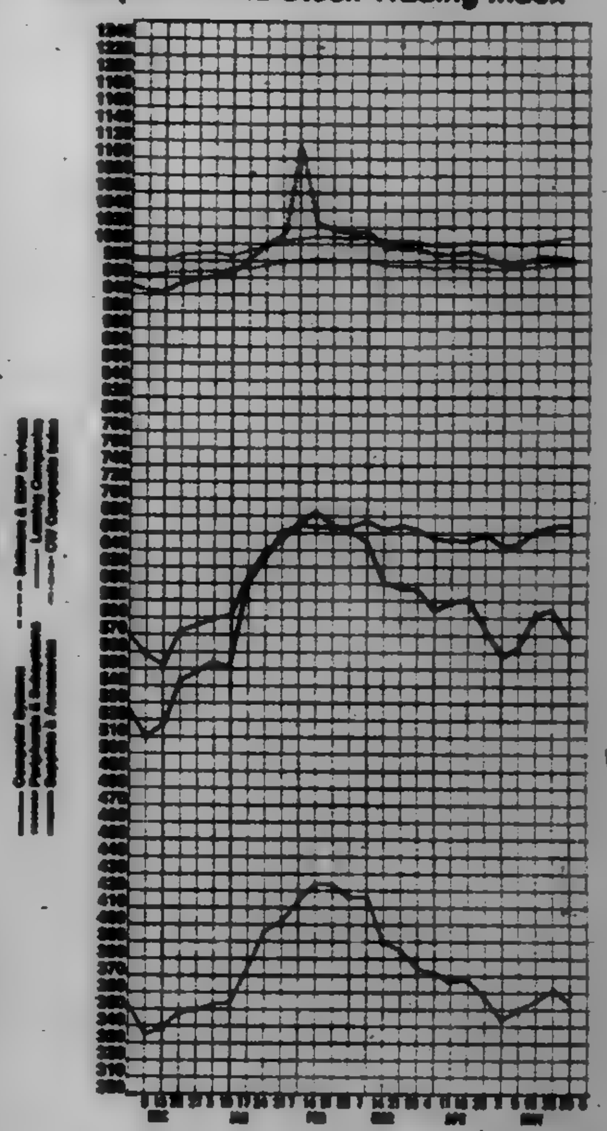

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Third-party service gains users' favor

By Jeffry Beeler
CW West Coast Bureau

Manufacturer service organizations, beware.

Systems users, take note.

After years of being widely perceived as the service field's poor relations, third-party maintenance companies are gaining respect.

PRODUCT SPOTLIGHT

The firms' newfound professionalism is evident in the quality of their customer service, which has recently shown strong signs of improving. The advances are not confined to one or two key measures of effectiveness. On the contrary, third-party maintenance providers have elevated their performance levels across the board, according to Rebecca Segal, a research analyst with Framingham, Mass.-based International Data Corp.

Segal based her conclusion on the results of a recent IDC survey in which users of vendor-supplied and independent maintenance were asked to rate the quality of their systems support. In general, the third-party providers were rated quite favorably compared with their manufacturer counterparts (see charts page 16).

Between 1983 and 1984, "the improvements in the service delivered from third-party firms [were] tremendous," the study concluded. In nine of the 11 performance categories that IDC asked customers to examine, the independent companies' scores in 1984 rose 0.6 of a point or more (on a rating scale of one to five) over their respective 1983 levels.

Moreover, in four of IDC's measures of service quality, the user evaluations of third-party maintenance jumped 0.9 of a point or more between 1983 and 1984. The study called the independent firms' strides "unbelievable."

"When any industry shows improvements of [0.9 of a point] . . . in one year, the competition must sit up and take notice, especially with independents targeting their markets," the researchers reported.

Although manufacturers as a whole still apparently hold an edge in some key service criteria like response time, third-party providers are clearly narrowing the gap in performance. In the process, independents have finally begun to shed their country cousin image and are increasingly forcing customers to reassess their longstanding doubts about the effectiveness of independent maintenance.

Probably nowhere is the third-party sector's growing stature among users more clearly demonstrated than in the recent findings of D. Roger MacNaughton, president of Franklin Lakes, N.J.-based Business Development International, Inc. As part of a report for Frost & Sullivan, Inc., a New York-based research firm, MacNaughton recently asked 2,000 MIS man-

See SERVICE page 17

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NEWSPAPER

CAI targets data center

System links software for managing DP shop

By John Gallant
CW Staff

JERICHO, N.Y. — Computer Associates International, Inc. is expected today to take aim at what may be the least automated bastion of the corporate world — the data center.

The systems software vendor will introduce a fully automated data center management system for IBM MVS environments that integrates 13 of CAI's systems offerings; a microcomputer- and mainframe-based service, support and training system; and on-line software that automates product installation and maintenance.

In a demonstration last week, CAI unveiled the automated CA-Unicenter, which features the following key components:

■ Data center management software consisting of integrated productivity packages for programmers and operations per-

See CAI page 6

Losses press Wang to lay off 1,600

By Peter Bartolik
CW Staff

LOWELL, Mass. — Anticipating its first quarterly loss since 1973, Wang Laboratories, Inc. last week dramatically accelerated its cost-cutting campaign by announcing it is laying off 1,600 employees across the board in U.S. operations and freezing salaries for six months.

One year after cresting above the $2 billion revenue mark, Wang expects to post a fourth-quarter loss for the period ending June 30, although the company said it expects to report a profit for the fiscal year. In the fourth quarter of fiscal 1984, Wang posted its highest quarterly profit ever — $73.7 million. In the third quarter of the current fiscal year, profits slumped to $17 million.

The declining sales problem that has stymied the company in the current calendar year has resulted in accumulations of inventory that will require Wang to write down the value of that inventory at the

See WANG page 10

TOP OF THE NEWS

Specter from within. A Data Processing Management Association-sponsored study showed that most computer crime is perpetrated by insiders. **Page 2.**

■

To the soul of the matter. Kinney Shoe reorganized its data collection to produce more timely top-down reports for key executives. **Page 4.**

■

IBM's modular CPU for a bank's remote locations headlined the American Bankers Association's annual automation meeting. Meanwhile, some 400 IBM sales reps were at the show. **Page 11.**

■

Tandem Computers unveiled five E-mail facilities to broaden its long-range product strategy. **Page 15.**

■

Death, taxes . . . and software maintenance. In the DP world, maintenance is an unavoidable need, although it is not always treated with due respect, said maintenance expert Nicholas Zvegintzov in a *Computerworld* interview. **Page 47.**

Cray-2 Unix supercomputer out

By Tom Henkel
CW Staff

MINNEAPOLIS — Cray Research, Inc. last week formally announced the Cray-2, a $17.6 million, AT&T Unix-based supercomputer that is said to deliver six to 12 times the performance of the company's first product, the Cray-1, while occupying about half the floor space of the more recent Cray X-MP.

The brainchild of inventor Seymour Cray, the Cray-2 appears to be the company's attempt to fend off intense competition from Japanese computer manufacturers to offer the fastest computer system in the world.

Cray users viewed the Cray-2 introduction as an attractively priced system that will have the most appeal to supercomputer users operating with large data bases. The adoption of Unix by Cray was

See CRAY page 8

Inventor Seymour Cray with the Cray-2

Crime survey indicts 'insiders'

By John Desmond
CW Staff

PARK RIDGE, Ill. — Company insiders commit far more computer crimes than outsiders do. Few computer crimes are reported to authorities. And fewer than half of all companies have part- or full-time staffs devoted to system security.

Those were the key findings of a survey of Data Processing Management Association (DPMA) members conducted by Detmar Straub of the management information services program at Indiana University, Bloomington, Ind.

Of 170 survey respondents, 21% reported that one or more system abuses occurred in the past three years in which the perpetrator was known. Of these, 2% were committed by outsiders. Individuals who committed inside abuses were programmers, systems analysts, machine operators and data entry clerks. Respondents were from companies in the fields of finance, retail and wholesale trade and education.

Suspected abuses

The total number of suspected abuses for which the victims had little or no knowledge of the perpetrator was "significant," Straub said. Some companies reported hundreds of suspected abuses, some dozens and some none, he said.

The largest category of computer abuse was misuse of computer services, reported by 49%. Of those, 42% involved unauthorized use and 7% involved disruption of services, such as bringing down the system. One programmer was using the company mainframe to run a mail-order business, complete with label printing. The company detected the abuse two years after it began and estimated its loss of the programmer's time at $20,000 to $30,000, Straub said.

Many examples were reported of DP employees using company systems to do programming assignments for night-school courses, which Straub called a petty abuse.

The respondents described 56 abuses, only 2% of which were reported to police or other authorities. Companies are reluctant to report such abuses because of embarrassment, fear of bad publicity or a disinclination to prosecute and pay legal fees, Straub said. "Banks are required by law to report material losses, but many of them are not doing that," he said, noting that many unreported abuses at banks involved significant dollar losses.

Program abuse was reported by 24% of respondents, data abuse by 22% and hardware abuse by 5%.

Several respondents reported the presence of tapeworm programs — code that runs whenever a system is brought up and is discovered only when it purges itself. In one incident of program abuse, when a company terminated an employee suspected of wrongdoing, the employee went to his terminal in an attempt to activate a tapeworm program. Luckily for the company, the system was down at the time. The company discovered that the tapeworm program would have erased the code that the employee used to skim $100,000 in funds into his own account.

Only 45% of respondents said they employ a data security staff. Many reported that abuses were detected by accident, rather than by auditors or security officers.

No distinct profile of a computer abuser emerged from the survey. DP managers, answering the survey as victims, reported that 27% of perpetrators acted out of ignorance of proper professional conduct, 26% out of misguided playfulness, 25% out of personal gain and 22% out of maliciousness or revenge. The DP executives said much of the unauthorized use arose from employees who used corporate information resources as personal property, in violation of company policy.

The DP managers said corporate personal computers are the biggest threat to their system security. Many said they fear users will download sensitive company data onto diskettes, according to Straub. One manager reported having nightmares of personal computer users walking out with strategic data, he said. Other respondents reported incidents of diskette theft and software copying.

Straub, a doctoral candidate in computer science in the university's Graduate School of Business Administration, said the DPMA survey is a pilot for a larger validated survey he is planning with a sample of up to 1,000 managers. "We need to have a sense of how big the problem is, and we need to identify ways to control the problem," he said.

NEWS SUMMARY

Kinney Shoe is providing information for its managers in more appropriate formats by reorganizing data collection techniques/4

DP professionals predicted a strong market for tools that automate manual processes involved in running a data center/6

Former Social Security Administration workers were charged with obtaining benefits through a computer fraud scheme/9

Geisco has reorganized its offerings to stress specialized network services, such as electronic data interchange/10

CW at NOAC: IBM introduced a 16-bit CPU for its 4700 line, targeting banks and financial institutions with remote locations . . . Micros are moving into the forefront of the banking industry's cash management techniques . . . Strong, centralized management control over micros gets concrete performance results in banks . . . Recent banking crises are prompting steps to strengthen the monitoring of cash balances/11-14

Tandem Computers advanced its long-range product strategy with the debut of five E-mail facilities/15

Although a hot topic in the industry, independent maintenance is not as popular in the marketplace/18

The FCC says customers who do not choose their long-distance carriers will be assigned to one/22

The emerging importance of program generators and software tool kits are among the trends forecasted for the software industry/24

Exxon's Exploration Division has signed a personal computer software site license — a first for the division and the vendor/25

New Hampshire's branches of government cannot agree on who should have access to the state's financial data base/28

A federal agency is using an auditing and financial system to generate additional revenue/30

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WHODUNIT

Sortland Yard warns against "Raffles-type sort programs."

Call (201) 568-9700.

Ask for Inspector SyncSort!

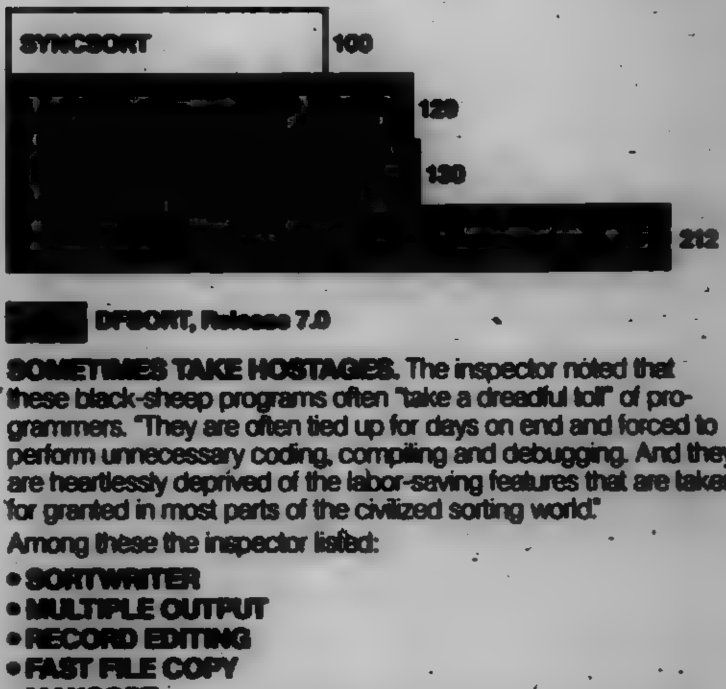
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied. "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

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Kinney revamps data collection to fit managers' needs

By Charles Babcock
CW New York Bureau

HARRISBURG, Pa. — At the start of work Monday morning, executives of the Kinney Shoe Corp. in New York are finding a report on their desks that had not been there before.

It lists the previous week's sales and compares them with sales figures from the same week a year ago and with budget projections, according to Kinney management information systems administrators here.

"It's the report card for our business. It tells us how we did for the week in our stores," said Philip W. Richards, senior vice-president for finance at Kinney Shoe. Kinney executives used to get the same information two days later, but it appeared via a ponderous, store-by-store reporting system, he said.

Former system

The former reporting system required store managers to report up the chain of command. It allowed eight divisions of Kinney Shoe to state their sales eight ways, making it difficult to compare results. And since some people need information for merchandising or inventory rather than sales, much of the same data was collected at different points and entered into the system more than once, MIS officials said.

The current management report is one result of Kinney Shoe's reorganization of its data collection. Instead of a bottom-up method, Kinney Shoe collects the data it wants at the point-of-sale terminal in each store and transmits raw data from 3,111 stores into its data processing center here, known as the Kinney Service Corp. It can then extract the information it needs for top-down reports as well as use it as grist for its regular batch processing, Kinney MIS administrators said.

"We are now stepping back and viewing the flow of data purely from an information processing point of view," said Richard H. McMichael, vice-president and director of MIS for Kinney Service.

Although he is part of Kinney Shoe, McMichael reports directly to executives at Kinney's parent corporation, the F. W. Woolworth Co. in New York, which is interested in consolidating management information in its other subsidiaries, Richards said.

Getting the sales report out two days earlier is not the sort of achievement that changes the course of the business, McMichael concedes, but it has made an impact on one group. District managers receive the week's results at 11 a.m. Sunday over portable teletype units. A quick review of the previous week can help them adjust their plans, he noted.

In addition, McMichael's staff can respond to executives' requests for special information and add it to the regular report — given a week's advance notice.

> ***'We are now stepping back and viewing the flow of data purely from an information processing point of view.'***
>
> **— Richard H. McMichael**
> **Kinney Service Corp.**

If executives are visiting the West Coast, they may want to know how Kinney Shoe stores did in the Los Angeles basin. If an advertising campaign began on the East Coast, they may want to compare sales there with those in the Midwest, said Fred E. Ream, assistant director and applications development manager.

Work on innovative use of information

More innovative uses of management information are in the offing, the Kinney officials said.

"We are looking at inventory processing at the point of sale," Ream said, and store managers would like to see computerized transfer vouchers that would allow quick transfer of goods from a store where they were not selling well to one where they were.

One of Kinney Shoe's hot sellers is a boot worn on stage and promoted by country western singer Barbara Mandrell. After a Mandrell appearance, Kinney may want to transfer boots from Lancaster County, Pa., where the Amish are less influenced by the fashions of popular music, to stores where demand is stronger, Ream said.

Analysis of sandal sales early in the year in the Sun Belt would indicate which styles will sell later in the North, offering guidance on which lines to mark up and mark down, Ream said.

Consolidation of data key

None of these uses would be possible, however, if Kinney Service had not found a way to consolidate its data collection.

From 1980 to 1983, it replaced a mixed bag of handwritten-receipt and scanning-device cash registers with IBM 3680 point-of-sale terminals.

The terminals communicate with Kinney's mainframes here through the Advanced Communications for Storage program, an IBM telecommunications polling package. Each day at 11 p.m., the program prompts Kinney's IBM 3083 mainframe, front-ended by an IBM 3725 communications processor, to initiate a series of telephone calls over 48 lines to the store terminals. The sales for the day have been "closed" on the terminals and the data is relayed into the mainframe, McMichael said.

Data that is collected at the point of sale includes a stock-keeping unit number that identifies the department from which the sale is made, a five-digit stock identification number, a gender and size code and the retail price, including any discount.

This information is tallied on sales that average $2.5 million a day for the eight divisions, and with it, Kinney drives its basic accounting and merchandising systems, including order picking, inventory replenishment and cash management.

Because the 3680 is programmable, additional data can be collected at the point of sale when the company has use for it, he said.

CORRECTIONS

The correct contact for the 1985 Advanced Manufacturing Systems Exposition and Conference [CW, May 20] is the Cahners Exposition Group, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

The three models of Data Switch Corp.'s Model 8044 channel extenders operate at 50K byte/sec., 250K byte/sec. and 650K byte/sec., not at the bit speeds originally reported [CW, June 3].

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Users back development of automated data center tools

By John Gallant
CW Staff

With the expected introduction of its CA-Unicenter system today, Computer Associates International, Inc. is gambling on the strength of the market for automated data center tools. If the DP professionals contacted by *Computerworld* last week are representative of their peers, the Jericho, N.Y.-based systems software vendor may be backing a winner.

"In large shops with multiple CPUs, a system that automates manual operations would be of great interest," said Benjamin Fong, director of computer technology and operations for Western Airlines, Inc. in Los Angeles. The company operates four IBM mainframes, including a 3083 under VM, a 3033 and a 4381 Model 2 under MVS and a 4381 Model 2 under IBM's ACP/TPF.

"It is true that the data center is one of the least automated departments today. But the environment changes so fast that it has been hard to stay on top of automation," Fong continued. "End users are our top priority. Their needs typically necessitate changes in CPUs, software and peripherals. In the face of that rapid change, it is hard to automate."

Fong's comments were echoed by Norman MacVicar, director of systems and operations for Avco Computer Services, a division of Avco Corp., in Wilmington, Mass. MacVicar said Avco has taken steps to automate many of the former manual processes involved in operating its data center, which boasts two IBM 3033s and a 3083 under MVS and a 4341 under VM. But despite the strides the company has taken toward automation, MacVicar said there is still much to be achieved.

"Data centers are not as automated as they ought to be. Even we have manual processes that we would like to automate, such as automatic problem tracking," MacVicar explained. "There are some individual solution-type packages out there. But where the products are not available, you have to build them yourself. Data center people do not have the time to do that. We are too busy addressing other people's needs."

According to Donald Arthur, manager of operations research with Chattanooga, Tenn.-based Provident Life and Accident Insurance Co., the individual solutions available from a variety of vendors are not the answer to automated data center management. Provident runs IBM 3084, 3081 and 3033 mainframes, all under MVS/XA. The processors support a network of some 2,000 terminals, 1,200 of them remote.

"The waste and overlap involved with those multiple packages concerns me," Arthur said. "Even one vendor's products overlap in functionality. The true one-vendor solution is what I am looking for; it is the dream I pursue. But I do not see it out there yet. In our environment, the tools have to be integrated, or they just will not be reliable."

Arthur said his company is actively seeking a reliable automated job scheduling and submission system and capacity forecasting software. "We are certainly not the least automated department in the company," Arthur said. "But we are not as highly automated as we have to become this year if we are to survive. We are losing roughly 10% of our CPU cycles because of the lack of a job [scheduling] system we can rely on. We need a system that can start scheduled jobs when required to make sure we have completed our production work in order to get our on-line systems up on time."

Even users who feel they have adequately automated their own shops acknowledge the growing need for data center management tools. Robert Best, vice-president of data systems with Toyota Motor Sales USA, Inc. in Torrance, Calif., said his company's philosophy is to ensure that its data center workers are "as well taken care of as our other users."

But, he said, "The market is waiting out there. Operational problems are usually not related to hardware or software failures. In most cases, it is a manual process that has caused the problem. Those manual procedures invite problems."

Toyota currently operates an IBM 3081 and a 3033 under MVS. Relying primarily on IBM's Operations Planning and Control (OPC) scheduling software, Best said, the data center is manned by only three workers per shift. Another three employees maintain Toyota's nationwide computer network that ties together some 1,000 dealers.

In addition to OPC, Toyota runs about 70 other software packages aimed at reducing the manual effort involved in operating the data center. Asked if he was concerned about relying on products from different vendors, Best said, "Certain companies make packages that IBM does not offer or that are as good or better than IBM products. But we are very judicious in what we select. We think the single-vendor philosophy would be the right way to go."

CAI from page 1

sonnel. Operations tools are provided for job scheduling, documentation management, performance measurement, on-line and batch job accounting, capacity planning, tape and disk management and sorting.

Programming facilities include utilities for program optimization, error analysis and detection, test and debug, report generation and file management. While each of the packages was previously available from CAI and was integrated to varying degrees, a spokesman said, they now feature common screen and report formats and function keys and a standardized installation procedure.

■ The CA-Uniservice micro- and mainframe-based service, support and training system. This component includes a hard-disk-equipped IBM Personal Computer workstation that acts as a central node between the user's mainframe software and CAI's Customer Service Center, based here. Through CA-Uniservice's micro-mainframe link, users have 24-hour, on-line access to CAI's data base for problem reporting, requests for central support, product ordering and review of support data files.

Users can search a data base of program temporary fixes (PTF) by key word, download a required PTF and apply it through the CA-Activator portion of CA-Unicenter. CA-Uniservice also provides interactive, micro-based tutorials for each CA-Unicenter component and includes management support software, including the Supercalc3 spreadsheet, the Superproject project management system and audit and reporting tools to monitor system use.

■ The CA-Activator automated software installation and maintenance system. CA-Activator is an on-line, menu-driven tool that simplifies the installation of CA-Unicenter. It runs under IBM's TSO/ISPF and can be accessed through a separate CAI-supplied micro-to-mainframe link from the micro workstation. The tool acts as a front-end processor to IBM's Systems Modification Program (SMP) installation software.

CA-Activator, which was designed to ensure complete and standard installation of the CAI products, monitors all installation activity, defines SMP and library data sets, automatically allocates disk space, generates required JCL and submits the completed job to SMP for execution.

CAI, which earned wide recognition as a leader in systems software for IBM DOS/VSE environments, has also become one of the top players in the MVS systems software arena through product introductions and acquisitions. The company last year acquired Sorcim Corp. and Johnson Systems, Inc. and in April bought out Value Software, Inc. CAI's fiscal 1985 revenue was nearly $129 million, an increase of more than 50% over fiscal 1984 revenue of almost $85 million.

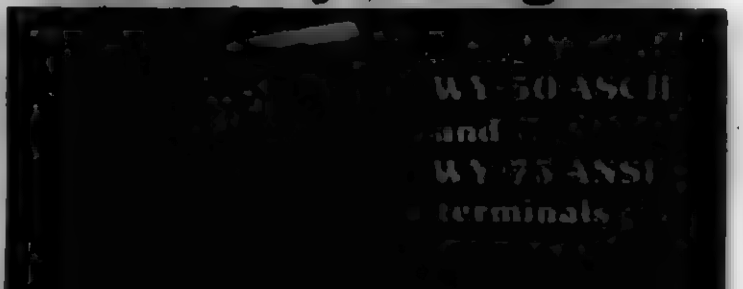
With the introduction of CA-Unicenter, CAI is betting that IBM's largest user sites are seeking to automate many of the manual processes involved in operating a data center (see related story above). Senior Vice-President David Tory said that the announcement and the company's thrust into the MVS systems software market are acknowledgments of the growing importance of MVS to IBM and its top customers.

"Our studies indicated that users are concerned about the spread of multiple vendor products and different procedures and levels of support," Tory said. "There is also a recognition that the data center is riddled with manual processes that are error prone. We have been automating all the other areas of the company, but the data center is a classic example of the cobbler's children having no shoes."

CAI said CA-Unicenter will be generally available in August. It will be priced at $144,000 for a three-year lease or at $188,000 for a perpetual license. CAI customers choosing to upgrade to CA-Unicenter will be offered credit for their products.

CAI is located at 125 Jericho Tnpk., Jericho, N.Y. 11753.

Smart Wyse Bargains



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[illegible]

CRAY from page 1

also viewed as a positive step that will make researchers' jobs a little less complicated (see story above).

The first commercially available system to use a liquid immersion technique for cooling, the Cray-2 features an internal clock cycle of 4.1 nsec and a main memory capacity of 256 million 64-bit words (roughly 2G bytes).

It is also the first large-scale supercomputer to use a version of AT&T's Unix System V operating system, the Cray-2 Operating System. This marks a departure from Cray's proprietary COS operating system used on the earlier Cray-1 and Cray X-MP supercomputers. The spokesman said Cray will continue to support COS but that the company plans to offer Unix on the X-MP by 1986.

Physical characteristics

The Cray-2 consists of four basic parts: a 14-col. CPU configured in the familiar Cray 300-degree arc; two pumping stations, called Pods, used to pump a fluorocarbon coolant in and out of the CPU; and a reservoir used to store 200 gallons of fluorocarbon coolant.

The CPU occupies 16 square feet of floor space, stands 45 in. high and weighs 5,500 lb. It is made up of 320 multilayer plug-in modules, each containing roughly 750 integrated circuit packages. Each module contains approximately 240,000 chips, including about 70,000 MOS memory chips. The gate array logic chips, consisting of 16 gates, use emitter-coupled logic circuitry, the vendor said.

The CPU consists of one foreground and four background processors. The foreground processor coordinates the data flow between the common 256 million-word main memory and all external devices via four I/O channels. The common main memory is divided into four quadrants with 128 interleaved banks. All memory access is automatically performed by the hardware, and any user can access all or part of this memory, the vendor said.

The four background processors are used to perform both scalar and vector calculations. Cray claimed each of the background processors is more powerful than the company's original Cray-1 CPU and includes its own 16,384 words (or 131K bytes) of local memory, which is used for temporary storage of vector and scalar data. The company said the background processors can operate independently on separate jobs or together on a single problem.

The Cray-2 CPU is divided into 14 vertical columns, each of which consists of 24 processor modules (there are 16 blank slots in the system) and a power supply. The entire CPU is filled with the liquid coolant, a chemical called Fluorinert, manufactured by 3M Corp.

The chemical is said to be a colorless, odorless, inert fluorocarbon that is both nontoxic and nonflammable. While the coolant is costly, about $230/gal., the Cray spokesman said the company believes the coolant will not deteriorate with age, nor will it have to be replaced.

The spokesman added, however, that Fluorinert does evaporate, and users will have to add coolant to the system periodically.

The fluorocarbon liquid is circulated through the CPU cabinet and comes into direct contact with the integrated circuit packages. The spokesman said the coolant is pumped into the CPU at 70 degrees Fahrenheit, and its temperature is elevated to 77 degrees Fahrenheit when it is pumped out. If a processor module fails, users have to pump the coolant out of the CPU and into the coolant reservoir before maintenance can be performed.

The Cray-2 Operating System is based on AT&T's Unix System V, but the kernel has been enhanced to boost I/O processing performance and to handle large data files more efficiently.

The Cray-2 was designed to use an enhanced version of the company's CFT Fortran compiler used on the earlier Cray-1 and Cray X-MP systems. Called CFT Version 2, the compiler is said to allow Cray-2 users to take advantage of the company's existing scientific subroutines.

Supports C language

The Cray-2 also supports the C programming language, which the vendor said was used in developing the Cray-2 Operating System and forms the basis of most of the utility programs used with the system.

Cray said it had installed a prototype of the Cray-2 several months ago at the Lawrence Livermore National Laboratory's National Magnetic Fusion Energy Computer Center in Livermore, Calif. A second system will be delivered this summer to the Numerical Aerodynamics Simulation Program at the National Aeronautics and Space Administration's Ames Research Center at Moffett Field, Calif., the company said.

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Two charged with computer fraud to gain SSA benefits

False entries alleged for 'large sum' theft

By Mitch Betts
CW Washington Bureau

JACKSON, Miss. — Two former Social Security Administration (SSA) workers are scheduled to go on trial July 16 in U.S. District Court here on charges that they fraudulently obtained disability insurance payments by entering false employment information into the SSA's computer in Woodlawn, Md.

A federal grand jury issued an indictment last month against a married couple, Walter S. Gandy and Margaret F. Gandy, of Edwards, Miss.

The indictment alleged that the two defrauded the SSA to obtain benefits for themselves and two other people.

The Gandys pleaded not guilty to the charges at an arraignment last month. The defendants' lawyer, Tom Royals, could not be reached for comment.

False entries to obtain benefits

The indictment states that in 1976, Margaret Gandy, at the time a claims representative in the SSA's Laurel, Miss., office, used a computer terminal to make false entries to obtain disability benefits, according to Assistant U.S. Attorney Henry Wingate.

Wingate said it is unclear exactly how much money the Gandys obtained, but he added that it was a "large sum."

The seven-count indictment against the Gandys included charges of wire fraud, mail fraud and making false statements to the government. Each charge carries a maximum penalty of $10,000 and five years in prison.

Access to terminal at work

Wingate speculated that Margaret Gandy had access to a computer terminal in the course of her work as an SSA claims representative and could make entries and changes in the files.

However, Phil Gambino, an SSA spokesman, said claims representatives do not have terminals yet.

According to Gambino, claims representatives help claimants to process paper forms. These forms are then turned over to data transcribers who enter the data into the computer.

This separation of duties prevents claims representatives from making direct computer entries, an informed source at the SSA said.

The source explained that the fraud alleged in the Gandys' case is actually perpetrated when the false information is supplied on the paper form.

Antipiracy unity urged

By Maura McEnaney
CW Staff

MONTREAL — Mention software protection to a group of worldwide developers and distributors, and suddenly you are speaking an international language.

Illegal copying of software is a problem that exists in every technologically advanced country, and each is mounting its own efforts to enforce software protection laws. "There must be a degree of international conformity in this area," said Daniel Mersich, a Canadian attorney specializing in computer law.

Speaking at the recent Montreal International Software Market, Inc. (MIM) '85, Mersich said software piracy in Canada is considered a criminal action, since it can be classified as theft.

Mersich cited several examples of Canada's efforts to control software piracy. Unauthorized copying of confidential names from a computer data base constitutes a theft in Canadian courts, Mersich said. The Superior Court in Montreal also recently ruled against a company that made unauthorized copies of a registered trademark displayed in the software and removed the publisher's name from pages of the user's manual, he said.

"Copyright law is the most effective weapon we have against software piracy," according to Brian Niblett, a Welsh attorney and author of a book on protecting computer programs. "Criminal law and patent law have a limited part to play in protecting software," while trademark laws can be only somewhat effective, Niblett said.

Although site licensing — under which companies pay a set price for an unlimited number of copies of a program — is becoming a popular concept among both developers and licensees, it is difficult to impose liabilities for contractual violations on the part of the user, Niblett said.

While copyright may be the best avenue of protection for software developers, it often needs to be combined with several contractual protections, noted Yoshikazu Takaishi, general counsel for IBM Japan, Ltd. "There is no set menu for protective measures as legal panaceas," he said.

Just published:

DOS/VSE JCL

If you want to learn to code effective job-control language for a DOS/VSE system, you've got your work cut out for you. The information you need is spread through more than a dozen IBM manuals. And because the manuals have to cover everything, the important points are often hidden by the details.

But now, a new book called *DOS/VSE JCL* saves you the trouble of struggling through the manuals. It teaches you everything you need to know to run everyday jobs...without burying you in detail. And with this background, you'll be able to use the IBM manuals efficiently when you have questions about unusual applications.

What this book covers

Part 1: Introduction The first part of this book gives you the background you need to start coding JCL. First, you'll learn about IBM mainframe hardware and configurations. Next, you'll learn about basic features of the VSE operating system, like multiprogramming, virtual storage, data management, and libraries.

One of the most confusing parts of VSE to new users is that some common system functions—like interactive editing and spooling—are managed not by VSE itself, but by other program products—like VSE/ICCF and VSE/POWER. So you'll learn right away what those products are and what they do. Then, you'll learn how to use ICCF to enter text at a terminal.

Part 2: Job-control language In Part 2, you'll learn a practical subset of VSE JCL and see how to apply it in realistic job streams. You'll also learn how to code JCL to control storage, libraries, and device assignments. And you'll find out how to code and use cataloged procedures.

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Part 5: Program development and library maintenance In this part, you'll learn how to code job streams to run the VSE language translators and the linkage editor. You'll also learn how to translate and test programs interactively through ICCF. Then, you'll learn how to code job streams to maintain VSE libraries.

Part 6: Utility programs Part 6 shows you how to code job streams for the most useful functions of 3 common utility programs: Sort/Merge, DITTO, and AMS. So you'll learn how to use these utilities to create, copy, print, sort, and merge files.

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If you're new to VSE, *DOS/VSE JCL* will get you started right. Instead of blindly copying other people's work, you'll learn what features of VSE to use and how to use them well.

If you're an experienced VSE user, this book will help you understand your system better. With our *OS JCL* book, an operations supervisor wrote that at last he knew *why* he was doing what he did. Several people told us how much that book helped with OS conversions. And a JCL expert said *OS JCL* let his programmers solve most of their own JCL problems...so he could focus on the really challenging ones.

I'm sure you'll find the same is true of *DOS/VSE JCL*. It will give you that extra knowledge that lets you do your job more easily...and with better results.

So why wait to master DOS/VSE?

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Geisco reorganization to target specialized net services

By Mitch Betts
CW Washington Bureau

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco), undergoing a major reorganization in response to a stagnant market for its traditional remote computing services, plans to make aggressive moves into such specialized markets as electronic data interchange for business-to-business orders and payments, Geisco officials said last week.

Geisco will specialize in a portfolio of electronic data interchange applications for vertical markets, such as the transportation and office supply industries, and automated clearinghouse services for banking and medical insurance transactions, company officials said at a press briefing.

In addition, Geisco officials said the company will continue to offer and enhance its packet data network service, office communications services, such as electronic mail, and the new Dealer Talk network for communications between manufacturers and their dealers.

"There is a heightened sense of urgency to get where we need to go," said W. James McNerney Jr., who was appointed senior vice-president of marketing and U.S. sales operations, citing the business pressures on Geisco's broad-based services.

"We've got to face that reality," he said.

Results of reorganization

Last month, Geisco announced that the reorganization resulted in the layoff of about 400 workers in marketing, sales and technical positions [CW, June 3]. On May 31, Geisco sold Network Consultants, Inc., a Chicago-based subsidiary specializing in wire transfer software for banks, to Dallas-based Mtech, Inc., a vendor of software packages designed for the banking industry.

As part of the reorganization, Geisco last week announced a series of management personnel changes. McNerney was given responsibility for marketing and sales, as well as for all of the new domestic business ventures.

Responding to questions, McNerney said the reorganization de-emphasizes certain business lines, such as single-client software packages and consulting services, that do not take advantage of Geisco's worldwide telecommunications network. "You cannot play everywhere in the computer services industry anymore," he said.

McNerney said the new ventures will produce annual growth rates of 25% to 45%, consistent with the corporate culture at Geisco's parent, General Electric Co.

"Luckily, selectivity doesn't dampen your growth rates," he said.

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MCDONNELL
DOUGLAS

WANG

from page 1

end of the quarter, the company said. Earlier this year, Wang said it would shut down production for two weeks in July.

Stephen K. Smith, a securities analyst with Paine Webber, Inc., said the company is facing a very tough situation from which it could take years to recover. "I would go so far as to say Wang has three problems: IBM, IBM and IBM," Smith said.

IBM's aggressive moves into departmental data processing with its System/36 have severely impacted Wang's sales, and the general U.S. computer sales slump and adverse foreign exchange rates have magnified the problem, according to Smith.

Wang spokesman Peter D. Connell said the layoffs, the first for the company since the 1974 recession, will "be across all areas of the company" in U.S. operations and will represent 5% of its worldwide work force. He said the slump is "mainly a U.S. phenomenon" but has impacted all product areas.

He added that sales of Wang's VS minicomputers are doing relatively well, and personal computer products are selling well in Europe.

Connell rebutted persistent rumors that John Cunningham, Wang's president and chief executive officer, will be leaving the company. "I wish I could put those rumors to rest," he said.

An Wang, chairman and founder of the company, has taken a more visible role in day-to-day operations this year, Connell said, but he added that Wang "has always been the driving force for the company; he has always been looking over the helm."

The retrenchment may serve to strengthen Wang's role in selling to MIS departments, Connell insisted. "We have focused our marketing efforts; we have hired aggressively people with special skills to reach the MIS director," he said.

But he conceded the company is directly battling IBM. "We have targeted [Wang's] capabilities in departmental data processing," he said. "That continues to be a major development area and market area where IBM has focused its System/36."

Smith said Wang has the "bright people and bright ideas" to turn things around, "but it is not going to happen overnight." Wang must broaden its product line, and in that vein, it may begin marketing engineering workstations that were developed internally, Smith said.

IBM's 4700 financial family gets modular processor

By Tom Henkel
CW Staff

DALLAS — IBM chose last week's American Banking Association National Operations and Automation Conference here to unveil a modular CPU for its 4700 line of financial systems.

The 4702, based on a proprietary 16-bit CPU, was designed for banks and financial institutions with remote locations. It can perform a variety of financial processing tasks such as teller transactions, loan processing and automated teller machine (ATM) functions, IBM said.

The 4702 is available with 512K to 4M bytes of main memory and can support up to two diskette drives and two optional fixed-media disk drives. The 4702 supports 4700 communications terminals and other devices at branch or remote locations while providing a communications link at up to 19.2K bit/sec. to a host processor. This, IBM said, enables terminal users to process transactions on-line and to update continually the data base in the host processor.

The 4702 can also be used as an off-line stand-alone processor for uses such as running an ATM terminal. For example, as customers use the ATM during the day, the transactions are processed and stored locally in the 4702. The transactions can then be sent overnight to a host processor, such as a System/36 or an IBM 3090 mainframe, located in the bank's main office.

A basic configuration of the 4702, including 512K bytes of main memory and a 5¼-in. diskette drive with 1.2M bytes of storage, costs $9,900. Main memory can be expanded in 512K- or 1M-byte increments up to 4M bytes at costs of $2,500 and $5,000, respectively. A second 1.2M-byte diskette drive costs $650. An optional 72M-byte fixed-media disk drive costs $4,000. The 4702 will be available in October, but the fixed-media disk drive will not be available until December, IBM said.

IBM is offering an on-site exchange service for the 4702 and 4700 display terminals. The service costs $215 per year for a basic 4702 configuration.

At the same time, IBM announced the 4708 disk drive, available in two capacities, for users of the 4701 Model 3 finance controller who want to store large amounts of data locally. Available in 72M- and 144M-byte capacities, up to two drives can be attached to the 4701 Model 3. Available in December, the 72M-byte version costs $6,400, and the 144M-byte version costs $10,400, IBM said.

Othes products in the 4700 line include the following: the 4704 finance communications display station, a CRT terminal used for interactive banking applications, the 4710 system receipt/validation printer, 4715 continuous forms printer, the 4720 forms passbook printer and the 4730 ATM.

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CW AT NOAC

Ramblings from the floor at the American Bankers Association's annual National Operations and Automation Conference (Noac) last week:

■ "Banking is Big Blue" would qualify as an appropriate theme for this year's conference.

According to one software house, its future success is contingent on designing for the IBM environment. Of the 300 top banks in the country, 100% have IBM installations, and installations are in the high 90% range for the next tier of banks.

"Bankers won't think of making any decision other than to buy IBM. They won't take the risk. They don't have to. They are bankers," he added.

■ During the conference, more than 400 IBM representatives flooded the exhibition floor, intently poring over the latest software enhancements in the banking marketplace and eagerly awaiting product previews of enhancements to the IBM 4700 financial communications system, rumored to be based on the IBM System/36.

IBM took over a Dallas hotel for its entourage and even printed its own program.

■ Not to be outdone, Ericsson, Inc., the Swedish electronics and telecommunications firm and a new entry into the micro market with a branch automation system, was making a splash by giving away designer telephones to anyone who would sit through their 15-minute presentation.

"An excellent way to get the attention of the marketplace," commented one attendee clutching his telephone.

■ Then there was Jack Chang, president of Dallas-based Quadstar Corp., a legend in his own time in the electronic payments industry, it would seem. He is a co-patent holder on the first automated teller machine (ATM) and the magnetic strip-coded credit/debit card.

While standing at his company's booth, Chang steadily acknowledged the continual stream of well-wishers who also appeared extremely interested in the late 1984 sale of his eight-year-old company to Citibank, the banking subsidiary of Citicorp.

Citibank strikes fear in the heart of regional bankers, who dread the day interstate banking could become a reality and who might face Citibank's deep pockets.

According to Chang, Quadstar is the only Citibank subsidiary that can sell hardware and software packages in a completely independent marketing mode. Quadstar developed and installed the nation's largest operating electronic funds transfer system for the Florida-based Publix Super Markets, Inc. chain, a system of 319 ATMs in 282 sites, to which is being added more than 3,000 point-of-sale terminals.

[redacted]

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Micros move to banks' front lines as client service tools

CW AT NOAC

By Bryan Wilkins
CW Washington Bureau

DALLAS — The microcomputer is moving into the front office next to the loan officer at the bank.

It is moving from the bank's back-office DP center as rapidly as competition from other financial service providers is forcing changes in the traditional way of handling money.

That was the consensus at last week's annual National Operations and Automation Conference (Noac), sponsored by the American Bankers Association for bank DP managers. In his keynote address, Joseph J. Pinola, chairman of the board of First Interstate Bancorp in Los Angeles, said, "The competitive strains on the banking industry are the most intensive ever."

Aided by micros, banks are developing new services such as daily reporting of corporate cash balances as users demand more sophisticated services.

According to John McAllister, executive vice-president of Broadway & Seymour, a Charlotte, N.C., developer of branch automation software for IBM's 4700 series financial products, bank technology is demanding a new type of performance: One such application, he said, is placing a smart on-line terminal on the desk of the bank officer to access a client's account record, look at the bank's current cash exposure or determine the daytime overdraft.

"We see a 39% annual growth rate for bank technology through 1990," McAllister said.

In the past, micros in banking were usually acquired on an ad hoc basis, said Joseph C. Cauley, manager of the end-user consulting group at Citizens & Southern National Bank in Atlanta. This was followed by management efforts to control their proliferation.

Now that microcomputers are being accepted in banking, Cauley said, they are being used in the development of new client services and products and to aid a bank's productivity, even though critical strategic bank decisions on the architecture of micro-mainframe links are not yet in place.

Micros, for example, are being linked in vendor-supplied local-area networks and connected to mainframe data bases, paralleling the evolution of data base management systems and the office automation sector, Cauley said.

However, according to Cauley, microcomputer users in banks tend to be demanding. Initially happy with off-the-shelf packages such as Lotus Development Corp.'s 1-2-3, they are now demanding access to raw mainframe data.

Cauley reported that simple downloading from the mainframe to the micro is not easy in the bank environment despite the existence of software packages designed for the task.

In one instance, "Our fixed asset people wanted to download selected information from fixed asset and general ledger. They thought by loading information into [the Lotus software] they could automate the balancing and would save lots of time. We had to write specific applications code to extract the information from the mainframe file," Cauley recalled in a conference session on managing micros.

> ”
>
> *Micro users in banks are now demanding access to raw mainframe data.*

"Micros are being used in distributed processing solutions because they are very modular. They can be set up to emulate a dumb terminal and they can also function as an on-line transaction processor," noted Bryan Girard, president of San Francisco-based Bankpro, which markets an IBM Personal Computer-based electronic funds transfer system called Wirenet.

Girard sees the micro being used to off-load job functions from larger systems, such as the IBM System/36, which can then become dedicated to another task, such as functioning as a server for micro cluster configurations.

The IBM Personal Computer and Personal Computer AT will allow smaller banks that make 600 to 1,200 EFTs a day to cost-justify connection to the Federal Reserve System's Fedwire and other payment systems.

In the estimation of Jerry M. Cox, senior management consultant for Charles Brooks Associates of Charlotte, N.C., the proliferation of the micro has been good and bad for banking.

Although the development of user-friendly micro software has helped give banks a competitive edge and provide up-to-the-minute cash management services to valuable clients, the packages are still too reliant on technology, he said.

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Strong micro control yields results for bank DP shops

CW AT NOAC

By Bryan Wilkins
CW Washington Bureau

DALLAS — Strong, centralized management control over microcomputers is winning converts in the banking industry as performance and productivity rise, according to bank DP managers who have fought the micro control battle.

Speaking at the annual National Operations and Automation Conference (Noac) here last week, Thomas E. Wilson, manager of information services at United Banks Service Co. in Englewood, Colo., said the critical issue for its parent company, United Banks of Colorado, Inc., when it installed micros was to ensure that the micros emulated existing mainframe computer functions.

"We had to ensure that we had a micro product that complemented our existing mainframe because we didn't want a proliferation of unrelated micro applications popping up all over the place," Wilson said.

The service company set up what it called a primary information processing system to centralize all processing for the $4 billion bank holding company. That system had to include processing from five individual banks, he explained.

Wilson said the next step was to follow a strategy for what jobs the micros would perform in order to define the structure in which they existed. "Budget and profit planning for the various services and products the bank wanted to offer was an obvious area," he noted.

With the bank's mainframe software running in an IBM Systems Network Architecture/Synchronous Data Link Control environment on IBM 3033 and 3080 mainframes, the micro-mainframe link initially depended on the IBM 3278 terminal system. An existing SAS Institute, Inc. data base management system package, as well as a file transfer program from SAS, was intended to be transferred to an IBM Personal Computer XT and AT environment, which would then run commercial off-the-shelf applications, such as Lotus Development Corp.'s 1-2-3 for DBMS and Multimate International Corp.'s Multimate for word processing, and some in-house-generated applications.

According to Wilson, when the micros began running in their mainframe mode, the mainframe appeared to function as a powerful dedicated hard-disk support system that contained 256M bytes of memory, making it an "extremely important resource."

The micros could access the bank customers' account data by bank service category and perform profit and loss analyses of bank data by service category on a monthly basis in a fraction of the time that it had previously taken.

Manipulating data for later uploading to the mainframe was a subject about which many bank MIS directors used to groan because of security and data integrity concerns. This was no longer an issue, however, because the micros were doing jobs the mainframe formerly did, Wilson explained.

Summarizing the bank's experience, he asserted that starting out with a good mainframe product is important to keeping data integrity from becoming an issue.

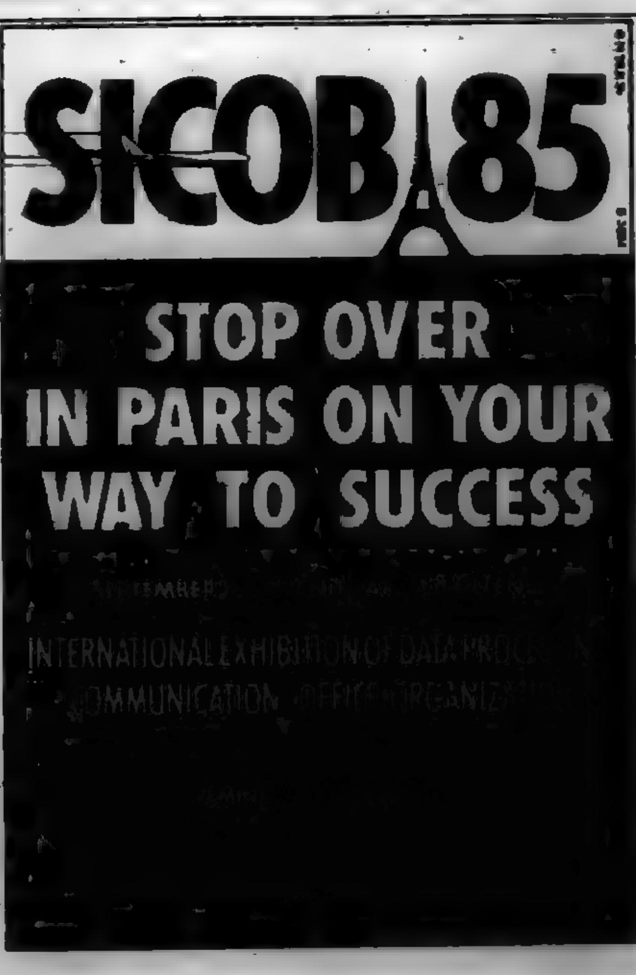
United Banks personnel are now calculating asset/liability ratios in 10 minutes with micro applications, Wilson said, while bank chief executive officers can project their bank-year figures in 20 minutes.

Labor groups sponsor VDT study

NEW YORK — Long outspoken in their views about pregnancy hazards associated with VDT use, two labor groups have commissioned a New York-based scientist to conduct a four-year study on the subject.

The Service Employees International Union and 9 to 5, the National Association of Working Women, announced last week that Dr. Irving Selikoff, professor at the Mount Sinai School of Medicine at the City University of New York, will study work patterns and reproductive histories of more than 10,000 working men and women. Both organizations will recruit study volunteers, a spokesman said.

The study will be funded in part by the March of Dimes. Selikoff's laboratory is supported by the American Cancer Society.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Banking crises bringing push for tighter EFT controls

CW AT NOAC

By Bryan Wilkins
CW Washington Bureau

DALLAS — The recent banking crises in Ohio and Maryland, where problems in individual bank loan portfolios fostered 1930s-style bank runs, are prompting new measures to tighten bank management practices, according to the director of data processing for the New York Automated Clearing House Association (Nacha).

Nacha, the country's largest private electronic funds transfer (EFT) network, processes 96,000 payments, worth approximately $300 billion, daily, explained William Walsh, its DP director. This volume compares equally to the Federal Reserve Board's total daily EFT transfers for the entire U.S.

"The financial problems we have experienced recently in various states have prompted a greater awareness by banks of the processes we use to manage cash," said Walsh, who was attending the American Bankers Association National Operations and Automation Conference (Noac) last week.

> *'The financial problems . . . in various states have prompted a greater awareness by banks of the processes we use to manage cash.'*
>
> — **William Walsh**
> **New York Automated Clearing House Association**

Walsh, however, distinguished between the degree of expertise that exists in a bank's oversight of its own customers' net cash positions and the less certain ability to monitor the cash exposures that rapidly change between banks themselves.

"We don't have many software applications that address a bank's exposure, and we see that the Fed is having to address this problem," he added.

Nacha recently inaugurated its own internally developed software program to monitor the bilateral cash relationships between banks in response to this perceived problem, Walsh said.

Essentially, the program establishes limits on the amount of a bank's exposure to another bank, with the information on the bank's net cash position at any given time stored within the Nacha system.

As many as 138 "world class" banks are currently connected to the Nacha system and are also connected into the Federal Reserve System's Fedwire. The banks must comply with the Fed's regulations on daylight overdraft limits between banks that measure the amount of net credits and debits that exist at any one time for a bank.

BMC Software abandons suit against IBM

ARMONK, N.Y. — BMC Software, Inc. of Stafford, Texas, last week dropped its 11-month-old antitrust suit against IBM.

The suit, filed last August in U.S. District Court in San Jose, Calif., claimed that IBM had been illegally requiring its customers to purchase an IBM disk-logging program when they bought IBM's IMS data base management system, according to IBM spokeswoman Pamela Hawkins.

BMC Software received no money or other concessions from IBM in return for dropping the suit, Hawkins said.

BMC Software could not be reached for comment at press time.

Hawkins, however, claimed that BMC Software's suit had been crippled in December when Judge William A. Ingram ruled that there was no basis for BMC Software's claim of illegal tie-in sales.

A secondary BMC Software claim that IBM had a lease-only policy for IMS 1.3, the software's latest release, remained to be ruled upon by the court prior to BMC Software's cessation of the suit.

Responding to that claim, Hawkins said "IBM doesn't lease [IMS 1.3], it licenses it." She maintained that BMC Software's dismissal of the suit was not the result of a settlement with IBM and said that the dismissal means that "BMC is prohibited from reinstituting legal action" in the case.

During the 1970s, IBM was sued by competitors alleging antitrust law violations on at least nine occasions. Of those cases that went to trial, IBM won all of them.

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Tandem E-mail tools let dissimilar systems swap data

By Jeffry Beeler
CW West Coast Bureau

CUPERTINO, Calif. — Tandem Computers, Inc. today entered a new phase in its long-range product strategy by introducing five electronic mail utilities that reportedly use existing Tandem networks to exchange information among incompatible business machines.

The Tandem communications software utilities are as follows:

- PS Mail, which reportedly allows users of selected models of dissimilar terminals or microcomputers to exchange documents electronically over a Tandem communications network.
- PS Text Edit, which permits those documents to be written and then edited prior to transmission or following receipt.
- PS Text Format, which aids users in designing and formatting their electronic transmissions.
- Faxlink, which enables images to be sent over a Tandem network, stored in a mainframe, retrieved and then printed out at any CCITT Group III facsimile machine.
- PC Link, which reportedly allows IBM or compatible micros to emulate 3270 or Tandem 6530 terminals and then exchange files with mainframes. A typical application might involve a large retail store chain that needs to download daily price changes from its central office to micros in the field, according to Jeri Edwards, a Tandem product manager.

The operation of each of the five mainframe-resident or diskette-based software modules depends on Tandem's Transfer, which reportedly moves information, regardless of its source or format, among individuals or applications.

Since Transfer's introduction in 1982, many of its information delivery capabilities have remained largely unused, according to Kathryn Weiner, a Tandem product management director. But the addition of the five information management tools finally permits those capabilities to be tapped, she said.

Tandem's move on the communications front broadens the selection of business machines that can exchange information over the company's network. In the past, the vendor's own 6530 and Dynamite workstations were the only desktop devices that could send and receive information through Transfer.

With the electronic mail programs, Tandem has expanded the range of Transfer-supported workstations to include TTY-class terminals, 3270s and IBM or compatible personal computers. The products also allow information to be moved over Tandem networks in a variety of forms. Used together, the packages reportedly enable the company's users, for the first time, to send, store and retrieve images either alone or combined with electronic text.

The additions to Tandem's product line mark the debut of the company's Information Management Technology (IMT) strategy, a long-term plan for interconnecting incompatible machines and networks through the firm's existing communications facilities. Ultimately, IMT aims to ensure that Tandem's own networks form the communications backbone for Fortune 1,000 companies, its major target customers, Weiner said.

Scheduled for shipment during the third quarter, the five Tandem electronic mail programs are available for initial license fees ranging from $495 to $12,500, with additional monthly charges ranging from $50 to $200.

Tandem is headquartered at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

ICCP outlines recertification

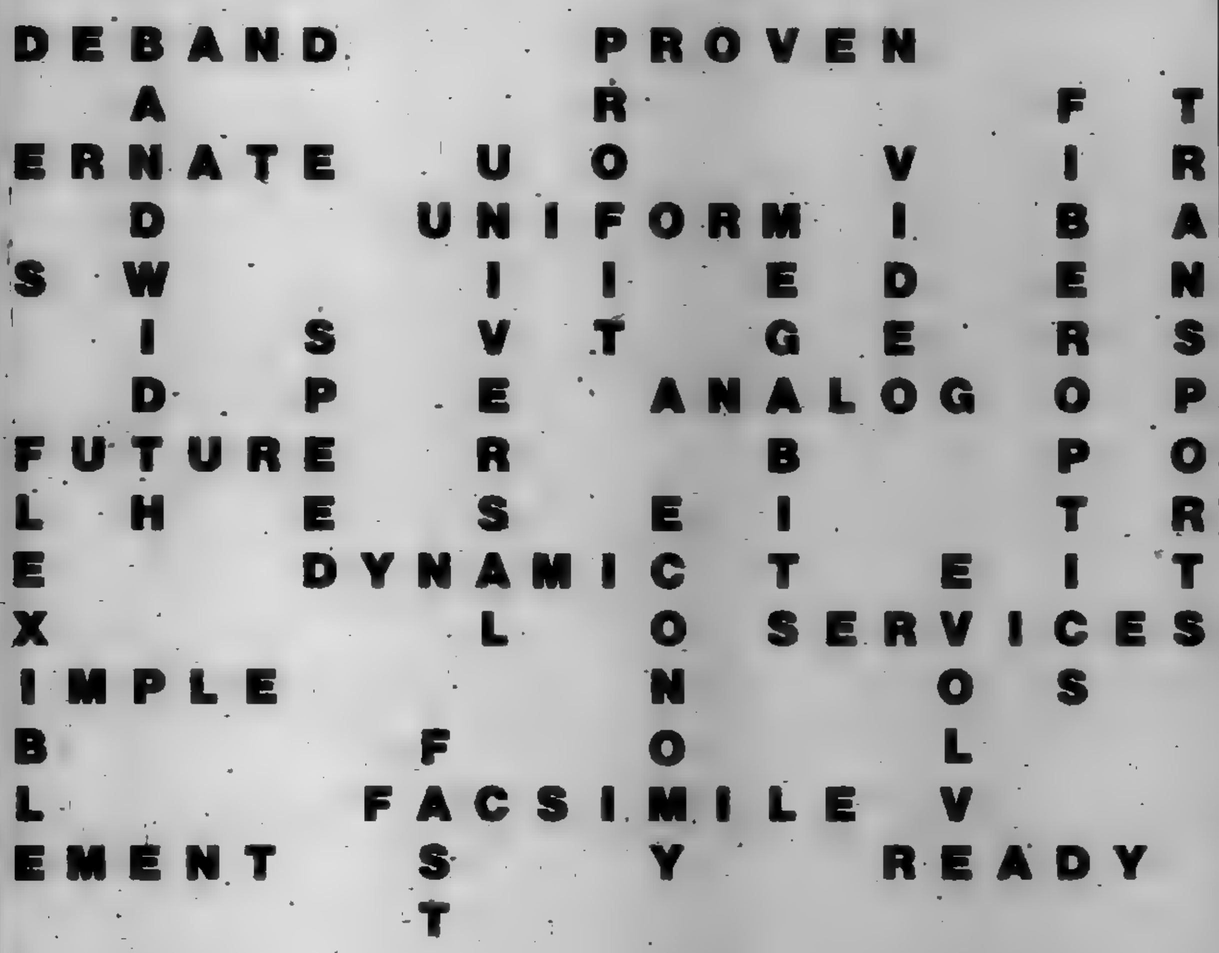
DES PLAINES, Ill. — The Institute for Certification of Computer Professionals (ICCP) has announced guidelines for recertification in its Certified Systems Professional (CSP), Certificate in Data Processing (CDP) and Certificate in Computer Programming (CCP) offerings.

A three-year recertification cycle for the CSP program will begin Jan. 1, 1986, a spokesman said. The program requires 120 contact hours of continuing education during each three-year period following the original attainment of the certificate. Educational activities preapproved by ICCP will be credited toward the recertification.

Current CSPs and those qualifying under the Professional Experience Provision, which ended May 31, may earn credits for approved educational activities as of Jan. 1, 1985, provided that validated documentation is submitted, the spokesman said.

The recertification cycle (120 hours of credit in a three-year period) for applicants taking the CDP and CCP exams will begin with the May 1986 applicants, the ICCP said. CDP and CCP holders who received their certificates before 1986 will not have mandatory recertification requirements, the spokesman said.

More information is available from ICCP, 2200 E. Devon Ave., Des Plaines, Ill. 60018.



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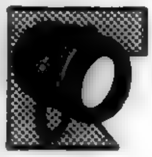
Vendor maintenance strong, despite third-party surge

By Jeffry Beeler
CW West Coast Bureau

Fox-Stanley Photo Products, Inc. relies exclusively on a third-party maintenance firm to service the IBM Personal Computers in the 153 photo finishing labs the user operates in 22 states.

For the rest of its in-house hardware, however, the San Antonio-based vendor of photographic supplies and photo finishing services obtains its maintenance directly from the equipment's manufacturers. "We use [NCR Corp.] personnel to service our [NCR Criterion 8575] mainframe and [Data General Corp.] people to maintain our Data General machines," according to Vincent Howard, MIS vice-president for Fox-Stanley.



In its division of maintenance work load between third parties and manufacturers, Fox-Stanley typifies medium and large corporations throughout the U.S. Although the independent service market is expanding rapidly and has suddenly emerged as a subject of intense industry interest, big-name manufacturers still hold a near-monopoly in large-scale CPU maintenance.

But at the opposite end of the processor spectrum, events have unfolded quite differently, according to D. Roger MacNaughton, president of Business Development International, Inc., a Franklin Lakes, N.J.-based consulting company. Among users of personal computers and their peripherals, for example, independent service providers have already made significant inroads, even though micros have yet to progress much beyond their technological infancy.

Third parties are also doing brisk service business with operators of large networks of automated teller machines and point-of-sale terminals.

Even among owners of products as large and comparatively expensive as minicomputers, small business systems and intermediate-scale processors, the independents have established a strong market presence. Bell Atlantic Corp.'s recently acquired Sorbus division, for example, owes roughly a third of its estimated $160 million maintenance business to IBM systems ranging from System/34s to 4300s, according to Sorbus President Ron Wallace.

But at the upper reaches of the CPU performance scale — in a realm synonymous with IBM 3080-class machines — third parties are comparatively rare, except for small, local outfits and firms serving specialized market niches.

Why is independent hardware maintenance distributed so unevenly over the range of market possibilities? Why have most major third-party firms shunned some product classifications and gravitated toward others?

Part of the reason is that procurement responsibilities are increasingly being dispersed from computing professionals to nontechnical end users — two groups with often sharply divergent views about which service medium is best.

Until recently, hardware buying power rested squarely in the hands of MIS executives, who typically have long-standing relationships with particular mainframe vendors and thus are culturally predisposed to sign service contracts with manufacturers. But with the growing popularity of micros, procurement has become increasingly democratic, according to John Harnett, industry services director for TRW, Inc.'s Customer Service division.

"People other than just MIS professionals are now making the service procurement decisions, and they are not necessarily brought up in a data center mode of thinking," Harnett said. "These people are more willing to go with third-party maintenance because they don't have as much cultural baggage."

Varied servicing practices

Another reason that the independent maintenance market has proliferated so unevenly has to do with the manufacturers, whose service practices vary widely from one industry sector to the next. Some of the practices have proven a boon to the growth of third-party maintenance, while others have inhibited it.

At the large-scale mainframe end, for example, many of the major equipment vendors have erected imposing barriers that effectively bar independents from the MIS service business. With IBM, the chief impediment for would-be challengers appears to be financial. "The sheer cost of entering the IBM mainframe segment of the maintenance market is so great" that most third parties are discouraged from even trying, according to MacNaughton.

With the Bunch companies, the obstacles to third-party competition often manifest themselves differently. In an effort to repel potential poachers from their mainframe service turf, many of the Bunch vendors have become increasingly reluctant

See COMPETE page 17

Critical service factors
by vendor

	Burroughs Corp.	Data General Corp.	Digital Equipment Corp.	Hewlett-Packard Co.	Honeywell, Inc.	IBM	NCR Corp.	Prime Computer, Inc.	Sperry Corp.	Wang Laboratories, Inc.	Third-Party Vendors	Factor Average
Software support	3.1	3.1	3.3	3.4	3.1	3.3	3.0	3.1	3.1	2.7	3.4	3.1
Preventive maintenance program	3.2	3.8	4.0	3.6	3.5	3.1	3.1	3.4	3.2	3.3	3.5	3.4
Service of field service management	3.2	3.1	3.6	3.4	3.2	3.4	3.4	3.3	3.4	3.3	3.5	3.3
Service by support representative	3.1	3.1	3.1	3.5	3.0	3.3	2.9	3.0	3.2	2.9	2.9	3.0
Telephone diagnostic capability	3.0	3.1	3.6	3.3	3.2	3.0	3.0	3.3	3.2	3.3	3.3	3.2
Emergency repairs noncontract hours	3.0	3.6	3.6	3.3	3.6	3.3	3.4	3.2	3.5	3.0	3.7	3.4

CW CHARTS

Service performance
by vendor

	Burroughs Corp.	Data General Corp.	Digital Equipment Corp.	Hewlett-Packard Co.	Honeywell, Inc.	IBM	NCR Corp.	Prime Computer, Inc.	Sperry Corp.	Wang Laboratories, Inc.	Other Vendors	Third-Party Vendors	Item Average
Reaching right person at service office	3.6	3.6	3.8	3.6	3.6	3.6	3.6	3.3	3.7	3.3	3.9	3.7	3.6
Reliability of spare parts	3.9	3.6	4.1	4.4	3.6	4.2	3.7	3.8	3.7	3.5	4.1	4.0	3.9
No need to replace parts	3.3	3.0	3.5	3.6	3.2	3.6	3.3	3.0	3.3	3.3	3.7	3.5	3.4
Company average	3.5	3.4	3.8	3.7	3.4	3.7	3.5	3.3	3.5	3.4	4.0	3.7	3.6

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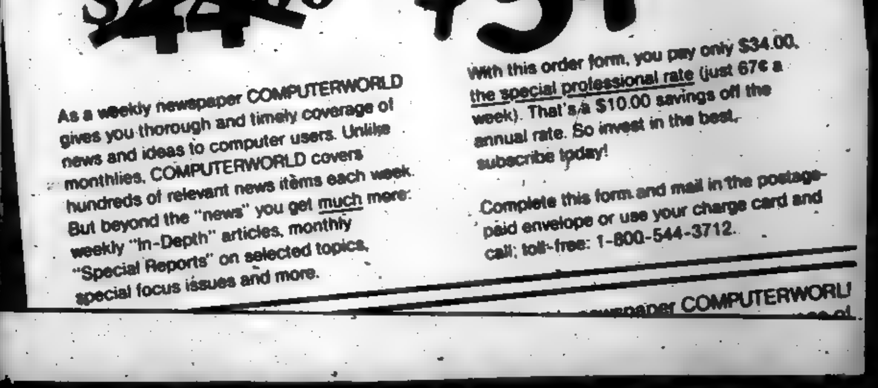
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End Users
- 10 Manufacturer (other than computer)
- 20 Finance/Insurance/Real Estate
- 30 Medicine/Law/Education
- 40 Wholesale/Retail Trade
- 50 Business Service (except DP)
- 60 Government—State/Federal/Local
- 65 Public Utility/Communication Systems/Transportation
- 70 Mining/Construction/Petroleum/Refining
- 75 Other User ______

Vendors
- [illegible] Manufacturer of Computers, Computer-related Systems or Peripherals
- [illegible] Computer Service Bureau/Software/Planning/Consulting
- [illegible] Computer/Peripheral Dealer/Distributor/Retailer
- [illegible] Other Vendor ______

2. **OCCUPATION/FUNCTION (Circle One)**
- 11 President/Owner/Partner/General Manager
- 12 VP/Assistant VP
- 13 Treasurer/Controller/Financial Officer
- 21 Director/Manager/Supervisor DP/MIS Services
- 22 Director/Manager of Operations/Planning/Administrative Services
- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 35 OA/WP Director/Manager/Supervisor
- [illegible] Data Comm Network/Systems Mgmt
- 41 Engr/Scientific/R&D/Tech Mgmt
- 51 Mfg Sales Reps/Sales/Marketing Mgmt
- 60 Consulting Mgmt
- 70 Medical/Legal/Accounting Mgmt
- 80 Educator/Journalist/Librarian/Student
- 90 Other ______

3. **COMPUTER INVOLVEMENT (Circle all that apply)**
Types of equipment with which you are personally involved either as user, vendor or consultant
- A. Mainframes/Superminis
- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems

3310-01

SERVICE

from page 1

agers to rate the relative effectiveness of independent and manufacturer service.

On the subject of how the two sides compare in response time, 80% of the MIS managers rated third-party providers as good as or better than their manufacturer counterparts, MacNaughton said. Independent companies also scored impressively in critical service factors like repair time, skill of maintenance technicians and price.

Nearly all the respondents, for example, credited third-party providers with being equivalent to or lower than the vendors in pricing, while 70% of the users found the independents as fast as or faster than the manufacturers in repair time. Three-fourths of the MIS managers believed the relative skill of the independents' technicians equaled or surpassed that of the vendor technicians, MacNaughton said.

The high esteem in which customers increasingly hold independent service firms has apparently resulted more from the field's own efforts at self-improvement than from any marked deterioration in service quality among the major manufacturers.

Among the most conspicuous of the third-party firms' recent advances has been their widespread success in improving the tenure and professional maturity of both their management staffs and service forces.

"Ten or 15 years ago, if you compared a manufacturer to a third party, you found an experienced guy on one side and a novice on the other," explained John Harnett, industry services director for TRW, Inc.'s Customer Service Division. "Today, many of the third-party companies employ a lot of managers and technicians who have 10 or more years of industry experience, which increases the expertise that can be brought to bear on maintenance problems."

With expanded resources have come heightened industry awareness of the third-party sector's existence and an increased willingness by users to consider alternative sources of hardware repair, he added.

However, the independent maintenance field's growing legitimacy does not portend a mass defection of customers from the manufacturers' national service organizations, noted Rawlin Fairbaugh, acting president of the Fort Meyers, Fla.-based Association of Field Service Managers.

"Most users are extremely loyal to the vendors [that] sell them their equipment," he said. "As long as the manufacturers continue to do a good job of servicing their products, customers will be reluctant to stray."

Manufacturers hold some potent trump cards for perpetuating their existing service business and keeping hungry third-party providers at bay. One such card is the strong desire among most users to ensure some form of vendor accountability.

"Knowing that a piece of equipment is made and serviced by the same firm gives you that warm, fuzzy feeling that allows you to sleep at night," according to Vincent Howard, MIS chief at Fox-Stanley Photo Products, Inc. of San Antonio.

Another inherent strength of manufacturer service organizations is that they enjoy ready access to critical spare parts — a claim that third-party providers are sometimes hard-pressed to match, Howard said.

But the independent maintenance companies also wield some effective trump cards of their own. For one, they offer a single-source solution to hardware maintenance problems and thus immunize multivendor installations from potentially destructive finger pointing, Fairbaugh said.

> ”
>
> *'As long as the manufacturers continue to do a good job of servicing their products, customers will be reluctant to stray.'*
>
> — Rawlin Fairbaugh
> Association of Field Service Managers

COMPETE

from page 16

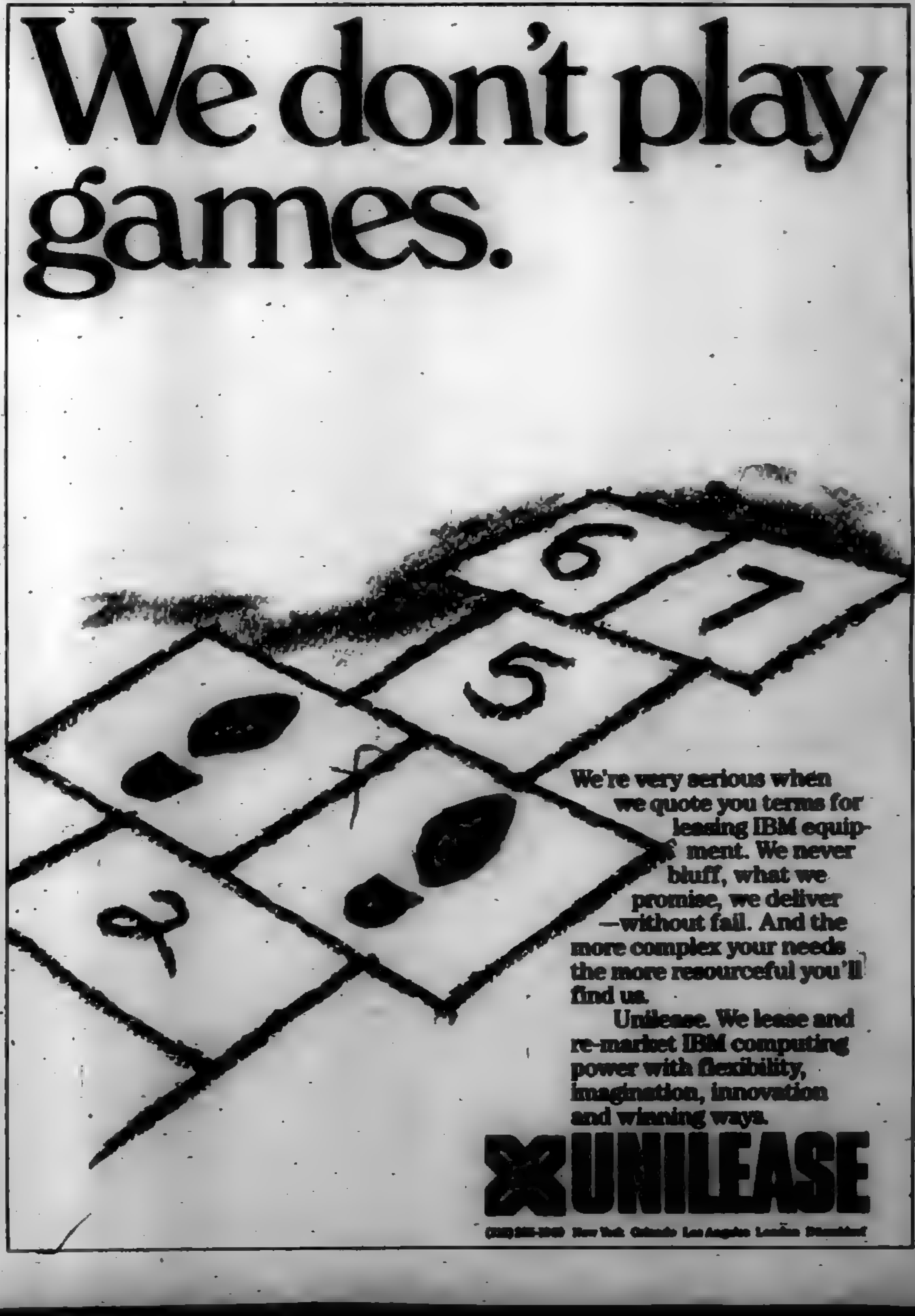
to supply independent maintenance companies with needed spare parts, MacNaughton said.

Low-end market hospitable

At the low end of the product spectrum, by contrast, third parties have found market conditions comparatively hospitable. Because of severe profit pressures within their manufacturing operations, most microcomputer equipment makers lack the financial wherewithal to build their own national service organizations.

In leaving users to fend for themselves, the vendors, in effect, have abandoned one of the maintenance field's fastest growing sectors to a host of third parties, which have pounced on the opportunity with relish.

Moreover, until just a year or so ago, most major hardware makers steadfastly refused to maintain other manufacturers' equipment, even if their own gear and the foreign products formed part of the same mixed-vendor system. That policy, too, led to a lucrative market opening that has contributed heavily to the independent service business' new-found prosperity.



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Independent maintenance market: Small fish, big pond

By Jeffry Beeler
CW West Coast Bureau

Hardware manufacturers are scrambling to enter it. Customers are increasingly evaluating it. And market pundits are tirelessly analyzing it.

But amid the growing activity, one salient fact about the third-party service field has been consistently downplayed: Independent maintenance remains a fairly paltry market.

The hoopla that has recently descended upon the third-party maintenance sector is all out of proportion to its current sales potential, according to D. Roger MacNaughton, president of Business Development International, Inc.

Even by the most optimistic estimates, the combined revenues of all the third-party maintenance business' current players total about $1.2 billion.

Although about 300 vendors now crowd the third-party marketplace, even the largest of these are small by computer industry standards.

Xerox Corp., for example, only recently joined the growing parade of third-party maintenance providers. With an annual service business calculated at $18 million, however, the firm ranks 10th in revenue among the industry's many participants, MacNaughton said.

For the others of the top 10 independent service suppliers, the same principle applies: Each is owned by a giant parent company whose total revenue dwarfs the financial contributions of its maintenance subsidiary.

Although the field is thought to be expanding at 15% per year, its climate is becoming increasingly competitive, MacNaughton said. One reason for the mounting difficulty is that hardware reliability has improved dramatically and thus has significantly trimmed the number of opportunities for revenue-generating service calls.

Another reason is that during the past year the third-party maintenance arena has turned into a magnet for a growing number of formidable competitors.

Prominent among the stream of recent arrivals are several big-name hardware manufacturers that had hitherto minded their own service business and had left the rest of the maintenanc*q* market alone. Early this year, for example, Digital Equipment Corp. disclosed its intention to begin servicing foreign peripherals that are attached to its own processors.

Honeywell, Inc. has also entered the third-party maintenance market, first by signing a service agreement with Apple Computer, Inc. and then by announcing — on May 31 — a similar arrangement with Convergent Technologies, Inc.

Market shaken to its core

IBM recently got into the independent service act when it revealed a plan to maintain competitive gear operating in concert with Big Blue's micros. But the recent market event that shook the third-party maintenance business to its core was the complex transaction that paved the way for Bell Atlantic Corp.'s acquisition of Sorbus, Inc.

Partly because it involved large dollar amounts, the deal created a national sensation and immediately turned independent service into an industry fad, MacNaughton said.

How the third-party maintenance business will ultimately react to the steady influx of major hardware manufacturers remains to be seen. "The market is probably growing fast enough to support almost everyone," according to Sorbus President Ron Wallace. "The guys with the big bucks and big organizations will capture their share of business, and the real little guys that operate in one city will continue to do well, too. But the middle-size companies are in danger of getting squeezed out."

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AMA plans information systems meet

NEW YORK — The American Management Associations (AMA) here has announced that its "Long-Range Information Systems Planning" seminar will be held June 17-19 in Boston.

The seminar will address techniques for determining priorities of management and users, linking data processing strategies to corporate needs, demonstrating cost effectiveness, evaluating hardware and software, setting measurable objectives, adopting procedures that provide for optimum use of data and refining plans to meet changing needs.

The course leader is Michael Albrecht Jr., president of M. Albrecht Jr. & Associates, Inc., a Michigan-based management consulting firm.

Course registration fees are $775 for AMA members and $890 for nonmembers.

More information is available from the AMA at 135 W. 50th St., New York, N.Y. 10020.

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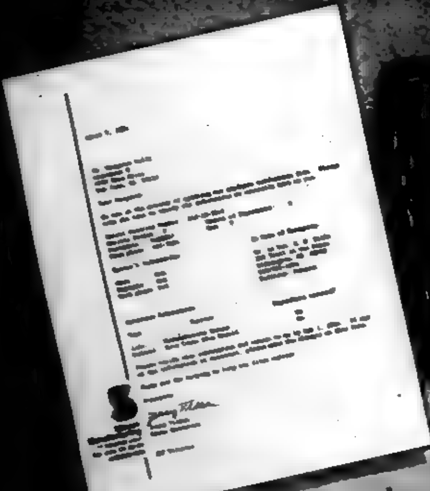

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FCC modifies equal access arrangement

WASHINGTON, D.C. — The Federal Communications Commission modified its equal access implementation May 31 and immediately ordered all customers to choose by ballot their long-distance carrier. Customers who do not choose will be allocated to a carrier based on a percentage formula of those voting.

The action came in response to complaints by MCI Communications Corp. that the automatic assignment of default customer traffic to AT&T Communications under existing rules was not a fair practice to encourage development of a competitive marketplace [CW, June 3]. The FCC called the previous arrangement "unreasonable and discriminatory" and said AT&T had enjoyed a "distinct advantage."

MCI reportedly was pleased with the FCC action, which takes effect immediately.

Approximately 10% of the local exchanges in the country have been converted to equal access, making it possible for phone customers to avoid dialing extra digits if they select a carrier other than AT&T. The implementation of equal access was ordered as part of the AT&T breakup.

The FCC action came after statistics showed that between 30% and 70% of customers were not making a choice of a carrier when an exchange was converted to equal access.

The new rules will require the local telephone company to send ballots to customers 90 days prior to an equal access cut-over. A second ballot would be sent if no reply was received 45 days before cut over. The last chance for a customer to presubscribe would be 30 days before cut-over.

The FCC said the local telephone company could not allocate any defaulted customer to a carrier until 45 days before the cut-over at the earliest or 90 days after the cut-over at the latest. A customer would have six months after the cut-over to make a free selection change in their long-distance carrier.

Coalition forms VDT info center

WASHINGTON, D.C. — A coalition of VDT manufacturers and businesses that use VDTs recently announced the formation of the Center for Office Technology, which will provide information and educational programs about VDTs, office automation and ergonomics.

Leonard H. Zippin, chairman of the center, said it replaces the Coalition for Workplace Technology, which was backed by the Computer and Business Equipment Manufacturers Association (Cbema) and which frequently lobbied in state legislatures against VDT regulations. Zippin said the new center is expected to have more credibility because it is supported by businesses that use VDTs and by VDT manufacturers.

He said the center will have a broader mandate than the former coalition and will not undertake any legislative lobbying itself. Instead, Zippin said, the center will provide generic educational materials and studies to in-state coalitions that lobby on VDT issues.

To act as national clearinghouse

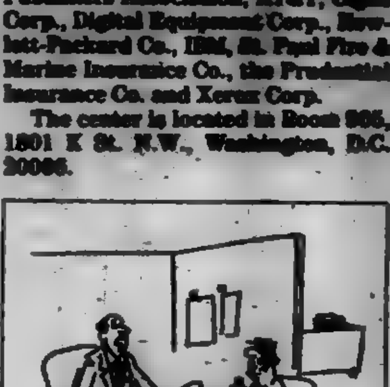
The center will act as a national clearinghouse for information on scientific studies on office automation, handle news media inquiries and provide workshops for private and government employers nationwide, Zippin said.

"Many private and public sector managers have planned and implemented excellent programs for introducing and using computer systems. Our goal is to build upon this knowledge and make it available to others," he said.

Zippin is executive vice-president of the American Insurance Association, one of the business groups supporting the new center.

In addition to Cbema and the insurance association, other supporters include Aetna Life & Casualty Co., the Air Transport Association, the American Council of Life Insurance, the American Electronics Association, the American Newspaper Publishers Association, AT&T, Cigna Corp., Digital Equipment Corp., Hewlett-Packard Co., IBM, St. Paul Fire & Marine Insurance Co., the Prudential Insurance Co. and Xerox Corp.

The center is located in Room 905, 1801 K St. N.W., Washington, D.C. 20006.



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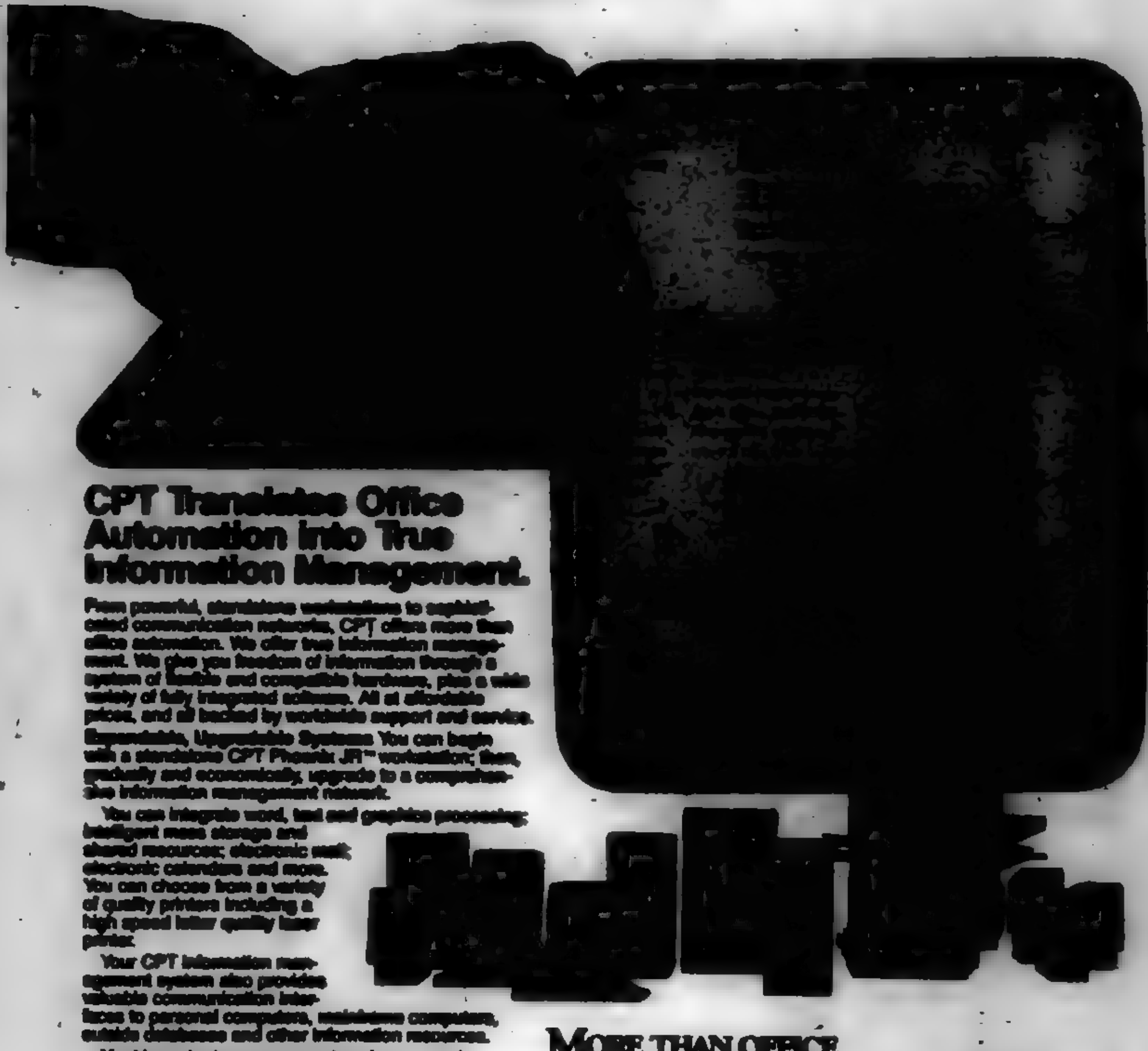

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CW AT
MIM '85

By [illegible]
CW Staff

MONTREAL — The software industry has a hard lesson to learn from earlier fast-growth industries, namely the importance of market share.

David Fairbairn, director of the National Computing Center in Manchester, England, told attendees at the Montreal International Software Market, Inc. (MIM) '85 that in order to withstand the pressures of a mass market, software companies must carefully categorize and understand their markets. The conference, titled "Software Marketing in the Global Village," was the first conducted by MIM, a private company jointly supported by the provincial government of Quebec and the Canadian national government.

In his speech, Fairbairn said today's software market is characterized by segmentation, massive sales volume and a need for product "robustness."

Custom software for mainframe applications remains the largest part of the software market, according to Fairbairn. To be successful, tomorrow's applications must be user-oriented and have a low development time, he said. "Software tool kits," or program generators that help companies develop such applications, will be a particularly important area over the next few years, according to Fairbairn. "System tools and program generators will be the most competitive areas" and will increase programmer productivity by four or five times, he said.

Massive production of software utilities and applications products will continue, but development costs will increase, Fairbairn said. Sales volumes, however, will offset those development costs, he said. "In 1980, products costing $500 would cost as much to produce as those that cost $5,000." Tomorrow's products will cost "two or three times as much to develop and bring to market," he said.

Multisystem software such as AT&T Unix products will see more growth over the next few years, according to Fairbairn, who said Unix-based products will capture 20% of the UK market in five years, compared with 8% penetration today.

Cries for standardization and integration of capabilities will continue, he said.

According to Fairbairn, software training needs will diminish as more products incorporate better Help facilities and tutorial packages.

Like other fast-growth industries that once worked with limited operations in a mass market, the software industry will eventually come into its own through the creation of diverse marketing channels that emphasize vertical markets, Fairbairn said. "[The software industry] is following a pattern, but the difficult task is finding out where we stand in that process," he said.

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End-user DP focus of meet

BOSTON — The Society for Information Management (SIM) will present its annual conference — this year titled "Managing the Explosion: End-User Computing and Emerging Technologies" — Sept. 8-12 at the Marriott Long Wharf Hotel here.

The conference will feature workshops on understanding the value, management and use of technology for managing the explosive growth of end-user computing. Registration fees are as follows: conference and workshop, $1,175 for SIM members; $600 for SIM faculty members; and $1,295 for nonmembers; conference only, $895 for SIM members; $450 for SIM faculty members; and $995 for nonmembers; workshop only, $350 for SIM members; $250 for SIM faculty members; and $395 for nonmembers.

More information can be obtained from SIM Annual Conference, c/o Kimberly Gandia, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Pick software directory out

SAN DIEGO — The International Data Base Management Association (IDBMA) has released the fourth edition of its Application Software Directory for the Pick Systems Pick operating system.

The directory details 630 applications software packages that run on the Pick operating system and lists 58 consultants who specialize in the Pick operating system.

The IDBMA Application Software Directory costs $30 plus $3.50 for shipping and handling. It is available from the IDBMA, 9740 Appaloosa Road, San Diego, Calif. 92131.

Exxon sees site licensing pact slicing software costs

By Edward Warner
CW Staff

HOUSTON — Exxon Corp.'s Exploration Division recently signed a site licensing agreement for personal computer software with Command Technology Corp. (CTC) that will reportedly save the oil company $13,600 in its first year. The agreement is a first both for CTC and Exxon.

The license, for CTC's SPF/PC programming utility, will permit the division to distribute an unlimited number of copies of the package — including copies for home use — to users of the division's approximately 125 IBM 3270 Personal Computers.

> ***The license agreement is unique in that for one price — $6,000 annually — it permits the Exploration Division to run the package on all the CPUs at Exxon's data center.***

Personal Computer users in Exxon Exploration's five subdivisions will also have a crack at the software, provided they have a valid business reason to use it, according to Michael Beddingfield, the division's supervisor of operating systems.

The software, for off-line programming of IBM's ISPF screen builder, will be downloaded to users from an IBM 3081 Model K mainframe, one of two at the division's DP center here.

The license agreement is unique in that for one price — $6,000 annually — it permits the division to run the package on all the CPUs at its data center, Beddingfield said. Mainframe site licenses usually are sold on a per-CPU basis.

A site license for personal computer software can permit the making of unlimited copies of a program, which would otherwise violate the software's copyright.

Seeking to avoid copyright problems, corporate personal computer managers, through groups like the Microcomputer Managers Association, have been demanding that software vendors create site licenses.

Without a site license, Beddingfield claimed, it becomes "unmanageable for a large corporation to manage the personal computer [software] usage."

For CTC, the use of site licensing "gets us out of the shipping business [and] allows us to work on code development," CTC President Barry Patton said.

Site license growth seen

Exxon was about the 15th corporate user to approach Patton's Oakland, Calif.-based software firm about a site license, the CTC president said. He added that, although CTC will still sell single copies, it expects its site license sales to grow.

Exxon's three-page contract with CTC, which was signed May 31, will save the Exploration Division about $13,600 in its first year, Beddingfield predicted.

That estimate, he said, was arrived at by multiplying the 80 copies of SPF/PC that have so far been requested by users by $245, the package's single-copy price, plus a $50 current-user upgrade charge. The software, he said, has been enhanced an average of twice a year.

The SPF/PC package will come into use this month in a pilot test with users, Beddingfield explained. Host-based ISPF screens, including the needed batch commands, will be written to make downloads "as user-friendly or idiot-proof as possible," he added.

Though the agreement was a first for Exxon, a company spokesman said the firm is currently exploring the possibility of gaining personal computer site licenses from other vendors.

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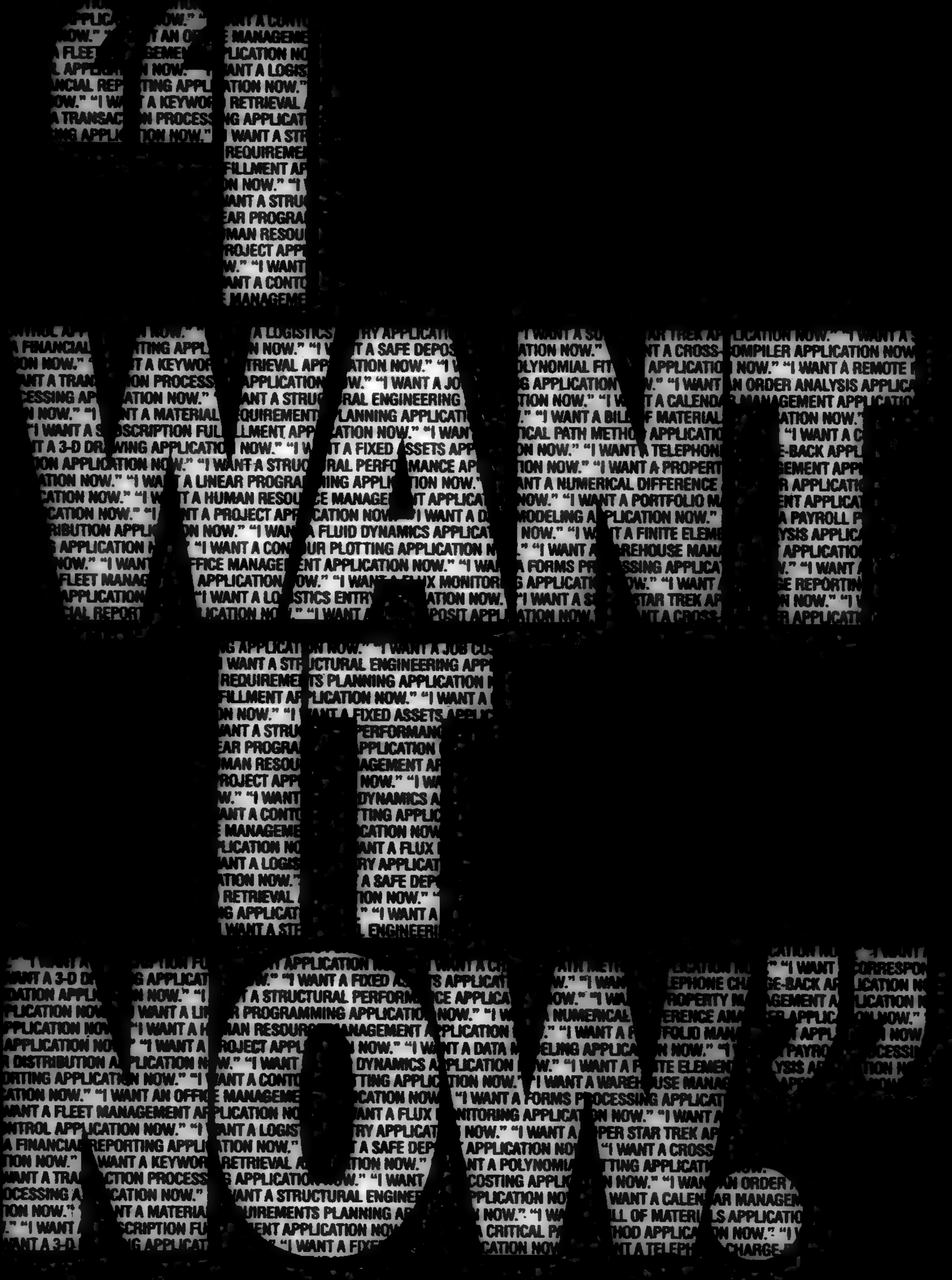
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New Hampshire leaders wrestle with data access issue

By [illegible]
CW Staff

CONCORD, N.H. — The branches of government in New Hampshire have reached an uneasy compromise as to who should and should not have access to computerized financial information.

The state will have completed the installation of an integrated financial system by July 1, said Norman VanderNoot, director of communications for Gov. John Sununu's office. When that system is installed, Sununu wants veto power over who has access to its data base, he said.

To a bill addressing issues related to the new system, Rep. V. Michael Hutchings (R-Plymouth) amended a request to reflect what he said are the access rights and privileges legislators already have on paper and should have electronically.

The bill passed in the legislature, but the senate amended it so that the governor would have veto power. This was done after the governor made it clear he did not favor legislative access, said Wayne King (D-Rumney).

The legislature and senate then worked out a compromise that will allow legislative access only through an employee of the legislature — the budget assistant, he added.

King is working on developing guidelines to allow New Hampshire citizens, as well as legislators, to have access to all parts of the data base that are not confidential, he said. He is also trying to consolidate all state computerized information, such as the financial system, statistical information on aid to families with dependent children programs and game management programs so that all the state's records will be together, making it easier to access needed information, he said.

"I don't see me winning that in the next round," King said. He said he hopes his efforts will lead to discussions and maybe to a pilot program, such as a few terminals set up in a state library for citizens to access information, he said.

The governor feels that legislators can get anything they want on paper or by phone, VanderNoot said, and should not have access to the data base. Information can be — and has been — misinterpreted in the state, he said, a problem that could increase if too many people have access to the records.

"This is not a partisan issue," Hutchings said, but a balance of power issue. The executive branch would have the upper hand if Sununu's wishes prevailed, he said. "Can we change from paper to computers and still keep the fine balance of power?" he asked.

"We're really talking [about] information as power here," King said. Information can be liberating if it is shared or enslaving if it is closely held by a few people, he said. He said he does not want to see the governor with veto power over who can access the data base. A governor with veto power over data base access could end up giving timely information only to "yes-men," he said.

IBM software strategies topic of forum

MONTEREY, Calif. — IBM's software strategies will go under the microscope when the Gartner Group, Inc. holds its second annual Software Forum, entitled "Software Strategies for the IBM World," at the Hyatt Regency Hotel here June 24-26.

The forum will investigate key trends in the software industry, and Gartner Group speakers and others will provide insights into IBM software strategies in such areas as operating systems, communications, applications and data base management systems. Among the speakers will be Scott Smith, vice-president, the Gartner Group; Fran Tarkenton, chairman of Tarkenton Software, Inc.; Gideon Gartner, president, the Gartner Group; and John Steuri, general manager of IBM's Information Services Group.

Topics of discussion are scheduled to include the following: "Can IBM recover lost ground in DBMS and applications software?"; "PC software — the next generation"; "Departmental computing — pipe dream or panacea?"; and "Programmer productivity — is help in sight?"

Conference fee is $875.

More information is available from the Gartner Group, 72 Cummings Point Road, Stamford, Conn. 06902.

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INTERNATIONAL REPORT
CW International
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DENMARK

COPENHAGEN — Communications giant ITT will invest $140 million in communications research and development efforts here, the company said. The investment is expected to create 1,000 jobs and generate increased export capital. Most of the companies receiving ITT funds are owned in part by ITT, including Standard Electric Kirk, producers of telecommunications equipment, private branch exchanges and electronic components; Christian Rovsing A/S, manufacturer of data communications and turnkey systems; and RC Computer, a systems manufacturer.

JAPAN

TOKYO — Two automatic language translation packages have been announced here. Toshiba Ltd.'s Machine Translation System reportedly allows users to translate English to Japanese, arranging the meaning of the sentences according to grammar. The translation system features 3,000 basic words, translates at 5,000 words per hour and runs on the vendor's UX-700 under its version of AT&T's Unix.

NEC Corp. announced an English-to-Japanese/Japanese-to-English translation system called Pivot, which runs on NEC's Acos mainframe series of processors. Pivot, which reportedly uses artificial intelligence to analyze sentences in the translation process, is expected to ship in December and will lease for $2,000 per month.

■

TOKYO — Nippon Telephone and Telegraph (NTT) announced it will offer a voice-mail service within the next two years. The service will enable users to record their voice messages if calling a busy telephone line, and messages will be forwarded automatically when the line becomes free, a spokesman said. The service can also transmit messages to many receivers simultaneously and send messages at specific times and dates. The NTT system reportedly will also feature a news service. Now being tested, the system supports digital and push-button phones, NTT said.

NORWAY

TRONDHEIM — Norwegian users of Digital Equipment Corp. systems formed an autonomous arm of DEC's Users Society (Decus) during a recent Decus convention here. Some 600 Norwegian users elected an advisory board composed of representatives from the data processing, scientific and academic communities. The organization's 1985 charter will offer seminars on fourth-generation language development.

UNITED KINGDOM

HIGH WYCOMBE — A $120 million race for an air defense system contract at Royal Air Force (RAF) command headquarters is under way here. According to a Ministry of Defense spokesman, four UK companies have been given the RAF's requirements, and the contract is expected to be awarded this year.

WEST GERMANY

MUNICH — A major change in the OEM agreement between Siemens GmbH and IBM Deutschland was announced here. Siemens will reportedly continue to market IBM's large disk storage device, the 3380, but it will no longer sell only to IBM customers. It will also sell to its own customer base and that of other plug-compatible manufacturers. The OEM agreement has been in existence since February 1984 and has not been popular among IBM sales representatives, sources said. IBM sales representatives have watched their colleagues at Siemens sell the same products at 15% to 20% less than IBM's prices.

Under the terms of the agreement, IBM users in West Germany will have to go back to Big Blue's prices and will start paying a lot more for IBM equipment.

■

NUREMBERG — The 1984 balance sheet for Triumph-Adler AG, the troubled Volkswagen GmbH high-technology subsidiary, registered only bad news. Approximately $117 million was pumped into the company during 1984 to keep it going, but losses are expected for 1985 as well, insiders said. Under the terms of an OEM agreement with IBM, IBM's recently announced $545 Actionwriter 1 Typewriter will be produced by Triumph-Adler.

■

MUNICH — Siemens AG has announced a $6.6 million project to design integrated circuits intended for use in computer-aided design systems here. Siemens reached an agreement with West Germany's Society for Mathematics and Data Processing to collaborate on the research and development project and to involve various West German technical schools in the project.

■

MUNICH — The robot-manufacturing industry is betting on an annual growth rate of 30% this year, according to the Association of Robot Manufacturers here. This will primarily be due to an increase in demand from midsize industries, a group spokesman said. Some 6,600 robots were reportedly sold last year in West Germany — 40% of which went to the automobile industry.

folks. So you can forget about publishing reams of short memos. Its voice prompts guide you step by step. So there's no chance for miscommunication. Problems are solved. Decisions are moved along.

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Federal agency mining benefits from auditing system

LAKEWOOD, Colo. — A government agency is pouring between $12 million and $15 million in additional interest into the U.S. Department of the Treasury's pot each year through the use of an auditing and financial system and will add even more as the system is fine tuned.

Collecting minerals revenue paid by private industry to the Minerals Management Service (MMS) of the U.S. Department of the Interior has become more complicated in recent years, according to Robert Boldt, associate director of the royalty management program at MMS.

Boldt said the number of leases issued on federal and American Indian lands skyrocketed and as high production prices led to multiple ownership of producing mining wells.

He noted that the cornerstone of the government's program to correct long-standing problems with the royalty accounting, collection and management system is MMS' Auditing and Financial System (AFS), designed by American Management Systems, Inc. (AMS) of Arlington, Va. AFS is a fiscal and accounting system designed specifically to handle the collection of royalty payments, Boldt said.

Patched software

Until recently, MMS used the U.S. Geological Survey's Amdahl Corp. computer on a time-sharing basis, Boldt said. "The [royalty accounting system] software was over 25 years old and had been patched continuously," he said. The aging system produced confusing account statements that were difficult to interpret, he said.

The government was unable to identify or track late payments, nonpayment and underpayment. There was no way to reconcile the statements received from the lessee or royalty payer with the production reports received from the operators of a mining well, he added.

To make matters worse, the number of federal and Indian leases had increased from 11,127 in 1968 to more than 30,000 by 1983, Boldt said. Some royalty payments were taking three months to process, he added.

From 1971 to 1983, royalty collections on complex marketing agreements and pricing arrangements leaped from $480 million to $4.5 billion, an increase of more than 800%, he said.

Program consolidation

Boldt said the improved royalty management program was launched in 1980 to design AFS and a Production Auditing and Accounting System (Paas), also designed by AMS. The eight regional offices that had administered the old system were consolidated into a new facility, the Royalty Management Accounting Center, here in July 1981, he said.

Under the old system, companies submitted sales, royalty and production reports each month, Boldt said. AFS requires one report from the lease operator that consolidates the sales and royalty data, he said. Companion production reports feed Paas, which reports on production for a lease from extraction to sale, he said.

Payers for each lease are given an account identification, and every selling arrangement is pinpointed, Boldt said. Should one organization pay royalty on behalf of all the overriding interest holders, as often happens, the account is maintained for that organization, he added.

Revenue tracking

MMS can track a revenue source through the entire system from payment receipt to distribution of the royalty, Boldt said.

Each of the interest holders in a mining well may make a separate selling arrangement, and each may receive a different price for output from the same rig, he explained.

The system can identify underreporting or nonreport-

See AFS page 31

IBM's best efforts are now going into Macintosh.

Macintosh and IBM PC software. Compatible at last, thanks to MacCharlie, a rather innovative coprocessing system.

And imagine the consequences.

Nearly 10,000 IBM PC software programs designed for general business and specific applications in real estate, insurance, law, medicine, banking, etcetera, can now join forces with Macintosh's own popular programs.

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You see, MacCharlie delivers hardware compatibility, as well. For example, IBM letter-quality printers can be easily used with Macintosh.

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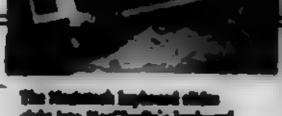
In other words, your networking capability goes beyond the Apple family.



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Once you plug in MacCharlie's power and keyboard cords, you're ready to enjoy a very happy marriage.

June meet to eye Mac

SAN FRANCISCO — Apple Computer, Inc. Chairman Steven Jobs and Chief Executive Officer John Sculley will be among the speakers at Macforum '85, to be held here June 26-27 at the Hyatt Regency Hotel.

The conference, which will examine Apple's Macintosh Office strategy, is sponsored by Future Computing, Inc., a Dallas-based market research firm. Other speakers will include Dennis Hayes, president of Hayes Microcomputer Products, Inc., and William Gates, chairman of Microsoft Corp.

The registration fee is $800. More information is available from Future Computing, 8111 LBJ Freeway, Dallas, Texas 75251.

PAY

from page 30

ing, and its reporting functions keep the MMS staff informed at all times on account status, Boldt said. In addition, the system will automatically identify situations where audits are warranted, he added.

Royalty distribution

The distribution of royalty amounts is recorded as soon as the sales and royalty reports are received, although actual disbursement can be made at a later date, Boldt said. As long as the total amount collected matches the amount prerecorded to be disbursed, AFS will automatically disburse royalties to the various federal agencies, states and Indian tribes, he said. When the distribution of the royalty is recorded, the amount of the windfall profit tax is also calculated, he added.

When the system was first installed, hundreds of millions of dollars were suspended each month because of an error rate of approximately 40%, Boldt said. MMS has cut the error rate to 12% and is aiming to reduce it to 5% by early 1986 because the agency ultimately must pay states and Indians interest on the payments distributed late, he explained.

Paas, now in operation with 14 companies of various sizes, gives MMS the ability to reconcile production data with sales volume and royalty payment information, further improving the agency's ability to determine the precise amount of royalty due from a lease, Boldt noted. Paas will compare what the royalty payer says was sold with what the operator of a mining well says was produced, he said.

Bonus accounting

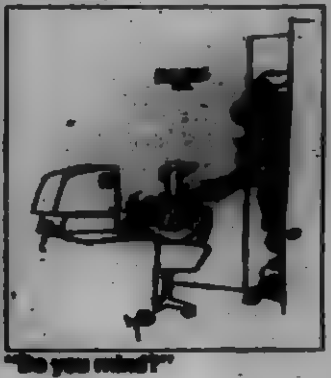
The Bonus and Rental Accounting Support System (Brass) evolved during the development of AFS and Paas when the responsibility for bonus and rental accounting for domestic minerals was transferred from the Bureau of Land Management to MMS, Boldt said.

Brass tracks information on approximately 144,000 nonproducing leases, he said, and computes how much is due in rents for each. It is compatible with AFS and adds its data to the AFS data base as each lease begins producing — when rentals end and royalties start — so that collection and accounting for royalties can begin.

AFS, Paas and Brass run on six Digital Equipment Corp. VAX-11/780 computers, Boldt said. Three are needed for AFS, one is used for testing and development and Brass and Paas run on one each of two that belong to MSS but are located at AMS' facilities, he added.

The systems are helping to eliminate underreporting, estimated at 1% to 2%, or $100 million to $150 million, per year, which Boldt said he ultimately hopes to recover.

"The main problem with the system is lack of capacity," he explained. "There is not enough on-line time, and our production cycles consume almost all the available batch mode time." MMS now has a request for proposal out for a mainframe so that it can handle all the modules on one system.



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TURNAROUND TIME

Larry Long

Q A month ago I hired a consultant who professed to be an expert in microcomputers and office automation.

She just submitted a bill for $6,000 covering the first month's work — I fired her on the spot. She was to have helped us establish a microcomputer policy, use her technical expertise to help us network clusters of micros and set up an educational program to help our users become more comfortable with personal computers.

She spent a lot of time on-site talking with almost everyone in the company and "reviewing" (I think learning) our software packages. For our $6,000 she has "a good understanding of what we do."

We assumed that she was on track and about ready to put everything together. But as of two days ago, she had nothing to show us. It was then that we realized that we were getting nowhere with this consultant. Is there any recourse to hiring an incompetent consultant?

If it's not too late, don't pay her. Otherwise, write the fee off as a contribution to experience and plan to be more involved with the next consultant's activities.

The next time you retain a consultant, make it clear that you expect results. If you are paying top dollar for experience and know-how, you should see some visible signs of progress each day.

For example, a good consultant would have examined needs and prepared a draft microcomputer policy for your review by the end of the first week. Total billable time for such an activity should be between one and two days.

Q My staff and I give presentations almost daily to users groups, the systems advisory committee or management on topics ranging from technology updates to budget proposals. Most of the meetings are no more than 1½ hours long. People have complained that we don't allow enough time for questions. How much time should be set aside for questions and answers?

The amount of time that you would allocate for interaction is directly proportional to the level of the audience. When making a presentation to top management, set aside about 60% of the planned time for direct interaction. Set aside 40% of the presentation time for interaction during mid-level management presentations and 20% for presentations to operational-level personnel.

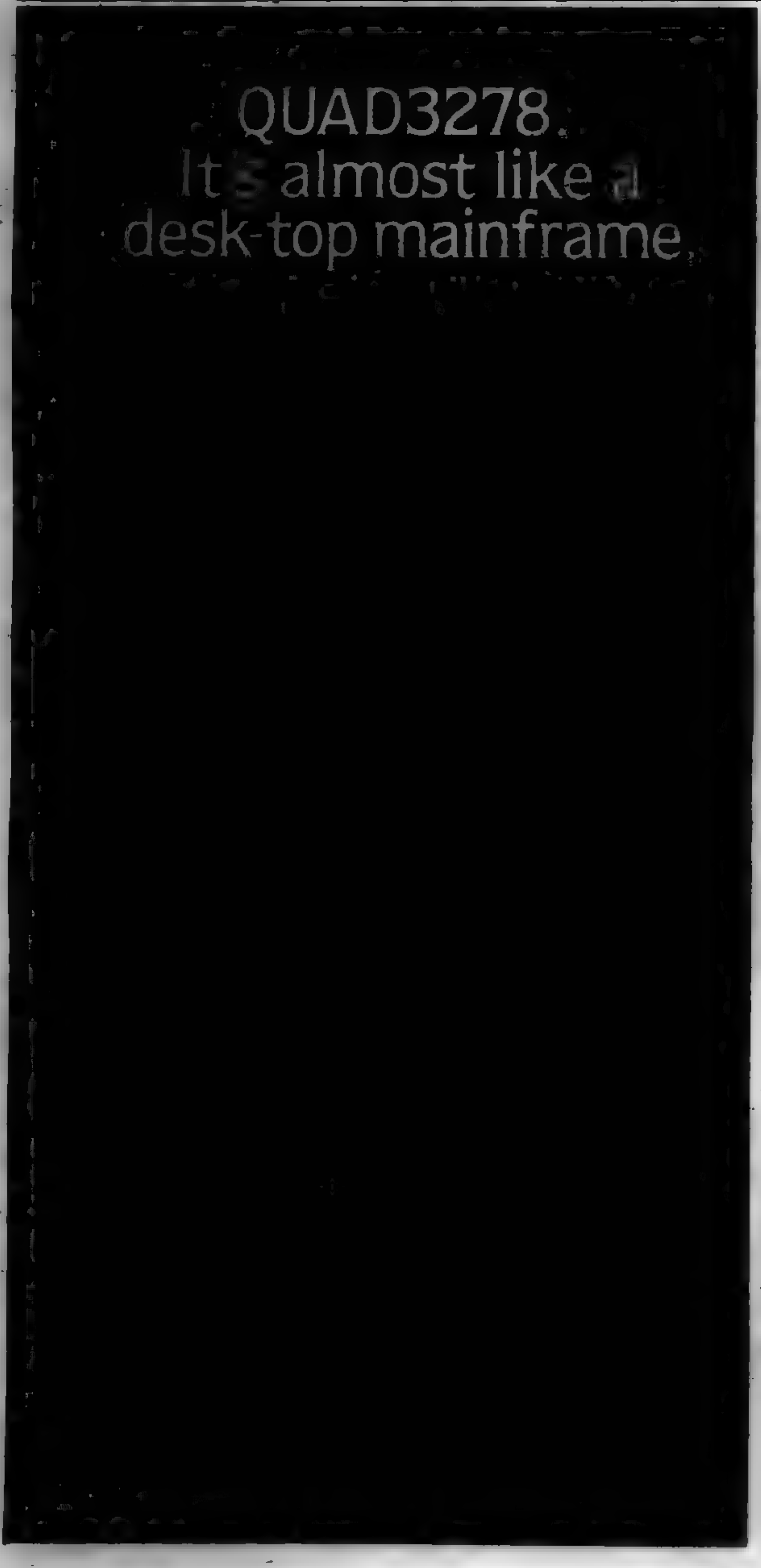
Q Two years ago we were a company of 25 people; today we have over 100 and are growing rapidly. I am the chief financial officer and am also charged with the responsibility for automation. However, we have no computer center and I have very little knowledge of how computers are used outside of accounting and finance. Each division purchases whatever hardware and software they need to do business. As a result, we are decentralized in our use of computers. Fortunately, we have state-of-the-art hardware from a single vendor.

Our vendor has recommended that we purchase a mainframe and centralize the information processing function. Just about everybody has told me that they like it the way it is.

Would you recommend that we move in the direction of centralization or continue as we are?

There is nothing wrong with decentralization as long as someone has control. However, your company may be on a one-way street to embedded, autonomous operations that will be very difficult and costly to integrate at some time in the future. It is important that you begin now to coordinate the growth of your computing resources.

I would recommend a "centralized decentralization" approach. Eventually, if not now, you will want to network your computers while maintaining decentralized operation. Work toward this goal by centralizing control of such things as hardware acquisition, software acquisition and data management, as well as various programming, communications and systems standards.



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CALL FOR PAPERS

1985 CAUSE NATIONAL CONFERENCE
New Orleans, Dec. 10-12, 1985

A call for papers has been issued for this national conference which will address the current state and future of higher education computing from a planning and management perspective through seven professional presentation tracks. They are as follows: Track 1: Policy Issues in Higher Education; Track 2: Planning for Information Technology; Track 3: Special Environments; Track 4: Telecommunications/Networking; Track 5: Microcomputer Issues and Applications; Track 6: People Issues in Information Technology; and Track 7: Managing Academic Computing.

You are invited to send abstracts for papers to be considered for presentation at Cause '85 or to propose a panel of colleagues to discuss the various aspects of any of these topics. The deadline for abstracts is July 15, 1985, and should be sent to Cause, 737 29th St., Boulder, Colo. 80303.

SEVENTH ANNUAL CONFERENCE ON EDP PERFORMANCE MANAGEMENT
Scottsdale, Ariz., March 1986

Papers are now being sought for this conference which will be held in early March. Presentations are requested for but not limited to the following areas: integrating business and information system planning; capacity management approaches; the impact of personal computers and end-user computing on capacity management; information system's role in raising user productivity; organizing for performance management/capacity planning; future trends in information systems/performance management; improving communications with users/management; charging, pricing and cost accounting; workload forecasting for capacity management; distributed data processing and communications management; capacity planning implications of information centers; service levels and service agreements; performance considerations in system design; data base management systems performance issues; productivity in systems development; and scheduling and production control.

Presentations should be management-oriented and approximately 30 minutes in duration. The deadline date is July 15, 1985. For more information on the conference, contact Applied Computer Research, Inc., P.O. Box 9280, Phoenix, Ariz. 85068.

EXPERT SYSTEMS IN CIVIL ENGINEERING
Seattle, April 7-11, 1986

This symposium will be sponsored by the Technical Council on Computer Practices, American Society of Civil Engineers. The three main themes for the symposium are as follows: tutorial on expert systems; application of expert systems to civil engineering; and developments in expert systems in civil engineering.

Prospective authors are encouraged to submit 200-word abstracts to Dr. Celal N. Kostem, Fritz Engineering Laboratory, 13, Lehigh University, Bethlehem, Pa. 18015; or Dr. Mary Lou Maher, Civil Engineering Department, Carnegie-Mellon University, Pittsburgh, Pa. 15213. The deadline for the submission of abstracts is August 1, 1985.

THE OFFICE SYSTEMS RESEARCH ASSOCIATION'S (OSRA) FIFTH ANNUAL RESEARCH CONFERENCE
Houston, March 22-23, 1986

A call for papers has been issued by the conference chairman for this fifth annual conference. The list of suggested topics includes but is not limited to the following areas: planning and conducting effective research projects; data gathering and analysis techniques; office automation case studies; office automation overviews; behavioral and psychological implications of office automation; environmental factors in the automated office; the impact of the microcomputer on office systems; new and emerging OA technologies; career opportunities in OA; collegiate education for the automated office; white-collar productivity; OA implementation strategies; factors involving VDTs; graphics; networking; and on-site vs. off-site office automation.

Papers and proposals should be submitted by August 15, 1985 to Mary K. Ruprecht, Conference Chair, Osra, 140 W. Myrtle St., Duluth, Minn. 55811.

INTERNATIONAL FEDERATION FOR INFORMATION PROCESSING SOCIETIES (IFIPS) '86 : 10TH WORLD COMPUTER CONGRESS
Dublin, Sept. 1-5, 1986

Ifips, the sponsor for this 10th computer congress, has issued a call for papers. The program has been divided into four main streams: design of components, applications, design of systems and informatics in a developing world. Within each of the four main streams there will be specialized subsections such as theoretical computer science, software engineering, distributed systems, artificial intelligence and computer-integrated manufacturing.

Papers are due no later than Sept. 1, 1985. For additional information, please contact David M. Hyatt, Data Decisions, Inc., 20 Brace Road, Cherry Hill, N.J. 08034; or Philip H. Dorn, Dorn Computer Consultants, Inc., 25 E. 86th St., New York, N.Y. 10028.

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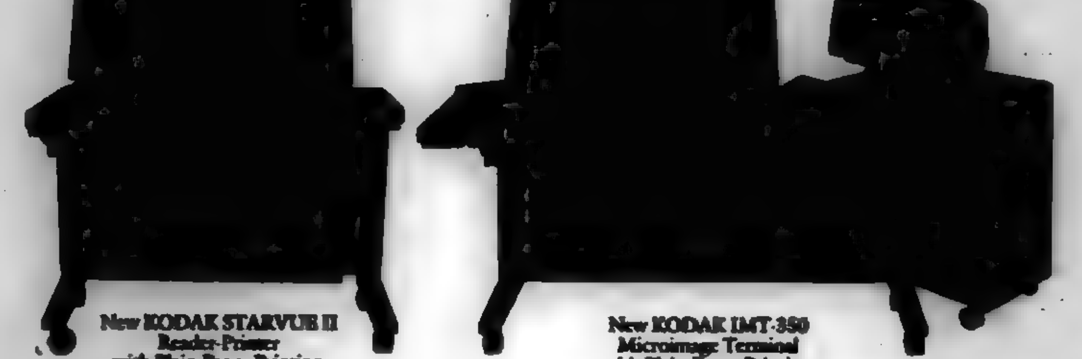

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CALENDAR

WEEK OF JULY 7

JULY 8, PARSIPPANY, N.J. — **Introduction to the Personal Computer and Personal Computer Software for General Business Audiences.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 8-9, BOSTON — **Successful Teleconferencing Systems.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 8-9, WASHINGTON, D.C. — **International Arms and Technology Transfer.** Contact: Technology Marketing Society of America Seminars, c/o Technology Training Corp., Department IATT, P.O. Box 3608, Torrance, Calif. 90510. Also being held July 18-19 in Boston.

JULY 8-10, PARSIPPANY, N.J. — **Job Control Language.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 8-10, BALTIMORE — **CICS Command-Level Programming.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

JULY 8-11, LOS ANGELES — **CICS/VS MRO/ISC.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 8-11 in Chicago, July 22-25 in San Antonio and Denver and July 29-Aug. 1 in Fort Lee, N.J.

JULY 8-11, SAN FRANCISCO — **CICS/VS Application Design.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 15-18 in Boston, July 22-25 in Atlanta and July 29-Aug. 1 in Chicago and Los Angeles.

JULY 8-11, ATLANTA — **Vsam: Its Structure and How to Use It.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 8-11 in Los Angeles and July 15-18 in San Antonio and Fort Lee, N.J.

JULY 8-11, BOSTON — **CICS/VS Logic and Debugging.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 8-11 in San Antonio and July 15-18 in Los Angeles.

JULY 8-11, NEW YORK — **Vtam: From Start to Finish.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 8-11 in San Antonio July 15-18 in Washington, D.C.; and July 22-25 in Los Angeles and Fort Lee, N.J.

JULY 8-11, FORT LEE, N.J. — **IMS/DB (DL/1) Application Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 29-Aug. 1 in New York.

JULY 8-12, WASHINGTON, D.C. — **CICS/VS Internals.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 15-19 in Fort Lee, N.J., and in Los Angeles; July 22-26 in Boston and in San Antonio; and July 29-Aug. 2 in Atlanta and in Denver.

JULY 8-12, SAN FRANCISCO — **Structured Systems Analysis Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

JULY 8-12, DENVER — **CICS/VS Application Programming — Command Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 15-19 in Atlanta, July 22-26 in Chicago and July 29-Aug. 2 in Fort Lee, N.J., Los Angeles and Washington, D.C.

JULY 8-12, FORT LEE, N.J. — **CICS/VS Application Programming — Macro Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JULY 8-19, CHICAGO — **Pick Operating System Workshops and Seminars.** Contact: Jonathan E. Sisk, JES & Associates, Inc., P.O. Box 19274, Irvine, Calif. 92713.

JULY 9-10, SAN FRANCISCO — **Data Communications II: Digital Communications Systems.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 9-10, PARSIPPANY, N.J. — **Introduction to DOS for General Business Audiences.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07064

JULY 9-11, SAN FRANCISCO — **Telecommunications Management.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 10, LOS ANGELES — **IMS, CICS and DB2: An Overview for Managers.** Contact: Information Management Systems Consulting, Inc., Suite 305, 16601 Ventura Blvd., Encino, Calif. 91436.

JULY 10, LOS ANGELES — **IMS, CICS and DB2: An Overview for Managers.** Contact: Information Management Systems Consulting, Inc., Suite 305, 16601 Ventura Blvd., Encino, Calif. 91436.

JULY 10-12, NEW YORK — **Information Systems Architecture.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JULY 10-12, COLUMBUS, OHIO — **C Programming Language.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

JULY 10-12, SAN FRANCISCO — **Local-Area Networks for the**

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IBM World. Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

JULY 10-13, LAS VEGAS — **The 60th Annual Convention and Trade Show of the National Office Machine Dealers Association (Nomda).** Contact: Matt Kaufman, Nomda, 810 Lively Blvd., Wood Dale, Ill. 60191.

JULY 11-12, PARSIPPANY, N.J. — **Utilities/IDCAMS.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 11-12, DALLAS — **Information Centers: End-User Computing.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JULY 11-12, DOOR COUNTY, WIS. — **First Annual Midwest Summer Computer Conference.** Contact: Technology Consulting Corp., P.O. Box 43, Sister Bay, Wis. 54234.

JULY 11-13, TAIPEI, TAIWAN — **Asia-Pacific Regional Information and Micrographics Management Congress.** Contact: International Information Management Congress, P.O. Box 34404, Bethesda, Md. 20817.

WEEK OF JULY 14

JULY 15-16, ARLINGTON, VA. — **Micro Security '85.** Contact: Conference Registrar, Computer Security Institute, 43 Boston Post Road, Northboro, Mass. 01532.

JULY 15-16, AVON, COLO. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

JULY 15-16, DENVER — **U.S. West and Telecommunications in the Northwest and Rocky Mountain States.** Contact: Telestrategies, Inc., P.O. Box 811, McLean, Va. 22101.

JULY 15-17, PARSIPPANY, N.J. — **MVS Dump Debugging.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 15-17, ATLANTA — **Standard Network Protocols: International and National Packet-Switching Networks.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015. Also being held July 22-24 in St. Louis and July 29-31 in Boston.

JULY 15-18, CHICAGO — **The 1985 National Computer Conference.** Contact: Helen Mugnier, American Federation of Information Processing Societies, Inc., 1899 Preston White Drive, Reston, Va. 22091.

JULY 15-18, FORT LEE, N.J. — **IMS/DC (Data Communications) Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 22-25 in Washington, D.C.

JULY 15-19, SAN FRANCISCO — **Systems Workshop II.** Contact: Ware Associates, P.O. Box 948, Groton, Conn. 06340.

JULY 15-19, SAN FRANCISCO — **Structured Systems Design Workshop.** Contact: Elise Rabelais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2900 N. Loop W., Houston, Texas 77092.

JULY 16-17, LOS ANGELES — **Local-Area Networks.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 16-17, WASHINGTON, D.C. — **Software Defined Network and Alternatives.** Contact: The Yankee Group, 89 Broad St., Boston, Mass. 02110.

JULY 17, PARSIPPANY, N.J. — **Introduction to the Personal Computer and Personal Computer Software for DP Professionals.** Contact: Chubb Institute, 8 Sylvan Way, P.O. Box 342, Parsippany, N.J. 07054.

JULY 17-18, SAN FRANCISCO — **Financial Analysis for Telecommunications Equipment Acquisition.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 17-19, AVON, COLO. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

WEEK OF JULY 21

JULY 22-23, FORT LEE, N.J. — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 29-30 in Boston.

JULY 22-24, CHICAGO — **1985 Summer Computer Simulation Conference.** Contact: Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

JULY 22-24, CARY, N.C. — **SAS Micro Language.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

JULY 22-26, SAN FRANCISCO — **Siggraph '85: The Twelfth Annual Conference on Computer Graphics and Interactive Techniques.** Contact: Siggraph '85 Conference Services Office, 111 E. Wacker Drive, Chicago, Ill. 60601.

JULY 23-25, DALLAS — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

JULY 24-25, FORT LEE, N.J. — **Recovery/Restart.** Contact: On-Line Software International, Inc., Port Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JULY 24-25, DALLAS — **SAS Report Writing.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

JULY 24-26, WASHINGTON, D.C. — **Financial Information Systems: The New Generation.** Contact: National Institute for Management Research Seminars, P.O. Box 3727, Santa Monica, Calif. 90403. JULY 24-26, WASHINGTON, D.C. — **Financial Information Systems — Integrating Personal Computers.** Contact: National Institute for Management Research Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

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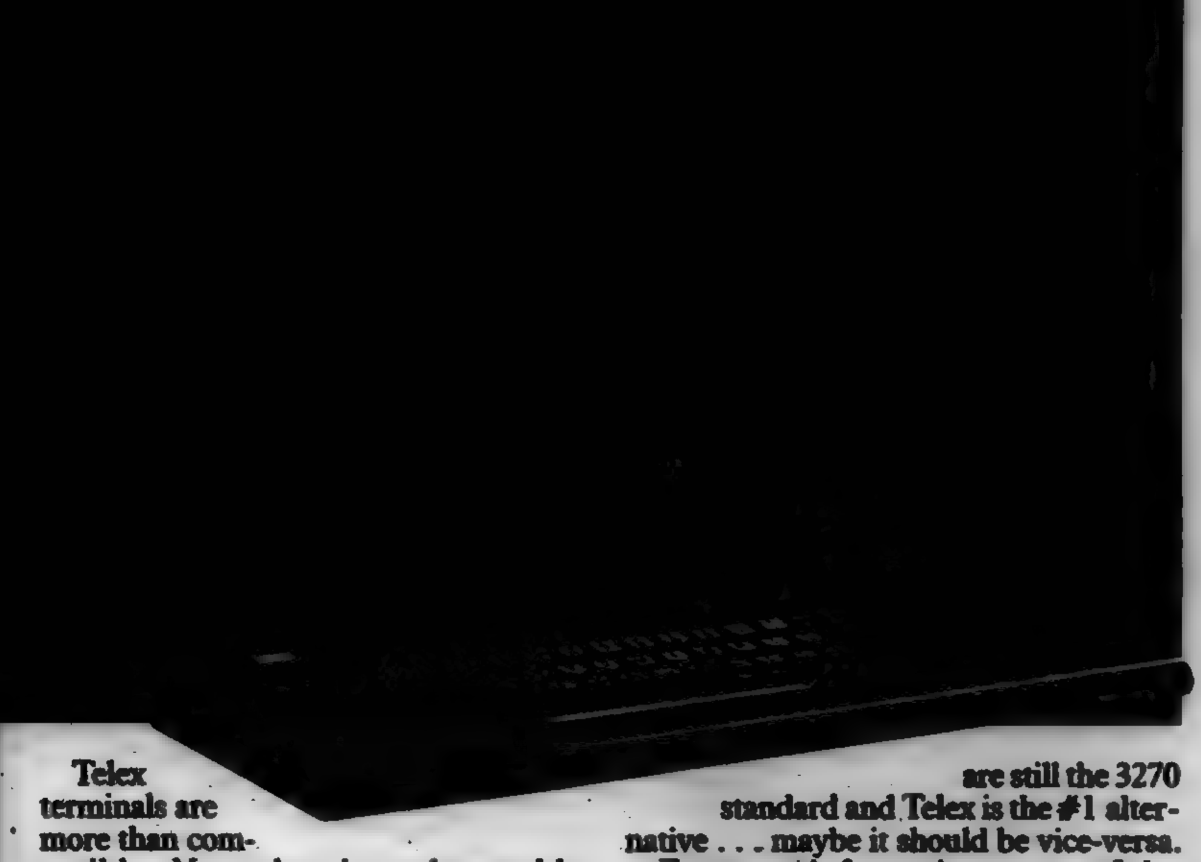

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EDITORIAL

Clarion call to a long war

The Association of Data Processing Service Organizations, Inc. has won the first battle in what promises to be a long war against software piracy.

Adapso recently announced an out-of-court cash settlement in which American Brands, Inc. admitted that its subsidiary, Wilson Jones Co., engaged in unauthorized duplication of three software products from Micropro International Corp. — Wordstar, Mailmerge and Spellstar [CW, June 3]. Adapso and Micropro had filed a 20-count complaint against the $7 billion American Brands in January [CW, Jan. 21], seeking $225,000 in damages and the return of any profits earned as a result of the alleged copying.

An Adapso spokesman said Wilson Jones agreed to pay an unspecified cash sum to Micropro and also agreed that "appropriate procedures will be instituted to [ensure] against such improper duplication."

We — and apparently Adapso, too — had expected the suit to travel a long path through the courts. The out-of-court settlement, while anticlimactic, nevertheless dramatizes the serious intent of software vendors to prosecute those who illegally copy software, even though theft occurs without the knowledge or acquiescence of corporate executives, as in the American Brands' case.

Software piracy is big business in this country. Roughly half of all microcomputer data base, spreadsheet and word processing programs in use are illegally copied, according to a study by Future Computing, Inc. [CW, Jan. 21]. Illegal software duplication cost U.S. vendors an estimated $1.3 billion in lost revenues from 1981 to 1984 and is expected to cost them another $800 million this year. The validity of the numbers in this study has been attacked, but the numbers nevertheless give some indication of the magnitude of the problem.

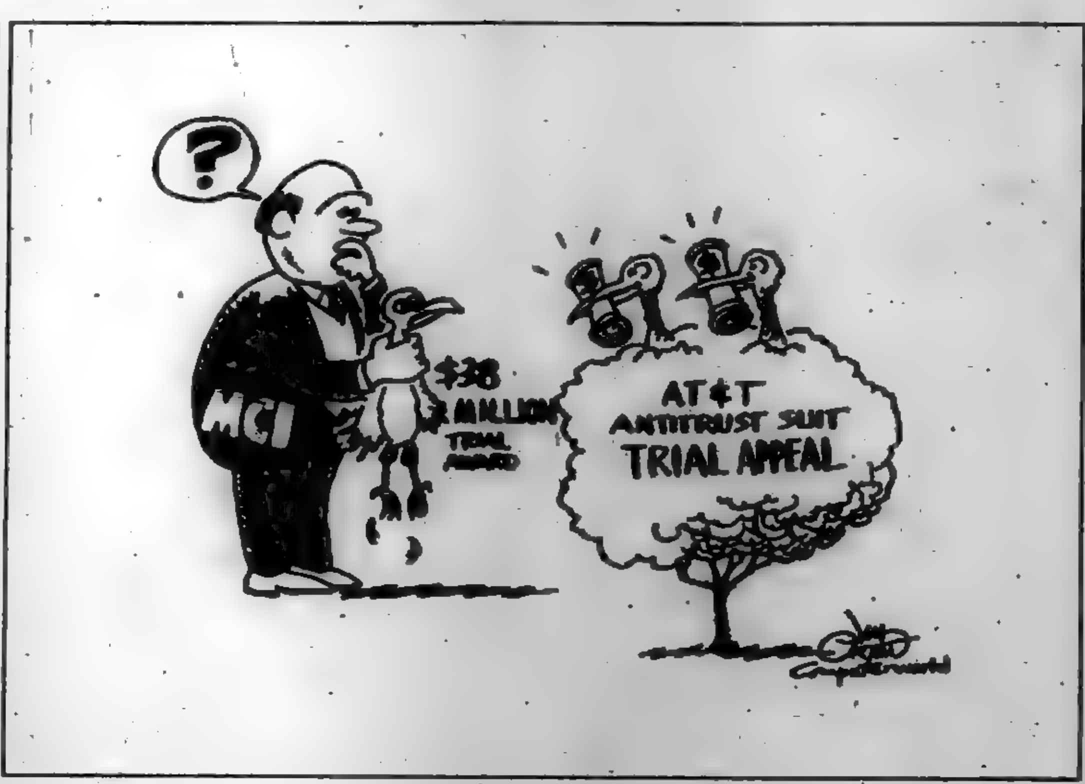
Considering the vast sums at stake and the success of the Adapso filing, we would expect more lawsuits to follow. Not that prosecution is the best way to proceed. Marv Goldschmitt, vice-president for business development at Lotus Development Corp. and chairman of Adapso's Software Authorization Committee, said that a lawsuit is a last resort for preventing piracy and is the least desirable tactic. But that tactic does seem to get the attention of top corporate executives.

Meanwhile, Adapso is also proceeding with an extensive publicity campaign. The association has mailed about 60,000 brochures to chief executive officers and chief legal counsels, detailing liabilities of software piracy and urging establishment of formal antipiracy policies.

The third prong of attack is the association's controversial proposal for a microcomputer software protection key scheme that is now only in draft form but is already meeting resistance from the user community.

Each of these steps may help combat software piracy in the short term. But even the American Brands case has left one question unanswered: Who is ultimately responsible for custody of software? The CEO? The data processing department? The end user? The manufacturer?

We encourage Adapso to continue its antipiracy efforts, whether they be through public relations or legal action. The long war has just begun.



LETTERS

DOD's resources not so abundant

In the column "Credibility gap undermines user confidence" [CW, April 8], the author may know the U.S. Department of Defense "to possess truly unlimited funding for data processing power and all the management and technical brains to go with it," but I didn't see much evidence of it while I was on active duty in the Air Force from 1972 to 1976.

I started my duty working on Sage, a vacuum tube museum piece that managed air defense until 1982. The machine had a 6 million instruction/sec. cycle time. It was rumored that spares were to come from Czechoslovakia, because no free-world company made the tubes.

I moved from Sage to a relatively modern Honeywell, Inc. 200 with a tape-based operating system. The printer was used constantly for up to eight hours a day when it wasn't broken, and it was broken often. In order to replace it with a surplus printer from another site, I had to go through heck. First, I got the Honeywell maintenance manager to refuse further contract maintenance on it. Then, I got the environmental engineers to certify it as a noise hazard. Then, I had to get a price from Honeywell on refurbishing it at the factory. Finally, I got lucky and knew the captain who had to OK the deal at higher headquarters. He took my word for it that the printer had to go. The cost I was justifying was $25/mo in increased maintenance. Honeywell hated the old printer so much that it had offered free installation on anything I could get that was in better condition.

My point is that the computer resources in the military were neglected systematically from the

See LETTER page 42

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VIEWPOINT

The heroes, victims of technology's fantasia

LECHT ON SCIENCE
Charles P. Lecht

This column is dedicated to the growing legion of information systems managers. To those of them still with us, I offer a hymn of praise to their survival capabilities. To those who have given up the ghost in their struggle to keep afloat in the technological flood of the '80s, this is a requiem.

Today's information systems manager may be forgiven if he is found treading water or even swimming against the current in the mighty river of technology that is gushing into corporate facilities. Managing its effective application and looking like you know what you're doing is no easy job. The increased arrival speed of cost-effective innovations is shortening the time periods that may be covered by plans so much that information systems managers seem myopic to their superiors.

As the definition of "long range" condenses from five years to three, two or even one year and the definition of "short range" does so commensurately, the number of disruptions in information systems production rise. Many top managers don't consider that the net effect of each disruption and the cumulative net effect is diminishing on an annual basis.

The old system conversion process was a traumatic event and frequently involved tossing the manager out with the replaced system, as if this would lessen the trauma.

Times have changed. Any shortsightedness around these days is likely to be found upstairs. Most corporate officers act surprised when they are informed that conversion to a new system is required and that production will decrease as a result. In the past, the officers could defer both by sending the manager who asked for the conversion on a quest from which many hoped he'd never return. Today, many have found that deferment may be dangerous to their corporations' health and to their benefits and are thinking twice about sending anyone on such a quest for too long.

Two questions to be answered

The quest involved a fact-finding mission to help corporate management decide whether or not the manager's request was to be honored. The subsequent report was always boiled down to answering two key questions: The first was whether a date could be predicted when the preconversion production levels could be surpassed; the second related to whether the newly installed system would last long enough to obtain a profit. Answering either question was predicated upon a marketplace that, in some way, was synchronized with production and where little surprise could be expected from the competition.

Today's corporate management demands that conversions to new computer and communications facilities be justified by classic return on investment criteria, and this can impede the corporate information systems department enough to render it useless.

The pace at which new and cost-justifiable hardware has entered the user marketplace verifies this conclusion. Consider the IBM Personal Computer line: The speed with which IBM's Personal Computer AT followed the Personal Computer and Personal Computer XT was dazzling.

Most corporate officers are used to receiving a plan that answers the two questions I mentioned, but they are truly unable to understand why it's getting harder and harder for the information systems manager to provide those answers. In the time it may take to gather this information, a generation of hardware improvements may have been missed. There are those who call for a slowing of the pace of hardware introductions to remedy this, but any purposeful retardation of technological innovation is unthinkable these days.

Predictions become dicey

It doesn't take too much imagination to see that predictability in the creation of corporate information systems plans must suffer in today's fast-moving scene. It takes so long to create such plans in some corporations that, once the plans are approved, the manager attempting to do so appears more of a historian than a planner. It is unfortunate that predictability is being eroded by change just when management practice in the appraisal of employee performance is so stagnant. It makes any sort of risky prediction dangerous to the planner's career.

Our industry has never been known for its predictability. Even in the best of times, creating plans and asserting their lasting quality has always been considered adventurous if not dangerous. Making predictions today — especially those labeled as long range — is, no doubt, riskier than ever.

Perhaps the only thing predictable today is that managers who create such plans will have to defend them by facing the fire of corporate politics. Many of those who do will be sent to a firing squad of incompetent corporate politicians. If retirement benefits are at stake, the politicians will be accompanied by their watchdog lawyers to ensure that their victims die of poverty, whether or not they deserve it.

We can only offer our prayers to the brave manager who still believes in corporate heroism and still attempts to create long-range plans while swimming in a technological flood. And we praise him if he finds himself labeled as more than stupid. And if his reward is to be labeled as nothing more than a janitorial Mickey Mouse, unable to comprehend today's fantasia of sweeping change, we say better luck next time.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Advanced DP training requires attitude adjustment

HUMAN CONNECTION
Jack Stone

A short while ago, I had the dubious pleasure of conducting a hands-on training class in "advanced" data processing systems for a contingent of office administrators employed by a large organization. The prerequisites for entry included formal class work in word processing on the same equipment, plus a minimum of six months hands-on experience in word processing applications.

Unfortunately, the entry requirements were not nearly stringent enough — but not in areas that I had anticipated. What my group members needed was some attitudinal realignment before they were allowed to attend the session.

All of the attendees were indeed knowledgeable of the basic WP functions: create, edit, print and others. But the members of the group were woefully short of the capabilities that fell in the general realm of "advanced" functions — those skills necessary for effective use of the data processing system — even though most of them had used the equipment for more than two years.

> ”
>
> *Is allocating some of your personal time to your employer's computer training endeavor too great a sacrifice?*

In a way as tactful as possible, I asked the class its views on why there exists a lack of knowledge of the advanced functions. Our dialogue on the subject went something like the following:

Class: "Our organization is responsible for providing users with the training necessary to perform on the job. Management arranges for basic training both on the premises and with outside vendors, but we nevertheless need classes in many of the advanced topics. Without such classes, we are unable to learn how to use the equipment in these areas."

Class leader: "I don't believe you're giving yourselves enough credit for your intellectual ability. After all, the hardest part of word processing is to develop typing skills. Thereafter, the functionality is virtually all automatic. Naturally, you must learn what buttons to push to achieve processing objectives and extend your thinking a tad beyond conventional word processing, but is this all beyond your learning disciplines?"

Class: "Of course not, but we are not given time off to pursue training on our own. We are completely occupied by the day-to-day pressures, and any lull in the workload is used for breathing purposes and not for learning new computer bells and whistles."

Class leader: "What is the difference between your working environment and those environments elsewhere? Office workers everywhere have their shoulders to the grindstone and are being directed to turn out more product in less time with fewer compensations.

"There is an alternative way to handle training. Perhaps it is an anathema in today's office world, but there is the concept of investing your own time, outside of business hours, to learn new features and capabilities of the machinery. After all, there are vast numbers of office professionals to be trained in a wide range of information-handling subjects, and the needs are certainly ongoing as systems are updated. Surely, one's employer cannot be expected to foot the entire bill for computer training, particularly because the individual benefits from the experience beyond the confines of the current job. Doesn't it make sense for the employees to share in this responsibility and commit some of their own time to the process?"

Class: "But you don't understand. We put in a very long day, and we are exhausted by the time we drag ourselves through the front door at night. This is hardly conducive to sitting in front of a terminal and/or reading high-tech literature. Furthermore, we want to spend more time with our families and less time worrying about the job. Finally, most of us are in car pools and it would be very inconvenient to stay late in the office."

Class leader: "I fully recognize the difficulties and problems associ-

See CLASS page 42

Stone is a Washington, D.C.-based independent management consultant, educator and writer, specializing in DP human communications and personnel development.

LETTERS

Take a look at the market

I would like to respond to several points Adam Osborne made in his letter "Pundits' analyses refuted" [CW, May 13].

First, I made no attempt to "tell the world inaccurately what [Osborne is] doing." I merely stated my view of the software marketplace, which happens to differ markedly from his.

Second, I stand by the statements I made in the article to which Osborne referred [CW, March 18]. There may exist a small segment of potential word processing software purchasers who are willing to accept limited functions based on a six-year-old technology. However, Infocorp's studies show a significantly larger segment of word processing buyers are willing to pay for advanced functions.

Osborne should know from painful past experience what happens to a computer company that attempts to foist products based on outdated hardware technology on an increasingly sophisticated buying public: The public buys the new technology.

The same is true for software. Document processing software that features scanned input of both text and images, electronic mailing to noncompatible word processors, combined text and graphics editing, built-in arithmetic, laser printer support with a wide variety of fonts, form-letter generation facilities and built-in spelling and grammar correction will be commonplace within a year. When Osborne's company ships a fully tested, well-documented, bug-free software package with all of these features for less than $100, I will be the first in line to buy a copy.

Robert M. Lefkowits
Cupertino, Calif.

Good luck with personnel

I feel so sorry for David Dorbandt from the description in the article "Out of work at 46, manager sets DP skills on new course" [CW, May 6]. He, of course, has the right attitude and a positive outlook.

However, no one has the slightest interest in his theory that his experience is transferable and that he is a highly skilled, well-trained manager of high-technology computer projects.

Most of his time and effort will be directed at communicating with the world's greatest ignoramuses: personnel departments.

These infamous (and justly so) dunderheads will have absolutely no idea what Dorbandt is talking about nor will they care. Their only interest will be in filling a job order to the letter. Dorbandt will never speak with a technically oriented person with the authority to hire him unless a minor miracle occurs.

Again, I wish him great luck in his search, but he is better off if he agrees to take half his last salary and learn how to type and shuffle a lot.

L. A. Brown
New York

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or fewer. Letters may be edited for the purposes of clarity and brevity. Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

CLASS from page 41

ated with self training on an after-hours basis. On the other hand, the reality of the situation is simply that most organizations do not have the resources to conduct lengthy training programs and that most future needs will have to be met from your own initiatives. Nearly all employers will provide access to machines, textbooks and ancillary self-training materials at no cost to the employees, which is certainly a major contribution. Is allocating some of your personal time to the endeavor too great a sacrifice?

"You will surely benefit from your labors since the added knowledge will hardly hinder your work productivity or professional development. As a final note, the success of many computer professionals owes, in part, to endless days and weeks of home study, which is considered an essential part of the job." ‡

LETTER from page 40

start of the war in Viet Nam until roughly 1960. The lower level people, from company grade down, struggled mightily to keep the junk running. The field-grade officers (majors and above) were mostly former pilots and radar surveillance types who didn't realize how bad the situation was or tried to keep a stiff upper lip in the face of disaster. Congress would fund only weapons procurement and not too much of that after 1972.

The procurement systems that everyone complains about now were definitely among the systems neglected. Until recently they were based on punched cards.

The lessons to be learned from the current DOD credibility problems are relevant to the costs associated with postponing system modernization in order to save on current expenses. In the long run you get creamed because your systems fail to provide needed information.

MIS managers faced with such cuts should make sure they explain the risks to senior management and get the heavy hitters to take the responsibility, preferably in writing. MIS managers who fail to make clear the long-term costs of delayed modernization will experience the "credibility gap" that the DOD has now.

Douglas Baker
Wilmette, Ill.

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IT'S ABOUT TIME AND MONEY YOU SAVE by getting on line immediately with DIALMUX, the new 5 channel switching multiplexer which uses the regular dial-up telephone network.

With the DIALMUX, once an automatic dial-up connection is established, up to five users can simultaneously communicate and share the same 2400 baud data connection. Since the telephone line charges are based on the duration of the connection, in essence, five calls can be made for the price of one.

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Features include:
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To receive more information about the DialMux, LineMux or DialSafe Security products, contact your local distributor or call collect (408) 279-8711.

To Be Successful In Information Management, You Need More Than Just The Right Connections.

Connectivity. The buzzword of the year. Everybody's talking compatibility, multi-user interfaces, and integrated applications.

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It's more than a matter of stringing cable. The goal is deceptively simple. You and your people need desktop access to the information and the software and hardware tools you use to do your job. Even more important than choosing the right connections is how you use those connections. Managing information flow. Controlling data access. Allocating shared resources. Integrating applications. These are the tasks that will determine the success of your information management system.

And here's where Datapoint comes in. Take our Resource Management System.® The heart of the Datapoint® ARC® local area network. In fact, the Resource Management System is the first operating system designed specifically to take advantage of the power of local area networking. And it's at least a generation ahead of all the others.

Powerful Resource Management. Powerful enough to integrate the most complicated data processing applications with the most commonly used office automation tools. Of course, all this sophistication is totally transparent to your users. From any desktop workstation, they simply select the tools they need to make them more productive. Even if that workstation happens to be an IBM®-PC.

Flexible Resource Management. You can add, shift or remove workstations, peripherals, and software applications without bringing the rest of the system down. Without reprogramming. And, most importantly, without affecting your users' productivity.

The right connections—and more. From our pioneering efforts in distributed data processing to the world's leading local area network, the secret to the Datapoint success story is this unique combination of technological innovation with a singular focus on business productivity. If you're looking for the right connections in information processing—and more—call us toll free at 1-800-334-1122.

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INTRODUCING

THE NEXT STEP FORWARD — A UNIQU

Recently, AT&T Information Systems introduced a product destined to set a new standard for business computers.

Its name: the AT&T UNIX PC Model 7300.

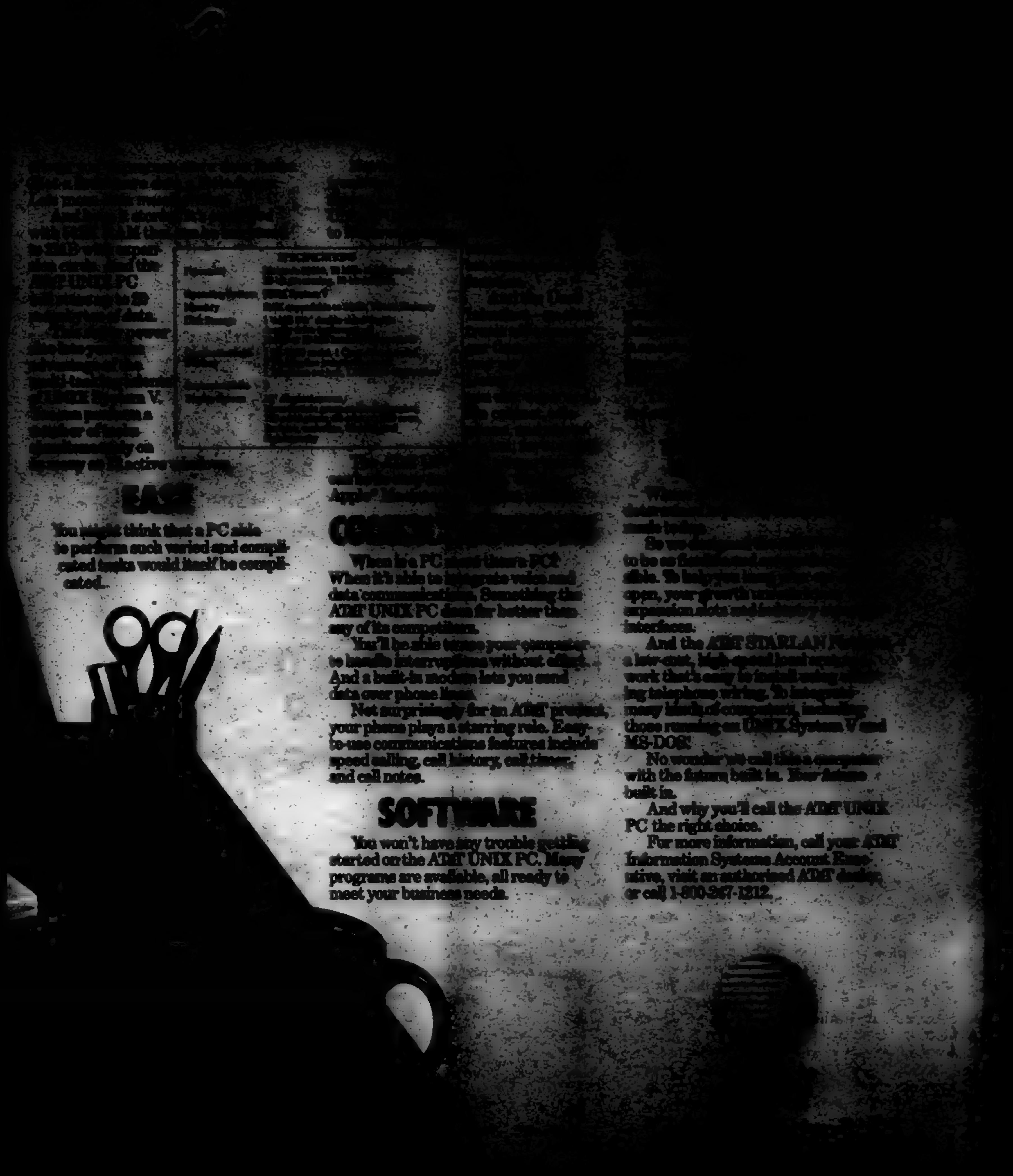
What places this PC so far out in front? Extraordinary power *and* exceptional ease of use *and* unsurpassed communications capabilities *and* maximum flexibility.

The operative word is "and." No other PC offers so much at once. No other PC offers this high-performance combination.

No other PC even comes close.

POWER

UNIX System V is the key to the power of the AT&T UNIX PC. It



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And [illegible] with [illegible] RAM [illegible] to 2MB with expansion cards. And the AT&T UNIX PC [illegible] to 20 [illegible] of data.

[illegible] also lets you take advantage of the multi-tasking [illegible] of UNIX System V. [illegible] a number of tasks simultaneously on as many as 12 active windows.

SPECIFICATIONS

[illegible]

[illegible] to [illegible]

And the [illegible]

[illegible]

The AT&T [illegible] Apple® Macintosh [illegible]

EASE

You might think that a PC able to perform such varied and complicated tasks would itself be complicated.

COMMUNICATIONS

When is a PC more than a PC? When it's able to integrate voice and data communications. Something the AT&T UNIX PC does far better than any of its competitors.

You'll be able to use your computer to handle interruptions without effort. And a built-in modem lets you send data over phone lines.

Not surprisingly for an AT&T product, your phone plays a starring role. Easy-to-use communications features include speed calling, call history, call timer, and call notes.

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You won't have any trouble getting started on the AT&T UNIX PC. Many programs are available, all ready to meet your business needs.

When [illegible] data [illegible] made today.

So we designed [illegible] to be as flexible [illegible] sible. To help you keep [illegible] open, your growth [illegible] expansion slots and industry [illegible] interfaces.

And the AT&T STARLAN N[illegible] a low-cost, high-speed local [illegible] work that's easy to install using [illegible] ing telephone wiring. To integrate many kinds of computers, including those running on UNIX System V and MS-DOS.*

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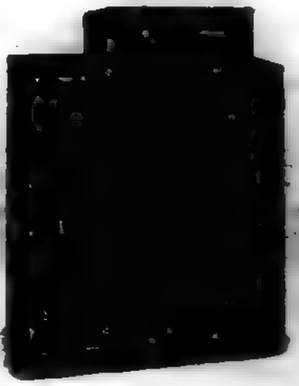
Thin-film head assembly no. 100,001.

An event that confirms our commitment to advanced disk technologies.

Once upon a time, disk ferrite heads were standard issue. So were disk drive products that couldn't be upgraded. What you had was what you had—forever. Ferrite head technology is still around but it's limiting. Using ferrite heads, the way to increase disk capacity is to add more heads and more platters. Adding more heads and platters also means more things to go wrong and costs will go up.

Advances in disk technology are contingent upon getting the bits closer together on the same platter so available space on the disk is more fully utilized. At Storage Technology we anticipated the future. Three years ago we moved up to thin-film head technology, and established a base from which we could expand our family of 8380 disk drive products. With four heads in each assembly, our base now includes more than 400,000 individual thin-film heads. No other independent supplier can make this claim.

It takes good technology to make good products.



Thin-film head assemblies allow us to increase track density beyond the 1000-tracks-per-inch barrier. We put the tracks closer together to increase data capacity and reduce the cost per megabyte of data storage. Thin-film heads are standard issue at Storage Technology. This technology is the foundation of our 8380 family of disk drives.

If you already have our 8380s, you made a better investment than you thought because our 8380s have used thin-film heads from the beginning. And, our 8380s are field upgradeable to the latest family enhancement, the dual-capacity 8380E.

We're manufacturing head disk assemblies; we're using them in our products; we're committed to disk technology—yesterday, today and tomorrow.

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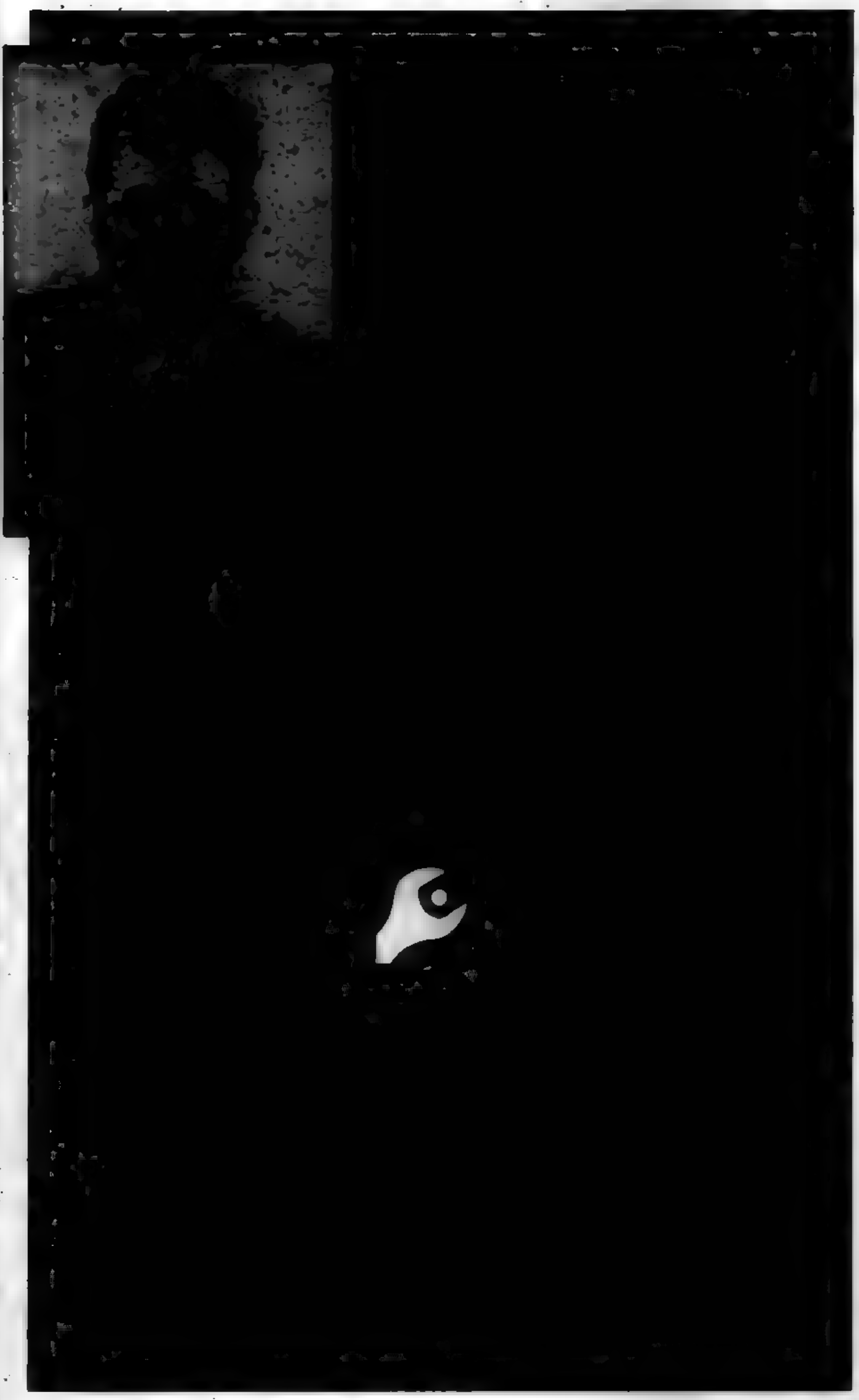
It's Our Commitment.

SOFTWARE & SERVICES



SOFTLINE/WILLIAM INMON

Dual data base: the right step?

One of the major issues facing many DP shops today is the dual-data base dilemma. To have dual data bases or not to have them; that is the question.

The dilemma stems from the belief that shops should have one data base management system for operational processing and another for decision support or information center-type processing. Some vendors loudly proclaim that the single data base approach is the best solution, while

See [illegible] page [illegible]

Inmon is a director at Coopers & Lybrand in Denver, a noted author on the subject of data base design and a regular contributor to Softline.

DSS buyer — Know thyself

By [illegible]
CW Staff

WASHINGTON, D.C. — Selecting the right decision support system (DSS) means knowing first how decisions are made within your company.

At a recent Digital Consulting Associates, Inc. seminar here on DSS, the instructor, John Wark, director of systems software for Walker Interactive Products, Inc., advised managers to examine carefully the way users communicate data before they establish the criteria to be used in selecting a DSS package. If managers are currently exchanging hard-copy graphs and financial spreadsheets, for example, those capabilities should be emphasized in the DSS, he said.

And, to be most effective, a DSS pack-

See DSS page 60

- Computer Corp. of America is developing software to link its Model 204 DBMS with Computer Associates International's Advanced Business Software line/48
- Project planning and management software for engineering and construction applications was offered by Harris for its line of superminicomputers/48
- Prime introduced facilities management software for its superminis under Primos/48

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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis, and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2.. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from mainframes to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

■ **Why not Cullinet, ADR or Focus?** There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as *the* standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language - each one painting the user into its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few shops nowadays run only IBM mainframes. Why, then, even consider a database solution that runs *only on IBM mainframes?* Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE *are* identical.

FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

■ **Why not just go with DB2 or SQL/DS?** A relational DBMS simplifies but does not by itself eliminate application programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are somewhat unlikely ever to run on another vendor's system). ORACLE runs on more IBM hardware and operating systems than do IBM's relational products.

■ **What about Goldengate, dBase III, Symphony or Framework?** PCs need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload.

ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 1060.

Prime unveils facilities management aid

NATICK, Mass. — Prime Computer, Inc. has introduced facilities management software for its line of superminicomputers running the Primos operating system.

Facilities Management+ (FM+) was developed by Micro-Vector, Inc. and consists of five integrated modules in the following three products: FM+ Planning, FM+ Tracking and FM+ Leasing.

The product is based on Prime's Information data base management system and can be used alone or in conjunction with the architectural design module of Prime's Medusa software, according to a Prime spokesman.

FM+ Planning consists of a Space Projection module that reportedly allows users to evaluate the effects of an organization's growth. Managers can query the data base by organizational level, office type or personnel code and then modify space accommodation plans.

A Vertical Stacking module is said to help users determine the placement of groups by floor or building.

FM+ Tracking includes an Equipment Management module that maintains an inventory of furniture and equipment, the vendor said. A Project Budget module provides billing information for contractors involved in a renovation project, according to Prime.

FM+ Leasing aids in the management of property leases, allowing users to maintain information on maintenance costs, parking availability and security levels.

FM+ facilitates report generation and data base searches. All modules are integrated, permitting data sharing between products.

FM+ Planning ranges from $14,000 to $19,000 in price; FM+ Tracking ranges from $8,000 to $12,000; and FM+ Leasing costs between $8,000 and $12,000, Prime said.

The products will be available in August.

For further information, Prime is located at Prime Park in Natick, Mass. 01760.

It's just your speed. On just your budget.

The quiet-looking printer above will win applause from your Accounting department, because it can turn out fanfolds by the carload. Flip a switch and its letter-quality mode can spiff up Sales, on your stateliest stationery.

It's Texas Instruments' Model 865 dual-mode printer.

And if you're the one who must make ends meet, it'll make you look good indeed.

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Leasametric, you see, has one of the broadest inventories of quality DP equipment anywhere. In addition to the TI Model 865 and its easy-to-change type fonts, you can get PCs, terminals, modems, multiplexers and protocol convertors.

Plus service that you just can't buy. Immediate delivery. Equipment that's fully tested and ready to work for you, complete with manuals, cables and other accessories. A toll-free number to call for on-line diagnostics. On-site maintenance if it's needed. And just in case something doesn't work as it should, immediate replacement.

With financing just as you like it. In addition to standard rental agreements, we offer volume pricing, rentals with options to buy, leasing and even used-equipment sales.

So when you need a printer that's just your type, just in time, or just the best — just give us a call: Leasametric.

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TEXAS INSTRUMENTS

Rent the best from the best.

LEASAMETRIC

• DATA COMMUNICATIONS DIVISION

Harris offers project tool for supermini

FORT LAUDERDALE, Fla. — Harris Corp. has announced the Project Planning and Management System (PPMS) for planning and management of projects in a range of engineering and construction applications. The package runs on Harris superminicomputers.

The menu-driven PPMS allows project and line managers to evaluate plans, optimize plan execution, maintain project schedules, facilitate communication between departments and staff, estimate costs and control budgets and plan and manage resources, according to a vendor spokesman.

PPMS includes a report writer and color graphics formats for project data presentations.

Multiple project data can be stored with PPMS to serve as many concurrent users as the host Harris system allows.

The number of users able to be accommodated ranges from 32 users on a Harris 60 to 200 users on a Harris 1000.

The PPMS software system costs $90,000 with a $900 monthly maintenance fee.

Harris is located at 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

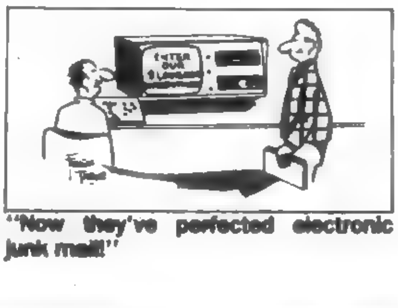
CCA, CAI plan to make module

CAMBRIDGE, Mass. — Computer Corporation of America (CCA) has entered into an agreement with Computer Associates International, Inc. (CAI) to develop an integration module for CCA's Model 204 data base management system and CAI's Financial Management and Distribution Management software for IBM's OS, DOS and VM/CMS operating systems.

The integration will allow the applications from CAI's Advanced Business Software line to access Model 204 files directly, rather than going through IBM Vsam files, a spokesman said. CAI's Advanced Business Software is a series of integrated applications including order processing, inventory control, sales analysis, purchasing, general ledger, accounts payable, accounts receivable and asset management.

The Model 204 integration module will be available in September and will cost $250,000.

CCA is located at Four Cambridge Center, Cambridge, Mass. 02142.



"Now they've perfected electronic junk mail!"

SYSTEMS SOFTWARE

■ **Compuware Corp. has announced Debug-Aid, an interactive test and debugging facility for IBM CICS under IBM's DOS and OS operating systems.**

Debug-Aid includes three levels of transactions: a Debug level incorporating Help screens for inexperienced programmers debugging Cobol programs; a second level for Cobol and assembler programs that allows programmers to browse CICS tables and areas and permits screens to be viewed at remote locations; and Sbug, which allows systems programmers to browse and modify CICS tables and areas and perform analysis on "hung tasks."

Debug-Aid is priced from $9,000 to $17,000, depending on configuration.

Compuware, 32100 Telegraph Road, Birmingham, Mich. 48010.

■ **Verdix Corp. has announced that its Verdix Ada Development System (Vads) is now available for Sun Microsystems, Inc. Sun-2 workstations.**

Vads is a development system that consists of the company's U.S. Department of Defense-validated Ada compiler and a set of software development tools that includes an interactive, screen-oriented symbolic debugger, library management tools and runtime system.

Vads is also available for Digital Equipment Corp.'s VAX series running Unix BSD 4.2 and the DEC Ultrix operating systems.

The cost of Vads on the Sun workstation is $7,500.

Verdix, 7655 Old Springhouse Road, McLean, Va. 22102.

■ **Tower Systems International has announced that its Epic/VSE data set management system is now compatible with IBM's VSE SP2.1 operating system.**

Epic/VSE allows companies to manage, secure and report on tape and disk data set resources, the vendor said. It includes an on-line display and maintenance capabilities for IBM Vsam catalogs. It can allocate disk space and provide disk and tape work data sets for intermediate data storage.

Epic/VSE for IBM's VSE/SP2.1 leases for $325 per month.

Tower Systems International, Suite 365, 19782 MacArthur Blvd., Irvine, Calif. 92715.

■ **SKK, Inc. has announced Multipak/VM, a productivity tool for the IBM VM operating system.**

Multipak/VM consists of a Spool Viewer facility that allows users to display spool files on an IBM CMS-based terminal. The utility displays print and punch files. File attributes can be changed by keying over selected fields.

A Short Cut utility is said to simplify CMS use by guiding users through a multilevel system of command panels. The Screen Painter facility enables users to build full screen application panels by laying out screens as they are to appear. Stretch Edit allows data sets from IBM's MVS or OS/VS1 to be copied onto CMS files without losing the line that is displayed.

Multipak/VM costs $8,000.

SKK, 10400 W. Higgins Road, Rosemont, Ill. 60018.

■ **Intrak, Inc. has introduced Fastneat, a compiler for NCR Corp. V series mainframes under the VRX operating system.**

Fastneat is an enhanced version of NCR's Neat/3 compiler, which was acquired by Intrak. It reportedly operates 30% to 60% faster than Neat/3 and is compatible with NCR's Expanded Disk Addressing disks. The product is both source and object code-compatible with the NCR compiler.

Fastneat costs $4,000, according to the vendor.

Intrak, 6841 Convoy Court, San Diego, Calif. 92111.

■ **Goal Systems International, Inc. has announced FAQS/XP Version 6, featuring additional reports, extended support for IBM 3179 and 3279 color terminals and improved password support for better security control. The software runs in IBM DOS/VSE environments.**

FAQS/XP is intended to better DOS system throughput by improving on-line transaction performance and Dasd scheduling and by enhancing console spooling and partition balancing.

According to a spokesman, Version 6 features an improved Console Spooling Facility with the addition of a job accounting report showing CPU seconds, start I/O activity and partition Getvis use for each step in the job, as well as a report showing each phase loaded during job execution.

FAQS/XP Version 6 is priced at $4,760 for a permanent license, or $119 per month for a three-year renewable license.

Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

PRODUCTIVITY AIDS

■ **Dylakor, Inc. has announced Dyl-Online, an interactive program development tool compatible with the company's DYL-280 and DYL-280 II packages. Dyl-Online runs in the IBM MVS/TSO/ISPF environment.**

The menu-driven Dyl-Online provides a series of prompts to help users select the functions desired,' a spokesman said. Users can choose from three levels of assistance in designing programs. Maximum assistance is provided in the first level, while the third level allows users instant access to IBM's ISPF editor.

Other features of Dyl-Online include automatic job control language generation and syntax checking.

The Dyl-Online system is priced at $17,000 for DYL-280 or $21,000 for DYL-280 II.

Dylakor, P.O. Box 3010, 17418 Chatsworth St., Granada Hills, Calif. 91344.

■ **DBMS, Inc. has announced an automated programming standards package for users of Release 10 of Cullinet Software, Inc.'s IDMS data base management system.**

The Quality Assurance Tool Kit reportedly provides data base administrators with methods and techniques for establishing guidelines for applications development.

The Tool Kit consists of DBMS' existing Standards, Procedures & Guidelines (SP&G) manual, a Standards Administration System Online that provides access to and maintenance of the standards in the SP&G manual and the Enforcer, a batch and on-line program checker for systems developers, the vendor said.

Price of the Quality Assurance Tool Kit is $14,900. It will be available in the fourth quarter.

DBMS, 1801 Mill St., Naperville, Ill. 60540.

■ **Micro Data Base Systems, Inc. has introduced Screen Maker, which allows applications developers to create end-user screen interfaces for Digital Equipment Corp.'s VAX-11/780 under DEC's Ultrix operating system, IBM's PC-DOS and Microsoft Corp.'s MS-DOS.**

A spokesman said Screen Maker allows a user to create and revise screens interactively. Designs are maintained in a screen dictionary. Each screen can consist of a number of windows and frames. Individual help text can be added at each level.

Screen Maker is priced from $2,500 to $5,000.

Micro Data Base Systems, Suite 400, 85 W. Algonquin Road, Arlington Heights, Ill. 60005.

■ **IMSL, Inc. has announced that its IMSL Library is now available for Hewlett-Packard Co. HP 9000 processors.**

The IMSL Library contains more than 500 Fortran subroutines for a range of mathematical and statistical applications, a spokesman said.

The software is intended to reduce the time and expense involved in program development by enabling the programmer to select fully tested Fortran subroutines from the Library rather than writing them.

The IMSL Library is compatible with the HP 9000 Models 520, 530 and 540 running the Fortran 77 compiler under the HP-UX operating system.

IMSL Library is priced at $1,200 for the initial year, renewable at $1,000 a year.

Educational institutions are offered a reduced price, the vendor said.

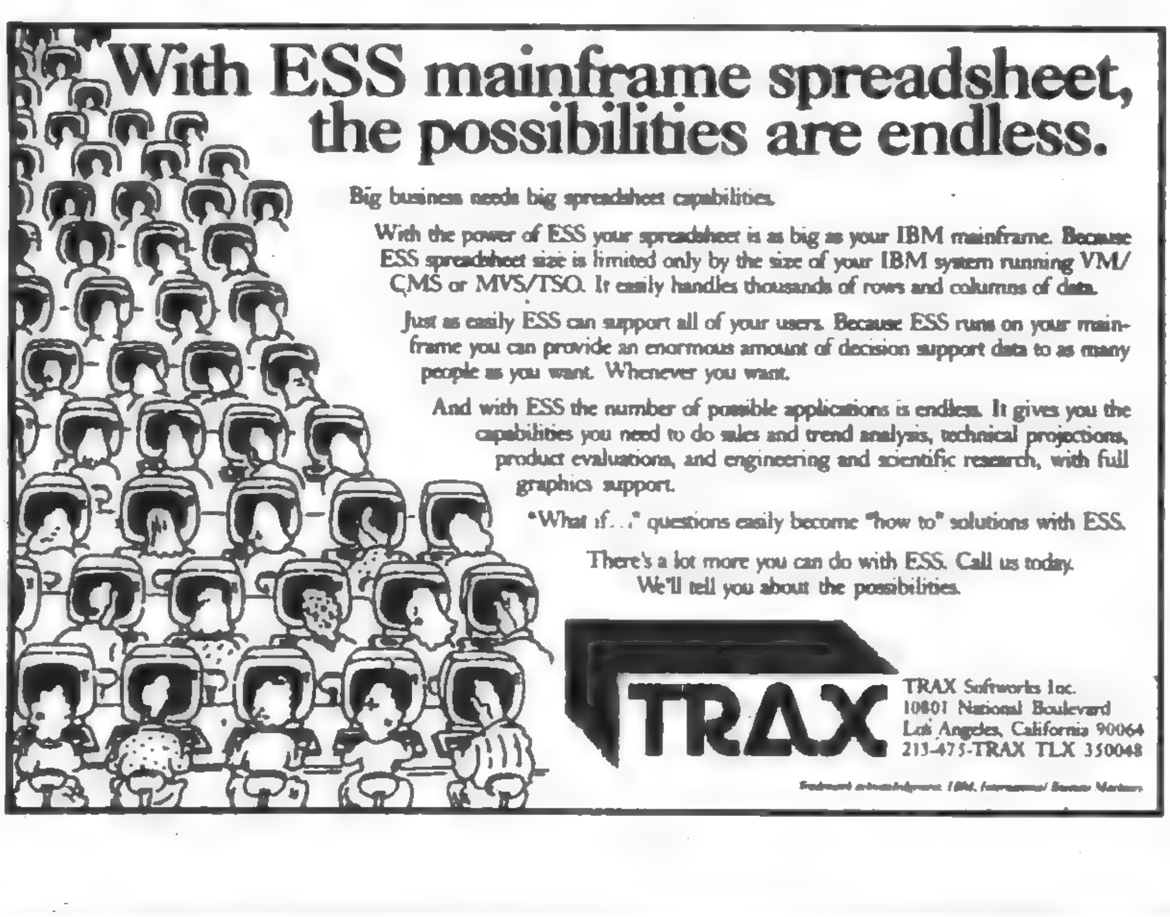
IMSL Sales Division, NBC Building, 7500 Bellaire Blvd., Houston, Texas 77036.

■ **Software Dynamics Corp. has announced an on-line version of Dynatune, its job control language (JCL) optimizer for IBM's OS/VS and MVS operating systems.**

Dynatune On-Line now includes a dynamic reallocation feature that reads existing JCL and minimizes job requirements for disk space allocations and CPU cycles, according to the vendor.

The product costs $5,800.

Software Dynamics, Suite 960, 1800 W. Loop South, Houston, Texas 77027.


With ESS mainframe spreadsheet, the possibilities are endless.

Big business needs big spreadsheet capabilities.

With the power of ESS your spreadsheet is as big as your IBM mainframe. Because ESS spreadsheet size is limited only by the size of your IBM system running VM/CMS or MVS/TSO. It easily handles thousands of rows and columns of data.

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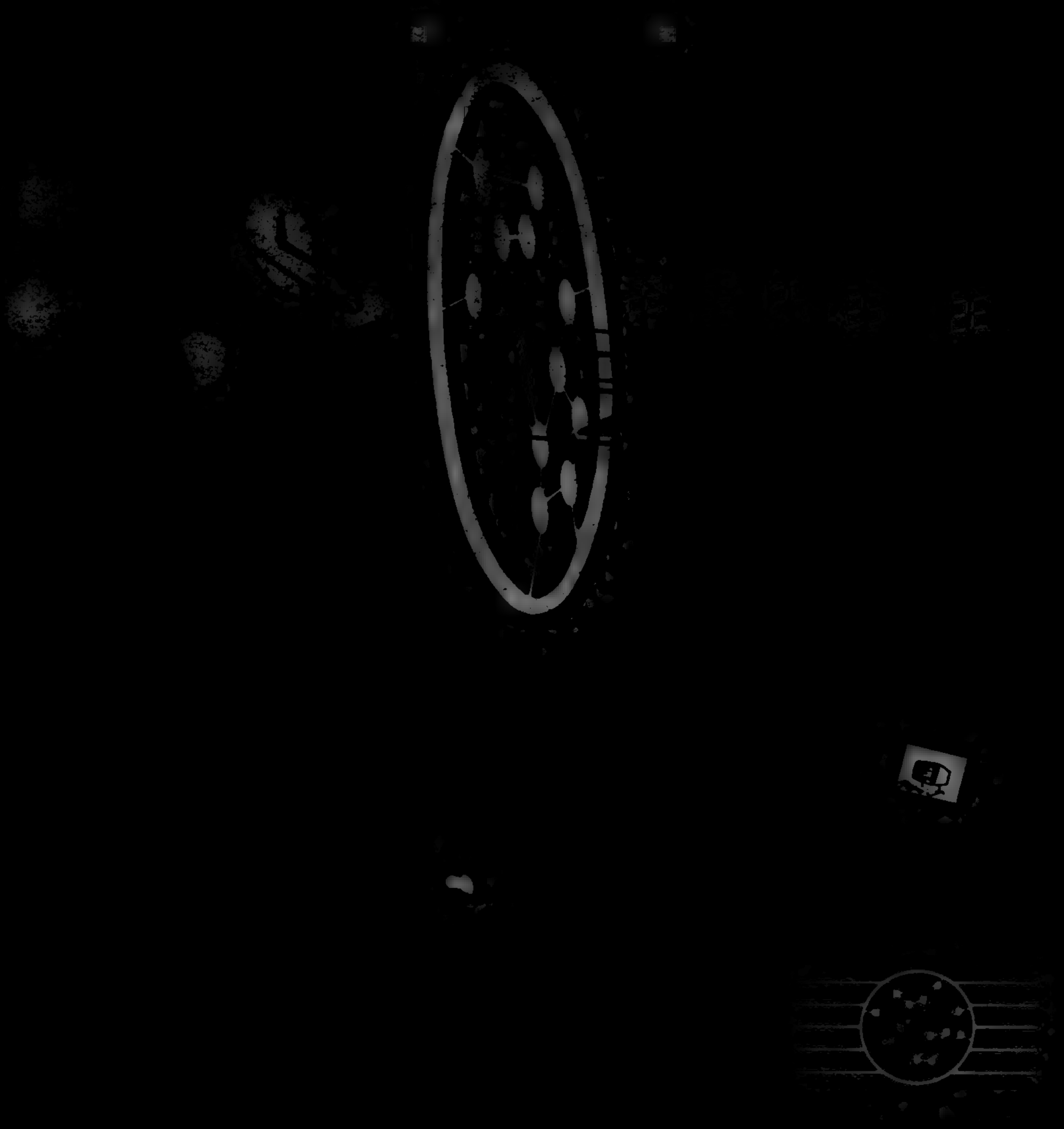

APPLICATION PACKAGES

■ Data Design Associates, Inc. has announced Release 7.7 of its Fixed Asset Accounting System software, featuring incorporation of tax calculations that conform to the federal Deficit Reduction Act of 1984. Written in Cobol, the program runs in IBM DOS and MVS environments, on IBM's System/38 and on Hewlett-Packard Co. HP 3000 superminicomputers.

Other enhancements include an option for the independent close of corporate and tax books and automatic location lockup.

Data Design's asset type code is intended to increase the user's ability to make accurate projections regarding company assets.

Release 7.7 of Fixed Asset Accounting System costs $30,000.

Data Design Associates, 1279 Oakmead Pkwy., Sunnyvale, Calif. 94086.

■ Digital Equipment Corp. has announced the availability of Interleaf, Inc.'s composite document processing software for the Vaxstation I and II workstations. The Interleaf Workstation Publishing Software runs under the MicroVMS operating system.

The Interleaf applications software enables users to prepare documents containing multiple typefaces and a range of graphics including data-driven business charts. Through a mouse-driven interface, users can access all editing and formatting resources necessary to produce original typeset documents.

The price for the Interleaf Workstation Publishing Software, scheduled for summer availability, is $3,000.

DEC, 146 Main St., Maynard, Mass. 01754.

■ AT&T Information Systems has announced accounting software for AT&T 3B series computers and its Unix System V operating system.

AT&T Glows consists of five integrated modules. A write-up module automates the analysis and consolidation of general ledger accounts. An audit module includes capabilities for preparing lead sheets, work papers and financial statements for clients who maintain their own financial records. An After-The-Fact Payroll Accounting module can be used for preparing payroll data and federal W-2 forms.

Fixed Assets Reporting includes capabilities for calculating fixed-asset depreciation for up to 8,000 assets and the 1099 System helps with the analysis of company records and end-of-year federal 1099 statements, a spokesman said. The product is priced at $3,495.

AT&T Glows Practice Management (PM) includes modules for due data monitoring, staff-time scheduling, expense and work-in-process billing functions, fee collections and cost analysis. AT&T Glows PM is priced at $2,495.

AT&T Glows and AT&T Glows PM together are priced at $5,495.

AT&T Information Systems, 10 Southgate Pkwy., Morristown, N.J. 07960.

■ Xerox Corp. has announced the Repetitive Manufacturing module for its Xerox Business Management System, with features for reducing inventories and decreasing material flow time from vendor delivery to shipment of finished goods. The package runs in IBM SSX, DOS/VSE, MVS and VM environments.

Repetitive Manufacturing is reportedly intended to eliminate work orders, increase the accuracy of work-in-process accounting balances and decrease paperwork. The application is directed at medium- to high-volume customers whose production is driven by daily or weekly production rates.

The product permits time-phased allocation of material by a work center in priority sequence, back-flushing of work in process through one or more work centers, lot tracking and automatic consumption of components from line receipt to completion of the end item and use of delivery policies to schedule vendor deliveries efficiently.

Prices for the Repetitive Manufacturing module begin at $75,000, according to the vendor.

Xerox Computer Services, 5310 Beethoven St., Los Angeles, Calif. 90066.

SOFTWARE & SERVICES

■ Software International Corp. has announced an enhanced version of its General Ledger & Financial Reporting System, which now supports Wang Laboratories, Inc. Wang VS series minicomputers.

Other enhancements to General Ledger & Financial Reporting Release 5.2 include on-line screen painting capabilities, on-line editing of standard journal entries and rewritten documentation, a spokesman said. The system can also be used with the global variables and return-code checking functions used in Wang's procedure language.

The product's on-line journal function, known as Trace, allows the user to develop exception displays and display transactions for only one employee. A Hero function is a mass maintenance facility that allows users to copy accounts within one entity or add an account in all entities.

Prices for the General Ledger & Financial Reporting System for the Wang VS range from $18,000 to $33,000.

Software International, 1 Tech Drive, Andover, Mass. 01810.

■ Applied Data Research, Inc. (ADR) has added a calendar and scheduling facility to Release 2.0 of ADR/Email, its electronic mail system for IBM's DOS/VSE, OS/VS1 and OS/MVS environments.

ADR/Email 2.0 includes Edate, which allows users to schedule appointments and view other calendars. The function allows users to preschedule recurring or standard events, issue reminders of upcoming events and scan calendars for unscheduled time.

A permanent license for ADR/Email, including Edate, is $45,900 for OS/VS1 and MVS environments and $32,400 for DOS/VSE systems.

ADR, Rt. 206 & Orchard Road, Princeton, N.J. 08540.

■ Precision Visuals, Inc. has announced an enhanced version of its GK-2000 graphics software tools for Digital Equipment Corp.'s VMS on the VAX superminicomputers and IBM's VM/CMS and MVS/TSO operating systems.

GK-2000 Extended implements Level 2B of the evolving Graphical Kernel System, an international standard adopted by the International Standards Organization. The product includes features that allow the display picture to be repositioned, rescaled, highlighted, combined, deleted and redrawn, a spokesman said.

GK-2000 reportedly allows users to configure segment storage and add floating-point coordinates for use with high-precision graphics devices. The graphics software also features extended error processing, on-line debugging, a pause function for examining images and file name control.

GK-2000 Extended is priced between $6,500 and $21,000.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

■ Tektronix, Inc. has announced Tektronix Caddport for design documentation. The product is said to link Tektronix Plot 10 Computer-Aided Drafting Software, Teknicad, with PDA Engineering's Patran Solid Modeling and Analysis System.

Teknicad runs on Tektronix terminals and mainframes and the Digital Equipment Corp. VAX superminicomputers.

Patran design information is carried to Teknicad via Caddport. Patran produces various product design views, and Caddport processes the views so they can be interpreted and manipulated by Teknicad to produce the design documentation, the vendor said.

Caddport license fees start at $2,010; Teknicad license fees start at $2,200; and Patran license fees start at $8,000.

Tektronix, P.O. Box 1700, Beaverton, Ore. 97075.

■ Balco Data, Inc. has announced Release 5.0 of its Warehouse Distribution and Financial Control Application Software for the Hewlett-Packard Co. HP 3000 minicomputer.

According to a spokesman, the software consists of the following modules: order management, accounts receivable, inventory manage-

Continued on page 54

YOUR TWO FAVORITE COMPUTERS NOW HAVE ONE THING IN COMMON. YOUR FAVORITE GRAPHICS TERMINAL.

Introducing the new CX4100 Series of Tektronix high performance, yet affordable color graphics terminals.
Now you can have the Tektronix PLOT 10 graphics command set you've always wanted while you use the host of your choice, IBM or DEC. Just by typing a single "switch-host" command.

Familiar 3270 IBM-style alphanumeric output is fully emulated on all CX4100 terminals. Enhanced IBM-style keyboard is part of the package.

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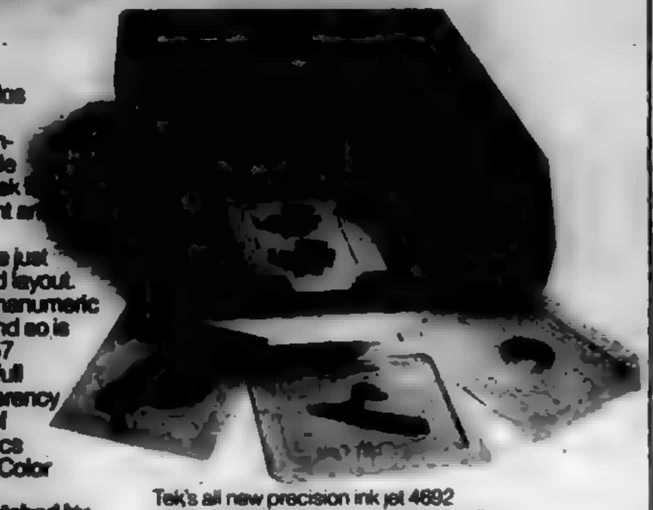
To make your use of existing or new graphics data fast and friendly, the CX Series comes with an IBM-style keyboard. Plus Tek enhancements: individual key programmability, user-selectable ten-key pad, and joydisk for quick cursor movement and graphics input.

Screen output will be just as familiar as keyboard layout. 32-line 3278/3279 alphanumeric emulation is built in. And so is full support for the 4957 Graphics Tablet, plus full hard copy and transparency output to a full range of Tektronix Color Graphics Copiers and the 4510 Color Graphics Rasterizer.

IBM flexibility is matched by DEC flexibility. In RS-232 mode, the terminals can run all VT100 applications through the extended ANSI X3.64 command set. In addition to the host interface port that transmits data at rates up to 38.4k baud, CX terminals are provided with two additional RS-232 ports and a Centronics-style parallel port for connecting a wide range of peripherals.

But best of all you'll have great graphics and full software compatibility. The CX Series will accept many existing programs written for 4010, 4100, and 4110 Series terminals. And they're fully compatible with PLOT 10 IGL, GKS, and TCS programs as well as with popular third-party software such as SAS/GRAPH,® ISSCO's DISSPLA® and TELL-A-GRAF® and Precision Visuals' DI-3000.®



Tek's all new precision ink jet 4692 color copier produces very high quality full color transparencies or hard copy.

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Tektronix

SOFTWARE & SERVICES

Continued from page 53

ment, warehouse locator, purchasing control, sales analysis/salesman commissions, accounts payable/cash management and general ledger/budgetary control.

The product's distribution module has been enhanced to generate more than 1,000 reports on demand, according to the vendor.

The inventory management module is said to provide the ability to maintain inventory status in 99 different warehouses and includes the capability to issue inventory shortage reports and an interface with a purchasing control system to generate purchase orders.

A Lot Control subsystem enables the distribution application to set up individual lots with a termination date for each lot, the spokesman said.

The product's modules are priced from $9,800 to $22,700.

Bakco Data, Suite 190, 85 W. Algonquin Road, Arlington Heights, Ill. 60005.

■ Sperry Corp. has announced that P-Stat, Inc.'s P-Stat System, an interactive system that combines a data management facility with statistical capabilities, is now available for Sperry's Series 1100 mainframe systems.

According to a spokesman, P-Stat software offers statistical analysis, data display, report writing and cross-tabulation capabilities. It features an on-line Help facility, interactive data entry, relational data base capabilities, a range of statistical commands and expandability through a user link facility.

A P-Stat lease for the Sperry 1100 is $8,000 for the first year, and $3,000 for each successive year, the vendor said. A permanent license for P-Stat on the Sperry 1100 is $15,000 or $5,000 for educational institutions.

Sperry, P.O. Box 500, Blue Bell, Pa. 19424.

■ Data Processing Services, Inc. has added serial number and lot number tracking features to its Distribution Processing System for the IBM System/38.

DPS/38 is written in RPG-III and includes order processing, accounts receivable, inventory control and purchasing and sales analysis modules, the vendor said. The product reportedly supports multicompany and multiwarehouse processing. Users can access a detailed history through inquiry commands.

DPS/38 can be integrated with the company's FIN/38 accounts payable package via user-defined tables.

DPS/38 costs $47,000.

Data Processing Services, Suite 100, 11712 N. Michigan Road, Zionsville, Ind. 46077.

■ Exeter Software Ltd. has introduced an apparel distribution planning and control package for IBM System/38 minicomputers.

Warehouse Management System (WMS)/Apparel reportedly tracks merchandise at the stock-keeping unit levels and considers variable order-filling cycles and the apparel industry's preshipping procedures. An on-line query and reporting capability for stock locations is said to facilitate inventory control.

The product also includes capabilities for automatic auditing of inventory changes, the vendor said. WMS/Apparel reportedly can receive information on stock that has been put away and can generate shipping documentation.

The product is licensed for $245,000.

Exeter Software, 100 Turnpike Road, Chelmsford, Mass. 01824.

■ MCBA, Inc. has announced a product routing package for manufacturers with a Wang Laboratories, Inc. VS series minicomputer.

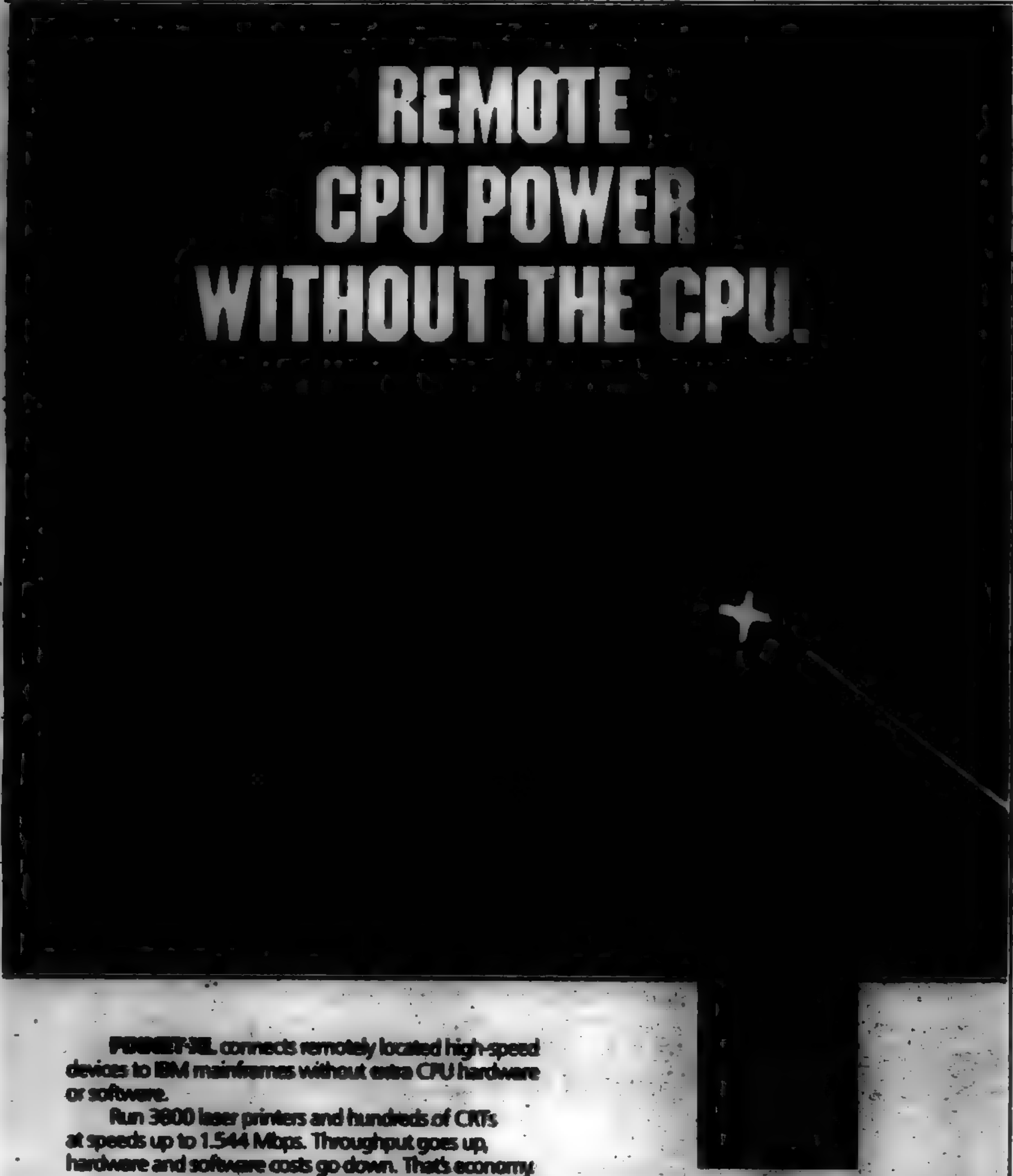
Standard Product Routing (SPR) controls the sequence of operations, tool and assembly instructions for product manufacturing, a spokesman said. The software reportedly permits interactive entry and editing of routing data and maintains labor and machine hour standards at the operations level.

SPR allows users to create new routings by copying portions of existing ones. It provides alternate routings and supports a variety of operation types.

SPR is priced from $2,500 to $3,500, depending on configuration.

MCBA, 2441 Honolulu Ave., Montrose, Calif. 91020.

See ABS page 56



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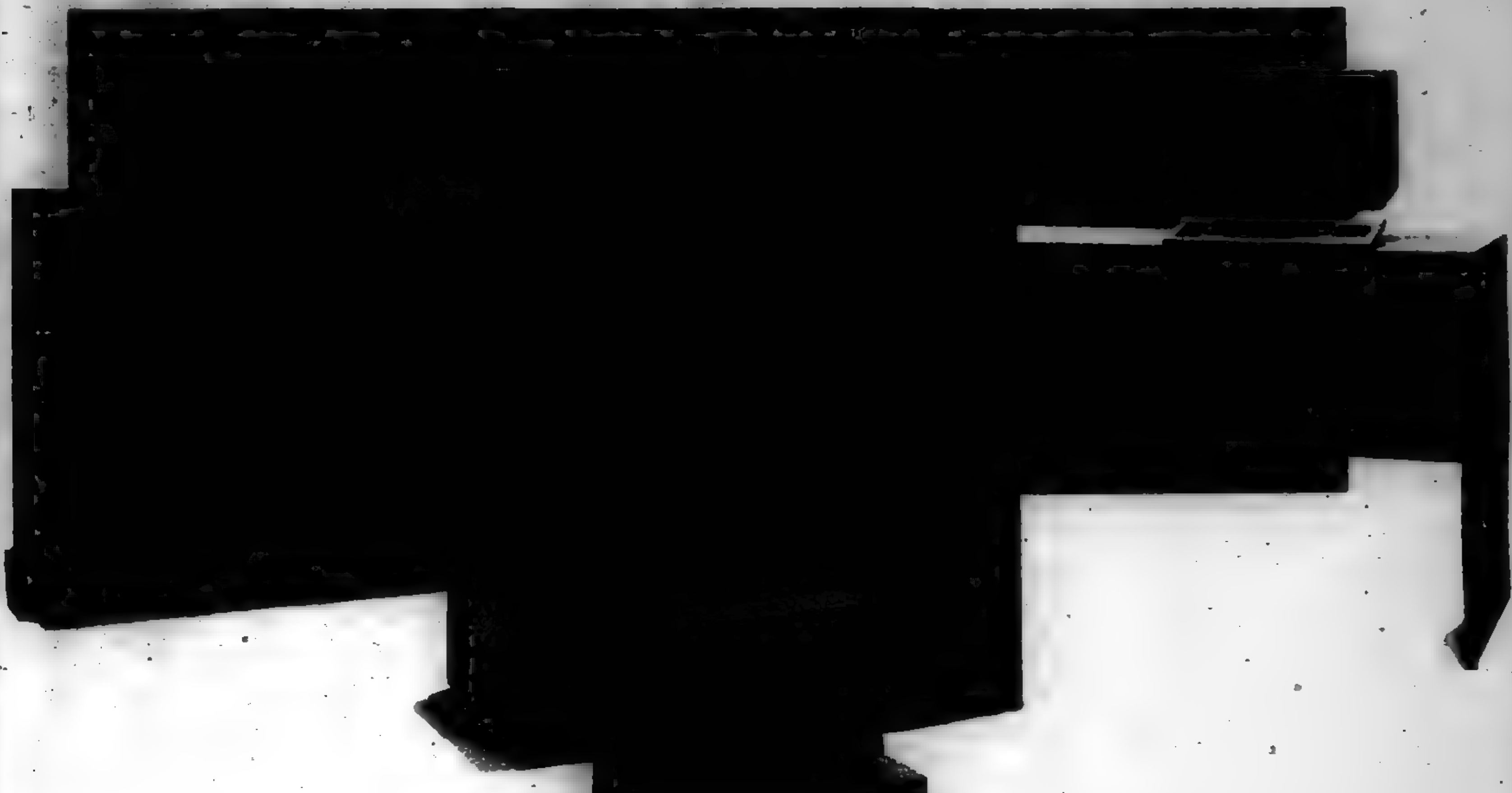


The UNIX* operating system from PC to mainframe.

SOFTWARE & SERVICES

AIDS

from page 54

■ **Digital Equipment Corp. has introduced an enhanced version of its integrated spreadsheet program for its VAX and Microvax computers.**

VAX Decalc Version 2.1 enhancements include financial, statistical, logical and trigonometric functions. The product supports DEC's VT100 and VT200 series terminals and integrates with DEC's Datatrieve data base management program, Decgraph graphics capabilities, electronic mail and network support for information acquisition and distribution.

VAX Decalc Version 2.1. financial functions include capabilities for determining discounted payback.

Prices for VAX Decalc Version 2.1 begin at $680.

DEC, Box 1003, 2 Iron Way, Marlboro, Mass. 01752.

■ **EEC Systems, Inc. has announced four software products for users of Digital Equipment Corp. minis.**

RJ-11 Cobol is said to be a Cobol compiler for the DEC RSX-11M operating system running on DEC PDP-11 minis. The RSX-11M version is priced at $4,000.

EEC Systems' VRT reportedly allows the user to run RT-11 software under the VMS operating system on DEC VAX-11 series machines. RT-11 programs running under VRT are said to have direct access to files in VMS directories. VRT is priced at $1,000 for a single CPU.

Filetab-D is a programming language and applications development program for the PDP-11 and VAX series. The product uses decision tables for debugging, program maintenance and documentation, according to the vendor. Filetab-D is priced between $1,000 and $7,500, depending on the operating system.

EEC also announced Greek Math capability enhancement of its LEX-11 word processing software for DEC computers using VT220 terminals. The enhancement is said to support all major printers and character sets and is available for $75.

EEC Systems, 327/E Boston Post Road, Sudbury, Mass. 01776.

■ **Integrated Planning, Inc. has announced an enhanced version of its decision support system for IBM mainframes running VM/CMS or MVS/TSO, Digital Equipment Corp.'s VAX series and Prime Computer, Inc. systems.**

Stratagem 4.7 combines a data base management system with modeling and reporting tools. It is an integrated planning environment that features capabilities for financial modeling, statistics, graphics and an applications development language.

Enhancements include an improved report generator and an on-line Help facility. Also added were functions that compute running totals of values in an array and that return the midpoint of the functions stored in an array and allow users to restrict the operation to specific dimensions of the array.

Stratagem costs from $25,000 to $70,000 for minicomputer systems and $85,000 for IBM mainframes.

Integrated Planning, 338 Newbury St., Boston, Mass. 02115.

■ **SDK Healthcare Information Systems has introduced a nursing management system for computers that support Ansi-standard Mumps.**

Components of the SDK Nursing Management System include Patient Acuity Classification, Nurse Staffing and Scheduling and Management Report Generation. Data can be entered directly at nursing stations or be collected on system-generated worksheets containing census and patient classification data. The system calculates acuities and reports staffing requirements by shift and station.

SDK Nursing Management System is priced from $15,000 to $40,000, depending on hardware configuration.

SDK Healthcare Information Systems, 1550 Soldiers Field Road, Boston, Mass. 02135.

■ **Oakland Management Services has announced the Automotive Release Management System (Arms) for IBM's System/36 and 38.**

A spokesman said Arms lets suppliers receive order release information from General Motors Corp., Ford Motor Co., Chrysler Corp. and American Motors Corp. Order release information can be transferred to the supplier's production scheduler. After the order is scheduled for production, advanced shipping notices are sent to the manufacturer.

Arms is priced at $6,000 per module for the System/36 and $8,000 per module for the System/38.

Oakland Management Services, P.O. Box 1019, 1754 Maplelawn, Troy, Mich. 48099.

■ **Digital Equipment Corp. has announced Decjobmatch, an applications and job requisition package for DEC's VAX series of superminis.**

Decjobmatch includes applicant tracking, job requisition entry and control, applicant resume entry and job searching capabilities. The software reportedly also offers an applications mangement function.

Decjobmatch can be interfaced with DEC's All-In-One and Datatrieve data base management system software.

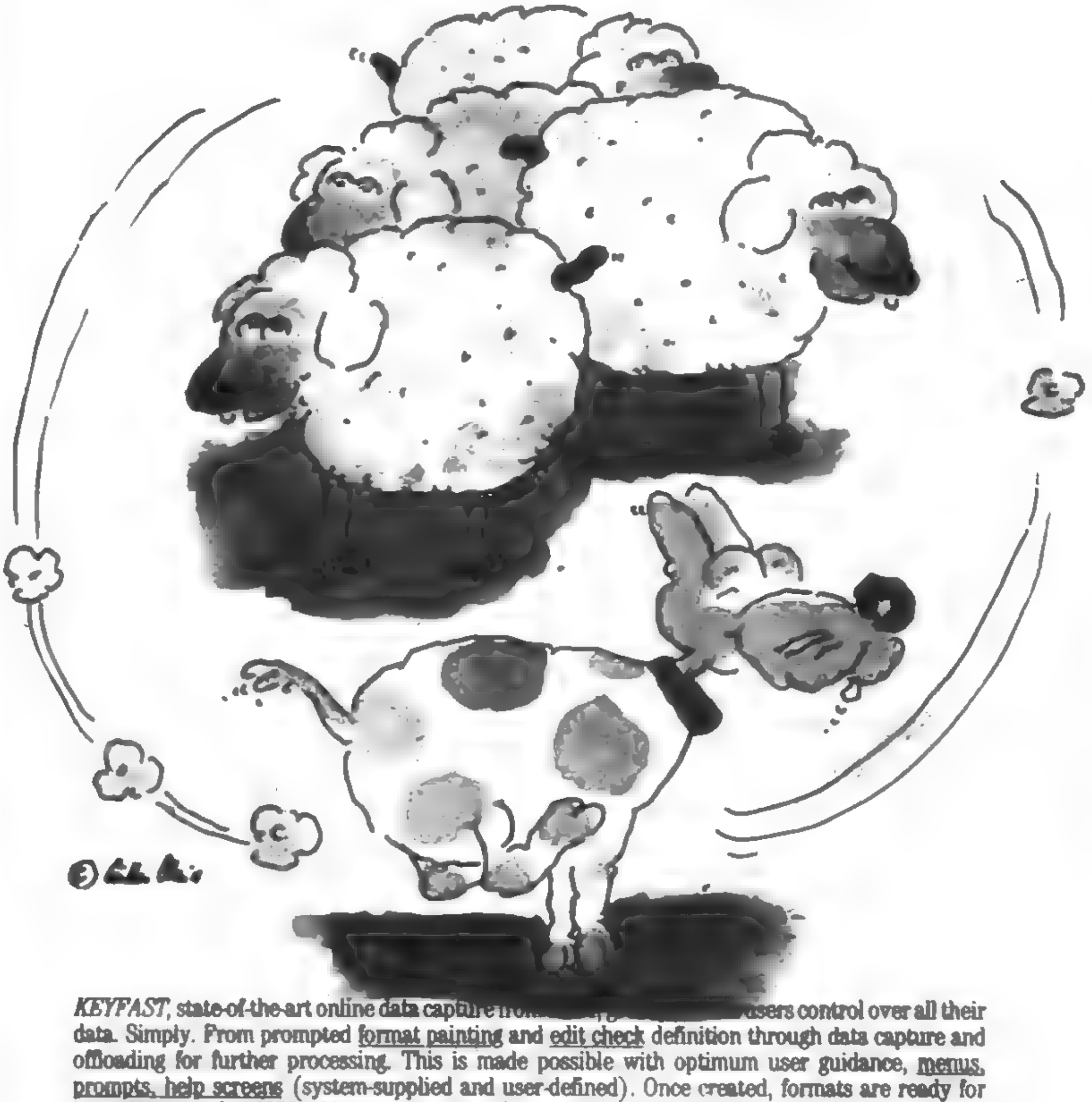
The product price ranges from $9,000 for the VAX-11/730 up to $27,000 for the VAX-8600.

DEC, 146 Main St., Maynard, Mass. 01754.

■ **Megatek Corp. has announced Contemplate, an engineering graphics package for use with Megatek's Template subroutine library.**

The product allows engineers to design interactively graphs and

Continued on page 62



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Closed systems
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the products of
closed minds.

Sun
workstations:
the open systems
from
open minds.

Sun Microsystems™ has declared open season on proprietary computer systems. And the closed minds that design them.

Sun's open attitude holds that no one should be dependent upon any one company to meet their every computing need. Because, at the speed technology is moving, any one who has to wait for their proprietary vendor to develop its own version of the latest breakthrough is going to get closed out. Period.

Full integration of proven industry standards gives Sun workstations performance equal to proprietary systems, without sacrificing compatibility. So, we give our customers the open opportunity to incorporate state-of-the-art products from a wide variety of vendors.

Sun workstations are designed to serve as the bedrock for a distributed information network. An open-ended network that overcomes the limitations previously imposed upon the users of proprietary systems: noncommunication with existing computer investments, single-vendor delays in incorporating new technologies, high single-vendor prices, and all the other exciting advances closed minds have brought us.

Distributed Computing Network

Sun's family of workstations epitomize the new, open attitude of the computer industry, elegantly incorporating an open system architecture with the distributed power and speed necessary to create a complete development environment. A powerful Motorola 68010 CPU. A multi-tasking UNIX™ operating system. High speed Ethernet networking. Direct Virtual Memory Access and support of diskless operations. An advanced window system. Advanced programming tools. And more.

The free exchange of ideas is at the heart of any successful business endeavor. So, Sun created the Network File System (NFS). NFS allows members of your engineering and software development groups to communicate with one another, with other computing resources (i.e. mass storage devices, supercomputers, etc.), *and* with a variety of computers already in use in other departments.

With NFS, the left side of your corporate brain will always know what the right side is doing. And the brain trust that results can really move a project along.

Open Market Options

But compatibility between Sun workstations and your existing computer investment is just the beginning. Today, a multitude of third-party companies in the "open" market are developing and aggressively marketing software, peripherals and add-on equipment for Sun workstations. CAD/CAM/Computer-aided-just-about-anything. Electronic publishing. Languages for artificial intelligence. Programming tools. And many, many more technical and general business applications.

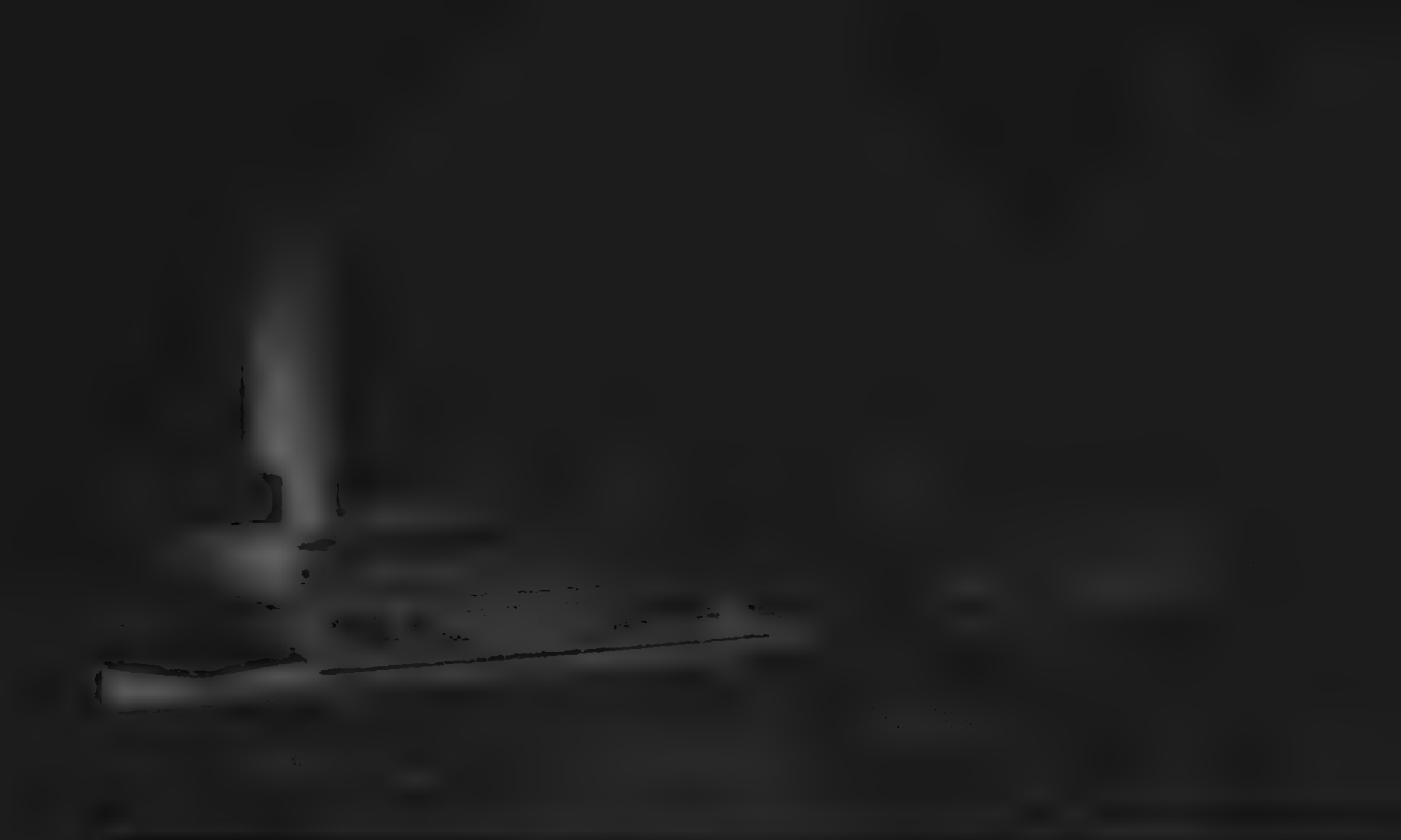
Sun workstations have earned a reputation among third-party vendors as the open door to the UNIX market. Consequently, the number and diversity of products for Sun systems grows daily. Spurred by this competitive atmosphere, open market companies provide Sun customers with the latest technology, fast. At highly competitive prices.

If you like the sound of what you're reading, you're not alone. Many Fortune 1,000 companies, the U.S. Government, and over 100 top universities are already on Sun's client list.

And, in a pleasant juxtaposition of business realities, the best cost less. Sun workstations can cost substantially less than comparably equipped closed systems.

It's an open and shut case. You can either try to explain to your board of directors why you've put all their corporate eggs into one, proprietary basket. Or, you can look them square in the eye and tell them it's time they developed a more open attitude.

UNIX is a trademark of AT&T Bell Laboratories.



Sun workstations: open architecture, open network, open options.

Sun workstations are in the vanguard of the open rebellion against proprietary computer systems. And the closed minds that design them.

Sun Microsystems designed its full line of general purpose workstations around industry standards for hardware, software and data communications. And the unique combinations that resulted have created the nucleus for a distributed computing network: an open information network.

Just For Openers

Each Sun Workstation® gives its user a dedicated 32-bit CPU. Up to 8 megabytes of main memory. Integrated high-speed networking to allow sharing of information and peripherals across a network of Sun workstations or multi-vendor systems. High resolution graphics display. Advanced user interfaces, and more. Sun workstations work at the speed of thought, so your people spend less time waiting on the system. Less time getting projects completed, and products out the door.

The open attitude built into every Sun workstation begins with an advanced version of the industry-standard UNIX operating system, supporting demand-paged virtual address spaces, fast I/O to disk and local network, diskless operations and multiprocessing. Fast hardware combines with more than 220 UNIX utilities, three programming languages (C, Fortran, Pascal), SunCore™ graphics library, SunWindows,™ plus additional tools, to create the most productive computing environment available today.

The Sun workstations' advanced Motorola 68010 microprocessor supports virtual memory of up to 16 megabytes per process. This allows users to develop applications larger than the amount of available main memory without complicated overlay schemes. And the Sun memory management unit allows the processor to access all of main memory with no "wait" states.

Sun Network File System

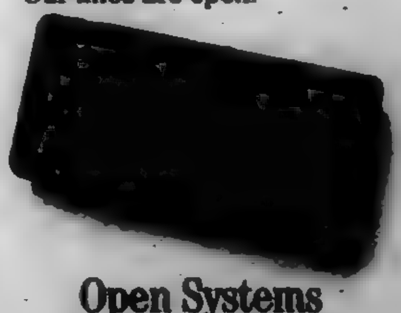
Perhaps most exemplary of Sun's total commitment to open system architecture is the Sun Network File System (NFS). NFS allows users to transparently access files across an information network of Sun workstations or a variety of multi-vendor machines. Via this network, teams of professionals can cooperate on project work, accessing any specialized computing resources they need.

Since Sun NFS is independent of any particular hardware or operating system, it will evolve with developing network and computer technologies. And as part of our commitment to industry standardization, we're making our NFS an open book to interested parties in the hopes of filling the need for an efficient standard in this crucial area.

Sun's choice of industry-standard, 10 megabit-per-second Ethernet greatly simplifies the task of building Sun workstation or multi-vendor networking environments. Sun workstations also implement standard TCP/IP protocols and support both Multibus® (IEEE-796) and VME backplanes with up to fifteen slots.

Open architecture means open options. Sun workstations give you a long list of powerful standard features and options, built around proven industry standards. *Plus*, an abundance of third-party hardware and software companies working to open new doors for you and your company.

To find out more about Sun's open attitude and the workstations that have evolved from it, write: Sun Microsystems, Inc., 2550 Garcia Avenue, Mountain View, CA 94043. Or, simply call (800) 821-4643. In California (800) 821-4642. Our lines are open.



Open Systems for Open Minds.

Sun Workstation is a registered trademark, SunCore and SunWindows are trademarks of Sun Microsystems, Inc. Multibus is a registered trademark of Intel Corp.

Continued from page 58

charts using logical graphics input devices. Users can design charts with several axis options. It can perform algebraic calculations for data analysis or manipulation. .

Contemplate is priced from $3,700 to $27,000, depending on configuration.

Megatech, 9645 Scranton Road, San Diego, Calif. 92121.

■ **Honeywell, Inc. has announced that Execucom Systems Corp.'s Interactive Financial Planning System (IFPS) is now available on Honeywell's DPS 6, DPS 88 and DPS 90 mainframes running Gcos 8.**

The IFPS is a decision support system and modeling package that uses a set of built-in routines for frequently used computations. The product includes functions for testing hypotheses. A report writer produces ad hoc and formal reports from models and existing files.

IFPS is priced from $40,000 to $69,000.

Honeywell, P.O. Box 8000/A-79, Phoenix, Ariz. 85066.

■ **The Bridge, Inc. has introduced an enhanced version of its Trak project management software for IBM mainframes running DOS/VSE or OS/MVS.**

Trak 2.3 includes functions for on-line employee work load forecasting, project scanning, as well as improved data access security, and enhanced project-level Gantt charts, the vendor said.

Trak 2.3 costs $9,900.

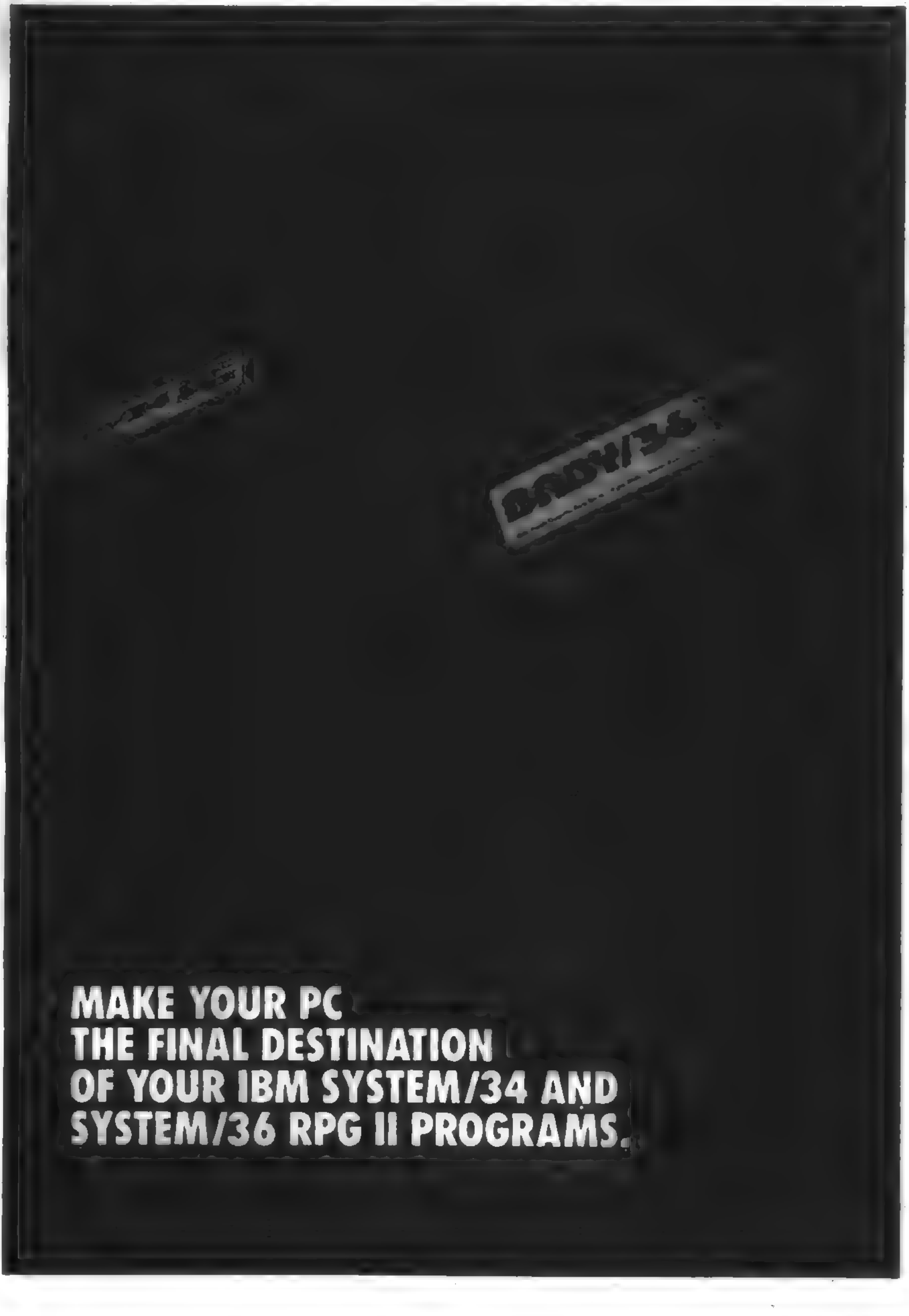
The Bridge, 199 California Drive, Milbrae, Calif. 94030.

■ **Software Express has introduced accounting software for several versions of the AT&T Unix operating systems, Pick Systems' Pick operating system and Microsoft Corp.'s Xenix operating system.**

Accountant's Client Write-Up provides users with audit tracking and report-generation capabilities, the vendor said. It is compatible with other Software Express accounting packages.

The product costs $3,500.

Software Express, 2925 Briarpark Drive, Houston, Texas. 77042.



■ **Jonas & Erickson Software Technology, Inc. has announced a Contractor Estimating System for the MAI Basic Four, Inc. 2000 and 8000 series minis.**

The Contractor Estimating System performs cost calculations, estimate summaries and estimate analyses. The package is integrated with the company's other construction industry software, including job costing and scheduling, equipment costing and analysis, bidding, fixed-asset control and trucker billing.

The Contractor Estimating System costs from $2,000 to $6,500 depending on the hardware chosen.

Jonas & Erickson Software, Suite 700, 235 Yorkland Blvd., Willowdale, Ont., Canada M2J 4Y8.

■ **Fusion Products International has announced Version 3.0 of Fusion/4 Information Retrieval, its fourth-generation report writer for the IBM System/38.**

Version 3.0 boasts performance improvements of roughly 150% over Version 2.0. Security features have been simplified, support for a multiple data dictionary has been added, Help text has been expanded and documentation has also been improved.

Reports created by users may be executed immediately or compiled into machine language for better performance, an option which now appears on the Fusion menu. The report is compiled automatically when its identifying number is entered at a prompt. An added Data Base Administrator feature decides which reports will be processed interpretively and which will be compiled.

Fusion/4 Version 3.0 is available in English, German, French and Kanji (Japanese) language versions. A single-copy license is $7,000.

Fusion Products International, 900 Larkspur L.C., Larkspur, Calif. 94939.

■ **Keane, Inc. has introduced a hospital information system for the IBM System/36.**

Hospital Information System/36 (HIS/36) consists of a

Continued on page 66

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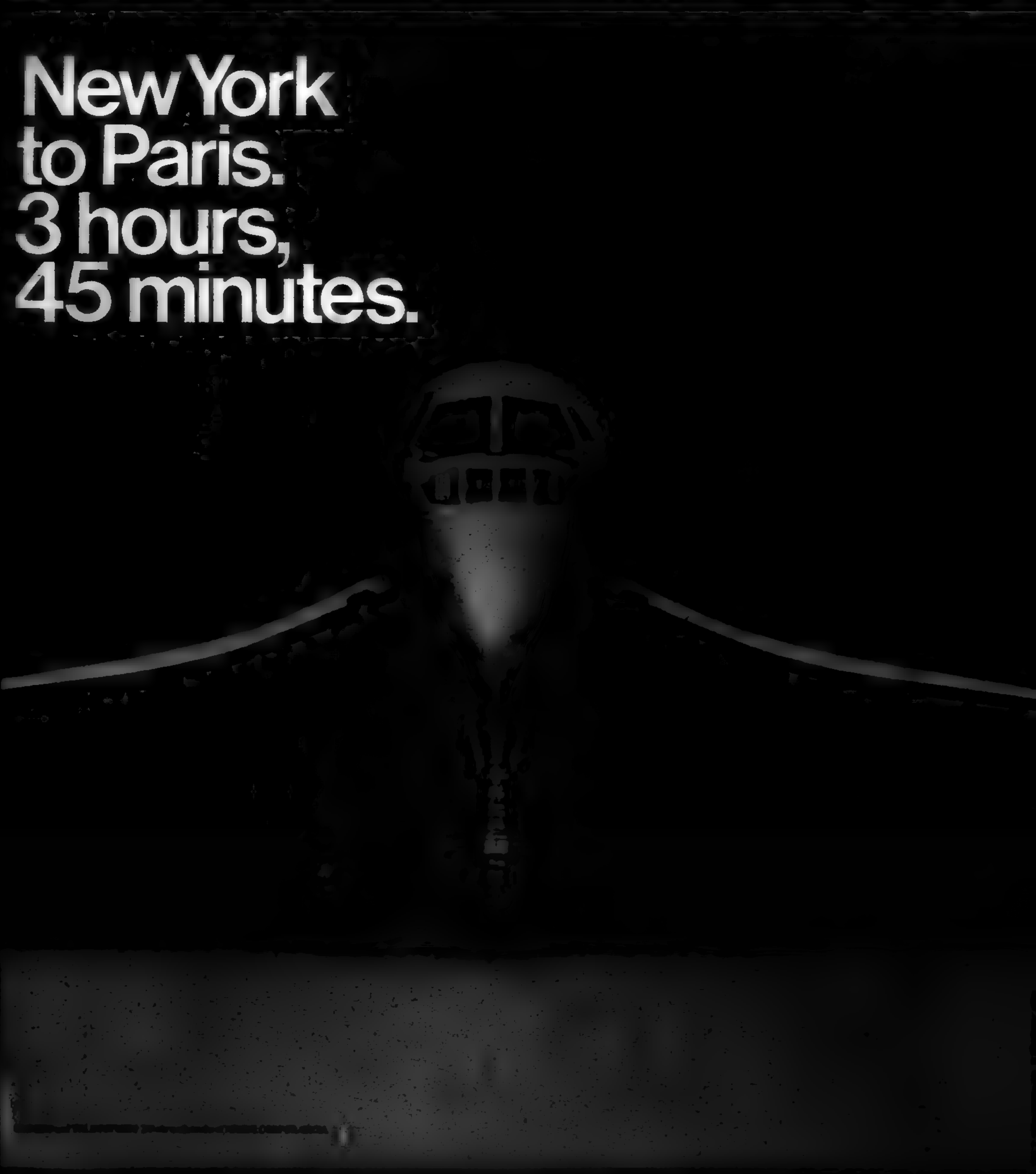
The carrier on the right is the Telecopier 295, a new high-speed facsimile just introduced by Xerox.

While it's not quite as flashy as the Concorde on the left, the technology is just as amazing.

Imagine a small, desktop digital facsimile that can transmit high resolution copies of your documents anywhere in the world in little more than the time it takes to fasten your seat belt.

But the Telecopier 295 is not only quick, it's less expensive to operate (with facsimile, faster is cheaper) and perfect for medium to high volume operations.

It's compatible with just about everything: the Xerox Telecopier family, most other facsimile terminals, and with the personal computer world as well, including



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the computers and workstations that are part of Team Xerox.

With the G1/G2 analog compatibility option, it can communicate with other slower speed facsimile terminals. With the RS-232-C option, it can also convert and print ASCII encoded information from a vast array of computers.

But the most amazing thing about the Telecopier 295 is its price: about the cost of one round trip to Paris on the Concorde.

Now that's progress.

To learn more about the Telecopier 295, call 1-800-833-2323, ext. 44, or send your business card to Xerox Corporation, Dept. 44013, P.O. Box 24, Rochester, N.Y. 14692.

New York
to Paris.
25 seconds.

Continued from page 62

patient registration, billing and receivable module; a communications and results reporting module; and a medical records module. Each module can be purchased separately, the vendor said.

Other software programs developed and marketed by Keane, including general ledger and budgeting, payroll and personnel applications, can be integrated with the HIS/36.

HIS/36 is priced at $43,000.

Keane, 420 Bedford St., Lexington, Mass. 02173.

■ Mobius Management Systems, Inc. has announced Release 3.0 of Infopac — The Output Management System, which provides for automatic distribution of computer-generated reports. The package runs in IBM DOS and MVS environments under CICS.

Release 3.0 features on-line report viewing and on-line definition of report distribution parameters to any output device. The on-line viewing system enables end users to go directly to the report, version and page they wish to view. Users can also choose the desired report or version from a system-maintained menu of stored reports. Users can perform character-string searches or can browse through the report. Both 80-char. and 132-char. screens are supported.

With the on-line viewing modules, users can selectively print part or all of a report. Printed output can be routed by the user locally to CICS printers, remotely to remote job output printers or centrally to high-speed impact or laser printers.

Prices for Release 3.0 of Infopac start at $12,500 for DOS and $22,500 for MVS.

Mobius Management Systems, 271 North Ave., New Rochelle, N.Y. 10801.

■ Software Design Associates, Inc. has announced a management information system for financial institutions with the IBM 4300 series mainframes running MVS.

The Risk Asset Management System (Rams) works in conjunction with Cullinet Software, Inc.'s IDMS data base management system. Rams can generate regulatory reports, reports on global customer and credit relationships, and it includes capabilities for monitoring adherence to credit policies. Rams extracts information from existing systems to build an integrated data base, a spokesman said.

Rams costs $500,000.

Software Design Associates, 71 Fifth Ave., New York, N.Y. 10003.

■ Polaris Systems, Inc. has announced the QDM + package for enhancing Hewlett-Packard Co.'s QDM/1000 Quality Decision Management software. Both packages run on HP 1000 minicomputers with the RTE-A operating system.

QDM/1000 is intended for use by manufacturing engineers to monitor and manage product quality. The QDM/1000 system collects numeric and descriptive data from the manufacturing environments and formats it for use in management applications.

QDM + enhances QDM/1000 by allowing a system manager to use full screen forms, soft keys and edits for data entry without programming, a spokesman said. Existing paper forms can be duplicated on the display, along with user-specific data collection cycles featuring single- or multiple-display forms.

QDM + costs $12,880.

Polaris Systems, 2339 Highway N. 34, Manasquan, N.J. 08736.

■ Datacamp Systems, Inc. has added query and spreadsheet modules to its Mirage utility system for IBM System/38 minicomputers.

Execquery38 gives users the ability to create reports from up to five files, the vendor said. Users can change sorting criteria and subtotals and specify which columns of data to print without having to rerun the data base interface.

Execsheet38 provides spreadsheet floating-point decimal capabilities, formula replication capabilities and a data base interface. Users can create bar, line and pie charts in both color and monochrome. A cut-and-paste feature allows users to create multiple graphs in one display, the vendor said.

Execsheet38 is priced at $3,495. Execquery costs $2,495.

Datacamp Systems, Suite 1, 2283 Dunwoody Crossing, Atlanta, Ga. 30338.

■ Burroughs Corp. has announced the Burroughs Advanced Manufacturing Control System (BAMCS) for its B5000, B6000, B7000 and A series mainframes.

BAMCS consists of five modules. The Business Foundation module lets users store, maintain, retrieve and utilize manufacturing data. The Business Planning, Scheduling and Shop Floor Control module lets users create production and purchasing schedules. The Customer Management module lets users record, manage and fill customer orders.

The Purchasing Management module provides capabilities for scheduling manufacturing material requirements. It allows users to select suppliers, manage purchase orders and keep track of inspected and purchased materials, the vendor said. The Financial Management module includes capabilities for tracking project costs.

BAMCS leases for $1;125/mo or $36,000 for a four-year license.

Burroughs, One Burroughs Place, Detroit, Mich. 48232.

See AIDS page 69

There are several ways
to simplify VM for your users...
and they're all called MULTIPAK/VM™

MULTIPAK/VM is a productivity aid designed by SKK, Inc. to enable your VM users to more easily perform daily tasks. MULTIPAK/VM is actually a collection of four seperate but related VM utilities that improve upon some existing facilities, while adding some powerful new capabilities for VM users under CMS.

MULTIPAK/VM was written to assist users at all levels of experience. The package offers a trove of features that will benefit the most experienced VM/CMS programmer as well as the non-technical, inexperienced VM user.

Here are just a few of the many ways that MULTIPAK/VM can help you:

1. SPOOL VIEWER
Spool Viewer gives users the ability to now display all spool files. This includes print and punch files, which were previously inaccessible. With Spool Viewer users are no longer limited by file size, because the entire spool file may be viewed regardless of size.

Spool Viewer offers user-tailorable screens, which may also be used to change the displayed data. The Display/Change feature enables users to change file attributes by simply keying-over the displayed data without using complex CMS commands.

2. SHORT CUT
Short Cut is a command shell which simplifies CMS by guiding users through a multilevel system of command panels. Short Cut is designed to reduce the CMS learning curve and to increase efficiency of experienced users by offering simpler, faster alternatives to existing facilities.

Managers may use Short Cut to restrict CMS command usage by specific groups of users or by individuals.

3. SCREEN PAINTER
Screen Painter enables users to construct full-screen application panels by laying out screens exactly as they are to appear. Screen Painter offers new levels of performance, while automatically validating all screens and allowing users to print screen hardcopies. These screens may be called from an assembler program, and EXEC, or a high-level language.

4. STRETCH EDIT
Stretch edit offers VM users new and enhanced XEDIT capabilities. MVS or VS1 datasets, or parts thereof, may be copied directly into CMS files without losing the current line displayed. Stretch Edit allows users to swap screens, rename files in one step, and enhance normal program function key usage.

5. FREE TRIAL
SKK can also give you a productive way to evaluate MULTIPAK/VM; a 30-day free trial. Simply mail in the completed coupon or call a MULTIPAK marketing representative at 312/635-1040.

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INMON

from page 47

other vendors voice the merits of the dual-data base strategy. Which side is right?

The controversy can be traced to the very origins of the data base itself. Consider the world of master files, where every new application breeds its own set of master files, which usually are redundant. The promise of the data base as a single system of record was made, and soon master files disappeared from the scene.

A single system of record is one in which the content of data resides in its up-to-the-second value at the most detailed level. With a single system of record, the difficulties of master file redundancy and data synchronization are greatly minimized.

With a data base, which was touted as the be-all and end-all for users, there was no need for redundant data strewn all over the DP landscape. Thus, the early and intellectually appealing argument was made for the "truth" data base — the data base that served all data needs. Unquestionably, the truth data base approach was an appealing step in the right direction from the master file concept.

To this day, some data base management system vendors still make the claim that a single data base is the best approach.

But just as the world changed from master files to data bases, so has today's world changed from a single-data base concept to a multiple-use concept of data. The demands on today's data bases are many and varied — from the high-speed uses in bank teller and airline reservations data bases to the analytical needs of a vice-president of planning for decision support processing.

Evolution to dual data base

The next evolution from the truth data base approach is the dual-data base scenario. The primary division of data base processing is made along the lines of on-line, or operational, data bases, and decision support data bases.

On-line environments typically require a very structured kind of processing, while the uses of decision support data bases are unstructured. To use hardware to its fullest advantage requires the separation of structured and unstructured activities onto different processors.

Systems programmers have long known that IBM's CICS should not be mixed with TSO. Today's data base administrators are making a similar discovery. Cullinet Software, Inc.'s IDMS does not belong on the same machine as Information Builders, Inc.'s Focus.

To even the most die-hard relational advocate, it is apparent that the purpose and uses of decision support data are very different from those of operational data. Thus, the division into a dual-data base environment is a natural progression.

This assumes that there remains a single system of record, which nearly always is in the operational environment. Were there to be multiple systems of record, the advantage of going to data base from master files would be lost. But the dual-data base approach in no way mandates that there be multiple systems of record.

For decision support processing, there simply is no need to have up-to-the-second currentness of data or the level of detail found in the system of record. Thus it is that the dual-data base scenario represents the next step up in evolution.

The world is evolving into not only a physical separation of processors but also a physical separation of types of processors. For example, on-line operational systems are not just being physically separated from decision support systems, but operational systems are dominating the world of mainframes, and decision support systems are rapidly migrating to the micro environment.

An interesting issue is whether IBM has embarked on the dual-data base philosophy by accident or by design. Certainly, with DB2 and IMS Fast Path, IBM is clearly advocating the dual-data base approach. Cynics have suggested that IBM embarked upon that approach merely to protect its many customers that have billions of dollars of applications code tied to IMS.

While it is possible that IBM chose the path of expediency, in this case IBM has chosen the proper next step of evolution. Clearly, the next evolutionary step for the data base is the dual data base.

IT'S TIME TO STOP PUTTING BAND

SOFTWARE & SERVICES

AIDS

from page 65

■ Learned-Mahn, Inc. has announced the Automated Clearing House (ACH) Interface for automating contract disbursements in banking applications. The package runs with the company's Contract Collection Manager on the IBM Personal Computer family.

The ACH Interface is used to replace deposit tickets and cashier's checks, a spokesman said. The master record of the Contract Collection Manager, which automates third-party contract collection and disbursement services, contains disbursement instructions.

Using the ACH features, disbursements reportedly are written to an ACH file instead of writing a cashier's check and deposit tickets. The file is prepared in National ACH format, the standard for paperless transactions.

Licenses for the ACH Interface are priced at $4,000.

Learned-Mahn, 2229 W. State St., Boise, Idaho 83701.

■ Tasvir Corp. has announced a bidirectional utility program that transfers data between Computervision Corp.'s Cadds system and Tasvir's Supercads computer-aided design systems.

Superlink transfers models to Supercads where the model may be edited and sent back to the Computervision system while retaining the model's data structure, a spokesman said. Supercads is written in C language and gives users three-dimensional mechanical CAD capabilities. Supercads runs on Digital Equipment Corp.'s VAX systems, Apollo Computer, Inc.'s Domain workstation and the IBM Personal Computer AT.

Superlink sells for $3,000.

Tasvir, 2490 Charleston Road, Mountain View, Calif. 94043.

DSS

from page 47

age must be brought up quickly or users will lose interest in the fledgling system and revert to their old ways of making decisions, Wark said.

When selecting the capabilities needed in the DSS, managers should determine what it is they want to do most, Wark said. More importantly, he emphasized, they should be wary of vender claims.

"Vendors are going to try to get you to look at what is interesting to them." If your budget permits, consider adding advanced data presentation facilities, Wark said. "You'll use more of these facilities than you will some of the sophisticated statistic modeling capabilities," he said.

Selection criteria

As when choosing an applications package, management must first develop selection criteria based on required capabilities and then conduct a preliminary evaluation of DSS products, narrowing the candidates to about four products, Wark recommended.

Once the list has been culled, Wark advised MIS management to learn more about the DSS products either through seminars or discussions with users.

Bench mark studies are not always the best approach for comparing products, Wark cautioned. "There is not a good vender anywhere that does not know how to skew a bench mark."

As an option, companies should consider using products for a trial period. Wark suggested that companies convince the vendor they need a trial period.

Ease of use is one of the most important aspects of DSS, according to Wark. Users must be able to express their problems easily to the machine, and the most natural way of expressing those problems can vary from user to user. "For instance, APL [might] be a natural tool for an engineer to express a problem," he said.

Intelligent editors, query-by-example facilities and a language that allows users to take advantage of a relational data base management system are some of the capabilities that might help users present their problems, he said.

But success of the DSS implementation does not rely only on technology, according to Wark. The political environment at the company can be even more crucial to acceptance than trying to justify a product's price, he said. Managers must get user support first, he noted. "You have to have all your ducks in a row. If you don't line up your support ahead of time, all this is a wasted effort."

INTERVIEW

from page 47

people who've written 10,000 or 100,000 lines of code in a particular [fourth-generation language]. There are lots of problems with the so-called [fourth-generation languages]. None were developed according to modern ideas of language design. They all have GOTO [commands] and strange labels and archaic control structures.

Secondly, there are too many of them. With a standard language like Cobol, there is a whole market of tools available. If you want to compare two source code files or draw a picture of the control structure of the Cobol program, there are tools to do that. But if you have 100,000 lines of some [fourth-generation language] and you go out to find something to draw a picture of its control structure, you're likely to draw a blank. The vendor may not have gotten around to it, and it's not big enough for anyone else to get around to it,

This is a good argument for sticking to the language that has the most users. All surveys show Cobol holding its own. I would say more than half of all the code in the universe is Cobol.

I wrote a story on [fourth-generation language] cannibalism. They're [fourth-generation language vendors] buying each other up, and some are really hurting. There are too many out there. I hear stories in New York of companies trapped into hiring [fourth-generation language] consultants when they have substantial applications running in [fourth-generation language]. Modifying and keeping those applications running is a specialized task.

Q What are the maintenance implications of prototyping?

Prototyping is a buzzword that nobody has really thought through. Really, what you're saying in prototyping is that you're going to develop something very fast and then modify and adapt it. The implication of that is you get into maintenance a lot faster than you do with conventional development. The more prototyping you do, the better [you] know about maintenance because that's where you're going to be after day one.

Q Should maintenance programmers be paid more as a reflection of their real value within a DP shop?

It's up to the maintenance people to fight, not necessarily for more pay but [for] more responsibility. If a maintenance group is paying a company's bills much more than a rival development group [is, it] should state that case to management. Nobody [else] is going to do it.

Software is not going to go away. If we don't learn to control and modify it, it's out of our control. Our society is dependent on software. Our hope is to support people who are now doing or trying to do software maintenance.

Q Are most computer science graduates interested in development rather than maintenance?

Education in any technology always lags behind the real world. Since there were, at last count, only four college courses in software maintenance in the entire U.S., it's very unlikely that anyone is going to come out of college knowing about maintenance. You have to learn it on the job.

Q Why are so few courses offered?

I think it's because professors don't have to deal with large systems that already exist.

The average textbook is about how to write a little routine to do sorting. Every semester the professor sees 35 more students write yet another sorting routine.

Q Why aren't programmers interested in maintenance?

It's hard to go into a job and find it [to be] something you never heard of in your education. A demotivating factor is that many shops still approach maintenance with a philosophy and technology that are not adequate.

Maintenance has been regarded as something people do in three-day or one-week projects, more or less without tools. But some modification tasks are between the quick fix and the 50-person-year development project. Most organizations have no place to put projects like that.

Q Are vendors guilty of overemphasizing products for development rather than maintenance?

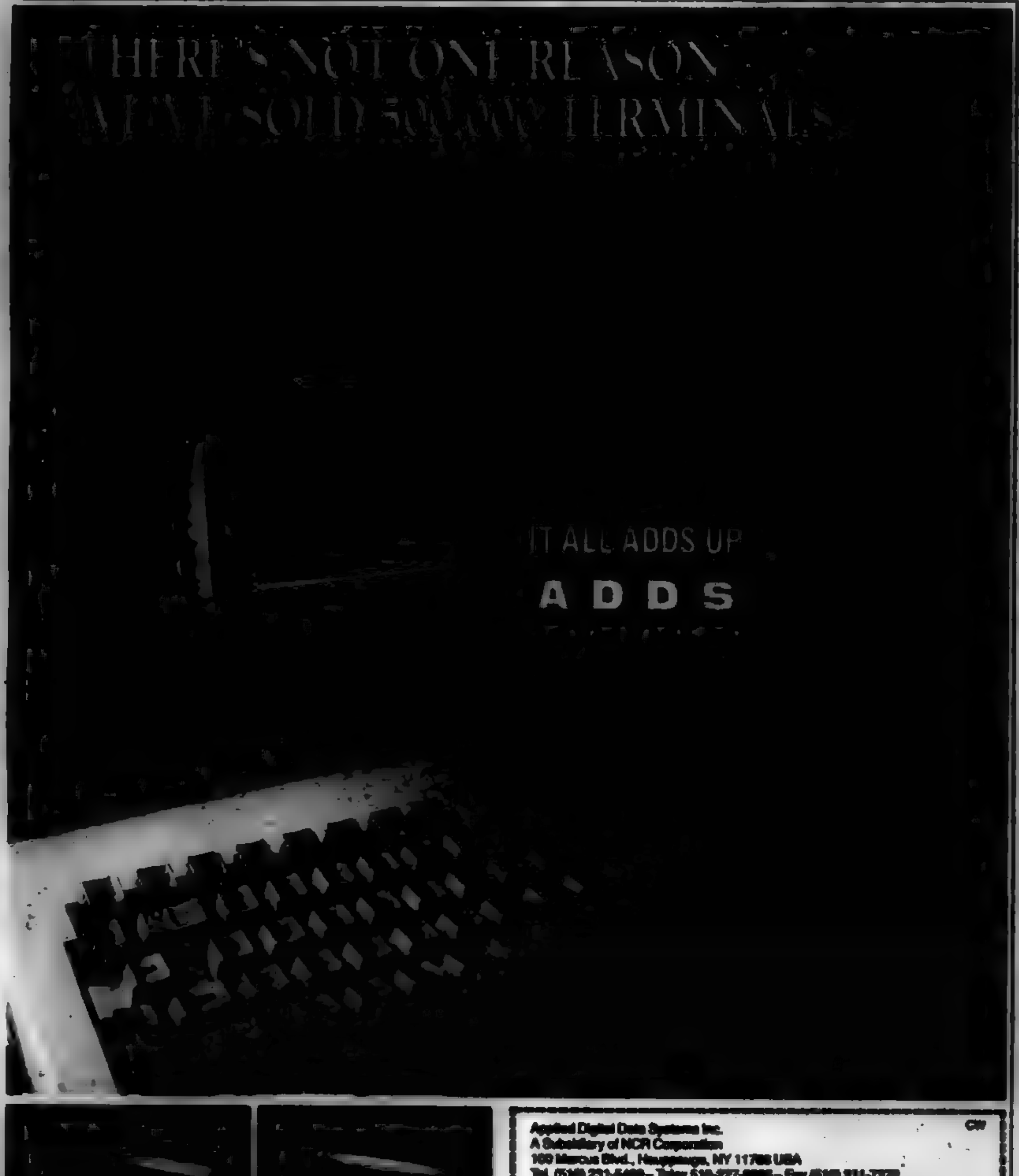
There is an elite group of vendors who understand maintenance, but vendors in general are hopelessly backward in this area. It's easier to write a tool that generates code according to some idea you have of how code ought to be generated.

There are probably 1,001 generators of fourth-generation languages. Every one is slightly different, and every one is a map of the brain of the company that produced it. It's easy to do that. What's difficult is to look at a system that exists and adapt yourself to it.

The vendors in the software maintenance environment tend to boast a whole lot less. . . . They don't try to sell you the total solution.

Q What's the state of the art in tools?

The state of the practice is that there are excellent tools for specific problems. There has been a lot of talk about putting the tools together in one consistent workbench. I'm skeptical about this. It's not clear that what's keeping people from using tools is not having the one workbench. Second, it's a lot harder to put these tools together than it appears. The interesting commercial opportunity I see is to combine 15 tools and put them together in a joint marketing effort: A tool bench of other people's tools.



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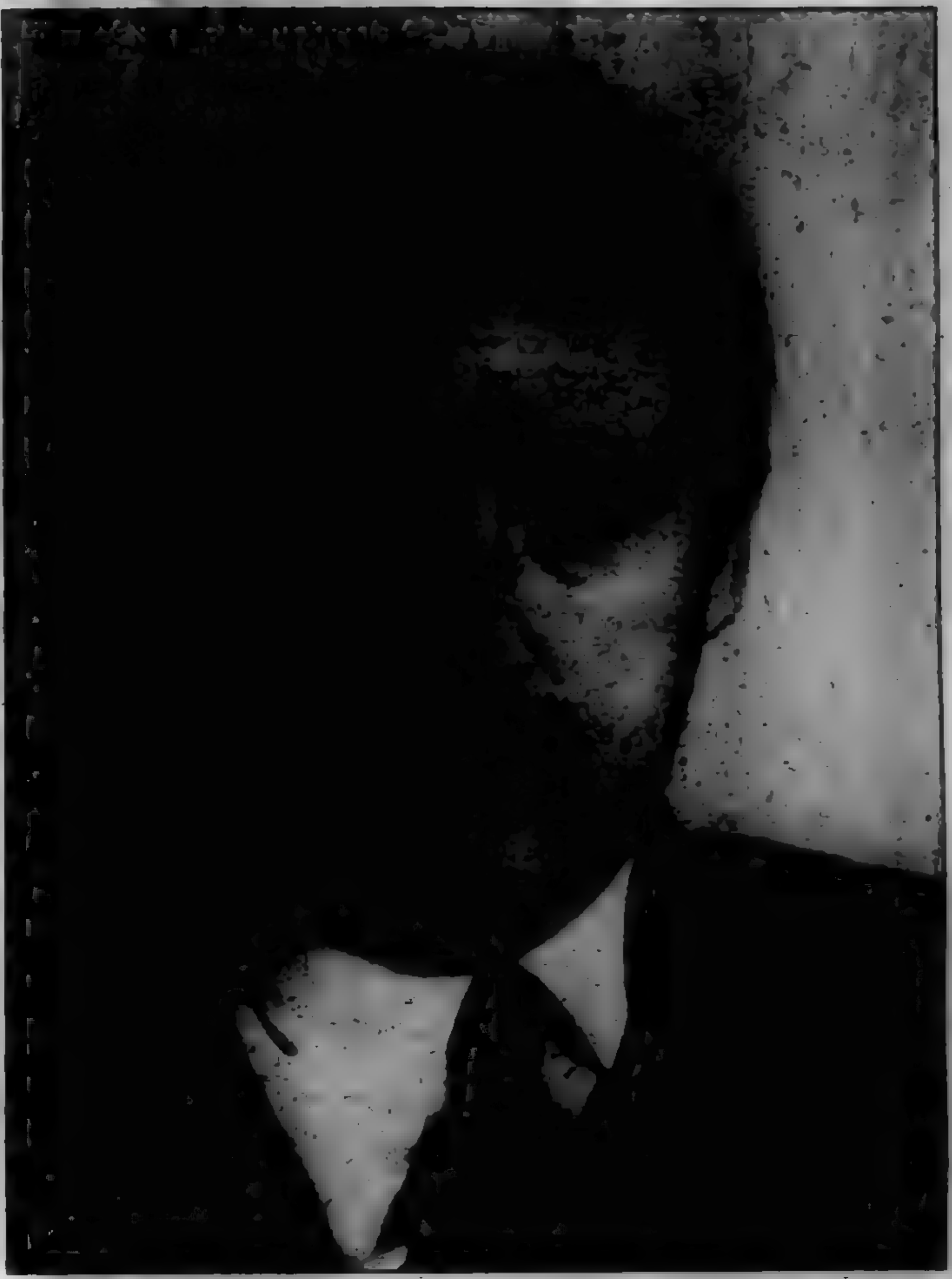
JOHN CULLINANE

On the Information Center Strategy

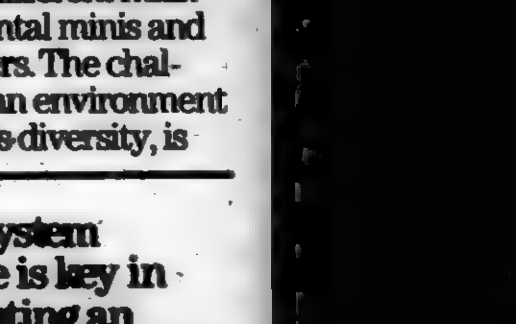


Today, virtually every IBM mainframe user is attempting to implement an information center. Formulating a successful information system strategy for the 80's and 90's requires it.

However, one of the major problems many companies face is the variety of software and databases located on different mainframes, departmental minis and personal computers. The challenge is to create an environment that integrates this diversity, is responsive to the corporate user community in meeting its information needs and, most importantly, provides access that is consistent and transparent. This is why open system architecture is key in implementing an information center strategy.

> "Open system architecture is key in implementing an information center strategy."

It also makes particular sense for a software company like Cullinet to adopt a policy of open system architecture that allows corporations to standardize on Cullinet's products without losing a significant investment in other vendors' products—whether they are mainframe applications, microcomputer software such as Lotus 1-2-3, Symphony and other PC products or departmental minis from companies like Digital, Data General, Wang, Hewlett-Packard and others.



That's why Cullinet has introduced the Information Center Management System. It's one part of a strategy that makes it much easier for the VP of Information Systems to standardize on the full range of Cullinet software, including our proven mainframe database and applications and our integrated GOLDENGATE microcomputer software.

Our strategy makes sense not only because Cullinet products are designed to work together, now and in the future; but also because our open system architecture means that data processing management will be able to accommodate satisfied users of other software while anticipating the introduction of new products.

For more information about the Information Center Management System and the full range of Cullinet products, I encourage you to phone, toll-free, 1-800-225-9930. In Massachusetts, the number is 617-329-7700.

IBM, DEC, Wang and DG are registered trademarks of International Business Machines Corporation, Digital Equipment Corporation, Wang Laboratories, Inc., and Data General Corporation respectively. 1-2-3 and Symphony are trademarks of Lotus Development Corporation. GOLDENGATE is a trademark of Cullinet Software, Inc.

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Announcing the NCC tour guide

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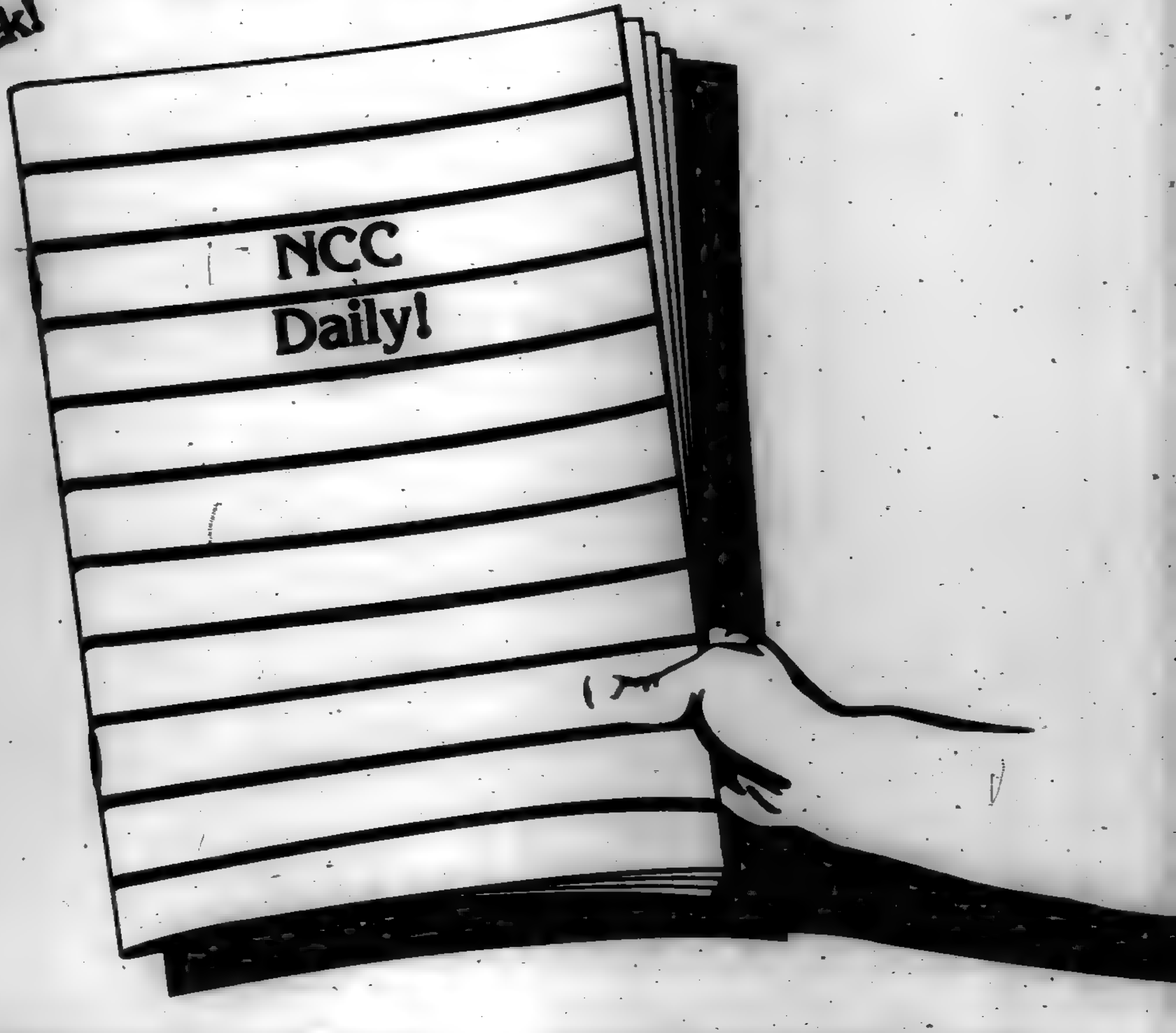

The National Computer Conference (in Chicago this July 15-18) is so big, attendees need a guide to the show. Something like a tour guide. To make sure they see everything they came to see.

And because NCC is so big, you need to tell your customers and potential clients how to find your booth. To make sure that you get a good return on your investment.

Computerworld will be at NCC with help for the attendees and the exhibitors. We'll publish four separate issues of the always popular *NCC Daily!* And we'll distribute 25,000 copies each morning of the show. So your ad will reach your target audience just as they're deciding which booths to visit.

Each issue is sure to be well read. We'll provide attendees with on-the-spot coverage of the major product announcements, speeches, and technical programs. Interviews with top industry personalities. A schedule of events for the day of issue *and* the next day. Plus a guide by local experts to Chicago's restaurants, museums, and entertainment.

We'll also cover NCC in three special issues of Computerworld. The July 8th Preview issue. The July 15th Show issue. And the July 22nd Wrap-Up issue. Advertise in these issues and ensure your investment in NCC. And, just as importantly, you'll keep your name in front of more than 687,000 computer-involved professionals all during this eventful period.

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Issue	Issues Dates	Closing Date
NCC Daily!	July 15, 16, 17, 18	June 10 (all 4 issues)
NCC Preview	July 8	June 21
NCC Show	July 15	June 28
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IN DEPTH

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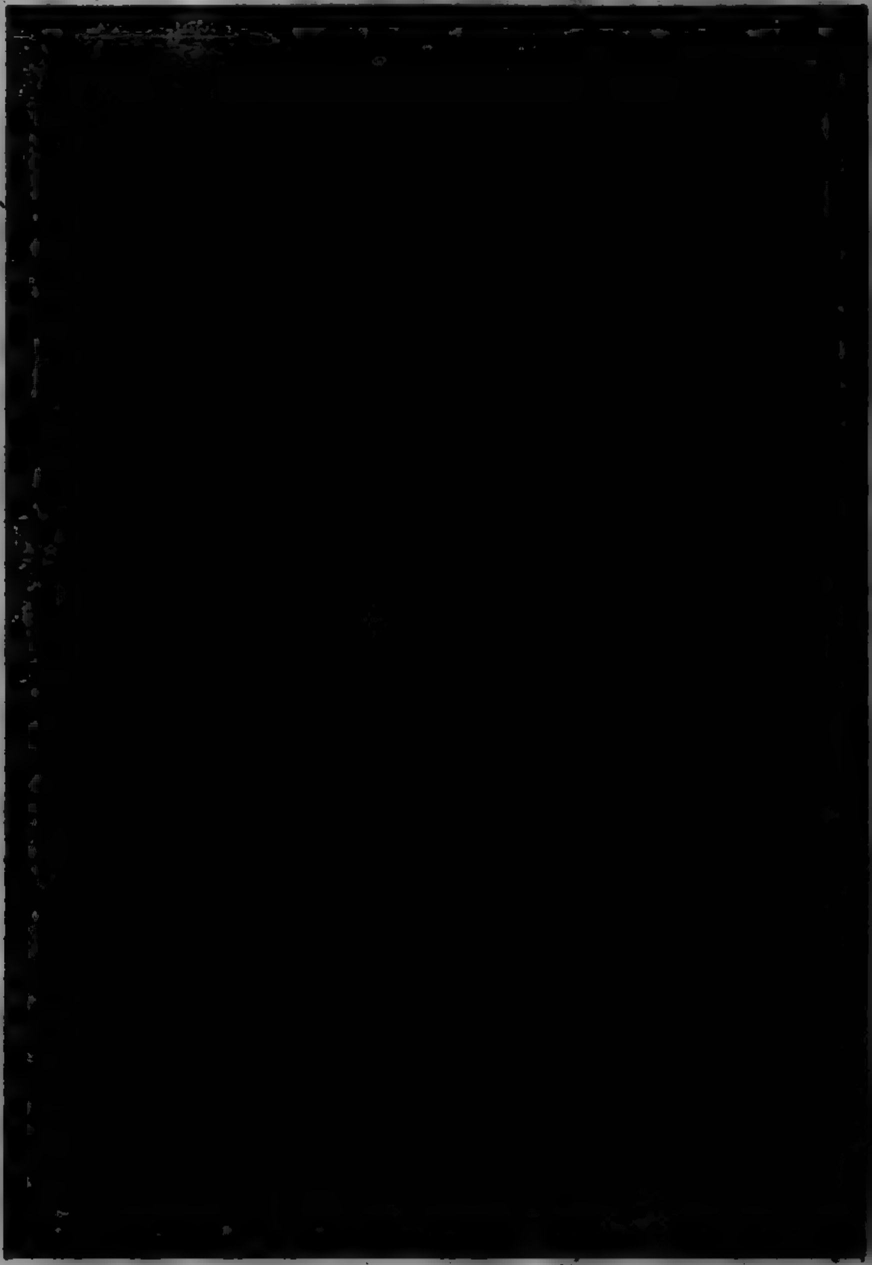


"It's going to be a good long time before they start seeing substantial results from this investment."

"MCC really is an effort to keep midsize companies independent and still able to play in the game."

MCC revisited

An interview with Bobby Inman

Retired Adm. B. R. Inman is president and chief executive officer of the Microelectronics and Computer Technology Corp. (MCC). This venture, begun in January 1983, is attempting to turn competitors into partners during the research and development stage of products. Inman, who will be the keynote speaker at the National Computer Conference in Chicago July 15, was interviewed by staff writer Clinton Wilder at MCC's headquarters in Austin, Texas.

When the idea for MCC was hatched, some questioned whether companies that compete against each other could work together successfully here. How has the cooperation evolved?

The key decision in the success of MCC, in defining the research programs, was that if the teams defining the programs could envision a product, the research should not go to MCC. What that means is that companies do not have to transfer in technology that they are now using for competitive advantage in the marketplace. That was probably the critical element in getting these diverse companies to work together. If you were looking at near-term things, and there was a question of somebody transferring in technology that might make a difference in three or six months of getting their product out, I don't know how that would have evolved.

Now that the principle is in place and the legislative action has settled the antitrust issue, then you will see some joint ventures for the near term created along the way. They're not likely to be as broadly based as the long-term ones, but you will see some with problems three to five years out being handled.

There was a lot written about how, for a while, you weren't satisfied with the talent levels of the researchers. Has that changed?

I am delighted with the talent that's here now. But I did not believe that a lot of the people I saw as candidates were of the quality that I needed. The board of directors has ultimately been very supportive of the approach we've taken, even if there were some early concerns about talent. But as I've noted, once it got started, it took off like a rocket. We got really superb talent, and that serves as a magnet.

In early 1983, the original concept was that all the talent we needed was to be found in the companies; it was just a question of getting it. The actual execution has turned out to be very different.

Lately, we have been blessed by a flood of resumes from people who want to be part of MCC. When you stand back and ask why they want to be part of MCC — it's because of our long-term goals and tough problems, problems where they think they could make a difference. That is what has drawn people, even in the companies. We have had a couple of direct hires who were in the companies, wanted to get assigned to MCC and didn't. They resigned, and then we hired them directly.

With 21 different companies out there, I presume there are differences in the significance each member attaches to MCC.

Well, it cuts two ways. First, this is an organization that was created from the top down. The chief executive officers and a group of senior people around them made the decision on whether the company would join. When you get into execution, and you get down three or four ladders, you have all of the situations that one should expect.

There are people who see it as competitive. They'd rather use the dollars on their near-term problems than on something long range that they don't know will ever benefit them. When it gets down several levels and they have to decide who to break loose to send, it is absolutely normal that they would be reluctant to send their very best person working on this year's problem, out of whose performance their whole bonus might be calculated. It's the kind of structure where, to get started, you need senior attention.

MCC was initially envisioned as something where all the researchers, including the research program directors, were going to come from the companies. How have they taken the change to 88% direct hire and all the program directors coming from outside? Has this process led to major misconceptions about the attractiveness of MCC to the companies' researchers?

Perhaps. But again, it was a learning curve. There was an assumption made about where talent was to be found, and none of them ever envisioned that MCC was going to be attractive to so many people who were not in the companies. But the companies have remained very flexible to adapt to the realities of MCC.

I had some advantages. I came from 10 years of managing organizations where I had to get people to work together who didn't necessarily want to but had to. Understanding how you go about that and how that process works was not in [the companies'] experience.

If the success of MCC is gauged by how effectively your research advances are translated into products back at the company level, how is that going to work?

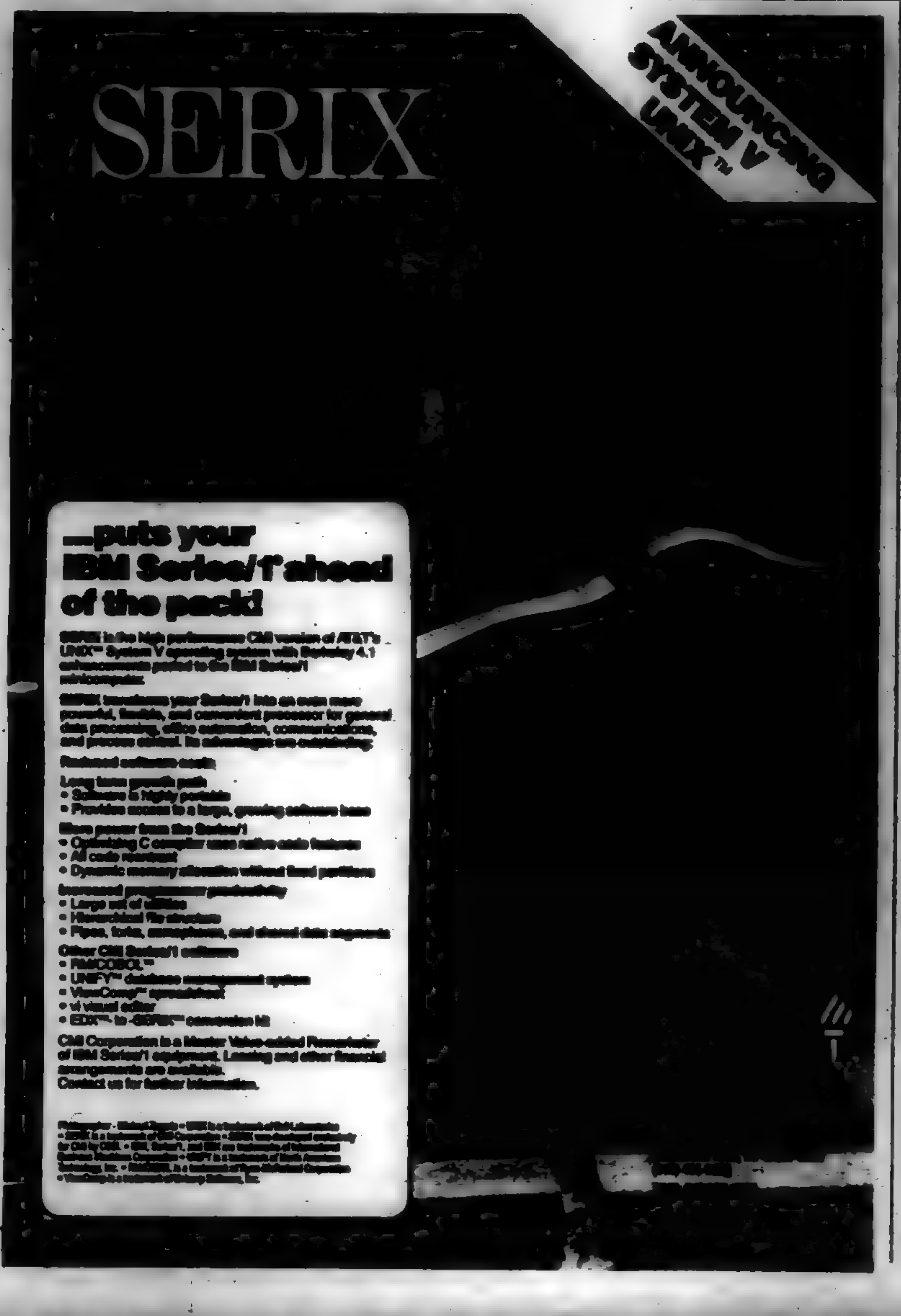
Technology transfer, internally, is a very tough thing to bring off. It doesn't just happen with the wave of a wand. People at the companies initially said, "don't worry about it, we're going to send people on assignment, we'll send liaisons that will rotate and bring the technology back with them." But with 88% direct hire, they aren't going to go back. Over time, the companies are going to have to have their own internal tracking organizations, and they're going to have more of their people come and spend extended periods of time here for hands-on understanding of where we are.

We'll end up with more people here on a temporary basis, as we get closer to the licensing. We're already seeing some companies sending teams — happily with some from the production side — to get them to begin to think about what may come out of here. That's a very good sign.

The 21 companies are very diverse, and that says as you're trying to make decisions, you have to work harder. But if you look at it from a different angle, the likelihood that several of those companies will end up using the technology that has been created is very high. And for what's going to motivate the researchers, it's knowing that what they produce gets used.

So as I look at the diversity and say, oh God, how long is it going to take to get the necessary vote through, I remember that for what's really going to motivate the scientists — the prospect that their technology is going to get used — that very diversity is a strong plus.

How big a role can MCC play once the technology transfer is accomplished?



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How are you ever going to get U.S. corporations to think long-term when the media is saying, 'What did you do last week?'

We play no role. And therein is where the antitrust laws get involved. The National Cooperative Research Act of 1984 is very clear that manufacturing and marketing products are excluded from the protection provided to joint ventures.

So we will create the technology, we will stream it out to the companies that have funded it and put together the necessary elements for that technology to be turned into products, and we'll say, "License it." We will support that technology for six months, but after that, we're out of it. So we're really supporting it well into the design phase, but not the manufacturing and marketing.

Has MCC come up with any technology so far that you have been able to license?

These are very long-range programs, with deliverables years out. But it's turned out that there are some proprietary approaches that we've taken in-house — the way we are attacking problems, a unique equipment configuration that we've put together or algorithms used in attacking software approaches — that the companies have looked at and said, "Gee, we can use that on our own research activities. We'd like to pull that now." The answer is, we will do it, but we won't support it in that case. We can't afford at this stage to send people off to maintain the techniques that we're using.

Are these the early deliverables we've heard about?

Yes.

So it's really your methodology of doing the research that has produced something to transfer back to the members.

As we've gotten through the planning stage and into the research itself, and with the teams that have been assembled, the uniqueness of the methodology has been a product in itself. It was simply a product, an outcome, that we had not anticipated. It's nice to have some of those because, unless we have fortuitous, unforeseen breakthroughs, it's going to be a good long time before they start seeing substantial results from this investment.

Does it get frustrating to have to keep telling outsiders that you're not going to be turning something wonderful out of here in, say, two years?

Yes, every now and then, my frustration level gets high. A great newspaper on the West Coast that I've admired all my life drew my ire last October with an editorial that said, "Gee, MCC has been in business 18 months, and they haven't produced anything in artificial intelligence and neither have the Japanese, so it's clearly a bad idea." I mean, that's a 10-year program. Now if 10 years from now we haven't produced anything that's usable, then that's a good [comment]. How are you ever going to get U.S. corporations to think long-term when the media is saying, "What did you do last week?"

Looking at the programs we have now, in five of them, you can already envision the kinds of things you can do and the directions they will go within the time frames. The two that are somewhat more problematic are AI and parallel processing. There, all the theory hasn't been developed. So some of the things we're doing are really just basic research. So it may turn out that the 10-year time line is too close. There will be things we'll learn in both those programs that will impact the next generation of computer designs. But it may turn out not to be as significant as in the other programs.

It must be frustrating to turn the technology out here and then have to sit around waiting for it to be used.

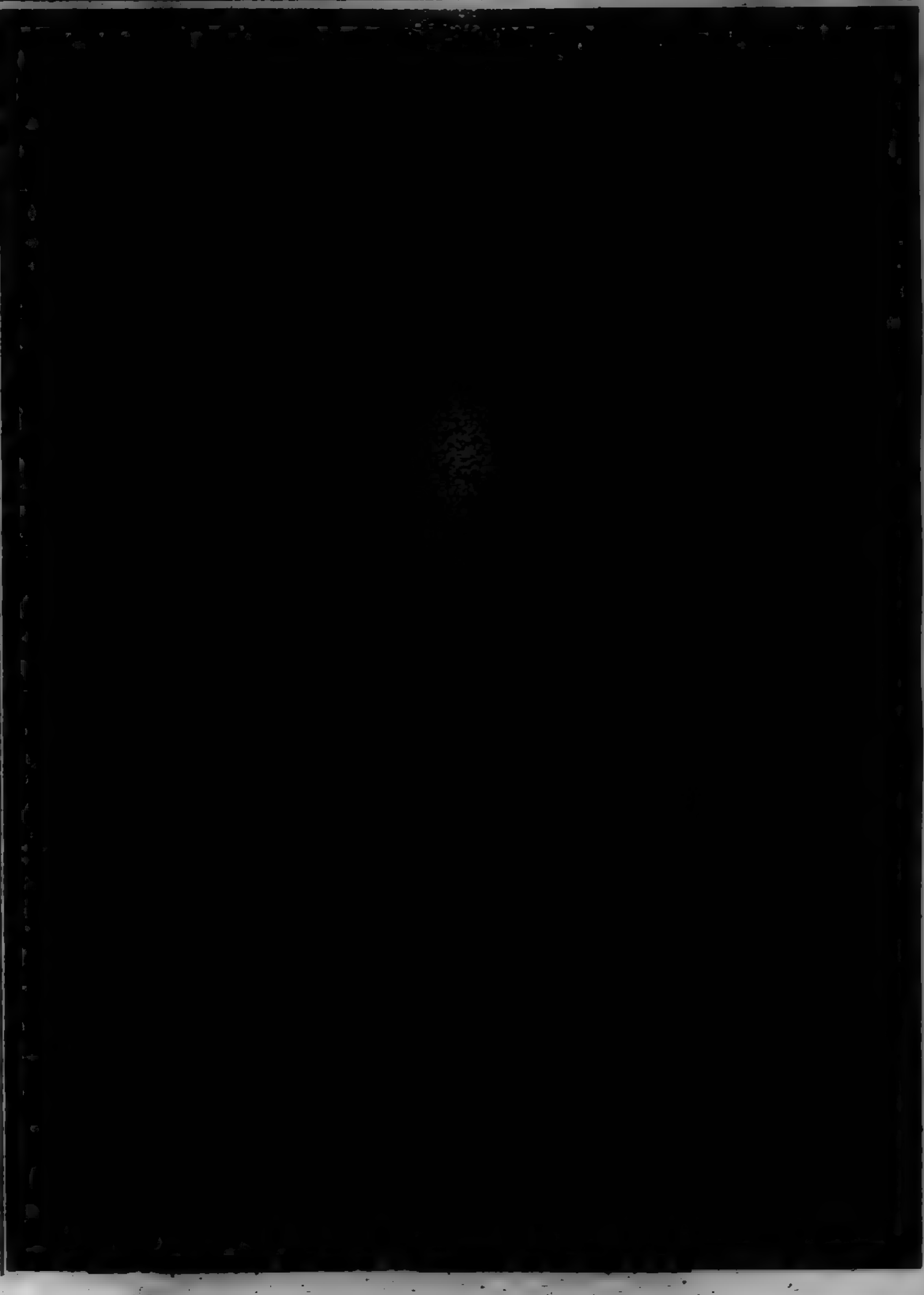
I worry about this topic a lot, and some of my shareholders tell me I worry about it too much and too loudly. But I'm confident because the members know that other companies will have access, that they will try, and they will plan to use this at a fast clip.

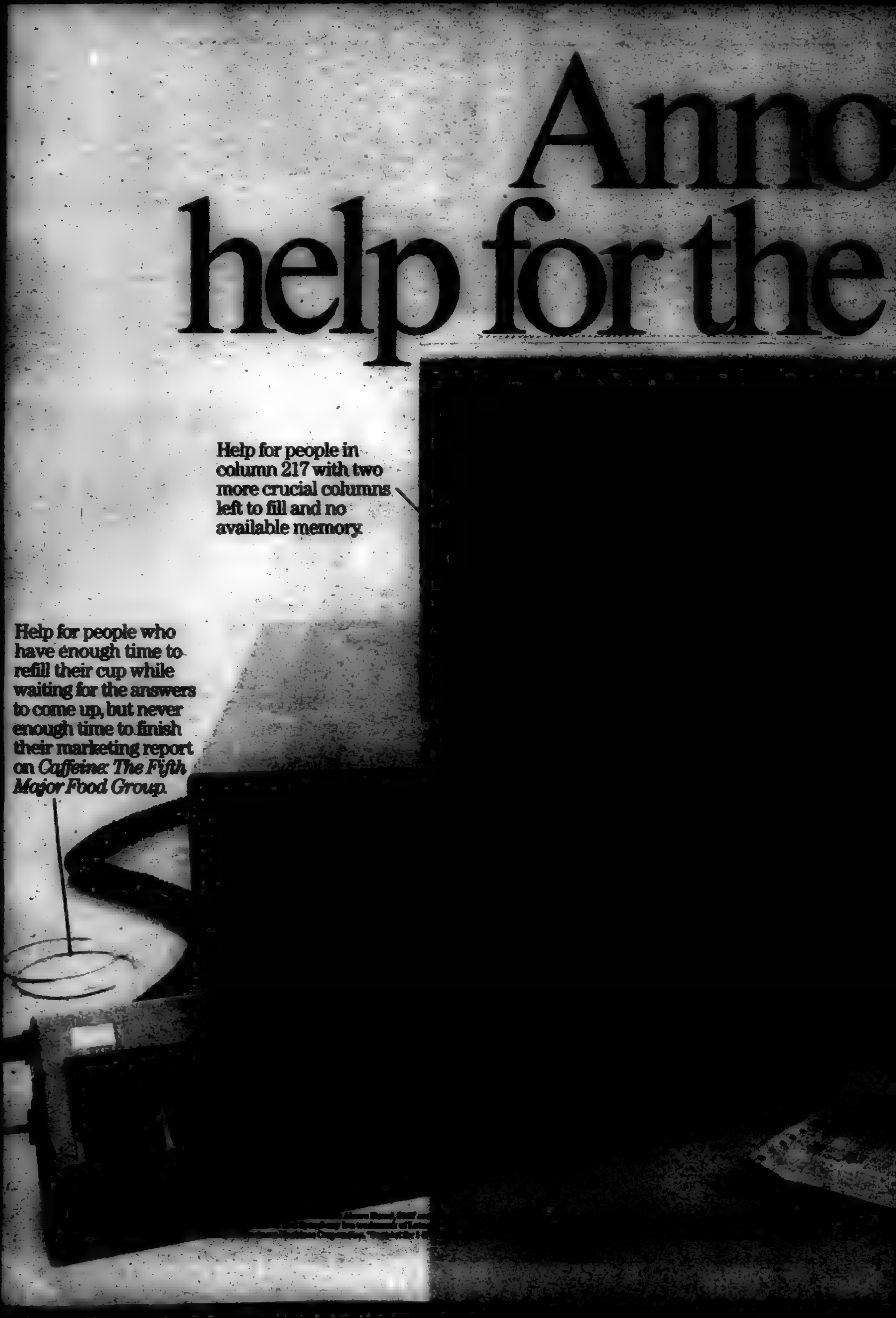
We've been hard at work now for more than a year on the mechanics of a master technology transfer plan, getting all the licensing arrangements in place, so at least we aren't going to have bottlenecks in the process from this end that slow down the availability.

Even if it means we'll have difficulty later in proving it was our idea that started it — that's a conscious risk that I hope we won't have to confront. But what we've worked on is that there are no impediments from the MCC side in the lack of flow to those that paid for it. This is not a laboratory simply creating ideas to publish and stop.

Turning to Japan — how much of an eye are you keeping on them?

To be very direct, I'm keeping almost no eye on them. It's primarily all the questions I get asked from the media that cause me to spend some time tracking [Japan]. It has no influence on research. Now if they were to suddenly have a great breakthrough, we would clearly scramble





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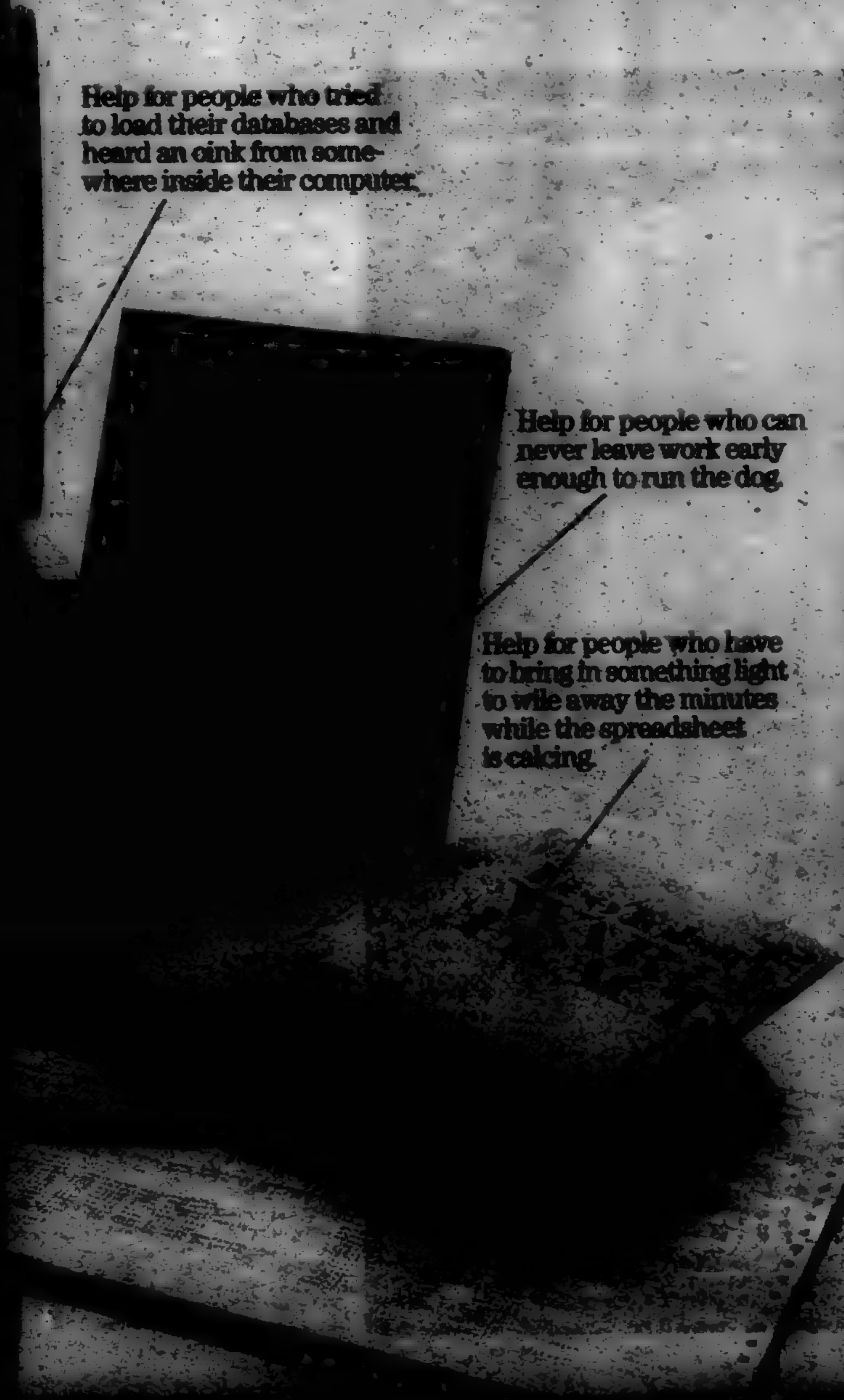

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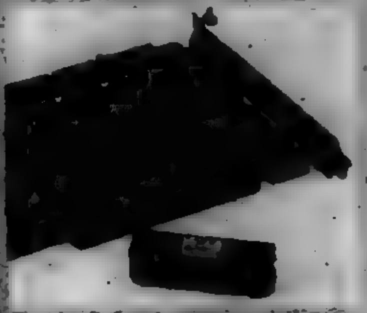

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to say, "Where are we? Did we try that? If not, why not?"

But short of that, first, there isn't a flow of information that gives you great detail on approaches the Japanese have taken. If [Nippon Telephone & Telegraph] would like to make very clear what it is doing and how it's doing it, my attention level would go up very quickly. But for the rest, I simply track reports I see and get reports back from people who've attended a conference there.

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> *I have great respect for the Japanese. I expect they will turn out some very usable products, and they have a shot at creating new technologies before they appear in the U.S.*

I have great respect for the Japanese. I expect that they will turn out some very usable products, and they have a shot at creating new technologies before they appear in the U.S. But I don't have a great sense that we are, at this point, behind in creating the technology. Where my worry lies is in the implementation.

If you look at the history of the last 15 years, where the Japanese have made their great advances has been at the speed with which they take their new technology to marketplace . . . in quality control, manufacturing, the skill in the market. So we could end up producing technology two years before the fifth-generation effort, and that could end up making little difference in the competitive marketplace, unless the U.S. firms can move the technology to marketplace at a faster rate than they have in the past.

What are your thoughts on trade barriers?

I'm opposed, instinctively. As I look back over history, whenever we've turned to them, results have been disastrous over the long term. The way you avoid those is by the speed with which you introduce the new technology.

If you ask me what in the country worries me like that, I worry that I don't see more focus on manufacturing technology. We're not really doing anything at all. I see a lot going on inside General Motors, General Electric — I presume it's going on inside IBM, but I don't see it in small and midsize companies.

I really worry about whether we are doing enough in this country to bring emerging technologies to bear, on modernizing basic industries to make them more competitive and productive.

How much does your own background help?

Almost none. I am an analyst of the Soviet Navy and Soviet government, things like that, not on Japanese technical matters, so I have little to offer them in that case. My experience was in electronic surveillance, and we're not engaged in that now, nor is there any possibility we would be. So my background turns out to be not that relevant.

Is IBM seen as a threat in the specific research areas MCC is pursuing?

A competitor, not a threat. I would expect they have very viable efforts going in all of these areas. Does MCC have any advantages in that competition? The answer is yes. We have advantages for the scientists who would prefer to work in a small organization, with a higher prospect that their specific contributions will be very visible.

IBM has existed for many years, and no one ever came together in response to it being there. Obviously, if MCC ends up making some of [the member companies] more economically viable, it also makes some of them more viable with regard to IBM. But I doubt that Boeing, Martin Marietta, Rockwell, Lockheed, Kodak or Bellcore, for that matter, are giving much thought to what IBM is doing.

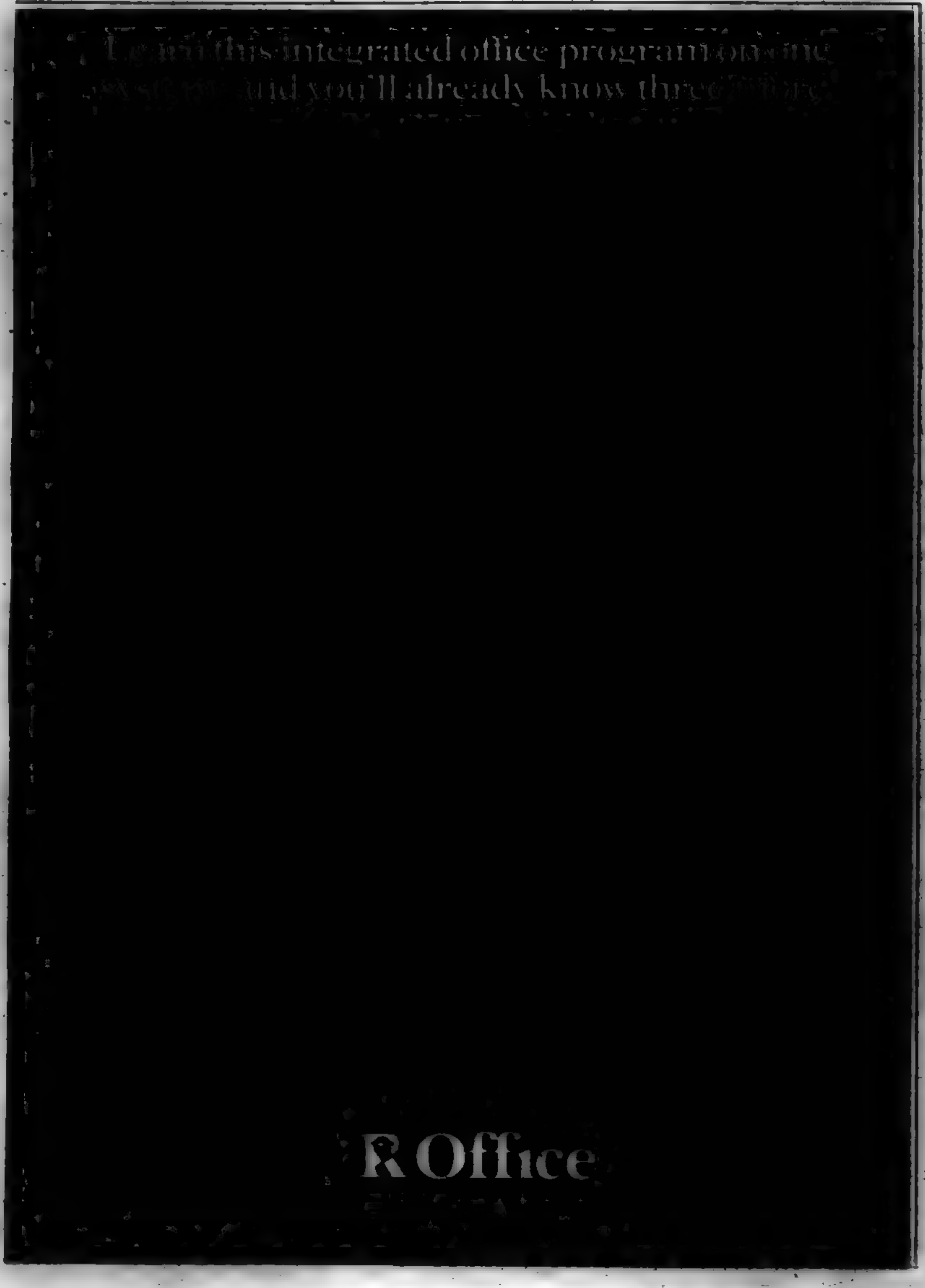
Clearly, some of our shareholders will be vitally impacted by what IBM does at the marketplace, both in products and tactics. But for some of the others, their only interest is whether IBM is going be purchasing their equipment.

But what about IBM's $4 billion R&D budget?

It's enormous. It's like another element of the federal budget, as is General Motors'. That has been our history, that as an industry matured and the cost of R&D became very high, you only had a few giant corporations because everybody else fell out. MCC really is an effort to keep middle-sized companies independent and still able to play in the game. That's what is going to be interesting to see.

There have been some indications that you may start a new research program. What is the status of that?

It's still in the formative stage. Originally, the board thought we should not contemplate any additional programs before 1986. But by last fall that changed, and there was no longer any doubt that MCC worked, so we accelerated the process of looking at some additional programs. We've done that, starting in March, but it's not proceeding as fast as I thought earlier. It takes a lot of hard work to lay out the specifics of a program that people would actually want to be a part of and invest a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> *We're a little ahead of the most optimistic hopes. There's no longer any doubt that diverse, competing companies can pool talent to attack long-term problems.*

substantial amount of money in, particularly in a time of economic downturn.

Has the relationship between MCC officers and shareholders executives changed?

It was clearly the intent of the shareholders that they be directed by a CEO and principal officers here, not by committees of shareholders. I am very quick to ensure that we have no erosion of that.

What about keeping research information proprietary for the companies that funded it?

That is an area where my past experience is relevant. In all my National Security Agency years, the key was to get scientists to exchange ideas and attack very tough problems. And then you compartmented the actual application for national security reasons.

Here you do it for proprietary reasons. So I know that the process can be made to work.

In terms of your original expectations for MCC, what is your assessment at this point? Is there any reason to doubt the high hopes?

I would say we're a little ahead of the most optimistic hopes. There's no longer any doubt that diverse, competing companies can pool talent to attack long-term problems.

You can build the teams, the funding profile works, ideas are going to tumble out.

What we clearly haven't established and won't for several years is that which turns out to be technology that gives an edge in the marketplace. But for the totality of the concept of joint venturing for creating that technology, there is no longer any doubt about that at all. It is a process that works.

The record will not be complete, though. The concept wasn't just to prove you can do joint research, but was this approach going to give us a competitive edge in the marketplace? And that is where the jury is still out.

Can you envision an MCC without Bobby Inman?

Oh, sure, very easily. You could have a number of other MCCs.

I brought some experience that was relevant in getting started, but you've already got a half-dozen people around here who could go run an MCC.

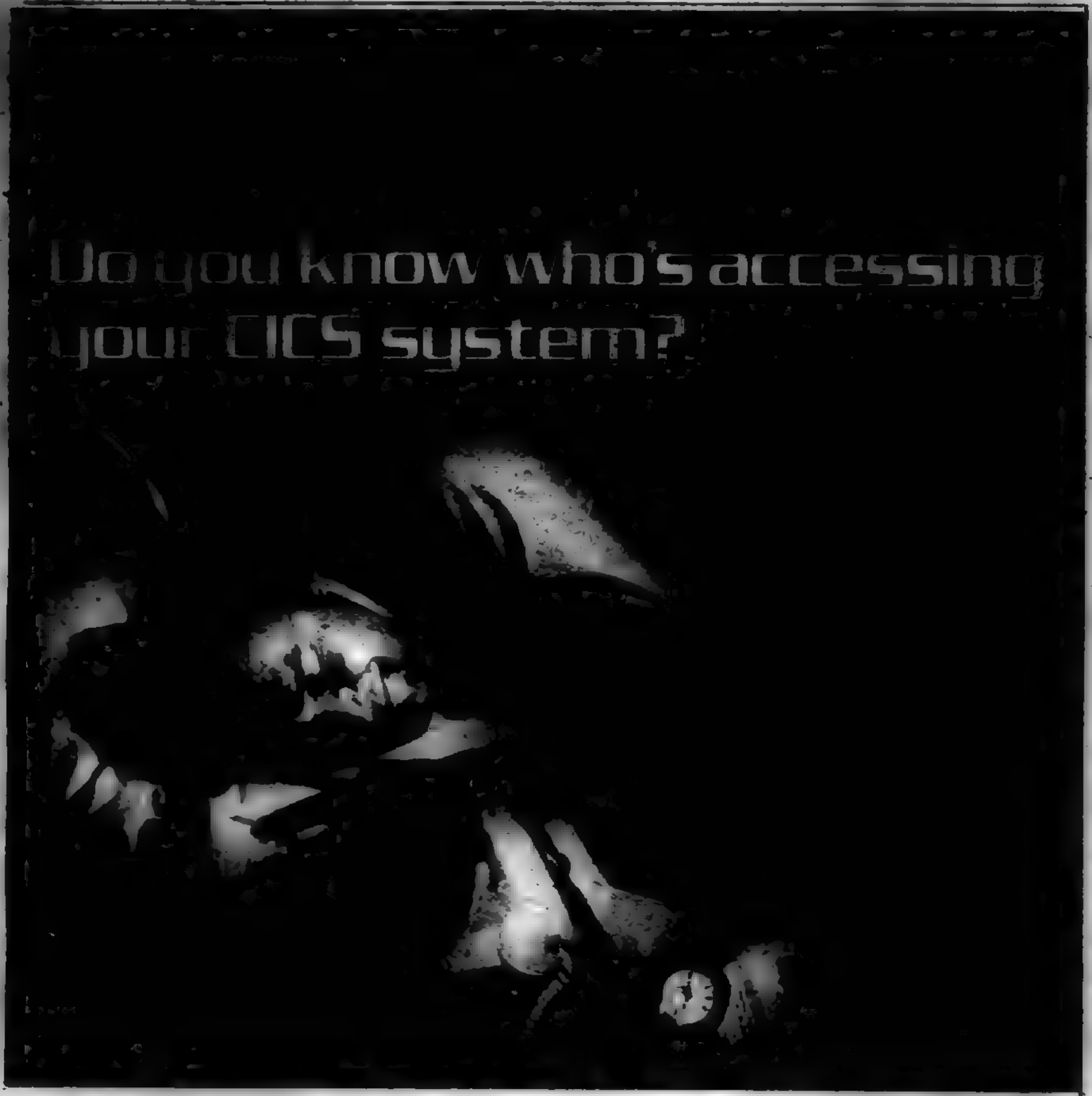
I'm not looking for someone to come replace me at this point. It's still in the building stage, there are new things that come along all the time, and that's what's exciting and fun about it. Whether it will be the same way five years out, well, I don't know.

But I was very careful from the outset to structure an organization that was not dependent on me. I made a mistake 10 years ago, when I was the director of Naval Intelligence, in having everybody report directly to me, and I made the decisions. I loved it, but it was awful, because I suddenly got pulled out of the job and promoted.

And I learned the very painful lesson that you don't structure an organization to be dependent on a single individual.

My real key here was to prove that the concept could work. That is behind us. Now the goal is to evolve it into a healthy, long-term organization, introducing some additional programs, getting through some actual technology transfer processes where the companies pick up the research.

These are still real challenges.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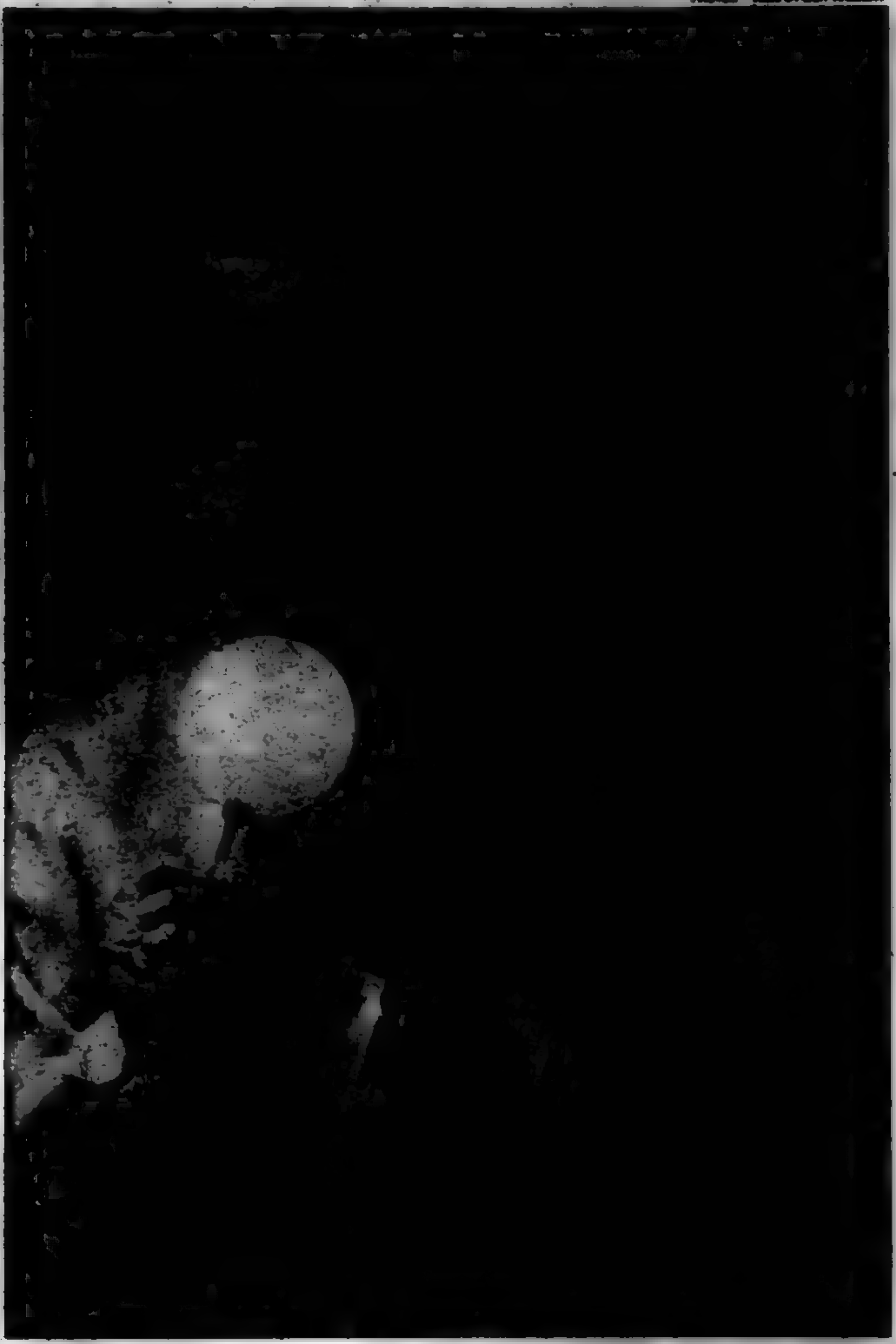

Semiconductor Packaging and Interconnect Technology is one of seven research programs under way at MCC in Austin.

The MCC payoff

Getting the technology back home

By Clinton Wilder
CW Staff Writer

Technology transfer.

It's a buzzword heard often in the offices and research rooms at Microelectronics and Computer Corp. (MCC), appropriately located on Research Boulevard on the edge of fast-growing Austin, Texas. Loosely defined, it means the process by which the 21 computer, electronics, aerospace and other companies that own MCC hope eventually to convert the research done there into proprietary products back home.

MCC's long-range research goals, such as fifth-generation computer advances, have met with both praise and skepticism in the U.S. computer industry. But for 21 firms investing substantial amounts of research and development money in the ambitious project, the jury on MCC is still out — and will be for the next several years. The member companies will judge the success of MCC not by what is accomplished in Austin, but by how quickly and how well those accomplishments become products that enhance the members'

Scheduled to open in mid-1986 is MCC's permanent office and research headquarters, a 200,000-square foot building leased from the University of Texas.

competitiveness with the Japanese and each other.

"At Honeywell, we have a saying that nothing happens until somebody sells something," says Richard Hill, a Honeywell, Inc. MCC liaison working in the artificial intelligence component of MCC's Advanced Computer Architecture (ACA) research program. "Well, nothing happens at MCC until the technology gets transferred. It's a live or die issue."

"Any company that doesn't prepare for that technology transfer back home is a loser," Control Data Corp. liaison Ellen Boughter says bluntly. "They would lose their whole investment."

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> *Today, a share goes for $1 million, and some of the programs, including the highest funded ACA program, have also increased the price of participation.*

By the standard financial measure of investment value, MCC has progressed quite well since its 1982 conception as the American answer to the Japanese Institute for New Generation Computer Technology (Icot) research effort. In 1983, MCC set up shop with the 10 charter members becoming shareholders for $150,000, plus their investments in at least one of the four research programs.

Today, a share goes for $1 million, and some of the programs, including the highest funded ACA program, have also increased the price of participation. Having added 11 new members and 13 peripherally involved associate members, MCC has seen its annual budget grow from $35 million in 1983 to an estimated $65 million this year.

By other standards as well, MCC has made significant strides since a rough start. Because MCC's newsmaking chairman and chief executive officer, retired Admiral Bobby R. Inman, began looking outside for researchers, most programs have begun to take off, the members say. Company liaisons believe MCC's transition from 100% shareholder employees to just 40% was an inevitable growing pain.

"The idea that members weren't sending their best people to work at MCC was a naive criticism," Hill says. "The people [candidates that Inman refused] were very good at what they do; it's just that they don't do this kind of thing. We quickly came to the realization that to do the 10-year perspective kind of research that MCC was formed to do, you needed a whole different breed of cat."

In the Software Technology program, for example, Inman deliberately held back the entire project until he found the right program director from outside — Laszlo Belady, a 23-year IBM veteran most recently in charge of software at Big Blue's Japan Science Institute. "He exercised his veto power to turn away people who didn't measure up," says Sperry Corp. MCC liaison Arthur Schneider. "The whole cadre of technical people there now is absolutely first class."

New identity

The result is a different identity for MCC, one that officers and participants say is greater than the sum of its parts. "When people come down here to work from the companies now, they hang their corporate IDs on the back of the door and become MCC employees," says George D. Black, MCC vice-president of Human Resources. "We've seen a remarkable difference in the last year in the number and quality of people who want to be part of MCC. People come because they want to be part of a whole new way of doing business in this country."

Part of that mind-set is MCC's emphatic commitment to the future. While the computer industry, like any other American business, is geared toward the balance sheet of the current quarter or the executive bonus at the end of the current year, MCC does not expect its research programs to produce tangible, transferable results much before the end of this decade. It is an orientation that nearly all members' liaisons say they lack back home.

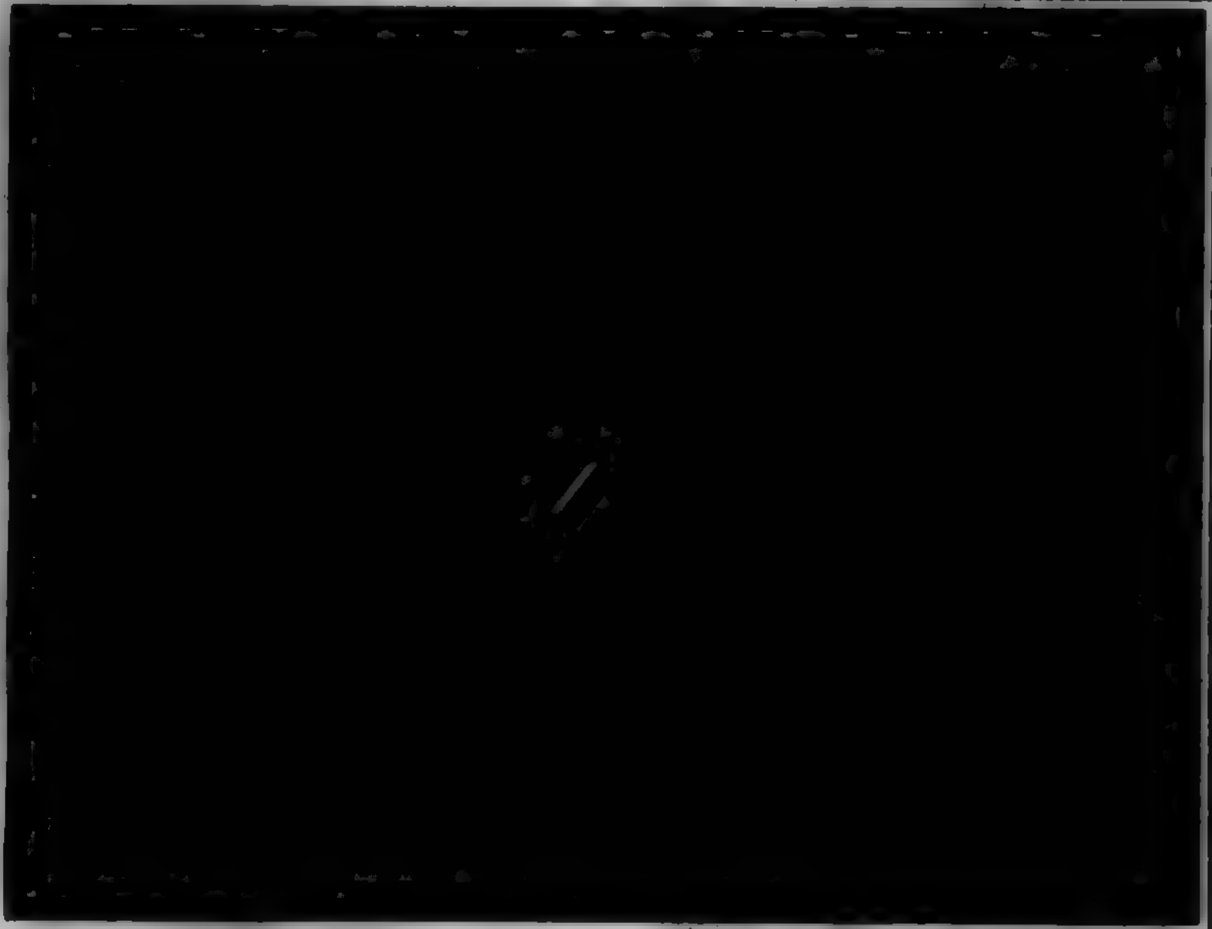
"That is certainly true at Control Data," says Boughter, a researcher in the ACA data base component at MCC. "It's extremely difficult to get funding for any kind of high-risk, long-range project."

"Who in the U.S. first kicked off a fifth-generation project looking at computers of the 1990s?" asks NCR Corp. liaison Joseph Scullion. "We, as companies, simply didn't do it. The advances of the past 20 years have been so rapid that we had plenty to do just mining what we know now without pushing things even further. There was a lack of urgency in looking at the long term."

But the urgency came from across the Pacific when Japan, with uncharacteristic fanfare, announced the Icot program in early 1982. Several computer industry leaders, most vocally CDC Chairman William Norris, decided the U.S. needed more than scattered corporate research efforts in order to keep up with Japan.

"I don't agree that the lack of a centralized long-term effort delayed the development of today's computers," says Honeywell's Hill.

"The advances of the last 20 years came out of the U.S., out of a free market system and piecemeal development. But maybe things have changed, and it's necessary to do it



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this way today."

Joint R&D agreements are nothing new, but the merging of 21 diverse companies with outside talent in a 325-employee corporation is. Liaisons talk about gaining a greater critical mass of research talent at MCC and better leverage of their R&D budgets, but they admit the risk is greater, too.

"R&D is always a risky business," says Larry Matteson, MCC liaison for Eastman Kodak Co., which spends $3 million every day on its own extensive research. "MCC's approach is certainly more innovative and has greater risk in that it has the greater challenge of technology transfer. But we hope to get much greater R&D results for the dollar than we would otherwise."

MCC is not viewed by member companies as the end-all of computer research but simply as an innovative project that may or may not pay off handsomely.

"We don't have all our eggs in the MCC basket," says Schneider of Sperry, one of just three members (with CDC and Harris) that have invested in all four research programs. "We have other outside research contracts with the Semiconductor Research Corp. (a 40-member consortium) and universities. We see a higher probability of MCC actually accomplishing something for us, but it's certainly not our only source."

Careful monitoring

Another aspect of risk for MCC is the chance of proprietary research leaking out — either outside of MCC or across MCC program boundaries to a member company not funding a particular program. MCC has followed the lead of Inman's former National Security Agency directorship, monitoring the flow of public information with a very careful hand. Even the lists of what members are participating in which research programs must be released by the companies, not by MCC.

"Regular corporate organizations start by saying nothing is confidential until they make it so. We do it exactly the opposite," says Palle F. Smidt, a Burroughs Corp. and Sperry veteran who became MCC's senior vice-president in charge of programs and corporate planning. "We start with the notion that everything is confidential, and we have to make it not confidential."

Internal security, however, is much more difficult to monitor. With the exception of its clean room for semiconductor research three miles away from the corporate offices, MCC's research rooms are not strictly grouped by the four research programs — Software Technology; Very Large-Scale Integrated Circuits and Computer-Aided Design (VLSI/CAD); Semiconductor Packaging; and ACA (comprising subprograms of Parallel Processing, Data Base, Human Interface Technology and Artificial Intelligence).

A company funding only one research program could pirate trade secrets from the others. But in practice, that hasn't happened, company representatives say.

"Bob Inman has pointed out that MCC is a unique experiment," NCR's Scullion says. "He has requested and received the commitment of everybody here to adhere to high standards of discipline and fairness. We

Members of MCC

Twenty-one U.S. companies own and set policy for MCC. The companies include the following:

Advanced Micro Devices, Inc.
Allied Corp.
BMC Industries, Inc.
Bell Communications Research Corp. (Bellcore)
Boeing Corp.
Control Data Corp.
Digital Equipment Corp.
Eastman Kodak Co.
Gould, Inc.
Harris Corp.
Honeywell, Inc.
Lockheed Corp.
Martin Marietta Corp.
Mostek Corp.
Motorola, Inc.
National Semiconductor Corp.
NCR Corp.
RCA Corp.
Rockwell International Corp.
Sperry Corp.
3M Co.

Associates Program

The Associates Program was formed in 1984 to allow mainly (but not exclusively) smaller companies to learn more about MCC without investing very large amounts of money.

For investments ranging from $25,000 to $150,000 (although most are at the $25,000 level), these companies receive technical reports, attend MCC symposia and have access to other nonpublic, but also nonproprietary, information.

The Associates Program is a means for these companies to get a feel for what MCC does and what technologies might be likely to emerge without getting involved directly in the research.

The associate members include:

Aluminum Corp. of America (Alcoa)
Celanese Corp.
Execucom Systems Corp.
Magnavox Government & Industrial Electronics Co.
Norton Co.
Quotron Systems, Inc.
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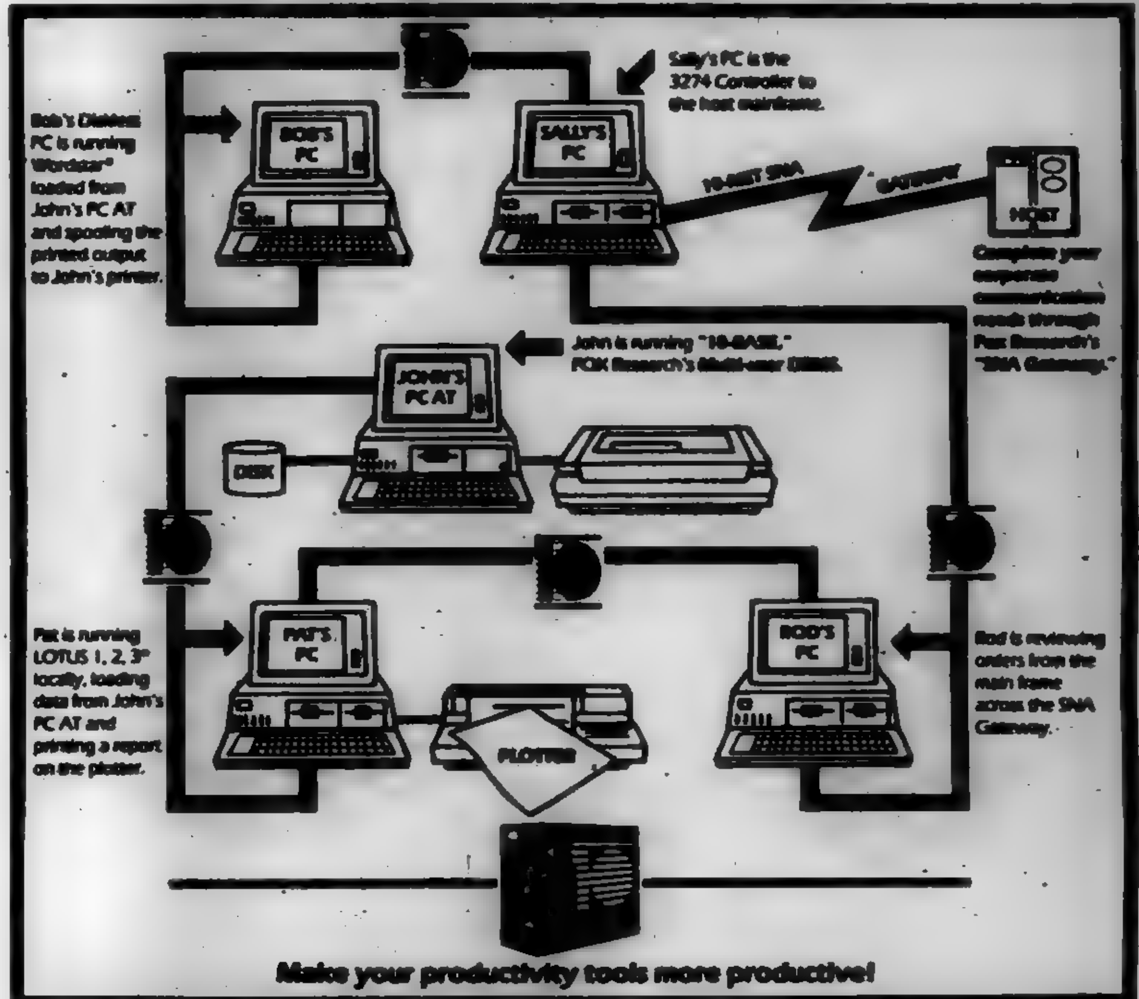
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> *If we just continue to milk the technology that we have in hand, we're going to miss the opportunity that the Japanese have identified to make quantum leaps forward.*

want to foster communication, even across programs, while maintaining an awareness of the fairness doctrine. If a little bit slips through here and there, we really can't cut off all communication to stop a little bit of flow. For the most part, it's a self-policing attitude. People here are much too busy with their own projects to run around being industrial spies."

"In the data base program [of ACA], we work directly with people from CAD and software technology," Boughter says. "If a shareholder in CAD did accidentally get some proprietary information from Data Base, what would they do with it? They're not prepared to receive it, and they're only getting a small piece of what's going on. It could be totally misleading."

The MCC liaison from one CAD program member, Gould, Inc., says that security was a key concern in Gould's decision to join MCC. "One of the tests that I applied to MCC was whether it would be necessary for me to disclose things in the VLSI/CAD program that are proprietary to Gould," says Joseph Rowe, the company's vice-chairman and chief technical officer. "The rules are set up so that you don't have to do that. Sure, one wonders how much hallway conversation goes on. But I have not heard many members express concern on that topic yet."

Another aspect of working together is the varying levels of support for MCC among member companies. Shareholders differ in their approaches to MCC — and enthusiasm is not necessarily commensurate with how many programs the shareholder has elected to join.

"I know that at Honeywell, MCC is held out as a very desirable assignment," says MCC's Black. "Another company [DEC] published its own brochure about its participation, and that kind of publicity is evidence of the value and commitment it attaches to MCC. There are some members with people back at the parent company who believe there are better uses for the resources they have committed to MCC. On the other hand, some companies, left to their own devices, would fund the entire organization."

"Without naming names," says Schneider of Sperry, "some companies are jumping in with more aggressiveness than others. But I believe those are the ones who will get more out of it. That, in turn, may lead to a change in membership as the thing shakes out."

Global significance

In looking at the future, MCC members, while not exactly expecting Japanese surveillance teams to set up shop in Austin, are very much aware of MCC's global significance. It has been said that the landing of a man on the moon, perhaps the U.S.'s greatest technological achievement, occurred because the goal — to succeed before the end of the 1960s and before the Soviet Union — was so clearly defined. Will the fifth-generation computer be the Apollo spaceship of the '80s and '90s?

"I think it is a race," says NCR's Scallion. "If we just continue to milk the technology that we have in hand, we're going to miss the opportunity that the Japanese have identified to make quantum leaps forward in computer technology. What is different now is that they have said they're not just going to follow a year or two behind [the U.S.] and do it cheaper and take the market away that way. They have actually stated a different perspective than they ever have before: 'We will be the leading information processing country in the 1990s.' They've identified that as the only way to have a strong economic position, because the only resource they have is their people."

"It's not a race like creating the atom bomb during World War II," says Honeywell's Hill, "as much as it is a kind of rededication on the part of the U.S. to technology as a way of life."

The ideas of national urgency and

Research breakdown

MCC members can choose one or more research programs in which to participate. Their choices include the following:

Advanced Computer Architecture: DEC, Sperry, Eastman Kodak, NCR, CDC, Honeywell, Bellcore and Harris.

Packaging and Interconnect Technology: DEC, Sperry, Eastman Kodak, CDC, Allied, Boeing, Mostek, Advanced Micro Devices, BMC Computer Corp., 3M and Harris.

Software Technology: DEC, Sperry, CDC, Bellcore, Lockheed, RCA, Rockwell, NCR and Harris.

VLSI/CAD: Sperry, CDC, Honeywell, Gould, Mostek, Advanced Micro Devices, Lockheed, Harris, Martin Marietta, National Semiconductor, NCR, Motorola and RCA.

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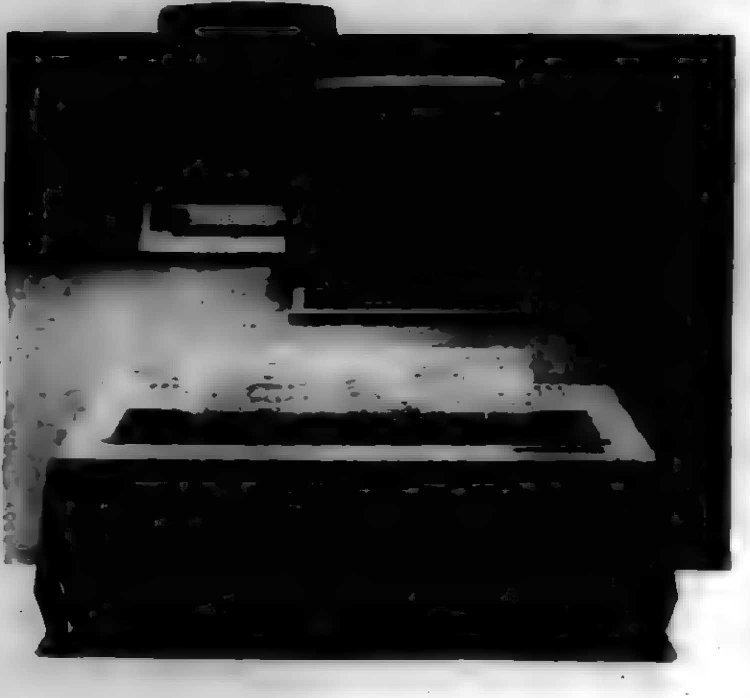

THEIR PRINTER.

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leading-edge, quantum leap computer research — the type of MCC — can only sustain the project for so long. The headlines about MCC's formation and the controversy over Inman's selection to lead it have given way to a quieter period in the last six months, one that has prompted skeptics to ask, "So what are they really doing down there?"

But MCC insiders say this is when the true progress has occurred — the steady increase in employees and an unexpected breakthrough in research methodology that has given the participating members a tangible new way of doing research that they can apply in product development back home. MCC officials are predictably tight-lipped about this proprietary deliverable, but liaisons say it is a good indication of MCC's progress exceeding its expectations.

"We fully expected there would be a long period of time where we would have to learn to work together and that it would be two to three years before we began to see anything," Scullion remarks. "The fact that we're seeing something in 1985 is a pleasant surprise."

No MCC label

All comments about MCC's success to date, however, come with an implicit qualification. There will never be a computer, software package or chip that bears an MCC label — only MCC research gains that help build those products.

While MCC, specifically Smidt, has devoted hundreds of man-hours to drawing up a formal plan for transferring and licensing MCC technology to the companies that paid for it, MCC must, by strict antitrust law, stay away from product development at the shareholder level.

So MCC's ultimate success or failure will not be determined in Austin, but in product development plans at DEC in Maynard, Mass., or Honeywell in Minneapolis or Sperry in Blue Bell, Pa.

"If we have done our part of the job, but the (shareholders) cannot cope with the business issue and not get the performance out of the deployment of our resource, then we will look bad also," Smidt says. "We can only make things possible. . . we cannot execute the possibility."

Because 21 different corporations hope to convert MCC advances into money-making product lines, there could be as many as 21 different approaches to aid and abet that process. In reality, some companies have set up similar types of MCC tracking at their own corporate levels, but there are differences as well.

DEC, for example, has established and funded formal "advanced development organizations" within the company to keep tabs on MCC research, trying to ensure that the research remains relevant to DEC's research goals. "These groups are an integral part of product development organizations," says DEC liaison George Champine. "They are in the best position to pick and choose the right technology to go into the right products at the right time. There is a formal funding program to help that happen within Digital."

Honeywell's tracking is not quite as formalized as DEC's, but it is every bit as committed to maintaining constant contact. Last month, the company sent 30 of its research and product development employees to Austin for two "Honeywell Days" to learn more about the direction of the human interface program within ACA.

"We've tried to push the contact level down as close to the grass roots as possible — we think that's the way to do technology transfer," Hill says. "We have an established organization that's the focal point for contact with the ACA program and a number of other divisions

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with specific interests that have established their own contacts as well. It's kind of a loose federation, but it seems to be working. And part of our job as liaisons is to contribute to managing that flow of information while we're here."

At NCR, the tracking consists of reorienting relevant departments to follow MCC, rather than establishing new organizations. "We haven't formally established programs that track, one-for-one, what's going on here," Scullion says. "We have identified those areas within the operating units of the corporation that will best utilize the technology we're developing. It's not exactly a shadow organization, but a question of identifying the things that are already established as the appropriate transfer points."

The need to create some sort of mechanism for the transfer may have the residual benefit of learning to streamline research, product and strategic planning communication within the member companies, Hill believes.

"Before MCC, we all tended to underestimate the technology transfer problem, even though we faced it internally," the Honeywell veteran says. "We have advanced technology labs that are different from product development divisions, and we have gone through the experience of trying to move the technology out of the lab into a production setting. When it got difficult, we'd just sort of run into it and say, "yes, it's a problem," without approaching it in any kind of organized way. But now we're in a situation where it's the name of the game."

The speed of the research-into-product process will be critical as well. Although the research itself takes place in a long-range time frame, the time for converting research advances into corporate revenues is shorter than ever. "When I started in the industry in 1959, we had things in the product line that generated revenue for 30 and 40 years," MCC's Smidt explains. "Today, there are products that spend less than 12 months in a revenue-generating phase. So if you miss time, it has a tremendous effect on your competitiveness."

In mid-1985, the members' judgment of the technology transfer process, and by extension the success of MCC, remains a waiting game. There will most likely be no tangible evidence for that judgment for several years. But no members are publicly voicing regret that they got involved; most believe that MCC has gone well so far, and they are willing to stick around for the long term. MCC officials happily point to the recent unanimous, eight-shareholder vote to increase their investments in the already highest funded ACA program as a good sign.

"I don't think any of the shareholders have set any specific goals in terms of target dates," Hill says. "They all realize this is a 10-year program, or maybe even longer."

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> *In mid-1985, the members' judgment of the technology transfer process, and by extension the success of MCC, remains a waiting game.*

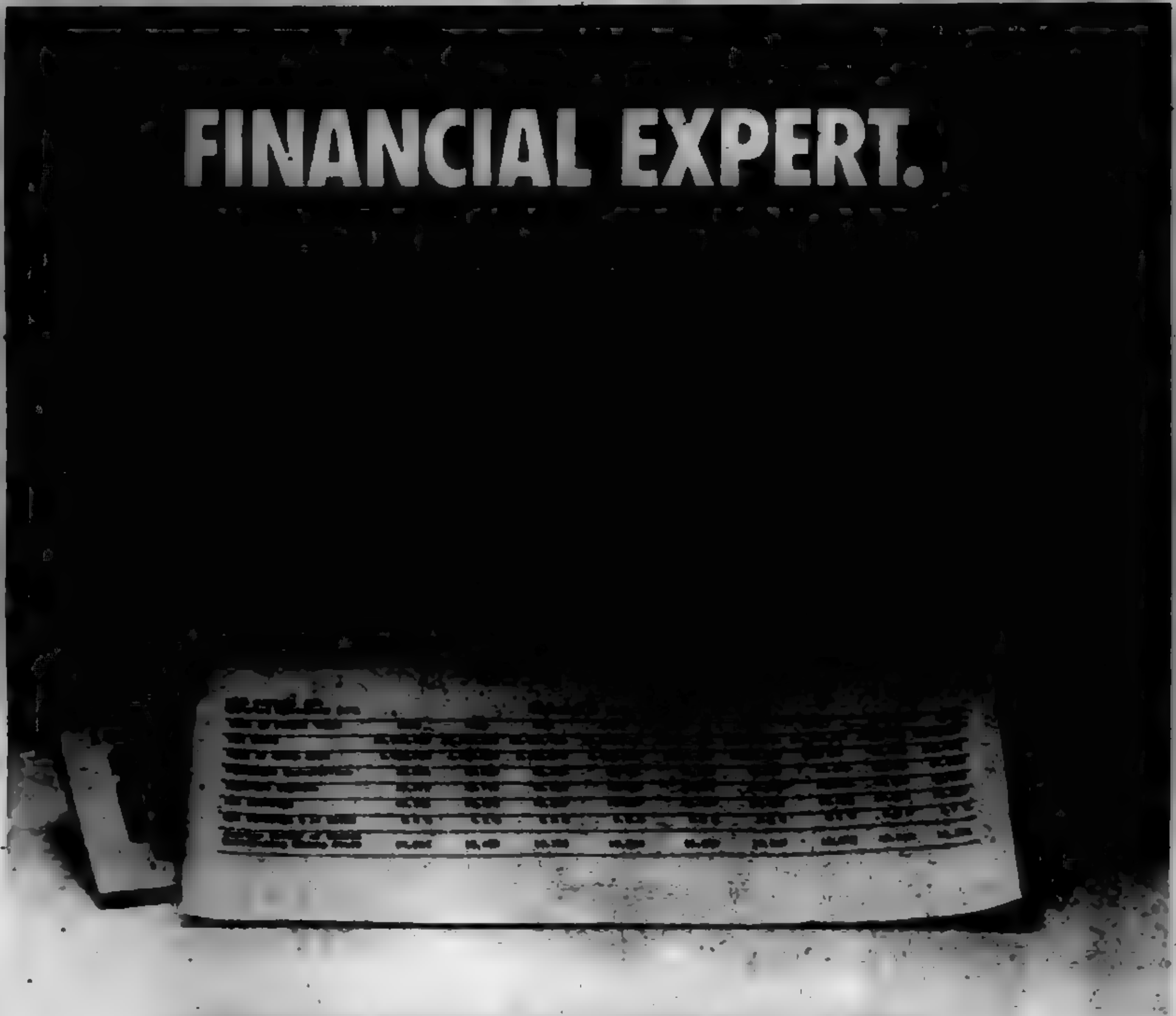
"We can only judge qualitatively at this point," says Sperry liaison Schneider. "The research programs are still new. . . the software program is very, very new, with the leader [Belady] coming on board less than a year ago. In terms of working out the responsibilities of a lot of different people, MCC has so far done all the right things. That doesn't guarantee success, but the things are in place that spell success, or at least a high probability of it."

Ultimately, the power of MCC to guarantee its own success is limited. Its long-term survival, financially as well as in the eyes of the industry, depends completely upon what happens when its research gains are sent back to its members.

MCC will derive income from royalties on the sale of products that incorporate its technology, but more important, the successful development, marketing and sales of those products will be the gauge for members to decide to stay with MCC, increase their investment in it or abandon it.

"If the performance is not up to its budget in the shareholder environment," says Smidt, "everything will be ascertained as to whether they should still put that much money in this or that. That's an area that will never go away, and MCC, because it's long term, obviously does have exposure in that area."

"MCC can do the best research and document it in an absolutely top-rate way," adds Bill Stotesbery, MCC's director of government and public affairs. "But if it goes back to the companies and isn't used, then we'll still be viewed as a failure. It's not only critical to the commercialization of the research, it's crucial to MCC's future as well."



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"Computer-aided design and drafting systems? They are all basically the same. Just select one and get to work!"

"Picking the right system can be the difference between success and catastrophe. Benchmark and study all you can!"

Picking the best Cadd system for you

By Joel Orr

The right course in choosing a computer-aided design and drafting system (Cadd) lies between "select any one" and "study them all." There are differences — some substantial — among systems; there are greater differences among vendors. Most important is matching what the vendor is offering to what you need.

Most Cadd disasters are caused by users focusing on system features instead of their own requirements. As with most types of computer systems, it is incumbent upon the buyer to figure out just how to apply the computer to the task at hand. Those who fail to do so have no one but themselves to blame for a negative outcome.

Turnkey Cadd systems constitute single-source solutions to the problems of drafting and design automation — or do they? Pro:

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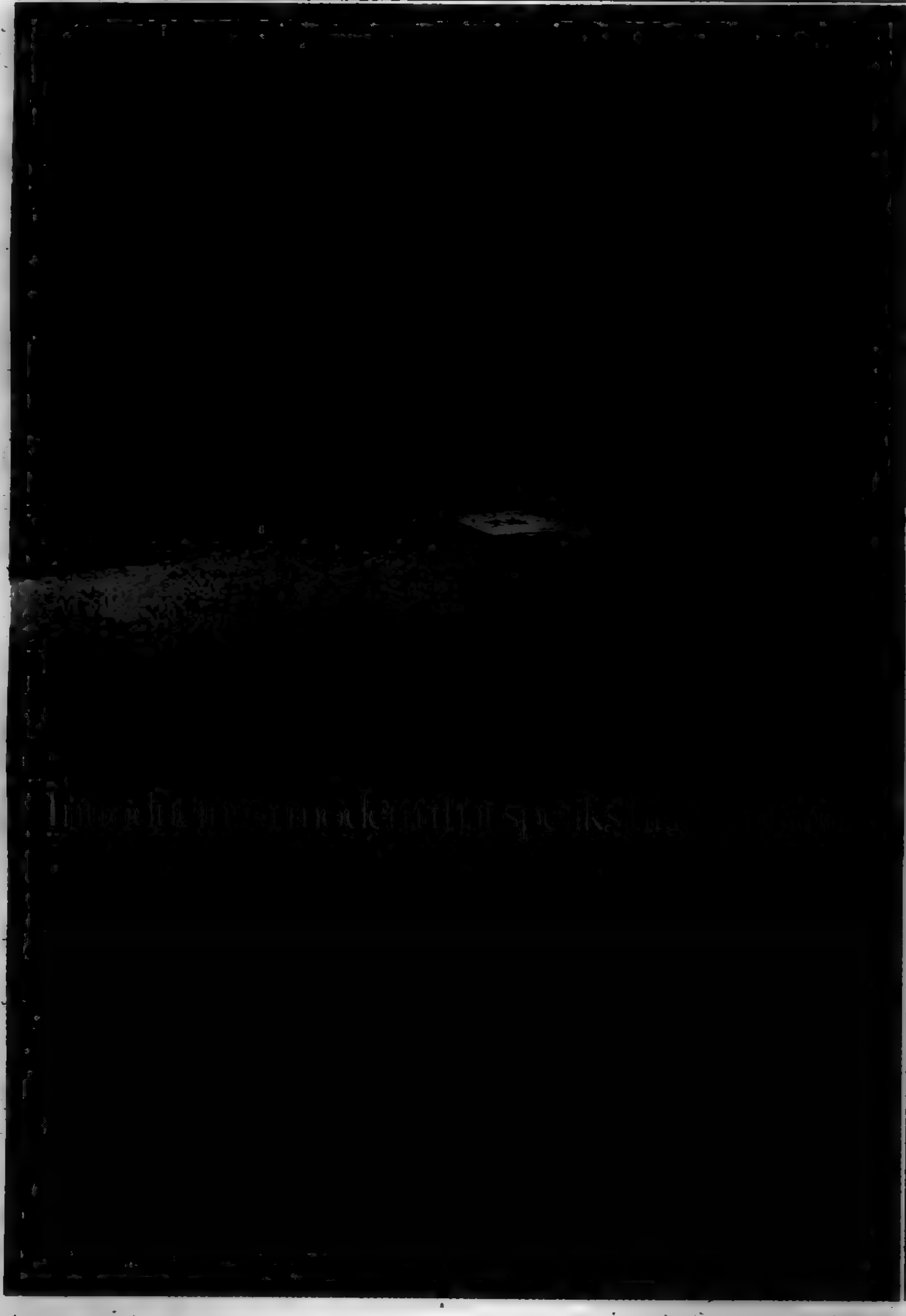
> *Turnkey Cadd vendors have ranked among the fastest growing and most profitable enterprises in this country for several years.*

The many success stories showing genuine gains in productivity (at least for drafting). Con: The fewer — but disturbing — accounts of catastrophic failures. These complex and powerful tools can be well-used or misused.

Fifteen thousand turnkey Cadd systems testify that this approach to engineering automation is popular. Some estimates show turnkeys holding more than 80% of the Cadd market (if IBM's products are counted as turnkeys). A turnkey is commonly defined as a combination of hardware and software acquired from a single supplier that requires no additional purchases before it can be put to its intended use.

This definition does not touch upon the main reason Cadd system purchasers prefer turnkeys to the alternatives: an understandable fear of confronting the problems of interfacing pieces of hardware and software.



The rampant growth of technology has led to increasing specialization of suppliers. Those who make excellent computers seldom have the resources to become expert at producing applications programs. Manufacturers of color displays rarely develop fine computers. Other examples abound; clearly, there is simply too much to know about Cadd technologies for a single supplier to do it all very well.

Another type of diversity is apparent in marketing. Firms that sell components of systems do not usually become successful systems suppliers. The two markets are very different and require different strategies and tactics.

Components vendors must have a thorough understanding of the technical aspects and competitive benefits of their products and must be adept at negotiating. Sellers of systems must develop a sensitivity for organizational considerations and must be more attuned to solving the customer's problems than to meeting his stated needs.

Turnkey systems suppliers take the responsibility of making the system components work well with one another, both prior to system installation and (usually) for the useful life of the product. Simple economics would indicate that the addition of the middleman between the manufacturers of system components and the consumer requires the price of the turnkey to be greater than the prices of the sum of its parts, and this is indeed the case. But most buyers feel the difference is well worth the cost.

Suppliers feel that way, too. Turnkey Cadd vendors have ranked among the fastest growing and most profitable enterprises in this country for several years. And for most of the leading Cadd vendors, field service is a profitable operation.

Getting more

Turnkey Cadd systems are tools of considerable generality. To get the most from them, users must take advantage of the customized features provided by the vendors. On most systems, it is possible to group combinations of oft-repeated commands as a new command, which can then be activated by a single menu pick or keystroke.

At Boeing Commercial Airplane Co., families of parts have been defined on Computervision Corp. systems so that new parts can be drawn by merely entering a few parameters. This arrangement saves time and money and ensures consistent and accurate drawings.

Nonturnkey systems are often more difficult to customize than turnkeys. While they are ultimately more

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flexible, their modification often requires professional programmers; turnkey systems were designed to be customized by nonprogrammer engineering users.

Purchase alternatives

Users can select a software package, then buy a computer to run it. Making sure of compatibility, they may choose graphics workstations and output devices. A local-area network could be added, completing the customization of the Cadd system.

This strategy would make it possible to take advantage of the highly competitive pricing in high-technology markets while acquiring components suited to your needs. The only catch is that the user has to make everything work together, and the components are so complex that they must be made to work together.

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> *Some companies have strong computer departments that can undertake support of a multivendor system; most do not and do not want to build them.*

This problem can be avoided by securing the services of a systems integrator — a service firm that helps select the equipment and software, negotiates with the suppliers, performs the integration and leaves the user with the apparent equivalent of a customized turnkey system — and potentially, the seeds of a major disaster.

Here's the problem: Independent vendors of hardware and software will often assure customers that their products will work together, and they rarely lie about it. At the time the assurance is given, their statements are usually valid.

However, software — and to a lesser degree, hardware — changes. The supplier provides periodic updates to the original product. Because business relationships are dynamic, products often cease to be compatible with each other. The hapless user is then faced with keeping the older products and eschewing updates (an intolerable condition in a society in which everything must improve periodically) or paying for the expensive expertise required to maintain compatibility among the latest version of the products.

Some companies have strong computer departments that can undertake support of a multivendor system; most do not and do not want to build them. These organizations find turnkey systems to be the only way they can acquire Cadd.

Data management issues

Because most turnkeys are configured as a computer with semi-independent workstations, growing beyond the number of workstations that the computer can support with adequate responsiveness generally forces the user to acquire an additional computer. (Decentralized systems, such as those based on Apollo Computer, Inc.'s Apollo, don't have this problem).

In the past, the number of workstations was usually between four and eight. With the current batch of superminis (Digital Equipment Corp.'s VAX-11/785, Data General Corp.'s MV/10000, IBM's 4361, Prime Computer, Inc.'s 850 and others), that limit has risen to about 16.

However, there is almost always such a limit — and when it is reached, another computer and contingent of peripherals must be acquired. Sharing a large engineering data base under a multicomputer arrangement is complicated, because many of the aids available in a single-computer situation must be emulated through procedures. For example, most operating systems will not permit two files to have the same name; when two systems are used, few of the networking arrangements in use today can exert such constraints.

While similar difficulties occur with nonturnkey Cadd systems on small computers, vendors of such software generally allow the packages to be used on a broader range of computers than do the turnkey vendors. For example, Matra Datavision, Inc.'s Euclid can run on VAX systems of all sizes, while Applicon, Inc. (a turnkey vendor) supports only part of the VAX line.

Furthermore, the networking activity itself often adds computational overhead to the system, impairing responsiveness. As networks on chips develop, this problem will diminish.

With a relatively large number of workstations, users often decide to set up a central plotting facility with a full-time plotter operator. Doing so requires the system to support spooling, wherein plot files are placed in a queue along with instructions to the operator. The operator can manage the queue by changing plot priorities and directing output to different plotters. Not all turnkeys support such an arrangement.

The user who wants to expand by acquiring a different type of turnkey is in for some disappointment if he expects to share data between systems from two different vendors. While arrangements exist for transferring data (see box), they are neither fast nor convenient. Only if the data bases of the two systems are to remain separate, with occasional transfers of small numbers of files, can such a configuration work. Turnkey system vendors leave

(Continued on ID/24)

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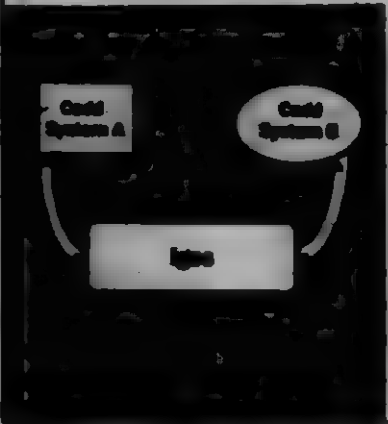
Data transfer between Cadd systems via Iges



Translating data from one Cadd system to another is difficult because representation formats are considered proprietary by the Cadd system vendors. A neutral format called Iges — Initial Graphics Exchange Specification — was developed to deal with this problem. Vendors need only provide translators from their proprietary formats into and out of Iges. File translations can then be effected by converting one system's file into Iges using the translator supplied by that vendor, then converting from Iges into the format of another system, using the second system's Iges translator.

Translation via Iges takes, at best, several minutes for an average engineering drawing. Extensive editing of the converted drawing can add hours to the translation process. In many cases, entering the drawing into the new system by hand might be more cost-effective.

Iges is the product of a committee founded by General Electric Co., Boeing and the National Bureau of Standards.

Almost all Iges post-processors (translators out of Iges) work well. Many vendors, however, have produced poor preprocessors (translators into Iges), because they don't want to make it easy for customers to convert their data for use on other systems. Consequently, service bureaus have sprung up to meet the need for thorough data conversion.

Iges makes it possible to convert drawings from one system to another, but it doesn't make it easy. Information is available from NBS, Building 220, Room A353, Gaithersburg, Md. 20899.

Designing and drafting

Computer-aided design and drafting (Cadd) is a phrase that glues together two terms of very different scope. Drafting is the producing of drawings; design is the ordering of intentions. Drafting is the most common way of giving form to designs, much as typing is the most common way of giving form to writing.

All Cadd systems have certain components in common: a computer; a workstation with a graphics display and an input device; a graphics output device; and Cadd software. They range in size from desktop personal computers to the largest of mainframes, supporting hundreds of workstations.

They can be centralized, like the IBM/Cadam system; decentralized, like the Auto-Trol/Apollo system; or a bit of both, like the Intergraph system. Prices range from $7,300 for a tiny Robographics turnkey, complete with plotter, to millions of dollars for a large Control Data Corp. Icem system with dozens of workstations.

Most Cadd systems are not used for other functions; doing so would negatively affect workstation response time, which is one of the most important ergonomic characteristics of a Cadd system.

Computer-aided drafting is easy to cost-justify because drafting has a well-defined and measurable product. The benefits of computer-aided design, on the other hand, must be taken largely on faith. Small wonder, then, that most of the 15,000 Cadd systems in use are made to function as drafting machines and that designers seldom use them.

Drafting systems for most engineering disciplines are similar; they must all permit the rapid production of drawings. Electronic, mechanical and architectural drafting demand lines and curves, text and symbols, panning and zooming and so on — but to varying degrees.

Design systems are applications oriented: Schematic capture systems must preserve topological continuity but have little use for shaded areas; mechanical design must have 3-D, which is of little use to the creator of integrated circuits. It is also helpful for design systems to interface to application-specific analysis programs that are seldom marketed by the Cadd system vendor.

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Pros and cons of leading turnkey Cadd systems

Selecting a turnkey Cadd system is a difficult and lengthy process. Describing the user's needs in functional terms is the hardest part. The functional specification makes it relatively easy to narrow down the choices so that final selection can be based on issues other than functional ones — for example, price and delivery.

The fact of the matter is that there is no best turnkey Cadd system or vendor; all the leading ones have pros and cons.

Here are some opinions on the best-selling systems:

IBM. While technically not a turnkey vendor (IBM sells its computers and workstations with third-party software — Cadam, Catia, Caeds and Cbds2), the largest computer company is also the largest Cadd vendor.

IBM has good computers, nice displays, excellent service, software that is poor in features compared with the other leading systems and intriguing plans for networking personal computers, 4300s and so on.

Computervision Corp. The largest Cadd-only company has undergone a transformation in the last two years from "aging leader with dying product line" to "dynamic mini-conglomerate."

An almost miraculous transition to using other people's hardware (Sun Microsystems, IBM) and software (CIS, OIR and others) has given this company a new vitality and a convincing sales story.

One concern is that a full-blown system involves hardware and operating systems from Computervision, Sun and IBM — a cumbersome mix. It is not a good "casual use" system; but it is strong across a wide range of applications, such as electronics, mechanical engineering and now architecture engineering and construction.

Intergraph Corp. This leader in mapping and architectural Cadd has become a major contender in the mechanical and electronic Cadd markets.

A well-integrated mix of Digital Equipment Corp. computers and Intergraph workstations and other devices (file processor, graphics processor and so on) presents a uniform personality to the user.

Intergraph features the best graphics. Ease of learning makes for a reasonable casual use system.

GE Calma Co. This company offers a range of products in all Cadd disciplines. After a rocky transition to General Electric ownership, a coherent product line and strategy are expected to emerge.

Calma has a reputation for excellent software but inconsistent responsiveness. GE ownership was expected to improve that situation, but those hopes have been only partially fulfilled. GE's determination that Calma spearhead its CIM efforts is sure to make a difference in the long run.

Applicon, Inc. The first turnkey Cadd vendor with raster displays was one of the last to take full advantage of them. The Bravo system had the makings of the first truly integrated CAD/CAM turnkey, but its introduction was long delayed and fraught with problems. Applicon's strengths are its integrated circuit design and mechanical design (especially solids).

Applicon lost much of its Bravo-given momentum when the product took a long time to live up to specifications. The departure of President Don Feddersen several months ago to pursue venture capital interests hurt the company's image in terms of stability.

The early performance limitation of Bravo gave it a bad reputation. Today, the system is a viable contender in terms of function and should help maintain the company's leading position.

McDonnell Douglas Automation Co. (McAuto) This aerospace company bought the firm that produced Unigraphics years ago and has nurtured it into one of the main Cadd systems on the market today. Lack of integration with solids and poor workstation ergonomics have recently been remedied. Interestingly, Unigraphics II (the current product) is available on DEC, IBM and Data General Corp. processors.

An unrelated system, BDS/GDS, is offered by McAuto on Prime Computer, Inc. and DEC processors in the architecture engineering and construction market.

Easy to learn, Unigraphics II is one of the best injection mold Cadd systems. The broad range of processor and display options is very convenient for customizing a system.

BDS/GDS on the Microvax with Tektronix, Inc. terminals is a high-power, low-cost system, which should prove attractive to medium- and large-size architectural firms.

Control Data Corp. Even more than IBM, CDC offers a broad range of Cadd systems and terminals. Systems range from micro-based electronic Cadd units for schematic capture, to very large configurations supporting dozens of terminals that function as complete mechanical design and manufacturing systems. CDC has an attractive data management/human interface regulating program called Engineering Data Library.

The company offers a broad range of services, including consulting, time-sharing, education and financing. The system is powerful but not easy to learn.

Auto-trol Technology Corp. This company sells two separate software packages (Series 5000 and 7000), corresponding to architectural Cadd and mechanical Cadd/CAM. Auto-trol was the first firm with a truly distributed system based on the Apollo computer network. Auto-trol's software also runs on the DEC VAX.

Having experienced a difficult time in business two to three years ago and changes in management, the company is now profitable and back on track in terms of growth. The architectural product is interesting, but the mechanical product is exceptional.

Ease of use and the network concept make this system one of the best for casual use.

Others systems include the following:

- **California Computer Products, Inc.** — interesting architectural system.
- **Gerber Systems Technology, Inc.** — good five-axis machining.
- **Graftek/Burroughs Corp.** — nicely integrated with solids and CAM.
- **Mentor, Daisy, Valid Logic** — the leading integrated-circuit design systems.
- **Matra Datavision's Euclid** — elegant solids, good CAM, great user programming language.

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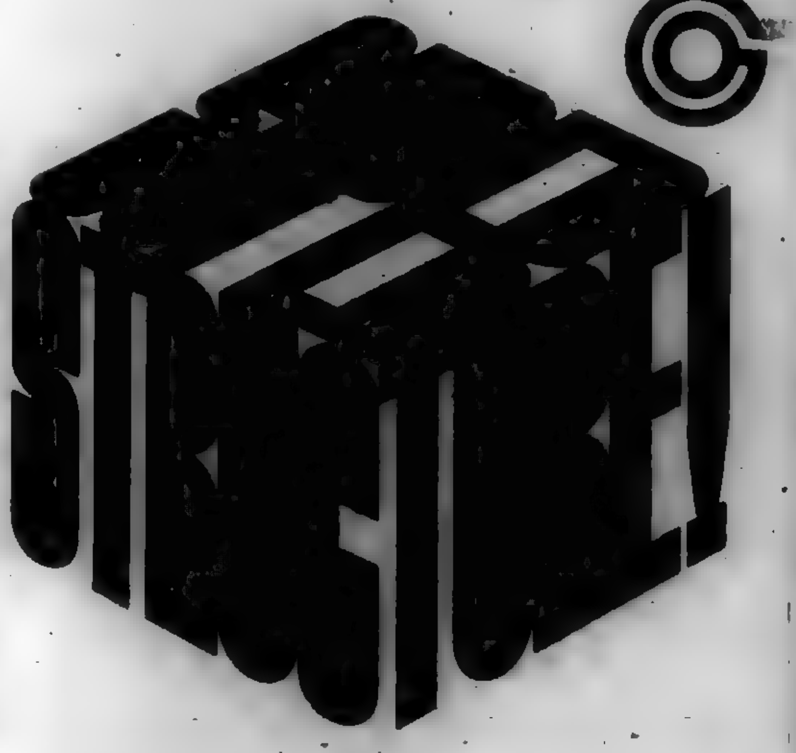

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> ***While many vendors pay lip service to the concept, there are no working examples of complete CIM implementation and only a handful of partially operative CIM installations.***

(Continued from ID/20)

prospects with the impression that all required training is vendor supplied. In fact, vendors do supply all the user needs to know about operating the turnkey system — but this is only a portion of the knowledge required to use the system effectively.

The onus is on the user to determine exactly how the system is to be integrated into the organization's operations. Once standards and procedures for the automated operation are developed, they must be used to develop a training course that integrates systems knowledge with procedures. Doing this properly yields substantial benefits; most users discover the need on their own, however, after much time has been wasted, because few of the vendors make the need clear.

For the most part, turnkey Cadd system vendors sell tools for the automation of existing engineering activities — principally, the creation of drawings. But drawings are out of place in computer-integrated manufacturing (CIM). In CIM, three-dimensional models are the basis for integrating manufacturing functions; they cannot be derived from drawings. Because of user reluctance to plunge into three-dimensional design, vendors have developed many demonstrable but untried-modeling system features.

Another cause of vendor reluctance is that CIM will demand customization, and turnkey vendors are not sure they can make money selling such services along with their products.

As a result, turnkey Cadd at large is not ready for CIM — but then, neither are most users. CIM requires a commitment to sweeping organizational changes that few users are prepared to consider. So while many vendors pay lip service to the concept, there are no working examples of complete CIM implementation and only a handful of partially operative CIM installations.

The demands of users for highly responsive Cadd workstations, coupled with the availability of low-cost, high-power computers, will surely lead to a proliferation of networks of powerful independent workstations as the dominant Cadd turnkey configuration. The growth in the average size of such networks is already forcing vendors and users alike to pay more attention to the data base issues.

The greatest obstacle to progress toward CIM is traditionalism. "We've always done it this way [whisper] and we are frightened by the implications of automation!" is the credo of many manufacturers. Technology is available today to make vast improvements. To take advantage of it, manufacturers must face the organizational and social issues squarely. Turnkey system vendors can help but cannot lead.

Buying a turnkey system relieves the user of many integration problems. But a turnkey is not a panacea; the user must still invest heavily in planning, training and customizing. The difference in cost between turnkeys and home-assembled systems is worth it for most users. Let the user remember that the success of the installation is not the responsibility of the vendor. Caveat emptor.

About the author

Joel Orr, a speaker and author on graphics, heads Orr Associates, Inc., an industrial automation consulting firm in Danbury, Conn. He is a founder of the National Computer Graphics Association and director of the Cadd/CAM Institute in Danbury.

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Where are the robots?

By R. C. Reeve

Five years ago, the drums of the robot revolution were beating feverishly. Predictions eclipsed predictions in projecting a new world of robots. Where is that revolution today? Are the robots still coming? And how will they impact data processing from the factory?

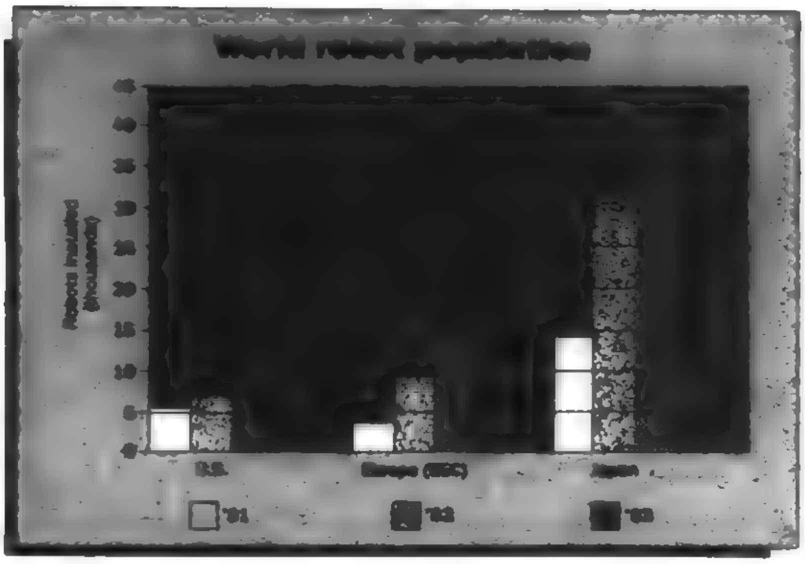
The Japanese dominate the world in installed robots. The Robot Industries Association recently reported the 1983 robot population in Japan at 41,000, in Europe at 13,000 and in the U.S. at 9,000.

Japan is employing more than four times the number of robots as the U.S. This statistic is even more alarming when factored by the relative size of the respective manufacturing economies. Some choose to disagree with the accuracy of these estimates based on differences in definitions of robots. However, the bottom line is that there are more robots in Japan than anywhere else in the world, and even Europe is ahead of the U.S.

It is little comfort that the robot revolution is safe and secure in Japan and Europe, because this technology has the potential to be the most human-felt ingredient of the computer age. Why is U.S. industry desperately lagging in installed robots? Will this create a robot technology gap?

The answer to the great disparity between the number of robots in Japan and the U.S. appears to be too simple. The Japanese want to use robots! Americans seem to be more interested in robot technology than in using robots in production.

This attitudinal difference may be linked to America's feelings about manufacturing. Manufacturing fell out of vogue in the U.S. about 30



years ago. American business fortunes are currently made through high technology, service, banking, finance and the information revolution.

Manufacturing remains behind the scenes. Everyone knows it's there, but no one wants to take responsibility. After all, what type of cocktail chatter would setting a new record in reducing quality defects make? Nothing exciting here. Henry Ford stories are passe.

Commitment to quality

The Japanese are totally committed to manufacturing. They have pursued a national goal of quality in manufactured goods for the past 30 years. When capital investment decisions are based upon a need for quality vs. a saving in labor costs, different conclusions are reached. Robot justifications based on quality requirements are more economical and viable than those based solely upon labor savings. The problems facing U.S. manufacturers today are the result of 30 years of neglect.

The U.S. was once the greatest manufacturing nation on earth. The size and prosperity of the American market invited large investments in dedicated automation for high-volume products such as automobiles and appliances.

But as America's basic needs for shelter, food and transportation were fulfilled, consumers turned to specialized products to satisfy their personal tastes.

During the 1960s and early '70s, the Europeans, who were experts in producing quality products for low-volume markets, captured a significant share of the U.S. market. With the strong U.S. dollar in their hands, eager consumers scooped up these high-quality European products. During the '70s and '80s, the Japanese came with variety, quality and price — far too much for the American consumer to resist.

The battle for today's consumer's dollar is being won by perfecting the manufacturing process. Automation and quality control are the battle cries of new-wave manufacturing. U.S. manufacturers continue to retreat to the high ground of volume products, clever advertising, promotions and balance sheet restructuring through consolidation and depreciation of obsolete manufacturing capacity.

But today, the effectiveness of clever marketing and innovative financing are passing. Japanese manufacturers have demonstrated their ability to produce moderate volume products with quality at low cost through automation. American manufacturers are now faced with survival decisions, but they lack the trained manufacturing personnel to repair the leaky boat.

U.S. manufacturers have been slow to implement robotics because of a lack of trained industrial and manufacturing engineers. As manufacturing fell out of vogue, manufacturing managers became less visible and took less risk. Managerial and financial support for innovation decreased. And as the current generation of manufacturing managers approaches retirement, there is even less incentive to take risk. Precious few young trained managers are available to assume command.

High-tech phobia

How do current manufacturing managers hold the aggressive venture-capital-fueled robot industry at bay? Simply by demanding better technology and more risk-taking from robot vendors.

"If your robot could only. . ." are the famous words that strike terror in the heart of a robot salesman. "If robots could only see, think, hear, sense [pick any appropriate word], then we could install them without any trouble!"

And just when the hapless robot company brings out the ultimate robot product, the other shoe drops. "It's far too expensive to justify even at the cost of our labor," or "It's too complicated with all those features . . . how will we ever keep it running?"

The bottom line is that U.S. manufacturing management doesn't want to install robots.

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The U.S. is the home of stand-alone robot companies, companies that have invested millions of dollars in the advancement of robot technology. This technology will benefit the next generation of robots, providing sensors, vision, hearing, touch and intelligence. Most of these companies are forced to continue to invest heavily in research and development, but none of them are able to show the profits necessary to attract much needed new capital investment.

In contrast, Japan and Europe do not have many stand-alone robot companies that must make strong profits to survive. The successful producers of robots there are companies that have developed robots for internal use or to exploit their basic products.

In Japan, a leading robot maker, Yaskawa, developed robots that use their electric motor and ball-screw products. Kawasaki licensed robot designs from Unimation (the American company that originated the robot) to manufacture their motorcycles and automobiles. Others, such as Hitachi Ltd., Nachi-Fujikoshi and Mitsubishi Electric Corp., manufacture robots that complement their existing automation products.

In Europe, Asea and Trallfa have developed robots to expand specific market segments they were already serving. Kuka, a German manufacturer of automation for the automotive industry, originally imported robots from Nachi-Fujikoshi of Japan but has since developed its own robots in conjunction with Siemens. Volkswagen developed robots for automobile manufacture. Renault of France also developed robots for its own use in automotive manufacture.

The need for robots is evident. Venture capitalists and investors have been willing to invest millions in robotics technology. There is no question that the robot revolution will happen in the U.S. — the only question is when.

Most successful U.S. robot installations have been initiated by senior management with the clout, financing and follow-through to make the technology stick. Currently, the largest installed base of robots is in the automobile industry. The robot revolution there is driven by the automobile industry's determination to survive. Some suppliers to the automobile industry have also taken the initiative and are robotizing.

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handling, disk drive assembly and clean room tasks. Robots used to assemble disk drives reduce the problems of contamination. Robots can also transfer printed circuit boards to and from workstations, into test machines and into automatic insertion stations. GMF Robotics of Warren, Mich., recently promoted a standard robot that could meet clean room requirements. Others have touted similar capabilities.

Separate paths

Robots and vision have been traditionally considered the same market segment. Now vision is receiving the same independent attention and promotion that robots received five years ago, creating a new independent market. Experts are predicting a billion-dollar vision market by 1990.

In addition to vision, tactile sense is another critical feedback that many believe robots must acquire to perform manufacturing tasks. Sensors are incorporated into robot grippers and tools to enable the robot to determine the object location or to adjust the force applied by the robot.

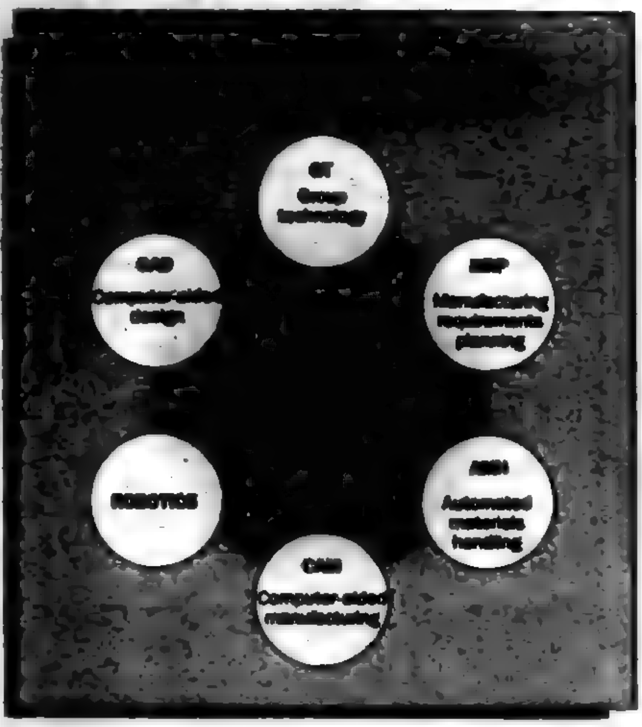
Use of robot transporters is also growing. These robots are like motorized carts and follow buried wires or transmitters strategically located along travel paths. Transport robots can be programmed to move materials in the factory between workstations and to and from inventory areas. In manufacturing, the robot transporter can augment or replace the forklift truck. In assembly, robot transporters can replace conveyors to move trays of parts and subassemblies to individual workstations.

The off-line programming of robots is still used primarily to study and simulate robot motion. Little progress has been made in expanding off-line programming's role to the rapid changeover of robot tasks or to increase the efficiency of programming. This delay has been in part because of the mechanical inaccuracies of robots and the unpredictability of their work environments. In the future, off-line programming is expected to be a standard feature of most robots.

The McDonnell Douglas Automation Co. (McAuto) group developed software tools for off-line programming of robots. McDonnell Douglas developed the Air Force's APL-based Robot Programming Language. And in an independent development, McDonnell Douglas introduced Place, a robot software simulation product used to simulate robot work cell set-up and evaluation. Place supports the geometrics of many of the current robot models.

The Japanese are not far behind in the high-tech robot race. Their success in implementing less sophisticated robots has fueled their sales, providing the income necessary to pay for new R&D.

In addition, the growing Japanese user base has increased their knowledge of robot applications technology, providing new and more cost-effective solutions to robot problems. Japanese manufacturers may already lead in robot product development. Advanced Japanese research is demonstrating robots that can walk, touch, feel, hold and even play.


GT
Group technology
MRP
Manufacturing requirements planning
AMH
Automated materials handling
CAM
Computer-aided manufacturing
ROBOTICS
CAD
Computer-aided design

Mainframe computers will be called upon to support robotics, and off-line programming may be one of the first areas. User data bases for specific robot geometrics, work-cell environments and associated machinery specifics will have to be maintained and updated routinely. Robot programmers will need to access CAD/CAM data bases for parts definitions, work-cell layout and tooling configurations.

The eventual efficiency and productivity of robots will depend upon their ability to communicate with the total factory and engineering environments. Just how these linkages will be made and the role of data processing in their implementation and execution remain to be defined (see figure).

To date, data processing has managed a large portion of the computer revolution. It has provided industry, government and education with billions of miles of printouts and uncountable pieces of information. What role will data processing play in the robot revolution? Stated another way, how will the robot revolution affect the data processing department?

One common definition of robots (see box on left) — "an easily reprogrammable,

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AJ ANDERSON JACOBSON

computer-controlled device that can physically manipulate its surroundings" — points out an important new idea. The robot is a means for the computer to interact with the physical world. Up until now, the computer has been providing information to humans via CRTs and the printed page. If humans were not there to use the information, computers would provide little impact on our world.

But robots provide a means for computers to perform physical functions in the real world. And because robots are run by computers and computers can be made to communicate with each other, we can imagine a mainframe computer directing a robot to replace its backup tapes, load fresh paper in its printers, retrieve media from storage and so on.

Data processing professionals who have chosen to make their livelihood with computers may be among the first to experience robots. The DP world may be one of the first to move from high tech to high touch.

In many ways, robotics has been a part of data processing for years. Devices such as automatic backup units, automatic microfilm systems, form bursters, mailing machines, laser printers and so on could all be considered dedicated robot devices. Not to stretch the definition of a robot, the main point is: "Who is more prepared to accept robotics than those who use the computer for their livelihood?" Perhaps data processing will play a key role in accelerating the acceptance of robots in U.S. manufacturing.

The decline of manufacturing during the past 30 years has created a shortage of skilled persons. Manufacturing has failed to attract the brightest stars and to provide them with a forum to display their talents. On the other hand, data processing has attracted many skilled and talented individuals. It has provided incentives and training that have created a significant body of talent with experience in computers and automation concepts. Perhaps DP will be called upon to assist manufacturing in utilizing robots.

One area where data processing may be called upon is in the implementation of statistical quality control. Statistical quality control is a new manufacturing buzzword. It means the collection and evaluation of component quality information as a means to control production quality. This function is often desired in real time. Data processing may be called upon to collect, process and disseminate information collected by robots, sensors and vision systems on the manufacturing floor.

A major obstacle is the lack of a means to communicate with robots and sensors on the shop floor. A great deal of attention is being given to local-area networks, communication protocols and integrated manufacturing. The lack of standards and the lack of understanding of the needs and problems of various groups may slow the process.

The latest buzzword of manufacturing is CIM, computer-integrated manufacturing. This concept has emerged as one means to explain how the various ingredients of the automation picture relate to each other.

Arthur D. Little, Inc. has broken the CIM concept into seven major technologies: computer-aided design (CAD); group technology; manufacturing planning and control system (MP&CS or MRP); automated materials handling; computer-aided manufacturing (CAM); robotics; computer-aided design (CAD) and computer technology. Each of these technology areas interact with others to form the whole CIM environment. CAM and MP&CS (MRP) are the most familiar segments of the seven. Each of these can be implemented on its own without the other supporting units.

However, significant additional productivity improvements should be realized when all elements are linked. Robotics is but one technology sphere, interfacing between CAD and CAM. The center sphere is computer technology, which links all technologies and performs a key function in the overall performance of the network.

At present, U.S. manufacturing appears to be enamored also of the automation of small-lot production. This type of automation is often called Flexible Manufacturing System (FMS). FMS requires sensors and feedback systems that measure and control the quality of the item being manufactured in real time. Much work has been done by the National Bureau of Standards to define the requirements of such systems and demonstrate their feasibility.

About the author

Ron Bowe is an independent consultant in robotics and automation and chief executive officer of Edison Welding Institute, Columbus, Ohio. He is the founder of Advanced Robotics Corp. of Columbus and has been involved with robotics and adaptive controls for 20 years.

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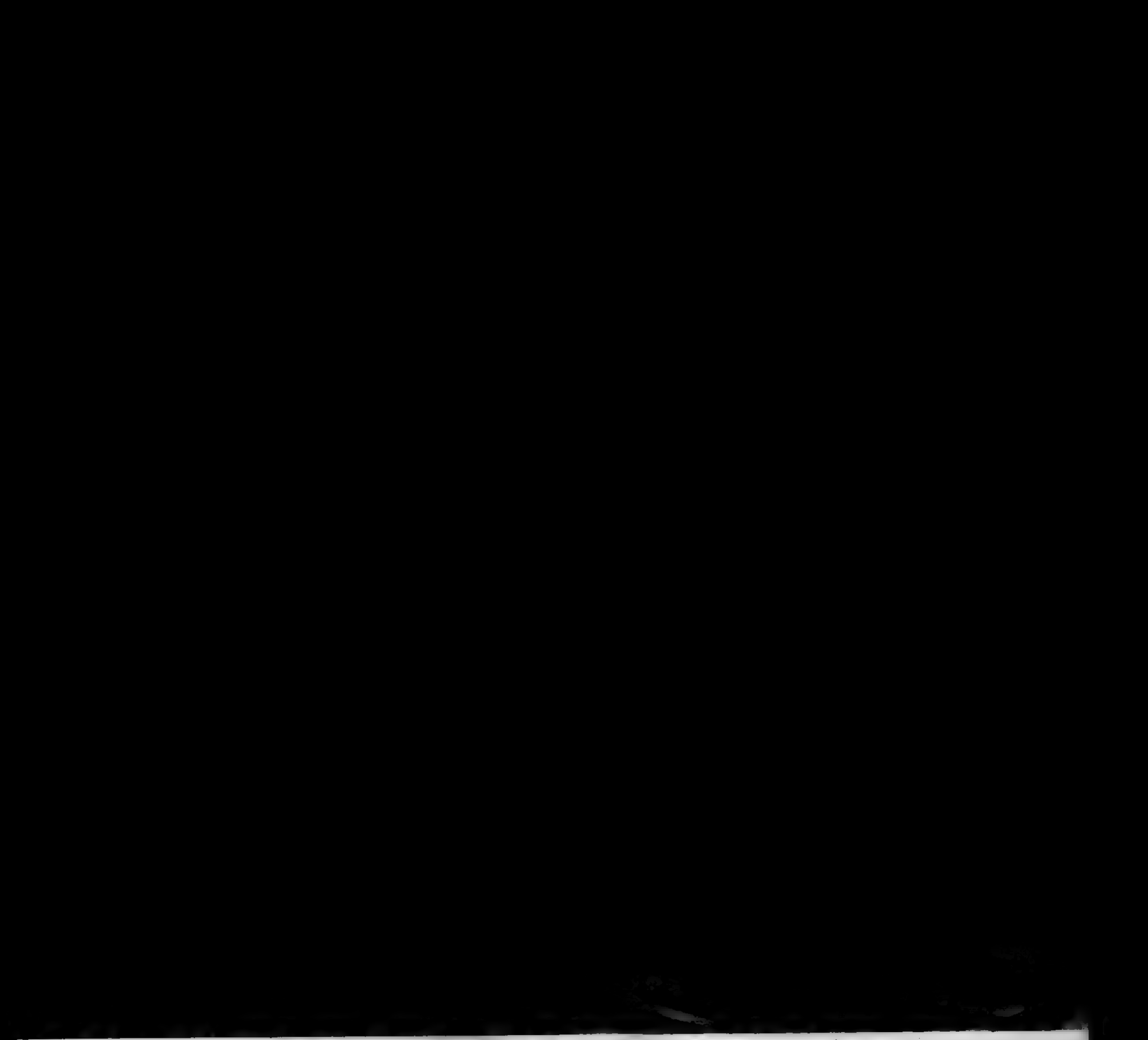

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MICROCOMPUTERS

Extender for 1-2-3 unleashed

SANTA MONICA, Calif. — Software that permits Lotus Development Corp.'s 1-2-3 to address nearly 1M byte of memory on the IBM Personal Computer AT has been introduced by Uniform Software Systems, Inc.

The software, a $99 program called the Extender, reportedly lets 1-2-3 run in what is known as "protected virtual address mode" on the AT, giving it access to roughly 920K bytes of memory.

Though the Personal Computer AT has the potential to address up to 3M bytes of internal memory, 1-2-3 is currently limited to running within the maximum 640K bytes now addressable under IBM's PC-DOS. A new product from Intel Corp., the $599 Above Board, reportedly increases that limit by 4M bytes but only after an enhanced version of 1-2-3 becomes available this fall.

The Extender, a one-diskette program, will ship in July and works with existing versions of 1-2-3, according to Uniform Software President Peter Wensberg. The Extender, Wensberg said, could conceivably address more than 920K bytes; the limit is 1-2-3's, not the Extender's, he said.

With the protected virtual-address mode barrier broken, Wensberg said the path is clear for his firm to produce similar extension products for use with such programs as Lotus's Symphony or Ashton-Tate's Framework. The Extender, he argued, will come to serve as a bridge between the world of software for the IBM Personal Computer and the "new world of the [Intel 80286]-based computer" machines.

Uniform Software is located in Suite 514, 225 Santa Monica Blvd., Santa Monica, Calif. 90401.

Keyboard utility programs reduce work, aggravation

By Edward Warner
CW Staff

It may seem like a small matter, but who wants to hit a function key, an End key, the right arrow key and then the Return key when deleting one word from an on-screen document?

Tim Stein, vice-chairman of Forum/Nevison Executive Computing, a Boston-based personal computer training firm, certainly does not. That is one reason, he said, why he uses a keyboard utility program, Alpha Software Corp.'s Keyworks, on his IBM Personal Computer.

Stein, one of the beta users of Keyworks, said he uses the utility primarily to reduce to one or two keystrokes the multiple-keystroke commands required by the integrated software package he uses, Alpha Software's Electric Desk. For simplicity's sake, Stein converts the commands of Electric Desk's word processor to those used by the word processor with which he is most familiar, Micropro International Corp.'s Wordstar.

Like Stein, an increasing number of personal computer users are turning to keyboard utilities to create macros, which are small programs that reduce to only a few keystrokes a command or function that otherwise would take many. Keyboard utilities also allow keys to be redefined, permitting users to standardize command keystrokes across applications — a feature that, for example, lets "F1" equal BEGIN BLOCK commands in both Lotus Development Corp.'s 1-2-3

See KEYS page [illegible]

Keyworks, Superkey praised

By Edward Warner
CW Staff

Just as it is hard for one to talk about word processors without mentioning Micropro International Corp.'s Wordstar, the beta users of two keyboard utility programs find it hard to discuss the software they tested without mentioning Rosesoft's Prokey, one of the first such products and the current market leader.

Both beta users — one of Borland International's Superkey, the other of Alpha Software Corp.'s Keyworks — said they liked their respective packages best for the advantages they offered over Prokey.

Keyworks user Tim Stein, vice-chairman of Boston-based Forum/Nevison Executive Computing, said he used to use Prokey often, particularly to create macros for use with Lotus Development Corp.'s 1-2-3.

"I stopped using [Prokey] because it was so easy to screw up and so hard to change [macro] defines," he said. With Keyworks, he said, creating a macro is more foolproof. A pull-down menu lists Keywork's macro editing functions, while another lists the macros the user has created, he explained. In general, Keyworks "gives much more information about what's going on than Prokey," said Stein, who uses Keyworks to build macros for his word processing software, Alpha Software's Electric Desk.

See BETA page 92

IBM

IBM has cut the prices on its PCjr and Portable Personal Computer/79

- Personal CAD Systems has announced four interfaces for use with its computer-aided engineering software/76
- Forte Communications has introduced micro-mainframe file transfer software/79

INSIDE

Software/79

Systems/84

Spreadsheet use: High anxiety?

MICRO BITS
Robert Firmin

Spreadsheet software has recently been the target of unprecedented attacks in the trade and business press. Perhaps never before has a specific software technology drawn so much critical attention from such leaders as *The New York Times* and *The Wall Street Journal.*

This time the press is right.

It has focused on the growing awareness in corporate America that extensive use of the spreadsheet as the basis for business analysis is fraught with danger. There are countless stories about business analyses that lead to erroneous advice and costly mistakes in organizations.

Published examples include the following:

- An error rate of "at least 20%" among the spreadsheets at a certain New Jersey-based Fortune 500 company.
- The firing of several oil company executives who recommended an acquisition that was a bad deal; in addition, a Big Eight accounting firm approved an erroneous spreadsheet supporting the recommendation.

The press is interested because there is a groundswell of concern among the millions of spreadsheet users who produce important analyses every day.

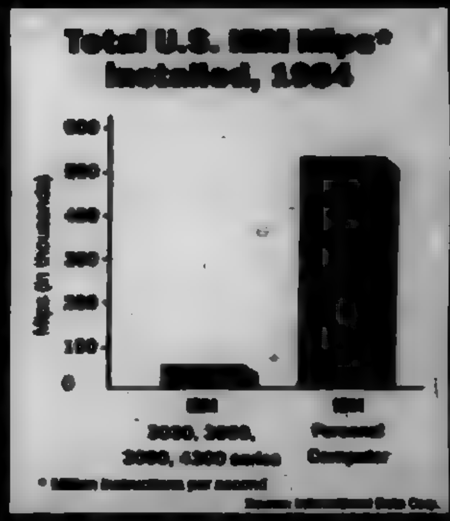
Businesses depend upon numbers but not just any numbers. They need and want numbers that are valid, prepared quickly and easily understood, even when analyses get complex. The press stories highlight what veteran users already know: that the spreadsheet approach fails to meet these needs.

Spreadsheet users are presented with a curtain of numbers that hides all of the reasoning used to arrive at those numbers. The user has to begin the analytic process in a report mode, weave relationships in the report mode, document in the report mode and, finally, report numbers with a very low level of confidence.

Or as Lotus Development Corp. founder Mitchell Kapor said in the November 1984 *Harper's*, "You can just randomly make formulas, all of which depend on each other. And when you look at the final results, you have no way of knowing what the

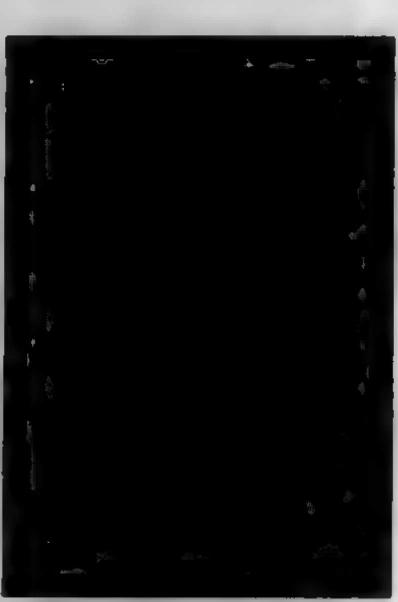
See FIRMIN page 92

Firmin, chairman and chief executive officer of Javelin Software Corp. in Cambridge, Mass., has been a research and business applications user for 15 years.



* Million instructions per second

Source: International Data Corp.



P-CAD interfaces out for design transfer

LOS GATOS, Calif. — Personal CAD Systems, Inc. (P-CAD) has announced four interfaces that reportedly allow circuit designs constructed on its Engineering Design Capture software for personal computers running on AT&T's Unix, IBM's PC-DOS and Microsoft Corp.'s MS-DOS to be extracted and transferred to a variety of computer-aided design and computer-aided engineering software packages.

The interface packages reportedly translate the net list, or circuit routing, information from a P-CAD design data base into a format that can be read by systems running Scientific Calculations, Inc. Scicards, the Regents of the University of California's Spice and Motorola, Inc.'s CAD software.

Another interface package is said to translate net list information into an Ascii format, which can then be manipulated into a form readable by other systems.

With the interfaces, P-CAD users reportedly can upload designs to a variety of CAD environments, including full fault simulators, physical layout stations and manufacturing control systems, the vendor said.

The Scicards interface reportedly translates three types of schematic components, packing information and net connectivity functions from a P-CAD data base into a format that can be read by the Scicards software.

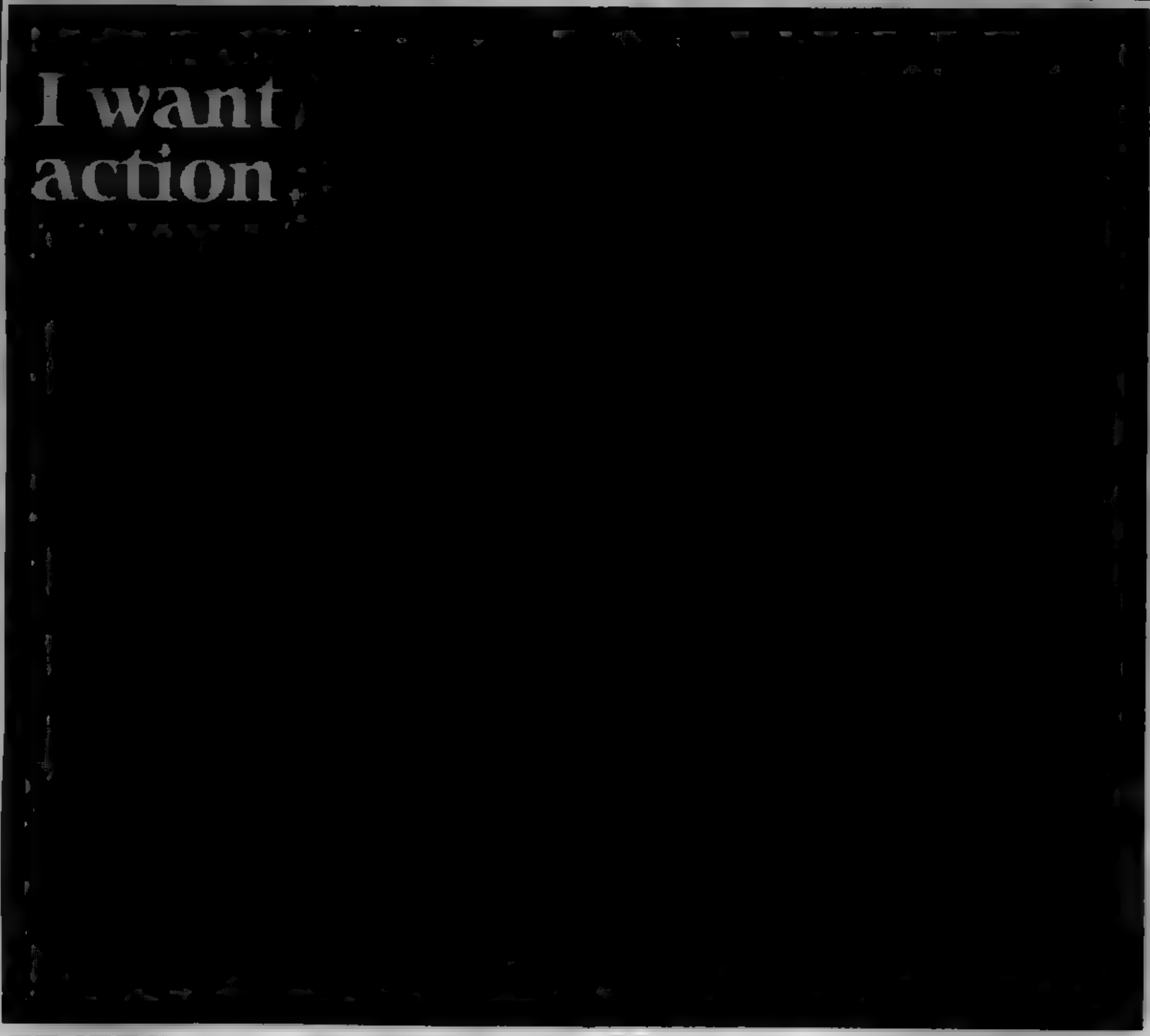
The Spice interface reportedly allows net list information to be read by Meta Software's Hspice software and includes a symbol library of primitives for creating circuit schematics and element types supported by Spice.

The Motorola interface program is said to translate P-CAD schematic data bases into Logcap, a format compatible with Motorola's semicustom CAD system.

An Ascii program reportedly allows schematic capture or physical layout data bases to be used as source files.

All interfaces are priced at $500, according to the vendor.

P-CAD is located at 981 University Ave., Los Gatos, Calif. 95030.



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Calif. considers micro buyer protection bill

SACRAMENTO, Calif. — Personal computer advertisements that promise one thing and deliver another could become a thing of the past in California if the California State Assembly enacts a bill under consideration.

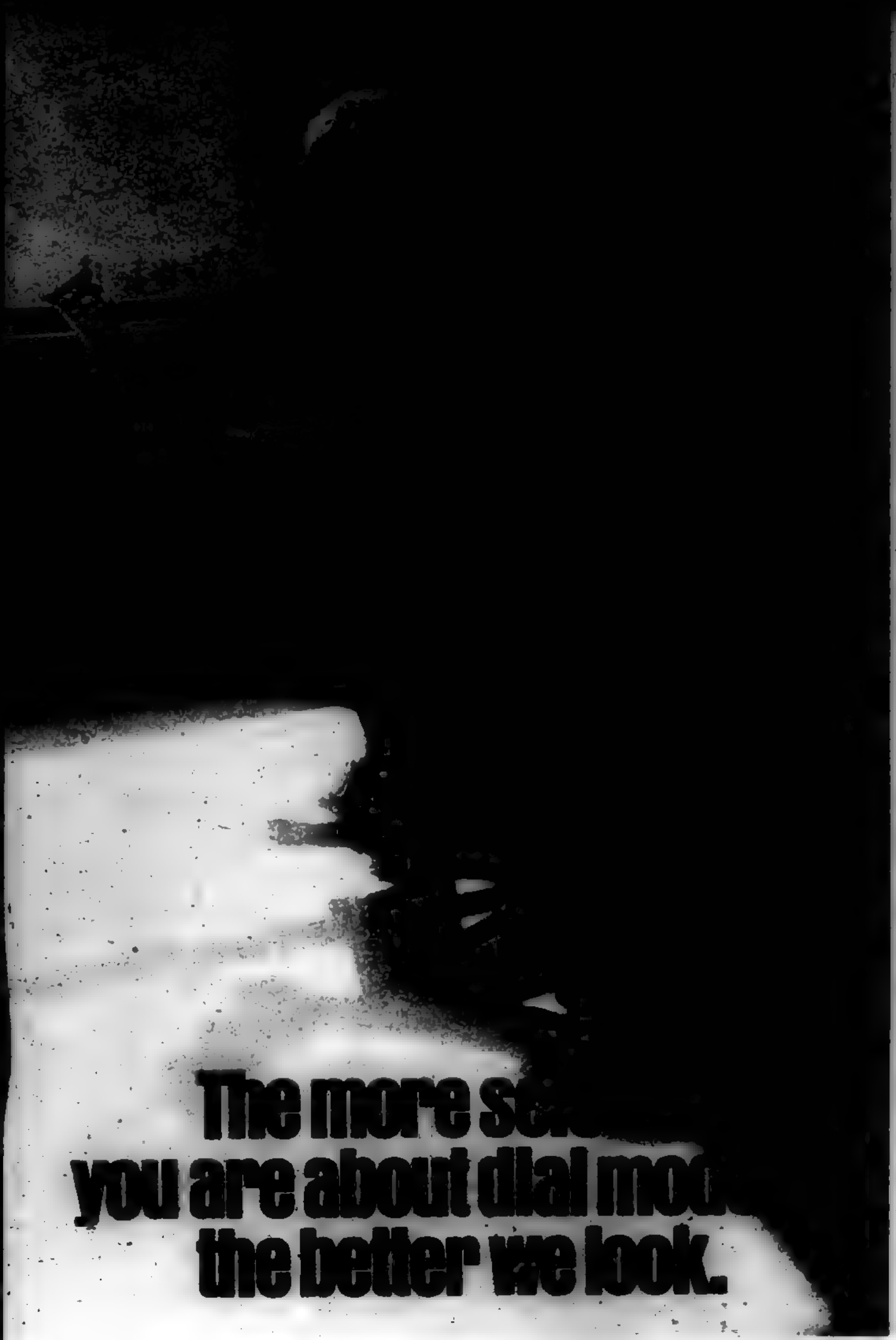
The Computer Buyer's Protection Bill, introduced by State Assemblywoman Gloria Molina of Los Angeles, would make both computer retailers and manufacturers liable to civil suits for breach of warranty should they engage in false advertising of their products. It would not provide criminal penalties, however.

The bill, which would also cover personal computer software and related hardware such as modems, was reported to be out of the assembly's Consumer Protection Committee last month, and a vote by the full assembly, the equivalent of a state house of representatives, is expected shortly.

Molina was inspired to introduce the bill after she purchased an Apple Computer, Inc. Lisa personal computer, according to her legislative aide, Alma Martinez. At that time, Martinez claimed, both the dealer and Apple were promising the addition of a mail-merge feature in the next enhancement of the Apple Lisawrite word processor bundled with the machine. The mail-merge feature was never added, Martinez said.

Apple Computer spokeswoman Rene Rodrigue said she did not know whether Lisawrite had ever been enhanced to offer mail merge but that the Lisa, or Macintosh XL as it is now known, can do mail merge using Keystroke Data Base software from Brock Software Products, Inc. Rodrigue declined to comment on Apple's reaction to the proposed legislation. Apple has announced that it will cease production of the Macintosh XL this year [CW, May 6].

Since the incident, Molina has "gotten a lot of letters" from people who have said their personal computers had not performed as promised. The bill would make any personal computer product's advertisement or brochure an expressed warranty for the product's performance, she said.



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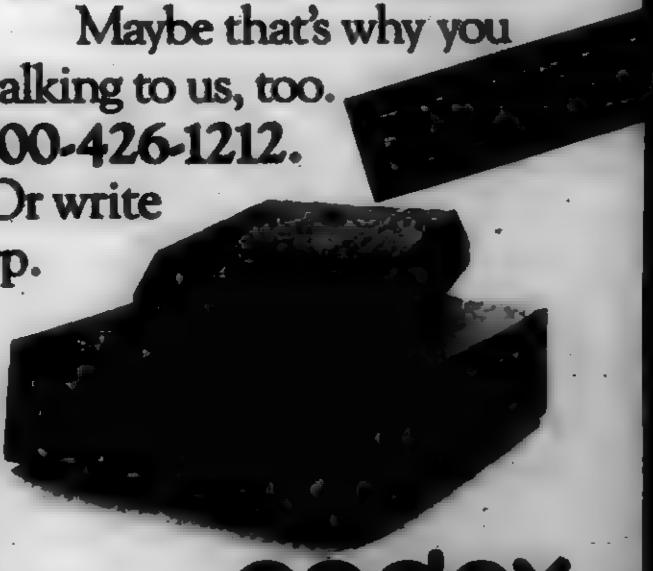

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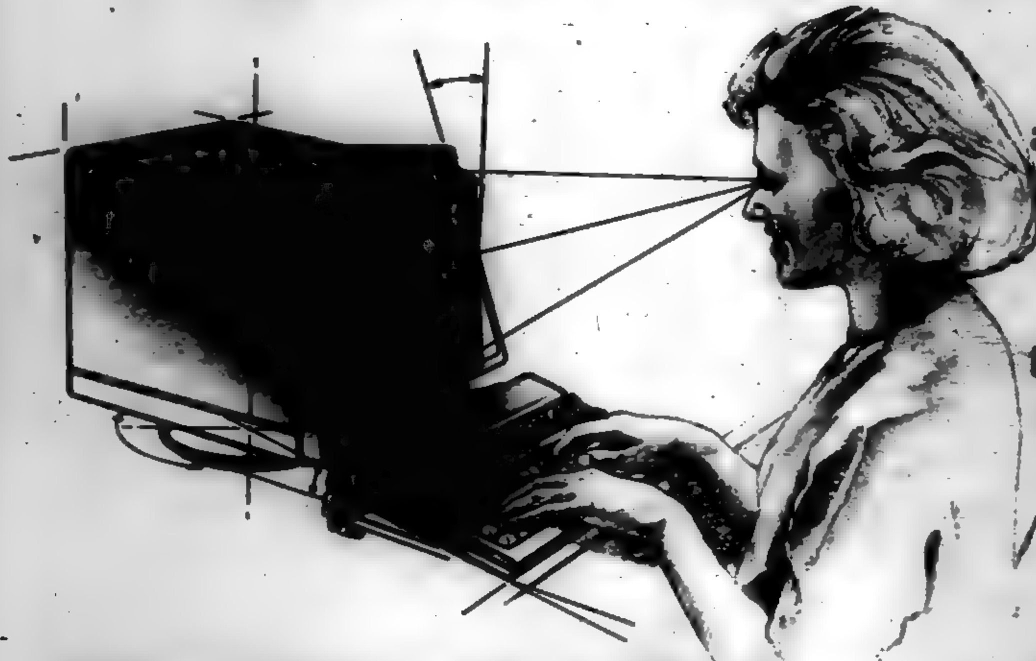

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PGD2307

CDBC adds mainframe link for IBM micros

MINNEAPOLIS — Control Data Business Centers, Inc. (CDBC) has introduced software that reportedly will link the IBM Personal Computer and Personal Computer XT with CDBC's mainframe-based services.

The software, called Orchestrator, will permit a firm to use the Personal Computer to access its data at the CDBC service bureau, according to the vendor.

CDBC provides such services as payroll check processing, and users will be able to download to their Personal Computer data such as payroll tax filing, tax change and benefits information. Users may then manipulate the data using such programs as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase II, the vendor said.

No need for mainframe

By relying on the CDBC, a vendor spokesman said, small to mid-size firms can have a data base that can be accessed by all of their Personal Computer users, and they would not need to purchase their own mainframes. Firms with a mainframe in place may elect to have CDBC process their payrolls, a popular feature of the service, according to the spokesman.

Orchestrator reportedly includes a telecommunications program, user security software, four data entry modules, automatic file translation, backup and restoration programs and printer support software, among other features. It requires IBM's PC-DOS 2.0 or later, 320K bytes of memory, a monochrome or color monitor and an RS-232 serial port.

The software is priced at a one-time license fee of $3,600 or a monthly fee of $150. Other pricing options are said to be available. There is a monthly maintenance fee of $35.

The CDBC service bureau itself sets the prices for its payroll processing service at an average of $350 a month for a company with 100 employees, and has three pay periods per month.

CDBC is located at 500 W. Putnam, Greenwich, Conn. 06836.

IBM cuts PCjr, portable micro, monitor prices

BOCA RATON, Fla. — IBM cut prices on its Portable Personal Computer, PCjr and PCjr Color Display.

The cost of the Portable Personal Computer with 256K bytes of internal memory and one diskette drive dropped from $2,595 to $1,950. The price of a dual-floppy-drive version was reduced from $2,895 to $2,250.

A PCjr with 128K bytes of internal memory and one floppy disk drive will cost $725, down from $999. The cost of the PCjr color monitor dropped from $429 to $399.

File transfer software out for IBM micros

SAN JOSE, Calif. — Forte Communications has announced micro-mainframe file transfer software that is reportedly compatible with IBM's 3270 Personal Computer host file transfer program. The Forte product is said to allow 3270-PC users to upload and download IBM's Professional Office Management System from IBM mainframes.

PJ/FTS comes bundled with Graph/FTS, which reportedly allows users to transfer IBM S3G mainframe graphics files to the 3270-PC.

Forte's PJ/FTS reportedly requires use of the Forte PJ 3278/79 emulation card and, to utilize its graphics functions, the Forte's IBM 3279 S3G graphics emulator card. It also requires IBM's MVS/TSO, VM/CMS or CICS operating systems running on the host.

PJ/FTS and Graph/FTS are available for $1,000 for a corporate single-site license and $5,000 for a corporate multiple-site license, according to the vendor.

For additional information, Forte Communications is located at 2205 Fortune Drive, San Jose, Calif. 95131.

SOFTWARE

■ **Real-Time Computer Science Corp. (RTCS) has released configurable versions of its real-time operating systems, PC/RTX and AT/RTX, which allow users to write their own IBM Personal Computer XT or Personal Computer AT device drivers for real-time applications.**

The PC/RTX and AT/RTX operating systems are implementations of Intel Corp.'s IRMX 86 real-time multitasking operating system specially configured to run on the IBM Personal Computer, Personal Computer XT and AT.

The RTX-C products are the configuration source files and device driver libraries contained in a file, which includes the object modules for all drivers and instructions for specifying device unit information

Continued on page 80

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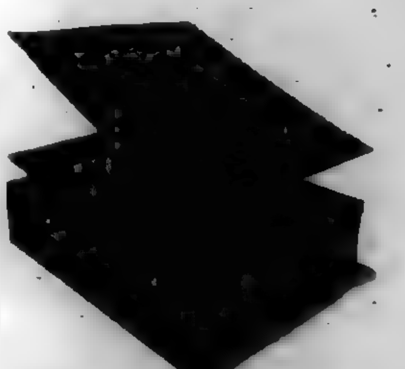

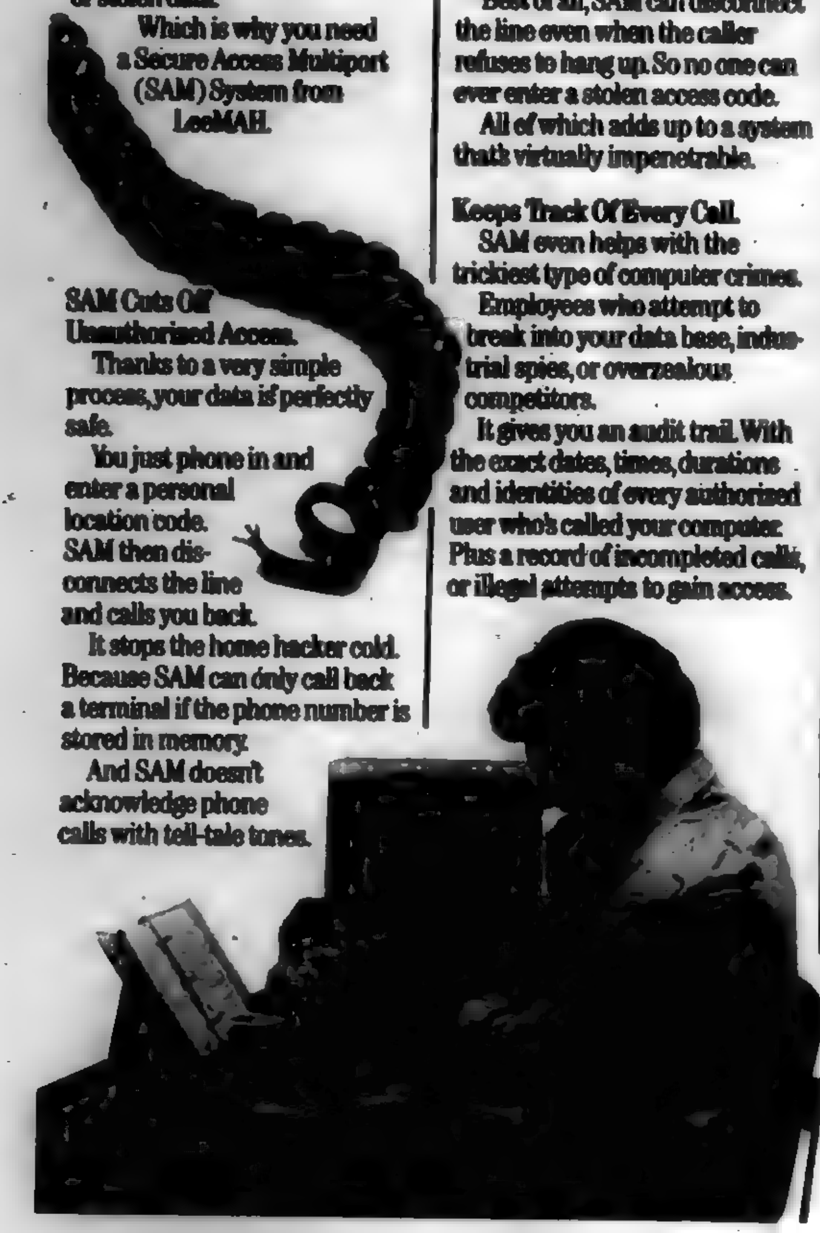

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MICROCOMPUTERS

Continued from page 79

blocks, the vendor said.

The PC/RTX operating system for the Personal Computer and XT costs $995 and the AT/RTX for the Personal Computer AT costs $1,495. The PC/RTX-C I/O library costs an additional $2,000 and the AT/RTX-C costs an additional $2,795.

RTCS, Unit E, 1390 Flynn Road, Camarillo, Calif. 93010.

■ Decision Resources, Inc. has announced enhanced versions of its business graphics software for the IBM Personal Computer, Personal Computer XT, AT and compatible machines.

Chart-Master 6.1 includes Datagrabber, a capability that allows users to bypass Data Interchange Format files and move directly into the spreadsheet to extract data for use in line patterns and axis and pie charts, the vendor said. The program includes access to two new fonts.

Chart-Master provides users with customizing options like hatch and line patterns, colors and axis control. Text can be underlined, italicized or justified in 16 different type sizes.

New graphics and fonts have also been added to Sign-Master 5.1, a text graphics product for slide presentations. The product allows users to change the size, color and position of data for the slide.

The products will work with IBM's recently announced Proprinter and Color Jetprinter, according to the vendor.

Available this month, Chart-Master 6.1 and Sign-Master 5.1 cost $375 and $245, respectively.

Decision Resources, 25 Sylvan Road S., Westport, Conn. 06880.

■ Hale Systems, Inc. has announced financial management modeling software that runs in conjunction with Lotus Development Corp. 1-2-3 on the IBM Personal Computer, Personal Computer XT or AT.

Financial Institution Planning System (Fips) is reportedly an asset and liability management model that allows financial institutions to develop, test and revise operating strategies based on data from 1-2-3 spreadsheets.

The software is said to integrate long-term strategic planning in short-term budgeting, produce budget-to-actual variance reports, generate earnings projections and test many different expansion and merger scenarios.

Fips is said to include gap analysis and predefined color graphics capabilities. According to the vendor, it also features report generating capability in detailed or summarized formats. The product requires 512K bytes of memory to run in conjunction with 1-2-3.

Fips costs $9,500.

Hale Systems, 1044 Northern Blvd., Roslyn, N.Y. 11576.

■ Deerasoft, Inc. has announced Version 2 of its menu system software for the IBM Personal Computer, Personal Computer XT and AT and compatibles running under either IBM's PC-DOS or Microsoft Corp.'s MS-DOS operating systems.

Features added to the Magic Menu program include configuration, user file maintenance, menu editor and menu display functions. An audit trail analyzer program is available at an additional cost.

The package requires 128K bytes of memory, a floppy or fixed disk and Version 2 or later of the operating system.

Magic Menu costs $99.

Deerasoft, P.O. Box 1966, Melbourne, Fla. 32901.

■ Software Synergy, Inc. has introduced software that reportedly enables IBM Personal Computers and compatibles with 256K bytes of memory and IBM's PC-DOS Version 2 or later to communicate with mainframes, minis and microcomputers as well as with on-line information services.

The system must include an internal or external mode, one double-sided diskette drive, an 80-col. monochrome or color monitor and an asynchronous I/O board with appropriate cabling.

The software, Respond/Async, reportedly emulates the terminal features of the Digital Equipment Corp. VT100, VT102 and VT52; the IBM 3101 Model 10; and Hewlett-Packard Co.'s 2621B, 2622A and TTY.

It allows micros to access subscriber services like Source Telecommunications Corp.'s Source; Official Airline Guides, Inc.'s Official Airline Guide; Dow Jones, Inc.'s Dow Jones News/Retrieval service; and Compuserve, Inc.'s Compuserve.

The package costs $175.

Software Synergy, 466 Main St., New Rochelle, N.Y. 10801.

■ Postley Software, Inc. has announced data base management and report generating software for the IBM Personal Computer, Personal Computer XT and AT.

DBS/Experience is said to contain on-screen Help instructions on all menus to lead users through procedures such as setting up files and inserting and retrieving information. The product is said to provide displays or reports from existing files or subsets of data files.

The software reportedly can perform computations on stored data and summary calculations. Reports are said to be automatically formatted for screen or printed presentation.

DBS/Experience requires IBM's PC-DOS Version 2 or later and resides in 64K bytes of memory.

DBS/Experience costs $345.

Postley Software, 6855 Hayvenhurst Ave., Van Nuys, Calif. 91406.

■ Coefficient Systems Corp. has announced a version of its Vterm software for the IBM Personal Computer line and compatibles.

The Vterm/4010 is said to combine Tektronix, Inc. 4010 terminal emulation, Digital Equipment Corp. VT100 terminal emulation, four error-correcting file transfer protocols (including Kermit) and communications capabilities up to 9.6K bit/sec.

The package is said to support Microsoft Corp.'s mouse, programmable softkey macros, setup screens, on-line Help facilities and automatic dialing.

The file transfer system that includes Kermit supports wild card transfer, server commands, data compression and command macros, the vendor said.

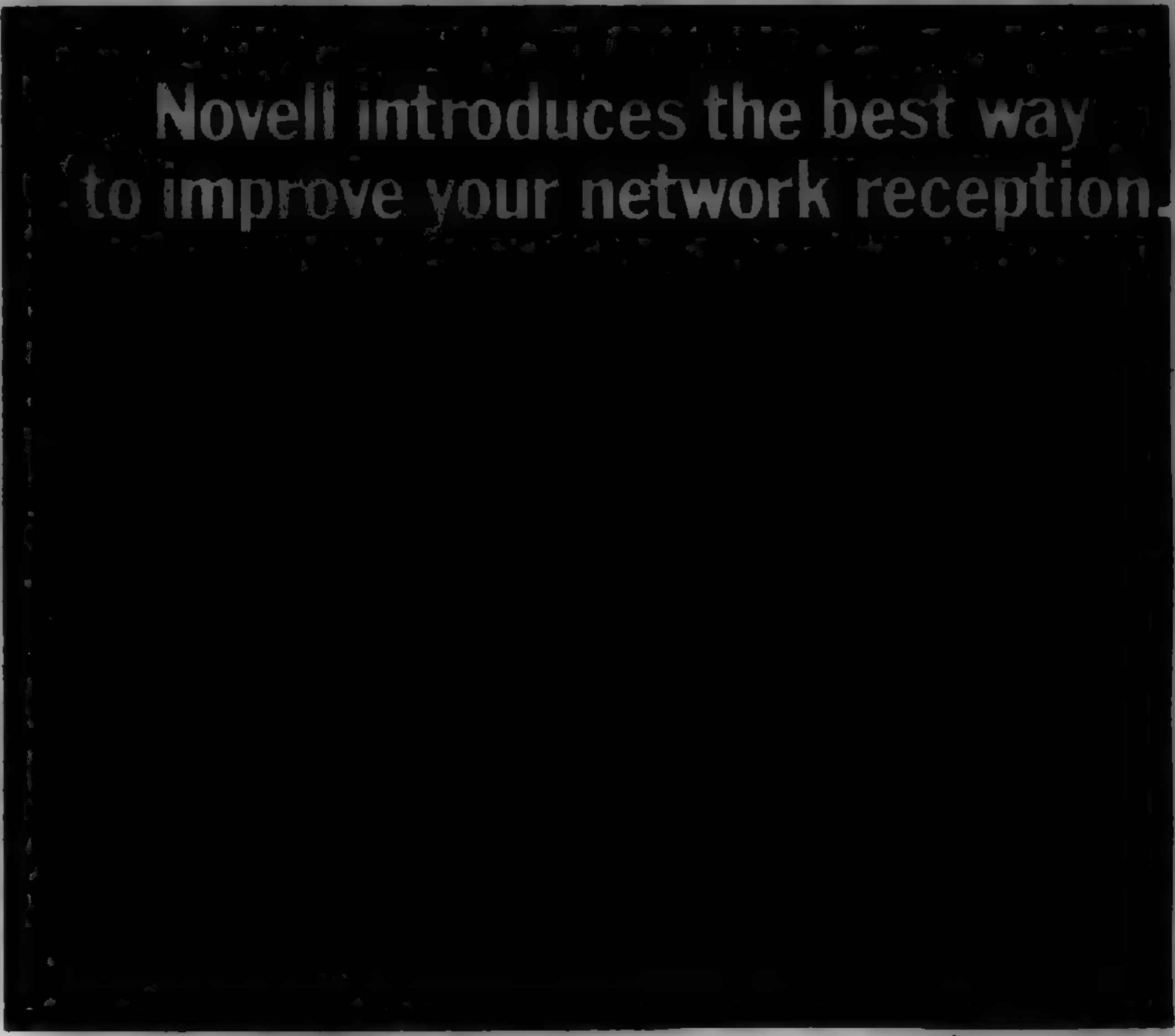
Kermit requires host software available from Columbia University.

The Vterm/4010 emulates 132-col. display with horizontal scrolling and can reportedly redisplay data that has scrolled vertically off the screen.

The package is priced at $249.

Coefficient Systems, 611 Broadway, New York, N.Y. 10012.

See TOOLS page 94



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*LAN Benchmark Report, May, 1985, Novell, Inc. and "Software, Not Hardware Key to LAN Performance," *PC Week* 1/15/85.

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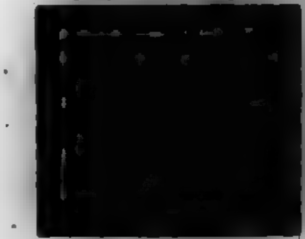

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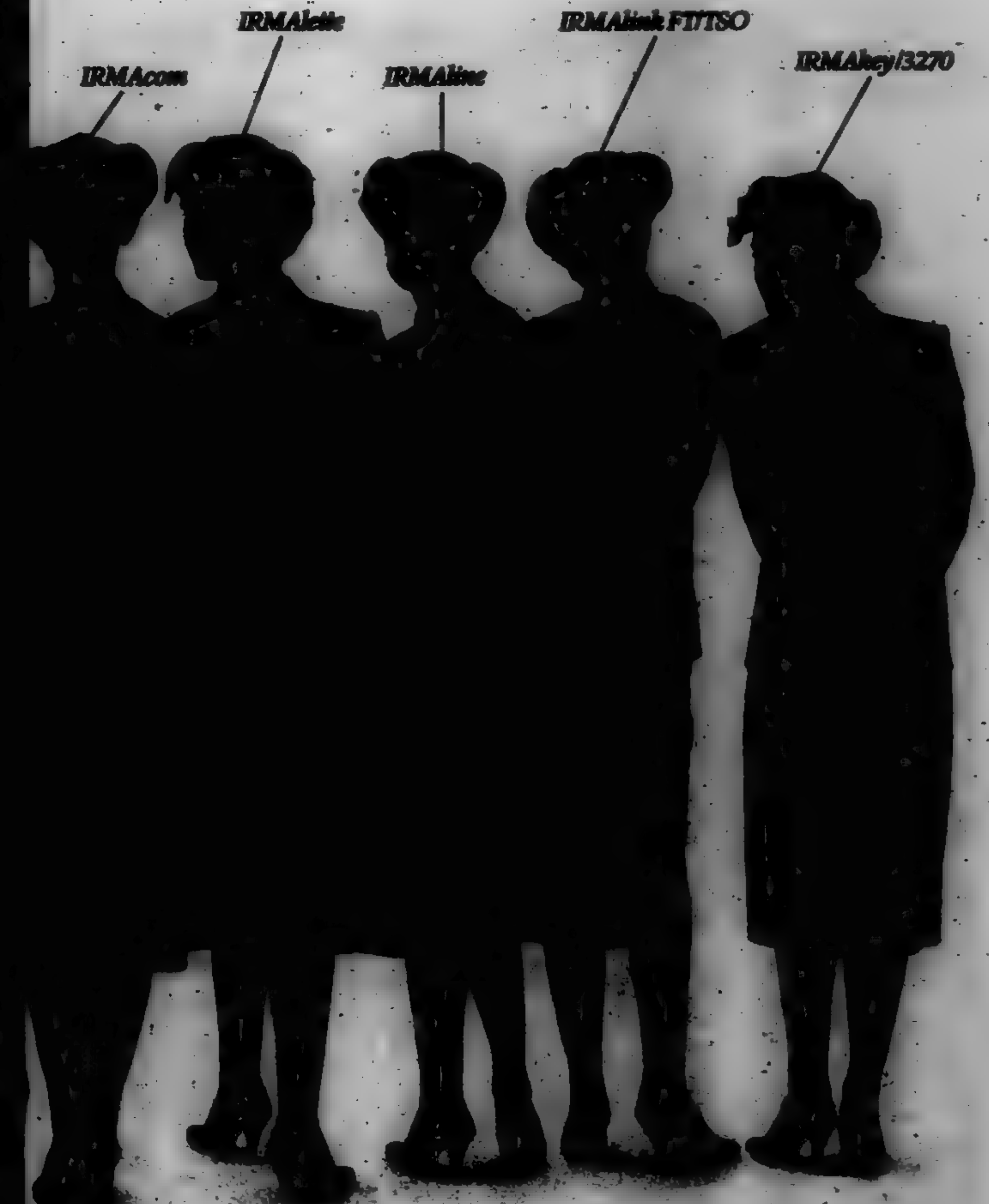

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TOOLS

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■ Applied Business Technology Corp. has announced the enhancement of its Project Manager Workbench software for the IBM Personal Computer line.

According to the vendor, Release 2.1 is also compatible for use on the Digital Equipment Corp. Rainbow microcomputer.

The enhanced project reportedly includes improved display capability for multiple projects on a Gantt chart and the ability to preview onscreen reports before they are saved on disk.

The release is said to include user-assigned priority in automated scheduling and to handle up to 200 resources or tasks per project, depending on system memory capacity.

The advanced version of Release 2.1 is also said to integrate text processing with two independent windows for cutting and pasting.

Project Manager Workbench Version 2.1 runs on the IBM PC-DOS operating system and resides in 384K bytes of memory.

Project Management Workbench is priced at $750 for the standard version and $1,150 for the advanced version.

Applied Business Technology, 6th Floor, 365 Broadway, New York, N.Y. 10012.

■ Beacon Hill Software Corp. has announced three data management software programs for the IBM Personal Computer and compatibles and machines under AT&T's Unix.

The DP Workbench (DPW) — written in C — is said to manage data stored in DOS files and to be capable of being ported to any machine that has a C compiler. It reportedly enables users to reformat, combine and extract information from data files. It can be used to manage a data base of DOS files and, in conjunction with a data base management system, to create and reformat data files for input to the DBMS, the vendor said.

DP Form is a forms manager, and DP Report is a report generator; both reportedly work in conjunction with the DPW or can stand alone.

The DPW package costs $99; DP Form and DP Report cost $49 each.

Beacon Hill Software, Suite 1409, One Devonshire Place, Boston, Mass. 02109.

■ Persoft, Inc. has introduced Smarterm 220 software, said to permit the IBM Personal Computer to emulate a Digital Equipment Corp. VT220 terminal fully supporting DEC's A-to-Z and other DEC software packages.

Smarterm 220 is also said to be able to transfer Ascii and binary program and data files between the Personal Computer and a host system. It offers all of the features of the VT220, including full keyboard emulation, English language setup mode, programmable function keys and multinational character sets.

The software is priced at $195. Existing Smarterm 100 users can upgrade for $75.

Persoft, 2740 Ski Lane, Madison, Wis. 53713.

■ Micro-MRP, Inc. has introduced its Management Performance Module for use with its "Max, The Production Manager," a manufacturing resource planning system for the IBM Personal Computer line.

The Management Performance Module reportedly analyzes and summarizes quantities and costs of surplus inventory, purchase orders, material requirements, work order activity and all inventory transactions. It also analyzes shop order shortages and the timeliness of vendor deliveries and work order completions.

The module costs $2,000.

Micro-MRP, 1065 E. Hillsdale Blvd., Foster City, Calif. 94404.

SYSTEMS

■ Docutel/Olivetti Corp. has unwrapped its M24 personal computer, said to be compatible with the IBM Personal Computer.

The M24 includes a serial port, parallel port, clock and calendar, monitor, graphics card for alphanumeric and graphics information and seven expansion slots.

Users may select either two 360K-byte floppy disks or one 360K-byte floppy disk and one 10M-byte hard disk. The monitor, available in monochrome or color, features 640- by 400-pixel resolution.

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Prices range from $2,745 for floppy drives, 128K-byte memory and monochrome monitor to $5,570 for a hard-disk model with 256K-byte memory and color monitor.

Docutel/Olivetti, 9615 Highpoint Drive, Irving, Texas 75062.

■ Leading Edge Products, Inc. has announced a model of its Leading Edge Personal Computer that reportedly is compatible with the IBM Personal Computer.

Model D features 256K bytes of random-access memory (RAM), expandable to 640K bytes of RAM; four expansion slots; two 5¼-in., double-sided, double-density disk drives; an Intel Corp. 8088 microprocessor; parallel port; and serial port.

The product includes a 12-in. green or amber screen and a Hercules Computer Technology graphics card that supports high-resolution monochrome or color output.

Bundled software consists of Microsoft Corp.'s GW Basic and MS-DOS operating system.

The product sells for $1,495.

Leading Edge Products, 225 Turnpike St., Canton, Mass. 02021.

■ Cado Systems Corp. has added two workstation models and an entry-level system to its line of Tiger ATS multiuser computers.

The Tiger DS/PC and the Tiger DS/XT workstations will function as decision support workstations in any Tiger ATS system or can be used as stand-alone desktop computers, the vendor said.

The DS/PC uses the 16-bit Intel Corp. 8088 chip and provides 256K bytes of memory and two 360K-byte diskette drives. The DS/XT substitutes a 10M-byte Winchester hard disk drive for one of the two diskette drives.

Both models incorporate Microsoft Corp.'s MS-DOS operating system, are available with either color or monochrome monitors and include graphics and real-time clock capabilities.

The basic Tiger DS/PC costs $2,960, and the DS/XT starts at $4,690. Prices include Contel Cado's Tiger-Link software, which allows the workstation to emulate the company's C-300 terminal and which accepts file transfers from Tiger ATS systems.

The company also announced the Tiger ATS8 entry-level system, which supports one to eight users. The system is compatible with other Tiger ATS computers that support from 16 to 64 users.

The basic model consists of a four-port processor module using an 8-MHz Intel 80186 microprocessor, 256K bytes of memory, a 10M-byte Winchester hard disk and either a 1.2M-byte floppy disk or a 20M-byte streaming tape cartridge for backup and a Cado C-301 word processing terminal.

The unit costs $7,650.

Cado Systems, P.O. Box 3759, 2055 W. 190th St., Torrance, Calif. 90510.

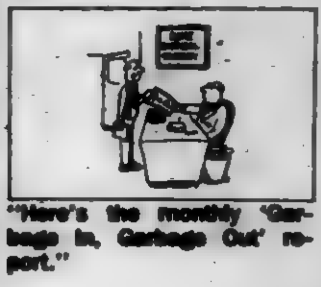
■ Innovative Electronics, Inc. has announced its Innovative Factory Data Collection System, which reportedly provides records of time and attendance, inventory control, work in process and job tracking.

The system, which runs under IBM's PC-DOS, reportedly also provides shipping and receiving control, quality control and customer chargeback functions. It operates in stand-alone mode or in conjunction with an IBM Personal Computer, a Digital Equipment Corp. VAX-11/780 or (with the addition of Innovative's MC80 protocol converter) with an IBM System/36 host computer.

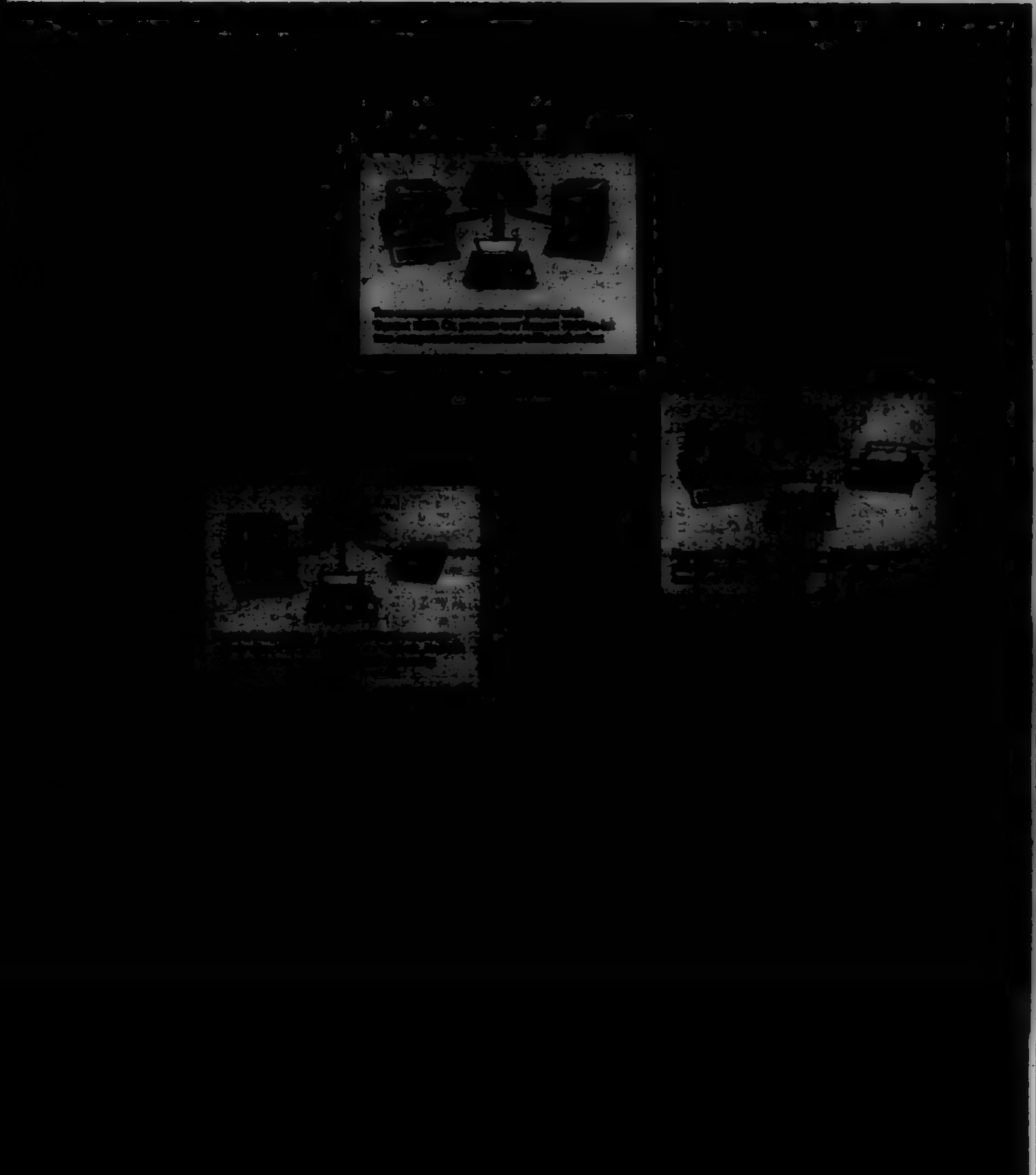
The basic system includes Innovative's Netmaster unit, 10 of the company's Transactor terminals with bar code wands, custom software, host communications software and two 360K-byte disk drives.

The basic system costs $35,000. A similar system with one 10M-byte hard disk and one 360K-byte floppy disk costs an additional $4,000.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.



"Here's the monthly 'Garbage In, Garbage Out' report."



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KEYS

from page 75

and Wordstar. Also called macro processors, the utilities reside in memory alongside an application, bringing to that application macros that have previously been written or those the user creates while the application is running.

Because these utilities work so closely with the keyboard, the greatest stumbling block can come when they attempt to interact with a program such as Microsoft Corp.'s Word, which is said to take over the keyboard. No keyboard utility is said to be able to work with Microsoft Word 1.0, for example, but all are supposed to be able to work with Word 2.0, the latest version of that word processor.

Since 1979 when Software Research Technology, Inc. introduced the first keyboard utility, Smartkey II, sales for such products have grown steadily. The current market leader in the Microsoft MS-DOS-based world is said to be Rosesoft's Prokey and, until last month, few other products had stepped forth to challenge its domain.

However, Borland International began shipment of its Superkey in May, and Alpha Software planned to deliver Keyworks last week. Both run under MS-DOS. Not to be outdone, Rosesoft also began shipment late last month of an enhanced version of Prokey.

Unlike other keyboard utilities, though, Keyworks reportedly will permit the user to use macros to change entirely the interface that an application presents to the user. In the words of Alpha Software Executive Vice-President Selwin Rabin, Keyworks' ability to let the user create his own pop-up menus will let him "make a program like [Micropro International's] Wordstar look like it was written for the [Apple Computer, Inc.] Macintosh."

Both the $89.95 Keyworks and the $69.95 Superkey reportedly offer data encryption in addition to their macro-generating capabilities. Superkey boasts two types of encryption: a proprietary method and the U.S. government's Data Encryption Standard.

The ability to create macros, though, is still each package's prime feature. Keyworks and Superkey both have pop-up menus of their macro editing functions and are compatible with most popular applications software.

Superkey also claims compatibility with Prokey macros — a feature that would permit it to interact with macros already created by any of the 50,000 copies of Prokey in use.

> *'If you've never used a macro processor, I think you're missing out.'*
>
> — Conrad Kageyama
> electronic bulletin
> board operator

The latest release of Prokey, the $129.95 Version 4.0, meanwhile, trumpets its ability to execute macros using English-language commands or user-created abbreviations. A user who wanted to find IBM's closing stock price, for example, could simply type "IBM," and the macro he had already created would log on to the Dow Jones News/Retrieval service and display the stock quote.

Despite the number of new or enhanced offerings, market analyst Mary Ellen Dick of the research firm Software Access International, Inc. does not believe that demand for keyboard macros extends beyond sophisticated personal computer users, who she said account for less than a third of all users. "I don't think you're going to see big growth" in the keyboard utility field, she observed. Regarding Superkey's data encryption feature, she said, "Only a small group of people are interested in encrypting their work," but added that their numbers may grow as the use of local-area networks and multiuser personal computers becomes more widespread.

Alpha Software's Rabin, however, said he believes user wariness about macro processors stems from the fact that "CONTROL A [a typical command for a macro] is only slightly less cryptic" than the original, lengthy command is. What is needed, he argued, are macro processors that simplify macro generation, with such features as moving-bar pop-up menus.

Whatever the method of selection, one dedicated macro user, Conrad Kageyama, operator of an electronic bulletin board in Los Angeles, said he thinks every personal computer user should have a keyboard utility. The use of macros "can save a lot of redundant keystrokes," he advised. "If you've never used a macro processor, I think you're missing out."

"In my opinion, a system has become far too powerful when it demands human sacrifice."

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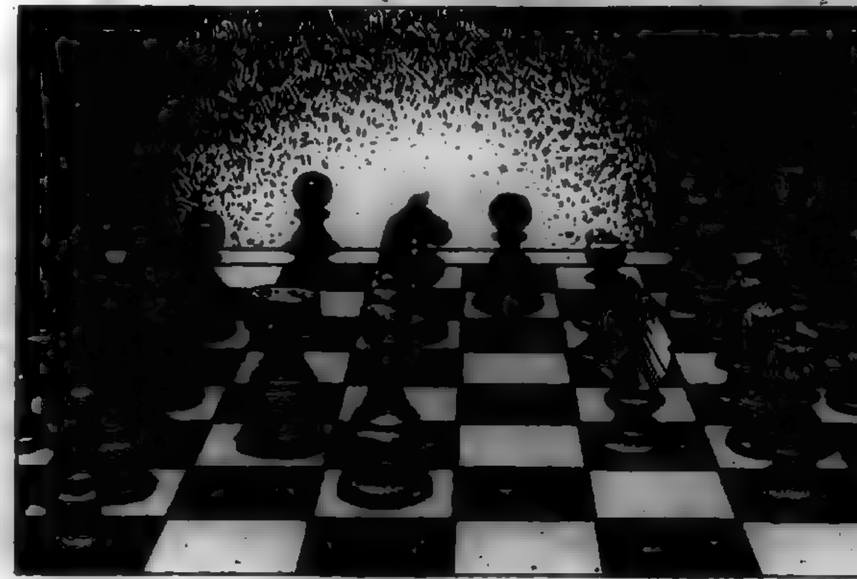

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Technology • Quality • Service

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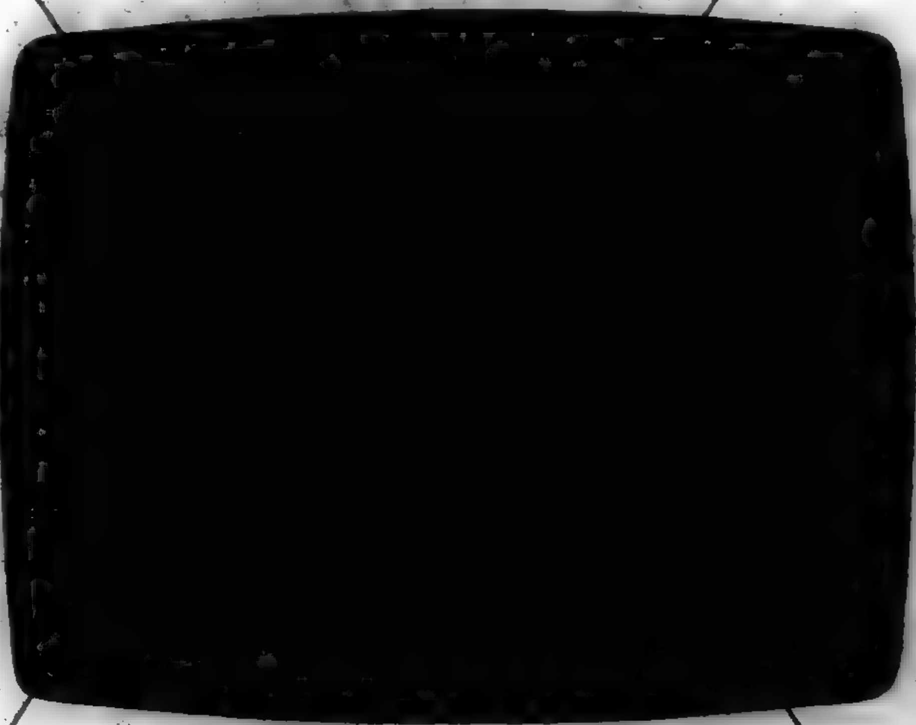
The Lee Data Open Window™ Display gives you single-terminal access to all applications needed to handle fund transfers automatically. *Shown: A live, remote Async host session with the Clearing House Information System.*

Associated or affiliated accounts can be displayed simultaneously for faster, easier assembly of funds, then dynamically updated. *Shown: A live 3270 host session displaying a cash management system menu.*



Remember, each window represents a live 3270 or Async host session, and you can jump from session to session with a single keystroke. *Shown: A live 3270 host session displaying a payment system menu.*

Naturally, fund transfers are only one example of how our Open Window Display can save you time and effort. Call us for more good ideas. *Shown: A live 3270 host session displaying a customer data base.*

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1200-610

LEE DATA CORPORATION

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THE ALTOS 3068
SIX BREAKTHROUGHS IN ONE
FOR OEM [illegible]

FILE PROCESSOR SUBSYSTEM
Controls 4 DMA channels for disk, tape, floppy and parallel printer port; overlapped seeks on [illegible]

CPU BOARD
[illegible]-bit MC68020 microprocessor running at [illegible] MIPS with no wait states; [illegible]K high speed cache memory; up [illegible] MB virtual address space per program; optional floating point processor

RAM BOARD
Can be configured to OEM's needs [illegible] 16MB using 1MB, 2MB [illegible] 4MB boards

BREAKTHROUGH PRICE/PERFORMANCE

Combining the 32-bit MC68020, multiple auxiliary processors, and a tuned version of UNIX™ System V, the 30-user 3068 "is capable of a performance that rivals large mini-computers." (Computerworld, April 1985). And it does it for a micro computer price—from $7,000 for OEM quantities.

BREAKTHROUGH MODULARITY

"Using plug-in boards the way a personal computer does really sets Altos apart." (research firm Creative Strategies, Computerworld, April 1985). OEM's can choose from a wide range of modules: 10 to 40 serial ports; 1 to 16 MB of memory; 17 to 290 MB (formatted) hard disk storage.

BREAKTHROUGH HARDWARE DESIGN

"Altos is way ahead of everybody else." (Creative Strategies, Computerworld, April 1985): high speed 8 KB cache maximizes CPU speed, with no wait states; cache is simultaneously shared between many processors; high performance memory management supports demand paged virtual memory; on-board microprocessors handle all I/O processing.

XPANSION
BOARD SLOTS

ERROR from page 75

rules are, unless somebody tells you."

As John Kennick of *Computer Update* said, "The probability of a programming error in a spreadsheet program is perhaps hundreds of times as great as it would be if the same algorithm were written using a more structured programming language."

In short, spreadsheet users are assembly-language-like programmers, whether they know it or not, and they are flying blind. Spreadsheets cannot instill confidence that analyses accurately reflect management's understanding of its own business. Among solutions proposed in the press are the following:

- Be more careful. Take notes and thoroughly document everything.
- Have central spreadsheet auditing staff members review all spreadsheet work.
- Use one of the aftermarket programs that prints spreadsheet formulas in their correct cell-by-cell orientation.
- Attend training seminars.

Proposed solutions do not work

None of these work, because they go against the grain of human nature. Nobody really wants to spend large amounts of time tracing logic that is buried in piles of hieroglyphic formulas; nobody wants to stifle the very spontaneity of the micro by submitting everything to an audit committee; and nobody wants to take a class just to learn how to trick a software program into doing the obvious.

The rest of spreadsheet limitations is that the software is the simple mechanization of row and column arithmetic that has been the practical calculating convention for several millenia. What may be an appropriate tool for formatting reports is now used as a general-purpose modeler. No amount of modification can satisfactorily make up for its limitations.

Finally, the spreadsheet way of doing things is just plain tedious.

Instead of other software Band-Aids on top of spreadsheets or additional layers of clumsy bureaucratic checks, what is needed is a new software paradigm, and some new technical directions are beginning to appear.

Artificial intelligence research clearly offers great potential in many applications. Practical results to date have appeared in medical diagnosis and prognosis, in diagnosis of mechanical systems and in the form of natural language.

The initial excitement over natural language interfaces has cooled, however. It seems that relating to a computer in long phrases is quite cumbersome in many applications.

Big business management has developed a healthy skepticism of quantitative analysis. The last thing business management wants is to jump from the frying pan into the fire — from inexperienced human analysts to much more naive, and much less tractable, artificial intelligence software.

But there is a new form of knowledge representation which offers great potential to business management: natural intelligence. Natural intelligence systems allow users to express their analytic thoughts as freely and clearly as a computer will allow at the present time, and then revise them or explain them to others.

What makes software so exciting is that its history has only begun and that the technology is cumulative in its knowledge. The basic inventions are yet to come.

BETA from page 75

Another feature that Stein said he liked in Keyworks was that it "prompts you as you go, [so that] you're never lost." His copy of Prokey, he continued, sometimes leaves him confused; when a key is defined as a pause, for example, all that is displayed is the cursor.

Stein found two "cosmetic bugs" in the version of Keyworks that he used and said both were later corrected. His firm, which trains executives in personal computer use, plans to recommend that its clients buy Keyworks and familiarize themselves with macro processing, he noted.

Conrad Kageyama, the beta tester of Borland's Superkey, is also a veteran Prokey user. A Los Angeles gas station operator by day and electronic bulletin board systems operator in his off-hours, Kageyama said he likes Superkey for its ability to clear a current macro and load a different macro without having to exit from an application. Such a feature, he pointed out, is not available in the earlier version of Prokey that he uses. The feature is available in the latest release of Prokey, Version 4.0, a Rosesoft spokeswoman said.

Kageyama is no stranger to macros; he uses a 7,000-char. macro, written using Prokey, to load his station's daily sales figures into 1-2-3 automatically. Since Superkey reads Prokey macros, Kageyama was able to avoid rewriting that massive macro and still gain Superkey features.

Kageyama said he has little use for Superkey's data encryption features, which reportedly allow users to encode data to either a Borland-created scheme or the Data Encryption Standard of the U.S. government.

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Data switching: Equinox makes it simple.
Introducing the Equinox Data PBX; a port selector that makes switching terminals between computers as simple as dialing a phone number.
Installation is simple; do-it-yourself using regular telephone PBX-type cabling and connectors.
And it's simple to integrate into your system, thanks to our super friendly, self-explanatory configuration menus.
The system grows to meet your needs, from 24 to 1320 lines. And the state-of-the-art design combines performance and reliability in a compact package that won't break your budget.
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COMMUNICATIONS

WIRE TAP/DANIEL MINOLI

Higher initial costs pay off

Divestiture has altered the way communications managers and network planners must function. Installation intervals have become longer and installation costs are rising, thereby curtailing network elasticity and the ability to effect quickly redesigns, optimization and patches. Mean time between failures and mean time to repair figures have generally suffered due to the intrinsic plurality of service providers on a given end-to-end link.

There are two ways to approach the altered fabric of network management in this new environment, and both can be valid depending on an organization's point of reference, definition of efficiency or optimality criteria.

The first approach follows the status quo philosophy in network design. The cost function is taken to be the sum of the cost of all network components, without explicit consideration given to secondary costs associated with downtime and repair intervals. When a network link fails, the operations manager faces the vicissitudes of restoration and the ensuing service interruptions. No explicit redundancy is built into the network at implementation time.

The advantage of this approach is an apparent reduction in costs, both when the network is implemented and in recurring expenses. This may be acceptable in an insurance company's bill processing or batch environment. In reality, this approach is the de facto paradigm for a large percentage of commercial networks.

The problem with such an approach is that literally millions of dollars in real or potential revenue can be lost

See ALTER page 102

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

Survey finds firms plan telecom budget increases

By Paul Korzeniowski
CW Staff

NEW YORK — There's a "whole lotta shakin' goin' on" in the communications field, according to a report by the Conference Board, Inc., a market research outfit headquartered here.

The report, "Current Issues in Corporate Telecommunications," found that 92% of the corporations surveyed plan a major telecommunications change in the next three years. The 348 survey respondents have more than $10 million in annual sales.

The telecommunications changes included budget increases. Three quarters of the respondents expected costs to increase during 1985 and 1986; one quarter of the firms projected 9% to 12% increases.

The survey determined how the budgets are divided. Costs were split into internal communications, which included private branch exchange costs; long-distance voice transmission; long-distance data transmission; local voice transmission; local data transmission; and overhead. Internal communications and long-distance voice transmission were the most costly items. Half of the firms reported that internal communications takes up 20% to 40% of their budgets. Long-distance charges account for 30% to 35% of most budgets.

Respondents were asked to name their most costly long-distance service. Close to 60% named AT&T's Wats. The second and third most cited services were AT&T's message units and AT&T's private lines, 15% and 10% respectively.

To implement communications changes, approximately two-thirds of the communications managers plan to revamp their staffs and organizations in the next two years. The most likely change will be pulling communications functions into one group or shifting communications respon-

See POLL page 104

Software boosts service options

DATA STREAM
John Dix
CW Senior Editor

AT&T has developed software for switches used by local telephone companies that will enable these companies to offer a host of new calling services for residential and business users.

The capabilities provided with the so-called Local-Area Signaling Services (Lass) were outlined by C. Brant Hirschman, Grant E. Swinehart and Marie L. Todd, all of AT&T Bell Laboratories, in an article in the May issue of the "Record," a Bell Labs publication.

Two telephone companies are reportedly testing Lass, which is said to be based on the Common Channel Interoffice Signaling (CCIS) technique used in AT&T's long-distance network. Local CCIS provides transmission of signaling information in the local network independently of the voice network. The four AT&T software components that make this possible run on 1A Electronic Switching Systems, which AT&T manufactured.

The new features include the following:

- Automatic reconnect. This feature enables callers to redial the last number they called, or the last person that called them, by dialing *66 on a push-button phone or 1166 on a rotary phone. The central office switch scans a temporary memory associated with that line and places the call, all within less than a second.

See SERVICES page 104

- Fujitsu America has announced an 810M bit/sec., single-mode fiber-optic system that can carry 12,096 signals/96
- California Network Systems has announced PCnetwork/SNA 3270 Gateway, which allows microcomputers on IBM's PC Network to emulate IBM 3270 series devices/96
- Fibercom has announced a fiber-optic multiplexer for IBM 3270 environments that can be multidropped/97
- MCI Communications has revised its residential and business rates effective July 1/97

INSIDE

Protocol Converters/97
Software/97
Multiplexers/Modems/98
Local-Area Networks/98
Network Services/102

How to make your computer room bigger by shrinking your modems.

Trade in your huge, old, ugly and under-featured 9.6 kbps modems on sleek new AJ [illegible] modems for only $[illegible].

We'll also give you a $[illegible] trade-in* for your old working model.

At just over 2" high x 6" wide, you can fit up to 64 in a standard six foot rack and save valuable computer room space.

Use the same modem for standalone or rack mounting.

The AJ [illegible] is a full duplex, synchronous modem that operates at 9.6 kbps over a four-wire dedicated circuit in point-to-point communications. It's V.29 compatible.

The AJ [illegible]'s two-call autodial backup system can regain your connection over dialup lines should lease lines fail.

(Actual size.)

You also get a full array of front-panel controls softstrapped for easy set-up. With down-line loading and security that redirects control to a central site. Full diagnostics and self-testing assure reliability.

Act now. Offer ends July 31, 1985.

*Trade-ins must be V.29, 4-wire, FCC leased-line modems from end users.

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UDS broadens product offerings with five modems

HUNTSVILLE, Ala. — Universal Data Systems, Inc. (UDS) has added five modems to its product line. They include the following:

- UDS 202S/D is an asynchronous or synchronous half-duplex modem that uses frequency shift keyed modulation and transmits data at speeds up to 1,200 bit/sec.

The product has manual answering and automatic answering, supports pulse or tone dialing and can store one 30-digit number and redial a number up to 10 times. The modem includes automatic loopback dialing circuitry that can be used to test for a problem.

- UDS 201B is an asynchronous/synchronous 2,400 bit/sec. half-duplex modem that operates over the switched network or a full-duplex modem with four-wire leased lines.
- UDS 201C is a half-duplex synchronous modem that transmits at speeds up to 2,400 bit/sec.
- UDS 212A and UDS 212A/D are full-duplex, asynchronous or synchronous modems that transmit data at speeds of 300 to 1,200 bit/sec. The products' built-in test features include digital loopback, analog loopback, remote digital loopback as well as self-testing.

Both modems feature automatic answering, and UDS 212A/D includes an automatic dialing feature that stores up to 10 126-char. logon sequences, UDS said.

UDS 202S/D costs $495; UDS 201B and UDS 201C each sell for $695; UDS 212A costs $495; and UDS 212A/D is priced at $545, according to the vendor.

More information on the modems is available from UDS, located at 5000 Bradford Drive, Huntsville, Ala. 35805.

Controller links IBM, Burroughs

SALT LAKE CITY — Beehive International, Inc. has enhanced its ATL-083 Burroughs Corp. TD830/MT983 emulator to enable simultaneous Burroughs and IBM 3270 communications.

When the ATL-083 auxiliary port is connected to Beehive's CC74 or 3270MS cluster controller, a keyboard command turns the ATL-083 into an IBM 3178/3278 emulator, the company said. IBM screen format and status line/icons are said to be provided, along with full IBM 3178 keyboard function. Concurrent sessions with IBM and Burroughs hardware can be maintained.

The device is said to support Burroughs' major polling protocols such as poll/select; fast select, group poll and multipoint contention.

The emulator costs $1,295 in single quantities and is available immediately.

Beehive can be reached through P.O. Box 30668, Salt Lake City, Utah 84130.

Encryption tools debut

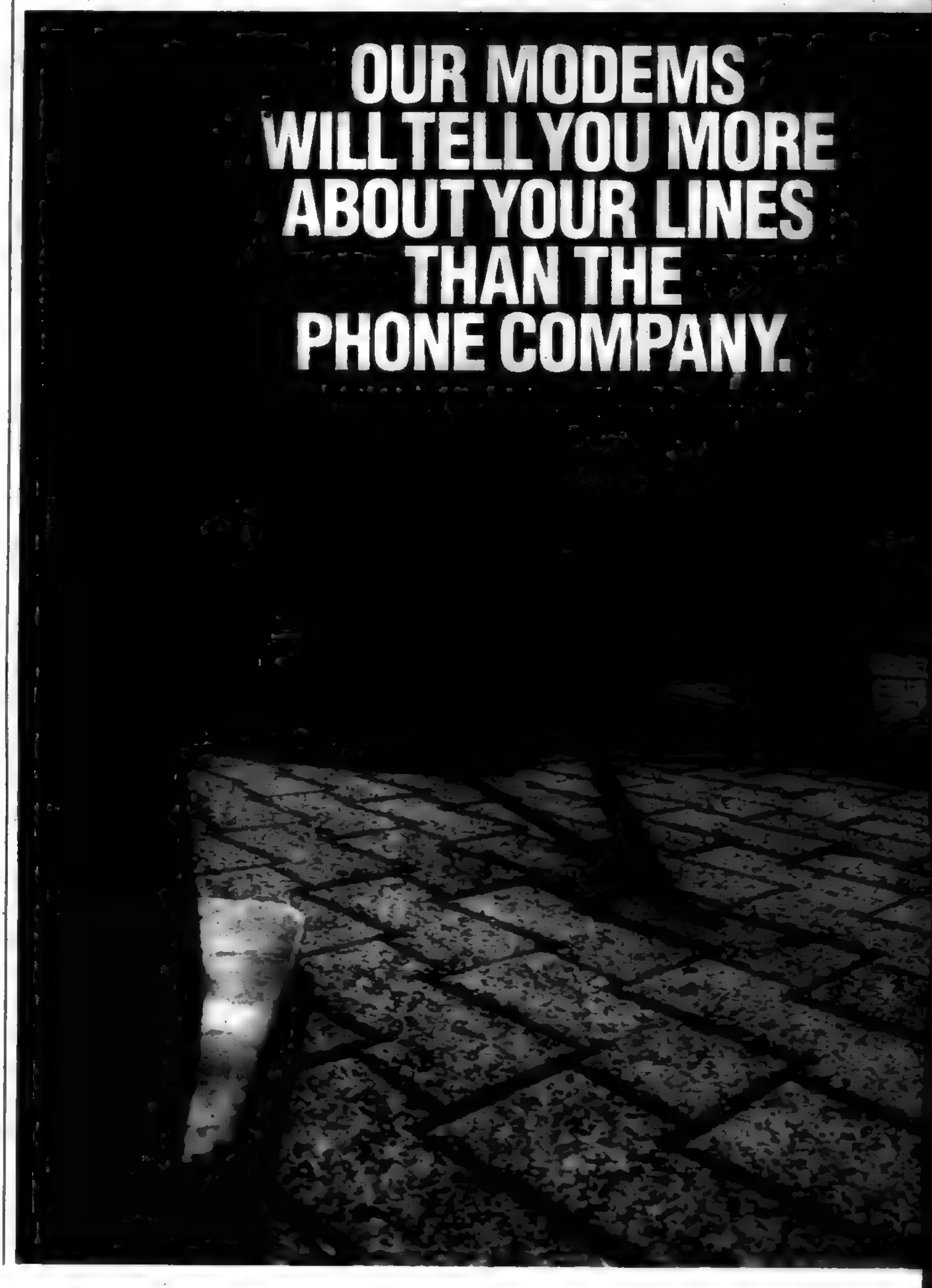
SUFFERN, N.Y. — Datasentry Technologies, Inc. has announced four data encryption devices.

Two of the encryption devices support both the National Bureau of Standards' Data Encryption Standard and DPS, a proprietary algorithm. The other two devices support one of the two algorithms.

The devices support full-duplex, asynchronous transmissions at speeds of 300, 1,200 and 9.6K bit/sec. The products are reportedly attached through an RS-232 interface.

Prices for various models range from $595 to $995.

Datasentry Technologies is located at 1 Executive Blvd., Suffern, N.Y. 10901.


OUR MODEMS WILL TELL YOU MORE ABOUT YOUR LINES THAN THE PHONE COMPANY.

Fujitsu touts capacity of fiber-optic system

LAS VEGAS — Fujitsu America, Inc. announced here recently the development of a single-mode, fiber-optic system that is reportedly capable of carrying twice as much information on a single pair of fibers as any lightwave system in use in the U.S. today.

The Optical Fiber Transmission System operates at 810M bit/sec. and can support 12,096 voice, data or video signals, the company reported. It uses proprietary semiconductors that are said to include laser diodes, photo detectors and large-scale integrated circuits.

Prior to the introduction of this system, Fujitsu's 405M bit/sec. fiber system represented one of the largest capacity systems in operation in the U.S., the company claimed. That system could support 6,048 channels.

After completing a final test phase in Japan, the 810M bit/sec. Optical Fiber Transmission System will undergo a U.S. field trial in a telephone network environment and will be added to Fujitsu America's product line in the fourth quarter, the vendor reported.

The estimated cost per circuit mile of the fiber system represents an 85% savings over traditional copper wire technology, the company said.

Fujitsu America is located at 3055 Orchard Drive, San Jose, Calif. 95134.

Gateway out for micros on IBM net

MILPITAS, Calif. — California Network Systems has announced PCnetwork/SNA 3270 Gateway that allows microcomputers on IBM's PC Network to emulate IBM 3270 series devices.

Depending on the configuration, either a personal computer on the network or a Netserver Communications System from California Network Systems functions as the gateway.

In either implementation, the gateway mimics an IBM 3274 Model 51C or Model 61C controller supporting 3278 and 3279 displays and 3287 printers.

The gateway is supported with IBM's Synchronous Data Link Control (SDLC) protocol under Systems Network Architecture (SNA).

The product will reportedly be compatible with all IBM-compatible networks that implement IBM Netbios, including Microsoft Corp.'s MS-Networks and Intel Corp.'s Open Net.

The PCnetwork/SNA 3270 Gateway family of products is said to provide users with three configuration options that vary by price and performance.

The entry-level product is software that runs on an IBM Personal Computer, Personal Computer XT, AT or compatible that has an IBM SDLC card. It enables up to 12 concurrent SNA 3270 sessions to be supported.

By replacing the SDLC card with a Comcard Communications Card the number of concurrent SNA sessions supported by the gateway can be increased to 24. When a Comcard and associated software is used in a dedicated Netserver Communications System up to 48 SNA 3270 sessions can be supported.

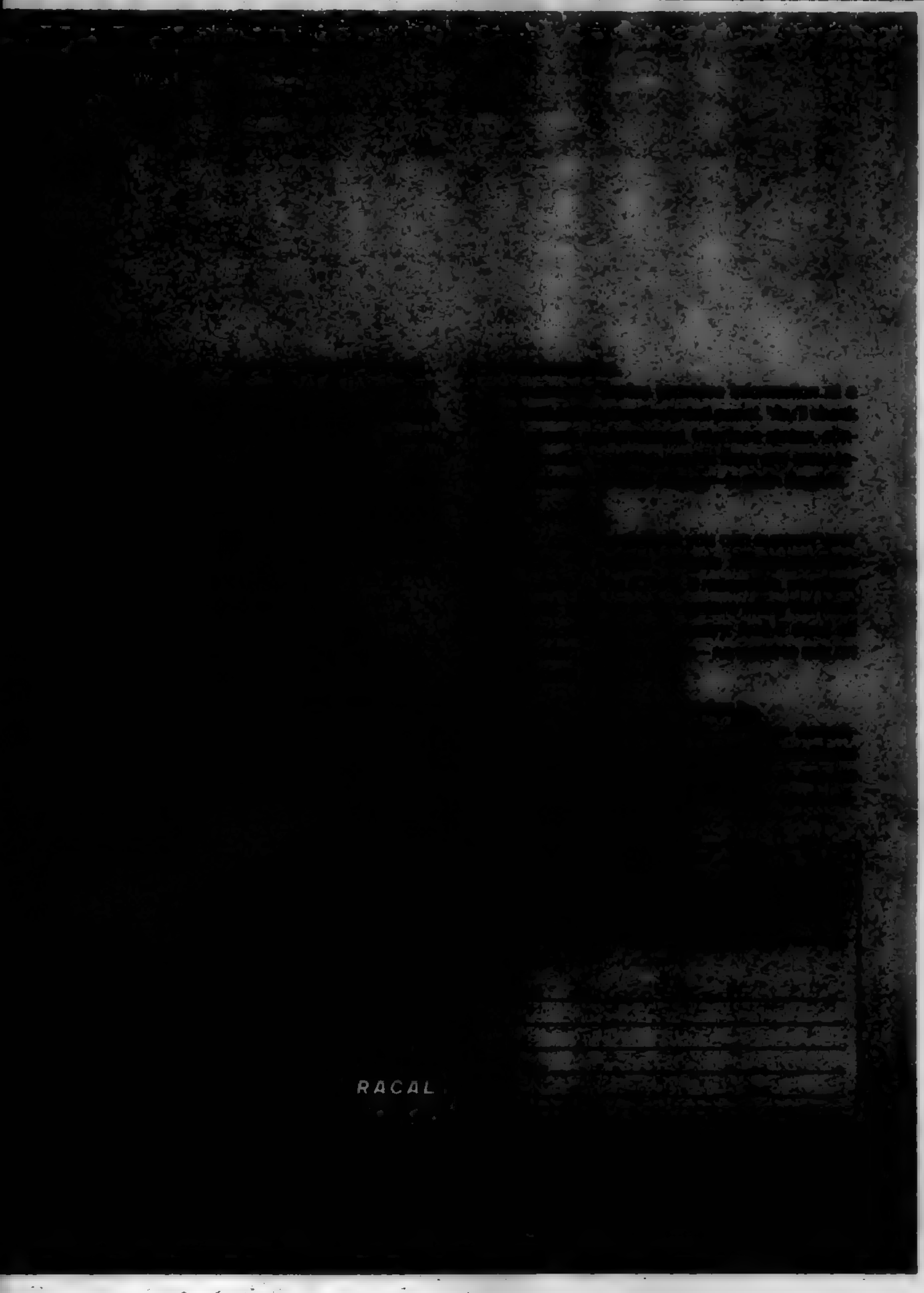
The Netserver can support a total of four Comcards, providing for up to 192 sessions on four SNA networks, the vendor reported.

A feature of the product called Hotkey is said to enable users to toggle between 3270 display screens and DOS applications that are maintained concurrently. Hotkey can also be used to switch between the gateway status screen and other DOS applications.

To serve as a gateway, Personal Computers must have 384K bytes of random-access memory (RAM) and 8K bytes of RAM for each active mainframe session.

Gateway prices average $500 per microcomputer.

California Network Systems is located at 372 Turquoise St., Milpitas, Calif. 95035.



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- Shows transaction problems—loops, ENQUEUE lockouts and VSAM string waits

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Summary, reporting and compression of multiple systems allowing long range data retention for utilization analysis and planning.

- Flexible report writer
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- Graphic/tabular reporting
- Historical archiving with summarization

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Online access to transaction data, "after-the-fact" problem determination and replay of performance for the day.

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- Easy-to-read formats
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Captures transaction level information without extensive file handling. Provides basis for online and batch reports.

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- PAII, CMF NOT required
- PAII conversion provided

Storage Monitor

Provides information for and analyzes effects of tuning CICS and operating system. Aids in pinpointing problems.

- Analyze CICS storage online
- Display, alter storage
- Show program compression
- Track temporary storage
- Show subpool use

File Monitor

Pinpoints problem files/volumes and shows effects of tuning. Aids VSAM file definition. Analyzes I/O contention.

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- CICS counts captured
- Provides VSAM split data
- Creates better balance and performance

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Identifies and tracks specific applications and events. Supports UFO™, MANTIS™, GENR/OL™, NATURAL™, and DMS™. User interfaces, clocks and counters.

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Prevents system outages by automatically cancelling applications that exceed CPU, file, I/O or storage limits.

Supertrace

Gauges effect of new applications on system, reduces testing time, allows production tracing and enhances performance.

- Quick application time
- Resource consumption data
- Application debugging tool
- Alternative to AUX TRACE in production system

MCI files rate revisions with FCC effective July 1

WASHINGTON, D.C. — MCI Telecommunications Corp. has announced that it has filed rate revisions with the Federal Communications Commission that are scheduled to go into effect July 1.

The rate changes include the following:

- Reductions of up to 11% for residential and business services.
- Elimination of the $10 Advantage Service Customer fee to customers with monthly bills of $200 or more, which automatically dials MCI access numbers and provides account billing.
- Volume discount reductions of 2% to 9% for customers with $20 to $200 monthly bills.
- An average 4% reduction for daytime MCI Wats customers with 40 to 80 hours of monthly use. In addition there is a 4% increase for nighttime Wats fees.
- A 5 cent increase in per-call surcharges of travel card rates. First-minute travel card rates have been increased, and most additional-minute rates have been decreased.

MCI Telecommunications is located at 1133 19th St. N.W., Washington, D.C. 20036.

Fibercom multiplexer out; supports up to 32 cables

ROANOKE, Va. — Fibercom, Inc. has announced a multiplexer that supports up to 32 coaxial cable outputs from an IBM 3274 communications controller over a single pair of fibers.

The rack-mounted FMX-32 is modular and can include from one to four eight-channel cards, according to Fibercom. Distances between controller and remote end points can range up to 15,000 feet, three times the reach of coaxial cable, the company reported.

Company President Albert Bender claimed the FMX-32 is the only fiber-optic multiplexer that supports multidrop configurations.

Using a passive star coupler at the remote site, the multiplexed signal coming over the pair of fibers can be split and routed to up to 10 locations, Bender said.

Full IBM Type A peripheral speeds are said to be maintained.

Available now, the FMX-32 costs $1,930 for an eight-channel unit and $3,860 for a 32-channel configuration.

For more information, Fibercom can be reached through P.O. Box 11966, Roanoke, Va. 24022.

PROTOCOL CONVERTERS

- Datagraf, Inc. has announced a bisynchronous protocol converter said to be available for IBM Systems Network Architecture (SNA), Burroughs Corp. or Ascii hosts.

The Series II 3270 Bisynch Host Protocol Converter reportedly supports the bisynchronous output of IBM 3271, 3274, 3275 or 3276 controllers for conversion to or from a protocol of the user's choice.

The 3270 Bisynch Host/SNA is said to enable bisynchronous controllers to emulate an IBM 3274 SNA/Synchronous Data Link Control controller. It reportedly supports eight devices, expandable to 32.

The 3270 Bisynch Host/Burroughs reportedly makes a bisynchronous controller look like a Burroughs TD 830 or MT-983 poll-select terminal. It is also reportedly expandable to 32 devices from its standard eight.

The Bisynch Host/Ascii converter is designed to be implemented over local-area or packet networks, the vendor said. It reportedly supports up to seven Ascii lines for porting to a network bus interface unit.

The 3270 Bisynch Host/SNA costs $5,995; the 3270 Bisynch Host/Burroughs is $6,200; and the Bisynch Host/Ascii converter costs $6,395.

Datagraf, No. 100, 6626 Silvermine Drive, Austin, Texas 78736.

- Method Systems has announced PCT-100, a communications device that enables Digital Equipment Corp. VT100 or VT200 terminals to emulate Data General Corp. Dasher D200 terminals.

The product mimics Dasher function key and screen attribute features so users can run any DG system utility, the vendor reported. A user can set communications parameters for various bit/sec. rates, parity checks and handshaking techniques.

PCT-100 for a VT100 costs $595, and for a VT200, it costs $605.

Method Systems, Suite 202, 3511 Lost Nation Road, Willoughby, Ohio 44094.

SOFTWARE

- Fischer-Innis Systems Corp. announced Release 2.4 of Emc2, an electronic mail service for IBM

Continued on page 98

Before VM Magic, embarking on a migration from one disk type to another was a formidable undertaking.

At last, an effortless path for DASD migration.

Now you can migrate to the new, faster disk device types in only the time it takes to copy your files—a matter of hours, instead of months or years consumed by program and job control conversions.

VM MAGIC bridges the distance between incompatible disk device types and guest operating systems running under IBM's Virtual Machine Facility (VM) without conversions or program modifications.

That's right. VM MAGIC enables your system to store and retrieve data from any type of disk device, regardless of operating system, access method or software.

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SDI.

SDI, 1700 SOUTH EL CAMINO REAL, SAN MATEO, CALIFORNIA 94402, TELEPHONE (415) 572-1200

Continued from page 97

mainframe MVS and DOS environments running TSO, CICS or ACF.

A spokesman said the product includes capabilities for forming electronic mail networks between mainframe sites. Emc2 also includes a programmer interface that provides application subroutines and user exits that communicate with Emc2.

Release 2.4 now provides integrated support for the IBM Personal Computer and compatible machines. Personal computer users can reportedly access all Emc2 mail and calendar features from their micros and download mail and documents from the Emc2 data base, the vendor said.

Emc2 Release 2.4 is priced from $14,000 for the DOS version to $18,000 for the OS version.

Fischer-Innis Systems, 4715 Merchantile Ave., Naples, Fla. 33942.

MULTIPLEXERS/ MODEMS

■ **Astrocom Corp. has added Extended Access System (Easy) to its Squeezplexer product line of coaxial and fiber-optic multiplexers for IBM and compatible controllers.**

Easy is said to allow a user to double the number of terminals accessing an IBM 3274 controller on a contention basis. The vendor said Easy permits up to 64 terminals to contend for the 32 3274 ports on a session basis using one RG62A/U coaxial cable.

Easy is suited for point-to-point, multidrop or star connection configurations, the vendor said.

The 64-port Easy unit costs $6,900, the vendor said.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

■ **Able Computer, Inc. has announced a multiplexer that reportedly emulates the Digital Equipment Corp. DHU-11 multiplexer for DEC VAX and PDP-11 series computers.**

The Able DHU/HS is said to support 16 lines at 38.4K bit/sec. and features on-board flow control to reduce overload on the host.

DHU/HS is said to support high-speed graphics, workstation and terminal-intensive applications. It is reportedly supported by all VAX and PDP-11 operating systems and can be used with several interfaces, including RS-422, RS-232, current loop and Telco Research Corp. Telco Jack, the vendor said.

The DHU/HS is priced at $3,495 and will be available July 1.

Able Computer, 3080 Airway Ave., Costa Mesa, Calif. 92626.

■ **Complexx Systems, Inc. has announced a seven-port, point-to-point statistical multiplexer.**

The TX7 reportedly allows seven devices to communicate simultaneously at speeds up to 9.6K bit/sec. by using buffers and data compression techniques. The product is said to correct any errors caused by transmission line noise automatically. The TX7 reportedly features speed and code conversion, allowing devices operating at different speeds and setup parameters to communicate.

The TX7 is compatible with most common Ascii, asynchronous and RS-232 computers and peripherals, according to the vendor. Its composite link can reportedly use any full-duplex synchronous modem at speeds up to 9.6K bit/sec.

The TX7 is priced at $1,495.

Complexx Systems, 4930 Research Drive, Huntsville, Ala. 35805.

■ **Amdahl Corp. has enhanced its line of 2211 time-division multiplexers with a high-speed synchronous loop access module (HS Slam) and support for higher speed transmissions.**

HS Slam is an integrated limited-distance data set installed with an Amdahl 2211 multiplexer. The product can be used to connect remote devices at up to 32 miles away over four-wire cable. It supports transmission speeds of 56K and 64K bit/sec.

The 2211 multiplexer can also now support channel and trunk rates at speeds up to 768K bit/sec. The higher speed enables users to send video as well as voice and data images, the vendor reported.

HS Slam costs $900, and a matching remote data set sells for $700. The channel option, which consists of a channel connecter assembly, asynchronous I/O card and interface card, is priced at $1,660. A fiber-optic trunk costs $2,000.

Amdahl, Communications Systems Division, 2500 Walnut Ave., Marina Del Ray, Calif. 90291.

LOCAL-AREA NETWORKS

■ **Network Systems Corp. has introduced its AC715 Link Adapter, which provides a gateway from its Hyperchannel network to T1 lines.**

Hyperchannel connects a variety of mainframes, mincomputers and various devices on a high-speed network, the vendor said. The AC715 Link Adapter adds full-duplex operation, data buffering and a continuous protocol to the Hyperchannel for T1 link gateway capabilities.

A vendor spokesman said that the product will sustain 80% line utilization for full-duplex file transfers at speeds up to 2M bit/sec.

AC715 Link Adapter costs $40,000.

Network Systems, 7600 Boone Ave. N., Minneapolis, Minn. 55428.

■ **Process Software Corp. has announced a version of its FTP file transfer software to run under Digital Equipment Corp.'s RSX-11 operating system.**

FTP conforms to TCP/IP, a U.S. Department of Defense standard protocol for Levels 3 and 4 of the International Standards Organization's

Continued on page 102

The cost of transmitting data just keeps getting lower and lower. Thanks to Datagram. And our line of inexpensive, yet immensely talented modems.

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The 5540 also has a more powerful microprocessor-based controller that will cluster up to 32 devices, including our letter quality printer. We also offer a tabletop controller that will cluster up to 12 devices.

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NCR's commitment to systems builders. It puts Tower XP in a class by itself.

TOWER XP.
BUILT FOR SYSTEMS BUILDERS BY NIT-PICKING FANATICS.

NCR

OEM Systems Division

Continued from page 98

network architecture model. File transfers can be initiated by a user or automatically from a command file, the vendor reported.

The package operates with DEC Deuna or Dequa Ethernet network controllers. The product runs under DEC RSX-11M, RSX-11M-Plus, Micro/RSX and IAS operating systems. FTP also runs on controllers from Proteon, Inc., which makes Pronet.

FTP costs range from $2,000 to $6,000 for each CPU on a network.

Process Software, P.O. Box 746, Amherst, Mass. 01004.

NETWORK SERVICES

■ MCI International (MCII) has announced that it will provide access to International Business Service (IBS) beginning in the third quarter of this year.

IBS allows customers to transmit digitized voice, data, facsimile and video signals at rates of 56K bit/sec. and higher.

MCII will initially offer service to the UK, West Germany and Ireland. Negotiations are under way to extend service to the Netherlands, France, Italy and Sweden, according to the vendor.

MCI Communications, 1133 19th St. N.W., Washington, D.C. 20036.

■ Western Union, Inc. has introduced Electronic Mail System (EMS), software that runs under IBM's OS operating system and enables mainframe systems to access Western Union's Easylink electronic mail system.

In addition to sending messages via Easylink, users can send messages to subscribers via other Western Union services, including Easylink mailbox, Telex I, Telex II, Mailgram and Express Document, Western Union said.

EMS is said to enable users to route messages to specific IBM terminals, printers or applications. The service features on-line directory, forms generator, security features and audit trail, according to the vendor.

A site license for the software costs $9,500 or $10,500 for IBM's OS operating system. Hardware costs an additional $3,700, according to the vendor.

Western Union News Bureau, One Lake St., Upper Saddle River, N.J. 07458.

ALTER

from page 98

every time there is a link or network outage, particularly in banking and financial industries.

The second approach for coping in the postdivestiture era involves a conscious philosophical shift by network planners and general management to build in resource redundancy.

The higher initial cost is accepted as a trade-off for reliability and for a more comprehensive measurement of financial efficiency. Here the real cost to the organization is the sum of the network cost and the revenue loss due to outages; the optimization criterion is that of minimizing the overall cost.

This unorthodox approach may require a redefinition of budgeting strategies. Clearly, in this scenario, the budget of the communications department must be enlarged to accommodate the cost of additional facilities, and the budget of users adjusted accordingly.

Notwithstanding the shift this approach implies, the organization as a whole should benefit in the long term from reliability in network-supported business revenue, productivity gains and user satisfaction.

> ”
>
> *The higher initial cost is accepted as a trade-off for reliability and for a more comprehensive measurement of financial efficiency.*

At the technical level, this approach may involve the following:

■ Spare local loops brought online by patching equipment and other redundancy for critical paths.

■ High-connectivity packet networks — having at least two or three links serving each city in the backbone net — with ability to route around problems.

■ Diagnostic equipment, which may actively point to problems for early resolution.

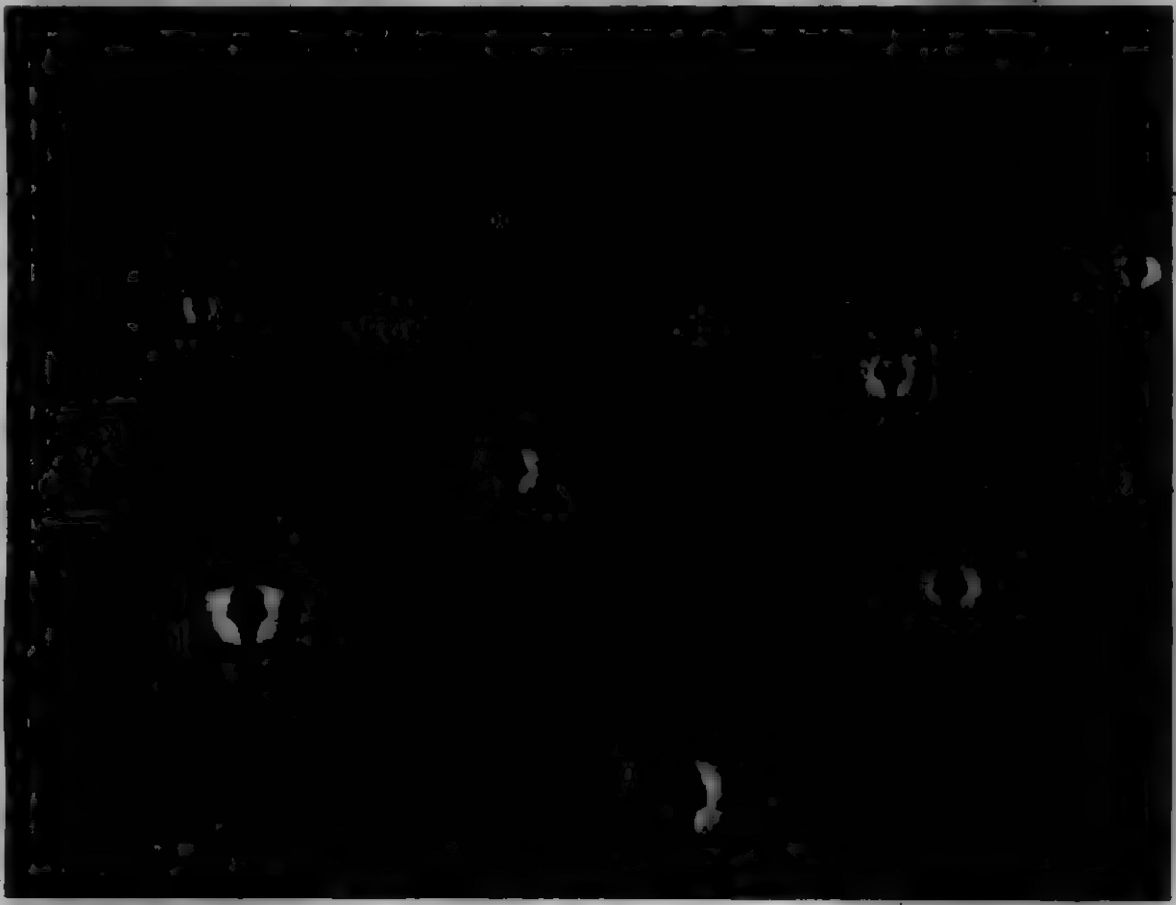
■ Existing and emerging customer-controlled rearrangement facilities such as digital access cross-connect systems.

■ Network simplicity dominating network cost.

As an example of the last point, in a previous affiliation this author was asked to design and implement a simple network connecting a South Pacific nation to New York. From a reliability point of view an international record carrier line from New York directly to the South Pacific through San Francisco would have been optimal.

Because of a modest cost differential, the intended user preferred to employ a circuit that ended up involving a local loop, 10 modems, three international lines, one domestic long-haul line in the foreign country, two multiplexers and a message switch. The propagation time, the retransmission time and the discrete components' processing time would be enough to raise serious doubts about the system's long-term integrity.

In remote computing services, the time has passed for plain vanilla.



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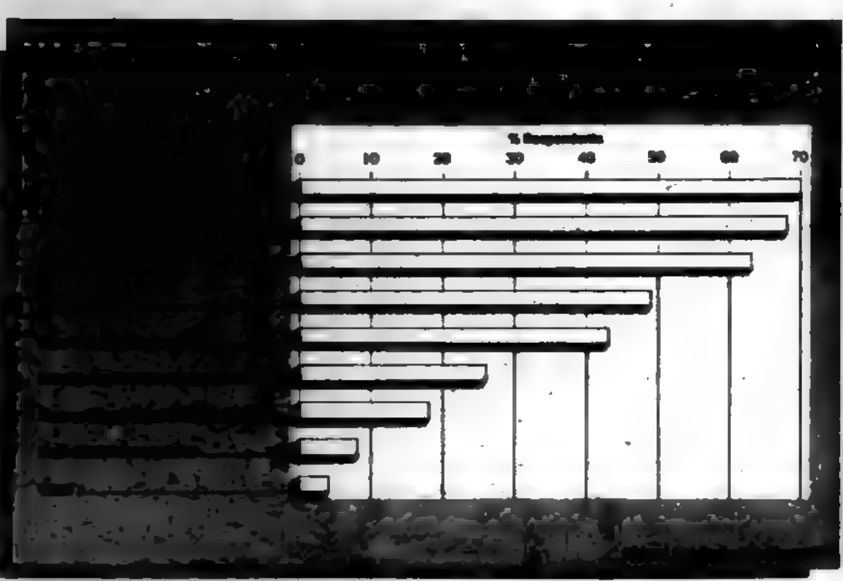
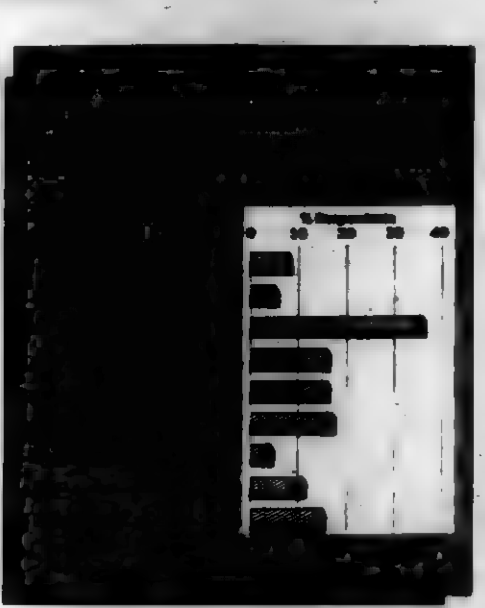




POLL

from page 93

sibility to a different part of the organization.

Communications is becoming a high-level management concern. A quarter of the companies moved their communications function higher up the corporate ladder. Only one company in 12 placed that function directly below a chief executive officer. MIS managers are most often charged with overseeing telecommunications.

Respondents were unhappy with AT&T's service since divestiture. The most widely voiced complaint was finding the right person to solve a problem.

The report is available to Conference Board members for $15 and to nonmembers for $35. The Conference Board is located at 845 Third Ave., New York, N.Y. 10022.

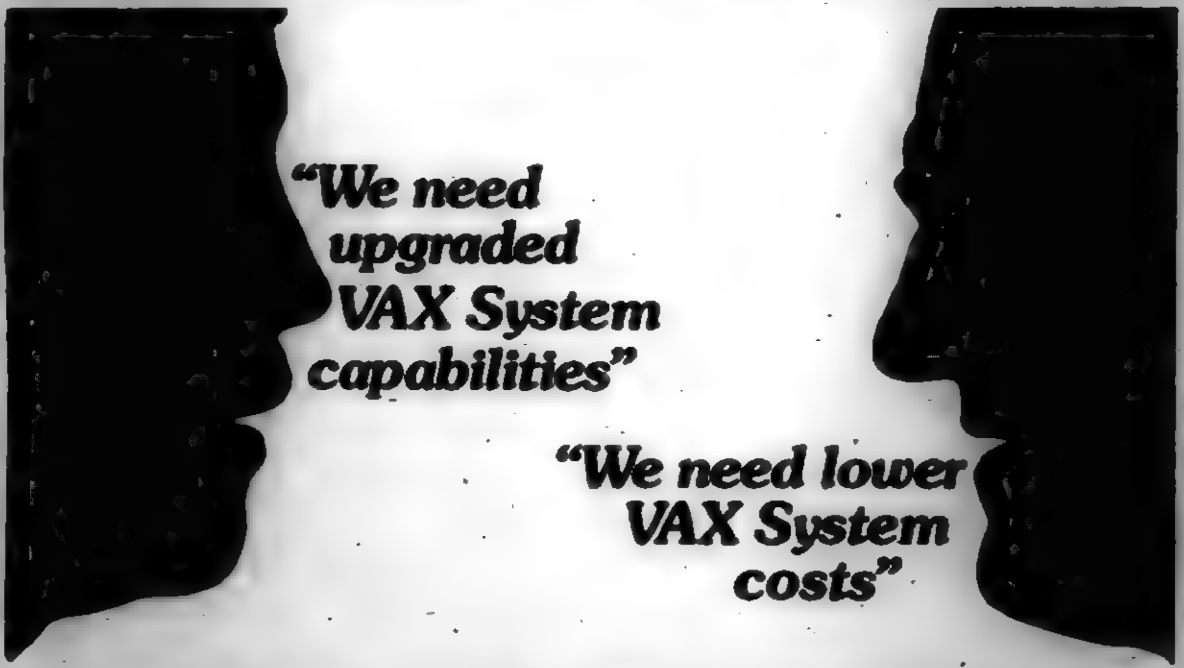
SERVICES

from page 93

If the recalled number is busy, Lass retries the number every 40 seconds for half an hour. If the called party answers within that time, the originator is notified with a distinctive ring.

- Selective call forwarding. This enables users with standard call forwarding to select calls to be routed to another location. To use the feature, users dial *63 or 1163 and enter the numbers of the calling parties whose calls will be forwarded.
- Distinctive ringing. By entering the telephone numbers of calling parties in the same manner as selective call forwarding, users can assign distinctive rings to certain callers.
- Nuisance-call rejection. As its name implies, customers can use this feature to block nuisance calls after they happen by hanging up and dialing *60 or 1160. Future calls from that number will be greeted with an announcement saying the call cannot be completed at the customer's request.
- Customer-originated trace. Drawing from nuisance-call rejection capabilities, users can also initiate call traces by dialing *67 or 1167. This routes the nuisance caller's number to the appropriate authorities where it is either stored in memory or printed.
- Call identification. With this feature, which requires the addition of a small display device, users can identify the telephone numbers of callers. This capability could be enhanced, the "Record" reported, to enable business customers to direct incoming calls to a computer that could display the number of the calling party as well as other customer information.
- Bulk identification. The former capability only identifies the caller's number while the call is in progress, but with bulk identification, business users can create a permanent log of incoming calls. This can be used to aid security by denying access to computer resources from certain numbers.

Charges for these services are based on usage rather than on a flat monthly fee. Some of the services, however, require the lease or purchase of additional hardware.



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SYSTEMS & PERIPHERALS

Adage unveils DEC-compatible color display workstations

Models target imaging, CAD/CAM applications

BILLERICA, Mass. — Adage, Inc. has announced three configurations of its Adage 3000 Color Raster Display System workstation that is used in conjunction with Digital Equipment Corp. PDP-11 or VAX-11 series processor under DEC's VMS operating system.

The Adage 3110 system was designed for computer-aided design and manufacturing and seismic applications, the vendor said. It includes a 1,024- by 1,024-pixel image, with more than 65,000 colors, and includes a 16-bit buffer.

The unit is expandable to a double-buffered 1,024- by 1,024-pixel by 24-bit image memory, 3M bytes of display list memory and 8K bytes of microcode memory, the vendor said.

The 3130 system is said to be useful for imaging and graphics applications. It includes a local graphics processor, 1M byte of display-list memory and quad-buffered 1,024- by 1,024-pixel by 8-bit image memory.

The image memory is software reconfigurable for 512- by 512-pixel full-color display with 256 overlay colors. Real-time video input is optional.

The 3140 system is designed for applications requiring real-time simulator display capabilities. It combines local graphics and transformation processors with a graphics generator module.

The 3140 is used with Adage's IDL2 software for display updates in response to changes in the simulator model, the vendor said.

The 3110 and 3130 systems, including Adage's FSS 3000 Fortran subroutine package and either its Seismic 3000 or Solid 3000 software, are each priced starting at $49,400.

The 3140, including IDL2 software, costs $58,200 and up.

More information is available from Adage, One Fortune Drive, Billerica, Mass. 01821.

Firm offers multiuser OA system

By Kathleen Sullivan
CW West Coast Bureau

SANTA CLARA, Calif. — Sensory, Inc., a fledgling company based here, has unveiled its first product, the Sensory Office System, a multiuser system said to provide voice, data and communications capabilities.

The Sensory Office System, which can support up to 32 users, is based on a proprietary operating system. At the heart of the system is the Sensory 5000, a network control unit built around two Intel Corp. 8086 microprocessors.

Sensory's workstations, which also include 8086 microprocessors, feature 512K bytes of random-access memory and 8K bytes of read-only memory. They can be attached to the controller via coaxial cable, the company said.

The system is said to include Sensory's

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- XYVision unwrapped an enhanced version of its line of turnkey integrated publishing systems/106
- A tridensity ½-in. streaming tape drive was unveiled by Kennedy Co./106

INSIDE

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Hybrid process doubles speed of Hitachi chip

Hi-Bicmos method keeps chips from overheating

SAN JOSE, Calif. — Hitachi America Ltd. has announced a static random-access memory (RAM) chip that can hold 64K bits of memory — roughly 12,000 words — and has an access time of 25 nsec.

Previously, the company's fastest chip was the HM6287-45, with an access time of 45 nsec, a spokesman said.

The company integrated the bipolar process, which delivers high speeds but causes the chips to overheat, with the lower power Cmos process for what Hitachi is calling the Hi-Bicmos process. The process is said to operate at top speeds with power consumption of a few hundredths of a watt.

Hitachi expects the HM6787 static RAM chip to be useful in graphics workstations, computer-aided design and manufacturing systems, mainframe computers used in data base applications and computers used by banks, airline reservations and electronic publishing systems.

The HM6787 cost $68.50 each in quantities of 10,000, the vendor said.

The product will be available in fourth-quarter 1985.

More information on the static RAM chip can be obtained from Hitachi America, located at 2210 O'Toole Ave., San Jose, Calif. 95131.

Integration snags slow automation

SHOP TALK
George Allen

Although "factory automation" has become a common buzzword, the automated factory is almost nonexistent. This is because the heavy up-front costs and complex tasks that must be handled make automating factories a difficult and expensive proposition.

True factory automation involves many elements, including: robotics; computer-aided design, manufacturing and engineering (CAD/CAM/CAE); direct numerical control of machine tools; simulation of factory flows; material requirements planning (MRP); inventory management and distribution; and a host of other capabilities. The problem is integrating all of these elements, tying them into a centralized data processing environment. Communications, data base management systems and applications software hold these components together.

There are several major efforts under way that attempt to combine the powerful capabilities needed to approach factory automation. Many of the most significant advances are evolving out of CAD/CAM/CAE for use in such applications as automating the design and fabrication processes, which include sophisticated direct numerical control operations and robotics.

In order to become useful, factory automation will have to include richer and more complete product modeling, including solid modeling and the ability to store the geometry of the part fully in the computer. Other major trends will be the improvement in graphics devices and workstations and the emergence of telecommunications as a major component in the total system.

If automation is to work in a factory, the software community must adopt open systems architectures. If this happens, the death knell of closed turnkey systems will sound.

Closed turnkey systems, the hallmark of many second-generation CAD/CAM offerings, use special-purpose computers running operating systems dedicated to the CAD/CAM function. Such systems feature special-purpose terminals and closed data bases, making their use beyond the scope of the CAD/CAM environment ineffective,

See AUTO page 109

Allen is a computer-aided design and manufacturing specialist with the McDonnell Douglas Manufacturing Industry Systems Co., a network management products vendor.

IBM rolls out factory systems

BOCA RATON, Fla. — IBM has introduced the 7531 and 7532 industrial systems, based on Intel Corp.'s 80286 microprocessor.

The 7531 operates as a floor-standing unit, while the 7532 is a rack-mountable version. The systems are functionally identical and are said to provide protection against temperature extremes, vibration and shock, voltage transients and particulate contamination, IBM said.

The systems were designed for industrial applications, such as machine monitoring, production control and distributed numerical control.. Both models are equipped with a removable filter for dust collection and cooling fans said to protect the power supply and system components.

Standard features include 512K bytes of main memory, expandable to 3M bytes, a 1.2M-byte diskette drive and seven expansion slots.

Options include a double-sided diskette drive that permits exchange of 320K- and 360K-bit diskette media between the 7531, 7532 and the previously announced 5531 industrial computer and IBM Personal Computers, the company said.

The 7531 costs $6,145 and the 7532 costs $6,370, according to the vendor. Both will be available in the third quarter.

IBM, Manufacturing Systems Products division, P.O. Box 1328, Boca Raton, Fla. 33432.

SYSTEMS & PERIPHERALS

TURNKEY SYSTEMS

■ XYVision, Inc. has unwrapped Release 4 of its line of computer-integrated publishing systems.

The Release 4 line reportedly includes a Level 100 system for commercial and in-plant production for text editing and composition with pagination and file management.

The Level 100 system, including hardware and software, starts at $49,000. It includes two XYText terminals, 2M bytes of memory, a 70M-byte disk drive, a 1.6M-byte floppy drive, a typesetter interface and a single RS-232 communications port.

The Level 300 system provides interactive page make-up facilities, excluding batch processing. It costs $79,000 and reportedly contains one XYView terminal, a 70M-byte disk drive, 3M bytes of memory and a dot matrix printer.

The Level 1000 system for text handling costs $90,000 and provides an XYView terminal, an XYText terminal, 6M bytes of memory, a 70M-byte drive, a 9-track tape, a dot matrix printer and eight RS-232 communications ports. An optional laser printer costs approximately $15,000.

The largest system, the Level 3000, includes one XYGraphix terminal with tablet and puck and one XYText terminal, 8M bytes of memory, a 70M-byte disk drive for text and a dedicated subsystem 300M-byte drive for graphics, a 9-track tape, the laser printer, batch and interactive software, graphics editing software and a scanner interface. It costs $165,000.

XYVision, 52 Cummings Park, Woburn, Mass. 01801.

DATA STORAGE

■ Kennedy Co. has announced the Model 9600A tridensity ½-in. streaming tape drive. The unit is said to operate at 800, 1,600 or 3.2K bit/in. and can record data at 45 in./sec. in a start-stop mode and 100 in./sec. in a streaming mode.

The unit features an 8¾-in. profile, horizontal mount with front tape insertion, autothreading and autoloading to the beginning of tape marker, and the field engineering panel for diagnostics, the vendor said.

The 9600A incorporates capstan and tension arms for tape positioning. The unit costs $5,400 in single quantities, with discounts for OEM quantities.

Kennedy, 1600 Shamrock Ave., Monrovia, Calif. 91016.

TERMINALS

■ Daisy Systems Corp. has announced the Boardmaster design system, a workstation for designing printed-circuit boards. The unit runs on Intel Corp. 80286 microprocessor-based Daisy hardware.

The Boardmaster performs a range of printed-circuit board engineering and layout functions, a spokesman said. It includes general-purpose drafting facilities for the creation of final manufacturing drawings and performs component packaging, selecting components in a way that minimizes parts count.

Other features are an 86M-byte hard disk drive, a 19-in. color monitor and a bit-slice-based graphics accelerator. Boardmaster is compatible with the firm's Logician, Gatemaster and Chipmaster workstation lines.

The system is available as either the full-function, single-user Boardmaster or the dual-user Boardmaster-D, which houses two workstations in a single cabinet.

Th price for Boardmaster, scheduled for September availability, is $110,000. The Boardmaster-D costs $140,000, the vendor said.

Daisy Systems, 700 E. Middlefield Road, Mountain View, Calif. 94039.

■ Esprit Systems, Inc. has announced its ESP 6515 video display terminal, which emulates Digital Equipment Corp.'s VT220 terminal and is compatible with all DEC VT100 applications software.

The unit includes a 14-in. monitor, a tilt and swivel display, support of the VT100 Graphics and national character sets and 18 user-programmable keys that are shiftable to provide 36 functions.

The terminal costs $795.

Esprit Systems, 100 Marcus Drive, Melville, N.Y. 11747.

■ Xpoint Corp. has announced an IBM 3178-compatible terminal with an optional Ascii printer port for IBM 3287 emulation.

The Xpoint 178 is a 12-in. CRT that is coaxial plug-compatible with an IBM 3178 or 3278 model 2 terminal and an IBM 3278 typewriter-style keyboard. An Ascii printer port, which will allow any serial or parallel Ascii printer to perform 3287 emulation, is available on a model called the 178P.

The Xpoint 178 costs $1,295, and the 178P with printer support is an additional $1,495.

Xpoint, Suite 130, 5800 Oakbrook Pkwy., Norcross, Ga. 30093.

■ GTE Telenet Communications Corp. has released a network color graphics monitor for its Telenet system.

The Color Monitor views network operations with color graphics. Configuration, traffic levels, line performance and other operating parameters appear in a variety of geometric shapes and numbers as well as in solid, dotted and flashing lines, the vendor said.

The monitor costs $52,000 for the color CRT, keyboard and network management software.

GTE Telenet Communications, 12490 Sunrise Valley Drive, Reston, Va. 22096.

PRINTERS/PLOTTERS

■ CIE Terminals, Inc. has introduced enhancements to its currently offered CI-300 (300 lines/min) and CI-600 (600 lines/min) printers.

The CI-300+ and CI-600+ printers will retain the performance and features of the older models they are replacing. CIE will continue to support the CI-300 and CI-600 models.

Continued on page [illegible]

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Enhancements include a print head mechanism that employs fewer moving parts and is said to result in extended ribbon life. The CI-300+ and CI-600+ models also include an RS-232C data transfer rate of 19.2K bit/sec.; a serial receive buffer size increase from 448 bytes to 4K bytes; and RS-232C communications protocol compatibility. Synchronous data communications protocols are available as options.

The CI-300+ printer costs $4,495, and the CI-600+ printer costs $6,795.

CIE Terminals, 2505 McCabe Way, Irvine, Calif. 92714.

■ **General Business Technology, Inc. has introduced a 200 char./sec. matrix printer for IBM System/34, 36 and 38 CPUs.**

Called the 5222DP, the unit prints near-letter-quality output at 50 char./sec. It features an adjustable tractor feed with tear bar, an automatic single-sheet document feeder, bidirectional printing and user-programmable or host-selectable character fonts and styles. It also offers emphasized and/or double-strike printing and super- or subscripts.

The printer costs $2,995.

General Business Technology, 1891 McGaw Ave., Irvine, Calif. 92714.

■ **Kearsarge Industries, Inc. has released a serial/parallel version of its SX-60 multichannel switch/spooler which will connect four IBM Personal Computers to Centronics Data Computer Corp. parallel printers.**

The SX-60 serves up to four computer systems and feeds two printers. Any of the input systems can direct its output to either of the printers. Spooler buffer sizes of 8K, 32K or 64K bytes store from 2½ to 20 pages of dense, single-spaced text. Expansion boards can increase the spooler's buffer capacity to 512K bytes and 160 pages.

The standard configuration for the SX-60 is four serial computers in, two parallel printers out.

Prices start at $490 for an 8K-byte buffer size to $629 for 64K-byte buffer storage.

Kearsarge Industries, 12310 Pinecrest Road, Reston, Va. 22091.

■ **Spur Products Corp. has released an adapter that makes IBM 3211 or compatible impact printers and the Xerox Corp. 8700 laser printer compatible with IBM's System/34, 36 or 38.**

The USA/Twin-Ax Universal Subsystem Adapter gives the system the capability of printing up to 3,000 lines of shaped characters per minute with a 3211 or compatible printer or up to 9,240 lines of dot matrix nonimpact printing with a Xerox 8700 laser printer.

The adapter costs $6,000.

Spur Products, 13469 Beach Ave., Marina Del Rey, Calif. 90292.

■ **Dataproducts Corp. has introduced a shared resource, color dot matrix printer with 400 char./sec. draft mode speed, 100 char./sec. text-quality speed and 50 char./sec. near-letter-quality speed.**

Graphics on the Dataproducts 8250 are produced with a resolution of 240 by 240 dot/in. at a speed of 10 in./sec. Options allow users to store a combination of continuous forms, cut sheets and envelopes or labels within the unit and to switch from printing on one kind of paper to another within 30 seconds. A single bin paper cassette allows cut sheets to be fed automatically.

The basic 8250 costs $2,650 ($1,900 in OEM quantities of 100). Options cost $425 ($275 in OEM quantities) for the single bin paper cassette and $975 ($730 for OEM quantities) for the paper express feature.

Dataproducts, 6200 Canoga Ave., Woodland Hills, Calif. 91365.

■ **Optical Computer Systems, Inc. has announced the Model 928 Drafting Plotter, featuring an eight-pen carousel and capable of accepting drafting media up to E size.**

The Model 928 allows the operator to select roller ball, fiber-tip or liquid drafting pens in varying colors and line widths. Different types of media can be used.

The Model 928 uses RS-232 and IEEE 488 interfaces. The product costs $13,600.

Optical Computer Systems, 2880 Wilderness Place, Boulder, Colo. 80301.

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FIRST

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proprietary Voicenotes feature, which allows users to embed voice comments in documents. Users insert voice notes into document files by speaking into a phone. A symbol then appears on the document indicating a note has been recorded.

In a standard configuration, Sensory's system includes Voicenotes, which can be used for standard voice messaging, and a variety of integrated applications, including telephone management, dictation, electronic mail and word processing.

Options include Microsoft Corp.'s Multiplan, a document processing program with form generating capabilities, a spelling checker and IBM's Binary Synchronous Communication 2780/3780 communications protocol. An IBM Personal Computer can be attached to the network through an RS-232 port, allowing users to transfer Ascii files between the Personal Computer and the Sensory Office System, the company said.

The Sensory 5000 controller is available in two basic configurations. A 16-user system with 56M bytes of formatted disk capacity, expandable to 112M bytes, sells for $22,995. A 32-user system with 150M bytes of disk capacity, expandable to 300M bytes, sells for $30,995. Each includes a 12M-byte cartridge tape drive for archiving, two asynchronous serial ports, two asynchronous/synchronous ports and two intercontroller communications ports, the company said.

The standard workstation costs $4,495, while a workstation with telephony equipment costs $4,995. Shipments are scheduled to begin in July.

Sensory is located at 2175 Martin Ave., Santa Clara, Calif. 95050.

AUTO

from page 106

inefficient and often impossible.

Open systems architectures, on the other hand, form part of a new generation of systems, which may become the building blocks for true factory automation.

Today's CAD/CAM/CAE systems rely on general-purpose computers and standard operating systems that allow specialized software to run alongside other applications. Terminals are usable for other applications because they are standard, off-the-shelf items or are provided with driver software.

One option that may improve integration of factory systems is compliance with the Initial Graphics Exchange Specification (Iges) and other exchange format standards to facilitate transfer of data between dissimilar systems without an uncontrolled proliferation of custom translators. Third-party access to a CAD/CAM data base can be supported through Iges or a direct subroutine interface. Access to workstation hardware and other utility packages can also be provided.

Telecommunications in CAD/CAM is growing in importance and will be increasingly essential to total factory automation solutions. With the advent of newer and better system architectures and the shrinking system footprint, it is becoming advantageous to distribute computer power for CAD/CAM and other applications.

Communications key

Communications with other data processing organizations and functions within the corporation is also a necessary requirement in maintaining open systems. CAD/CAM must be able to interface with a DBMS or management information system, as well as with MRP and bill of materials systems.

One means of assuring smooth integration of telecommunications — and thereby maintenance of an open systems environment — is adherence to the seven-layer Open Systems Interconnect model established by the International Standards Organization.

The nature of factory automation and its components will continue to be defined and refined throughout the '80s. As the vendor community pushes back the boundaries of automation with integrated systems, the equally forward-looking user will adopt management processes and select products and services that fit into his strategic vision of the future.

The convergence of these two efforts will produce the de facto automated factory as a logical extension of today's CAD/CAM systems.

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COMPUTER INDUSTRY

The Yankee Group: Age and experience a plus

Market research companies are increasingly called upon to analyze the myriad product announcements and shifting business strategies of the computer industry. This week, Computerworld begins a five-part series profiling a handful of prominent market research firms.

By Peter Bartolik
CW Staff

BOSTON — Despite its relatively advanced age of 15, the Yankee Group, Inc. exploits an image of the brash, aggressive kid on the increasingly crowded block of market research and consulting houses.

Ignoring younger contenders, Howard Anderson's firm positions itself with the heavyweights of an earlier generation and sells itself as the provider of analysis and insight that adds value to factual data provided by others.

When he started out as a one-man operation in 1970, Anderson lied about his age, he said in a recent interview, because "who the hell wants to hear from a 25-year-old, a punk in pinstripes out of the Harvard Business School." Approaching age 41 in an era where young people with MBAs are a mainstay of the industries the Yankee Group covers, Anderson said he does not "have to put gray in my hair anymore," but he actively cultivates the image of the upstart competitor providing something more than the numbers that older firms crank out.

Commenting on the competition, Anderson positions his company with Dataquest, Inc. and International Data Corp. (IDC). Dataquest, according to Anderson, "has

See MART page 112

Apple revamps for stability

By Kathleen Sullivan
CW West Coast Bureau

CUPERTINO, Calif. — With its recently announced reorganization, which included the demotion of its cofounder, Steven P. Jobs, Apple Computer, Inc. has taken a series of long-overdue steps to bring stability to its troubled operations, analysts said.

Industry observers applauded the company's moves. "John Sculley [Apple's president] and the board have moved to solidify the firm and make it more stable," said Tim Bajarin, an industry analyst with Creative Strategies Research International, a San Jose, Calif.-based market research firm. "It should have happened a long time ago."

See APPLE page 123

Tandon wins first round

WASHINGTON, D.C. — Tandon Corp. has won the first round against three Japanese vendors that Tandon claims infringed on its patents for double-sided microcomputer floppy disk drives in products the Japanese firms imported into the U.S.

Administrative law Judge Sidney Harris recommended May 30 that Tandon be granted temporary relief from the impact of imports fr a Sony Corp., Mitsubishi Electric Corp. and Teac Corp. If the recommendation is upheld by the International Trade Commission (ITC), the three Japanese firms would be required to post a financial bond with the U.S. Customs Service on every shipment of floppy drive

See TANDON page 122

National Semi to cut staff 3.5%

By Clinton Wilder
CW Staff

SANTA CLARA, Calif. — In one of the most drastic work force reductions of the current semiconductor industry slump, National Semiconductor Corp. announced last week that it will lay off 1,300 U.S. and European employees during the next few months.

The company said the layoffs, its largest substantial work force cut of the current slump, will affect all levels of employees. The cut affects 3.5% of National Semiconductor's 37,000-member work force worldwide but a much higher percentage of its domestic and European employees. Approximately 600 people will be dismissed from the company's world headquarters, based here.

National Semiconductor also said it has scrapped plans to build a wafer fabrication plant in Portland, Ore. The company blamed both announcements on the lack of signs of recovery from the severe semiconductor industry downturn that began last year.

"The reality is that semiconductor market conditions have not shown significant improvement for the past year," said Charles E. Sporck, National Semiconductor's president and chief executive officer. "We now must come to grips with this fact and adjust the corporation's cost structures to reflect the current market conditions."

Sporck said layoffs were a last resort after the company had tried to cut costs over the past several months through plant shutdowns, a wage freeze and reductions in capital expenditures.

Earlier this year, National Semiconductor laid off 400 Salt Lake City employees and has been running a four-day workweek schedule at all European and North American facilities since mid-March [CW, March 18].

See LAYOFF page 123

■ Memorex and Control Data recently announced cost-cutting measures/113

■ Lotus 1-2-3 warranty: Don't look now!/116

■ AT&T recently announced a videotex venture in partnership with Chemical Bank, Bank of America and Time/118

■ Honeywell's third-party service organization signed up an additional vendor, this time agreeing to provide maintenance for Convergent Technologies hardware/122

Good news and bad news from the industry grab bag

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Although President Reagan's tax reform proposal contains generally good news for the computer industry, let's not forget that the ball now moves into the most divisive court of all — the U.S. Congress.

On the positive side, the proposal keeps computer depreciation schedules at five years, in contrast to an earlier proposal for writing off the expense in eight years; the capital gains provisions will maintain incentives for investing in new companies; and the R&D credit was extended for three years.

On the downside, some would say, is the proposed elimination of the investment tax credit. But good investments pay off, bad investments don't. Investment brings its own reward or punishment, depending on whether good or bad business decisions were made.

However, the White House has opened the doors to tinkering with the plan. By making certain concessions, such as to the oil industry, the proposal makes it that much harder for Congress to stand tall against "me too" demands from other industries. And a basically populist Congress is certain to shift more of the reform benefits to the middle class, further enhancing the climate for tinkering.

■

My, my, how forthcoming IBM is this year about earnings projections. At the end of May — for the third time in recent months — Big Blue issued a statement forewarning bad news.

The statement's missives, certainly out of character, hint of a damage control campaign. With the likelihood of two disappointing quarters under its belt and no indication as yet of an upturn in the industry, the prospect of IBM turning things around in the second half of the year seems to be fading.

■

Sterling Software, Inc. recently said that its data storage management system, DMS/OS, was selected as the standard disk management software system for all General Motors Corp. and Electronic Data Systems Corp. (GM's subsidiary) data centers. The contract gives GM and its subsidiary the right to install DMS/OS in all of their DP sites, Sterling Software said.

■

Genix Corp., the spin-off profit center and former part of National Steel Corp. [CW, May 20], recently announced it was granted an exclusive license to market the Programaster applications development package by Master Software, Inc. on a remote processing basis.

■

On the leasing side of things, privately held Capital Associates International, Inc. of Boulder, Colo., recently announced a $40 million revolving credit facility with the Mellon Bank, along with the participation of the First National Bank of Minneapolis and the Colorado National Bank of Denver. The credit facility will be used for working capital purposes and the short-term financing of equipment leases.

AT A GLANCE

the
YankeeGroup

89 Broad St., Boston, Mass 02210

Founded - 1970
Employees - Approximately 100
1984 Revenues - $7.7 million
1984 Profits - $1.6 million
Specializations - Communications technology

MART

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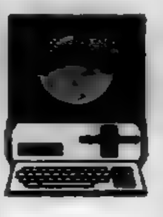
said the world is sand — silicon," while IDC takes the tack that mainframe computer installations are what is important. At the Yankee Group, according to Anderson, "we have said, being the new kid on the block, 'No. You're both wrong. The world is a communications link of which there are some interesting peripherals: [IBM] 3083s, memory, micros, minis, office automation, [computer-aided design and manufacturing].' "



Not mentioned was the fast-growing Stamford, Conn.-based Gartner Group, Inc. Locked in a bitter court battle with the Gartner Group over the hiring of a former Yankee employee and charging misappropriation of proprietary information, Anderson is seen by observers to be conducting a feud.

Anderson disdains to rank the Gartner Group in the same league. "We look at Gartner Group as primarily a Wall Street analyst; I mean, Gideon Gartner was a Wall Street analyst, Tom Crotty was a Wall Street analyst, and they know earnings projections or whatever," Anderson said, giving no mention to the technical staff at the Gartner Group.

It is a three-cornered ring in Anderson's view, with Dataquest dominating the semiconductor industry, and IDC dominating the numbers on processor installations. In the communications arena, he said, "we have probably, in our own minds, lapped the field; we have literally forgotten some things that [our competitors] are just discovering."

Anderson delineated a second tier grouping of Arthur D. Little, Inc. and the Stanford Research Center; on a third tier, he said, is the Gartner Group, along with Infocorp, "a growing company we have some respect for," and Quantum Science Corp..

In addition to U.S. offices here, in the Washington, D.C., area and in California's Silicon Valley, the Yankee Group has branched out internationally to the UK, Japan and Australia. The company has about 100 employees, including 10 sales representatives. Anderson claims 425 clients, including "every major vendor and the majority of smart large users."

Although the company is telecommunications focused, research is divided into an Information Processing Group and a Communications Industry Group, both of which offer four services, including a data communications module.

Each client is also provided with an on-line electronic mail and data base service, Yankeenet (also available separately), of which Anderson is particularly proud. "The biggest point that we are making now is that the smart user is going to extend his network to his suppliers and his customers," he said. "That's what we are doing with Yankeenet."

One client, Kerry Overian, director of Corporate Telecommunications and Office Automation for United Brands Co., said Yankee Group reports cover the full scope of a particular subject, and he values the option of phoning Yankee Group analysts, including Anderson, to elicit further information.

Additionally, he said, "the seminars in New York are generally good, and I get to meet a lot of other people in different industries." Also, Yankee Group analysts make presentations at annual meetings of United Brand's international managers, Overian said.

Mid-life transition

But there are signs that the Yankee Group is going through somewhat of a mid-life transition. Anderson said compound annual growth has begun to slow from the company's historic 60% rate.

Dale Kutnick, who said the firm became a two-man operation when he joined 7¼ years ago, earlier this year left his position as director of strategic services after a dispute with Anderson. Since then, he said, five senior people have also departed, including two IBM watchers who signed on with competing companies.

Kutnick said the Yankee Group historically was "able to bring relatively young, inexperienced people in and was able to [develop] them into decent analysts very quickly." With the departures of senior analysts, he added, the question is whether a young staff "can add enough meat" to standard research data.

Anderson countered that "there is a lot of body-snatching going on right now" and said he was in the process of hiring away an IBM analyst from a competitor.

Kutnick, while dismissing Anderson's brashness as a marketing ploy that gains attention, agreed that the firm's strength has been its attempts to find and define new markets.

Another former employee said the staff identifies with Anderson's image. "The corporate culture is very strong; they are somewhat the bad boys in the industry, always willing to offend anyone if the cause is right," said the former employee, who asked not to be identified. But he also said the Yankee Group "needs to put in mechanisms that are a little less Andersonian."

William Rosenberger, Kutnick's replacement and former director of product planning with Wang Laboratories, Inc., views his new company as an aggressive, leading-edge firm that provides crucial information before products are announced. "It is about like an early warning system of what's happening in the industry," Rosenberger said.

Distancing the Yankee Group from the competition, Rosenberger said, "Some players in this market are people who deal only in market data. Others deal with data and analysis. Yankee is the latter. We do primary research by survey and add a heavy dose of analysis."

The formula has apparently been successful. The *Inc.* 500 list, which has included the Yankee Group each of the past three years, in December estimated 1983 revenue at $10.1 million with profits of more than $1.6 million, estimates with which Anderson initially said he has no serious disagreements.

Kutnick, however, said 1983 revenue was more like $6 million, and 1984 revenue was about $7.2 million. Profits were more than $1 million in 1984, according to Kutnick, but he said revenue will probably be flat this year.

Anderson later said revenue estimates vary based on accounting assumptions. On a cash-in basis, he said, the company recorded $7.7 million in 1984 and expects to hit $10 million this year. May "was the best month we ever had," according to Anderson. Competitors, he charged, record as sales the fees that will be accruing in future years.

Another relatively new wrinkle is Anderson's creation of a venture capital firm, Batterymarch Ventures. Anderson said he sees no potential conflict of interest from owning equity in companies involved in the area the Yankee Group covers because the investments are relatively minute.

"We have said the reason for [the venture capital firm] is that we want Yankee Groupers attuned to new technology, and how you take that technology and incorporate it into a business strategy," he said. "My guys are just a lot smarter about new software, new hardware, new applications." Competitors have similar venture funds, he said.

Asked to pinpoint the company's greatest achievements, Anderson recalled a 1974 report, "The Unbundling of AT&T," predicting a successful U.S. Department of Justice antitrust suit and restructuring of the telecommunications industry and a second report, "The IBM Grand Design, SNA." He also pointed to early analyses of the OA market.

Anderson said he could not recall any major mistakes. "I think part of the reason that we've grown is we've been right; if you're constantly wrong, you don't stay in this business." Kutnick agreed, saying any

See MART page 121

Basic Planning Service	Prerequisite subscription for all clients; includes Yankeenet, consulting, seminars	Both	$8,000
INFORMATION PROCESSING GROUP			
Information Systems	DP/MIS strategic planning and implementation in large corporations	Both	$4,500 each module plus cost of basic service; $26,000 for full services of this group
[illegible]	[illegible]	[illegible]	
Office Systems	End-user computing environments and office systems requirements	Both	
[illegible]	[illegible]	[illegible]	
COMMUNICATIONS INDUSTRY GROUP			
Communications Systems and Services	Forces shaping decisions in building public and private networks	Both	$4,500 each module plus cost of basic service; $26,000 for full services of this group
[illegible]	[illegible]	[illegible]	
Data Communications	Changes in demand for data communications	Both	
[illegible]	[illegible]	[illegible]	
Manufacturing Automation Planning Service	Design, strategies and use of factory systems	Both	$15,000; includes Yankeenet

Stratus continuing to seek OEM pacts: president

By Clinton Wilder
CW Staff

BOSTON — Stratus Computer, Inc. has charted a new direction in the fault-tolerant computer market — a market that will change significantly in the coming year, according to Stratus President William E. Foster.

Foster, addressing shareholders at the company's annual meeting here recently, said Stratus will continue to seek OEM partnerships such as its unprecedented agreement with IBM, signed in January. He predicted that Big Blue's first foray into the fault-tolerant market would help Stratus not only because of its OEM sales to IBM but also because IBM's action elevates the status of the entire fault-tolerant industry.

"We have already seen some major potential end users who want to hear more about us since the IBM agreement," Foster said. "Anytime IBM enters a new market, people ask why."

Stratus, which had previously signed OEM agreements with major vendors such as Ing. C. Olivetti & Co. and Burroughs Corp. subsidiary Systems Development Corp., announced an OEM partnership with Digital Switch Corp. The multimillion-dollar deal calls for Digital Switch, based in Richardson, Texas, to incorporate Stratus/32 computers in its Network Control Center communications switching system. "Stratus has targeted the communications industry for aggressive marketing in 1985 and beyond," said John P. Morgridge, Stratus' vice-president of marketing.

"We feel the way you grow in the 1980s is by looking at different ways to leverage your sales force, primarily because of the increased cost of people," Foster said. "This summer, we will begin a major new campaign to develop third-party agreements."

Foster said alternative sales channels, such as OEMs and third-party software developers, currently account for 21.3% of Stratus' revenue. The only larger single-market segment is brokerage houses, which account for 24.1% of the company's sales. Stratus posted revenue of $42.1 million in 1984, making it the second largest fault-tolerant vendor, behind Tandem Computers, Inc.

Company officials refused to disclose the number of units that have been sold to IBM since the January agreement. "We have a very good working relationship with IBM," said Nicholas Bologna, Stratus' vice-president of product marketing, formerly an IBM employee for 13 years. "We're not involved in their marketing, but we expect they will move cautiously at first."

Stratus admits that the IBM agreement may not directly impact Stratus sales until 1986, and industry observers agree. "IBM has said [it] will not announce until the end of this year how [it] will utilize [its] sales force for the Stratus product," said Los Altos, Calif.-based analyst Omri Serlin, editor of "FT Systems," a monthly fault-tolerant industry newsletter. "The deal is a double-edged sword. It certainly enhances Stratus' reputation, but if IBM decides to market it aggressively, that could overwhelm Stratus' production capability."

Foster predicted that the demand for fault-tolerant systems will increase as the need for on-line transaction processing becomes greater. "Most new applications are on-line, which means the costs of system failures are much greater for the user," he said.

Stratus' first-quarter revenue of $15.2 million was double that of the year-earlier quarter. The company earned $1.5 million, or 9 cents per share, for the period ended March 31.

Disk vendors plan closings

Magnetic Peripherals, Inc. (MPI) will close a 450-employee disk drive plant, and Memorex Corp. will idle nearly all of its domestic operations for two weeks next month, it was announced recently. The two unrelated announcements signified the continuing slump in the computer peripherals business.

MPI, jointly owned by Control Data Corp., Sperry Corp., Honeywell, Inc. and Bull, will begin to close its disk drive assembly and test plant in Burnsville, Minn. Most of the 450 employees will be transferred to two MPI facilities in Bloomington, Minn. CDC, MPI's majority owner and managing partner, termed the move a "consolidation" and said CDC's Government Systems Division will move into part of the facility.

MPI also said most of its domestic operations will be shut down for two weeks beginning July 1. Many employees will be allowed to use the shutdown period as paid vacation time, the company said.

Memorex announced it will idle 90% of its U.S. operations for the same two-week period. The shutdown will close its large disk storage and communications peripherals manufacturing plant in Santa Clara, Calif.

MPI and Memorex said the actions were caused by sluggish demand for their disk drives.

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Terms of assurance: Lotus customer plan poses catch-22

OUTSIDE LINES
L. J. Kutten

A major problem in the computer industry is that small companies grow into big ones so fast that they forget the customer is the reason for their expansion and growth.

In the course of that growth, companies often develop something called "chutzpah." Chutzpah is a Yiddish word meaning gall. It is used to describe someone who does something so outrageous that it is unbelievable. Recently, Lotus Development Corp. did something that set a new record for corporate chutzpah.

Last month, I went to my local software store and examined Lotus' 1-2-3 package. The package was covered in shrink-wrapped plastic, and on the back was a page describing the program. At the bottom of the page was a paragraph titled "Conditions of purchase." It stated, in part, the following:

"This product is subject to limitations on warranty and permitted uses customary in the sale of microcomputer software for personal use. The details of such limitations are set forth in the Lotus Customer Assurance Plan which is available from Lotus or from your dealer."

Since 1-2-3 is an expensive program, and I am a cautious consumer, I felt it was reasonable to find out what these terms were before buying the program. I asked the dealer, and he examined his Lotus file. There was no copy of the plan in it. But according to my dealer, Lotus' Customer Assurance Plan stated in detail its policies on customer support and product upgrade.

It also explained the details of Lotus' "limited warranty." I then asked him to open up a shrink-wrapped package. He refused, saying that opened packages are harder to sell. If I really wanted to see it, I would have to buy the program.

Not wanting to be bound by an agreement I had not read, I declined his offer. I then tried two other authorized Lotus dealers and met with the same result; no one had a copy of the Customer Assurance Plan available for customer inspection.

Letter to Lotus

Taking Lotus' statement literally, I wrote a letter asking for a copy of the plan. One week later, a Lotus representative called and asked why I wanted the copy.

I replied that I had read the firm's conditions of purchase on the 1-2-3 package, none of the local dealers had a copy of the Customer Assurance Plan available for inspection and I wanted to know the terms of the agreement.

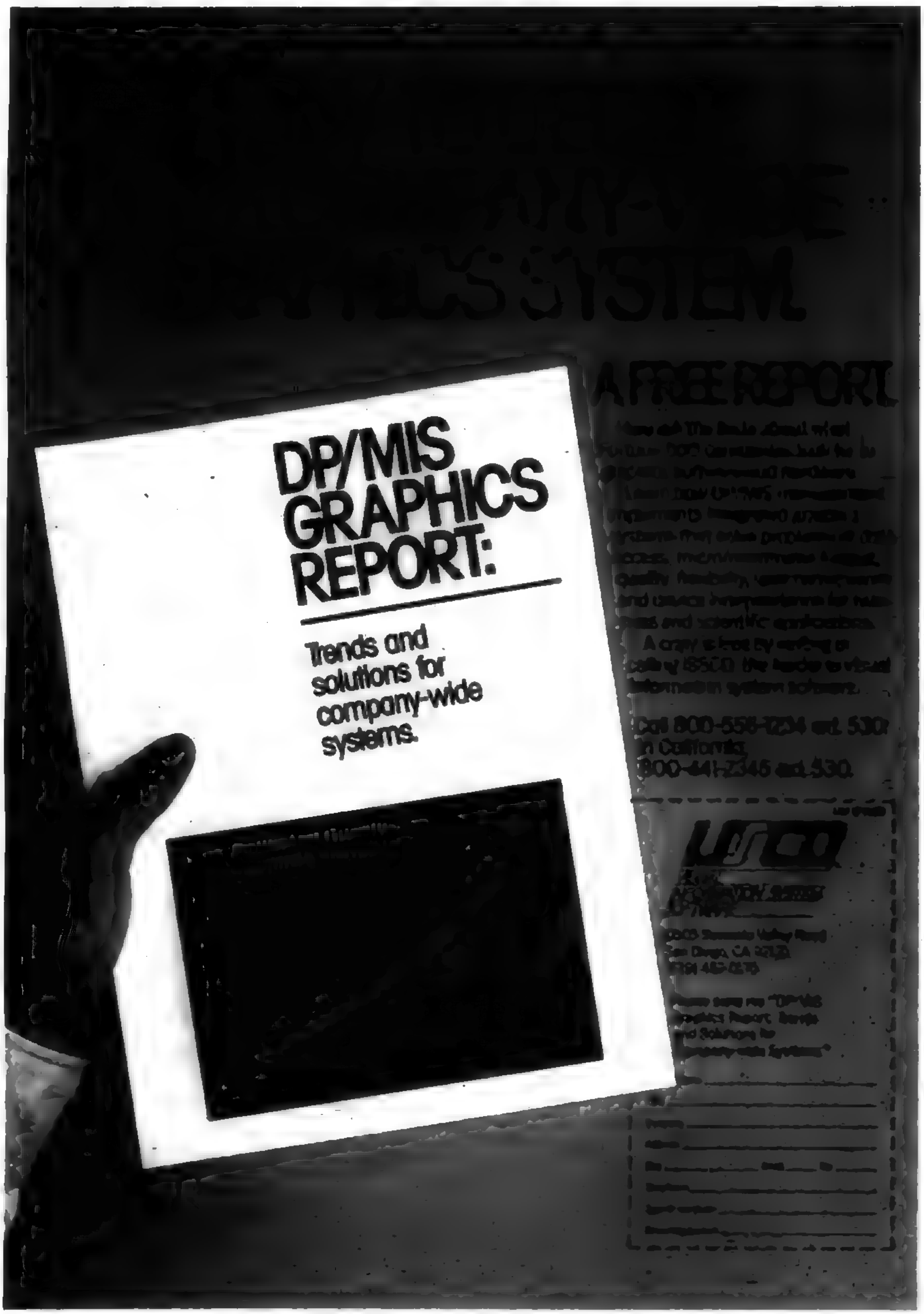
I was promptly informed that it was Lotus' policy not to mail out copies of its Customer Assurance Plan. While the representative would tell me its terms over the phone, the only way to get a hard copy was to buy the program.

This shocked me. Never before had any company refused to send me a copy of its product warranty. I do not know why Lotus refused. Maybe its Customer Assurance Plan is so one-sided that Lotus does not want me or any consumer to see it until we have made the emotional and financial commitment to buy 1-2-3.

All I can do now is speculate why Lotus refused and hope this policy does not spread to other software and hardware companies.

Editor's note: After completing this article, Kutten reported that on his fifth visit to a dealer, he was able to view a copy of the warranty.

Kutten is a frequent Outside Lines *contributor who specializes in computer law topics. He is a member of the Illinois and Missouri bars. His book,* Computer Buyer's Protection Guide, *was published last year by Prentice-Hall, Inc.*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Chip slump forces firms to cut staff

Two companies that sell capital equipment to semiconductor manufacturers recently announced work force reductions because of the continued slump in the semiconductor industry.

GCA Corp. of Bedford, Mass. laid off approximately 250 employees, or 7% of its U.S. work force, mainly from its Massachusetts-based semiconductor products division.

Fremont, Calif.-based Optical Specialties, Inc. (OSI), a maker of automated inspection and measurement systems for the industry, laid off more than 20% of its 240 employees. In the announcement of the 50 dismissals, OSI cited the recent cancellation of a $550,000 order and continued overall sluggishness in the semiconductor industry.

Industry recovery delayed

GCA President Richard D. Stewart said the company is scaling back its production rate of semiconductor-related components to 1984 levels.

According to Stewart, "GCA has recently seen mounting indications that the [semiconductor industry] recovery is being delayed and that substantial bookings of products [that] GCA had anticipated in the coming weeks are being delayed as well."

GCA announced the possibility of posting a second-quarter loss because of costs associated with the layoffs and the potential of shipping fewer DSW Wafer Stepper systems than originally planned.

The company expects to post profits in the third and fourth quarters, but not enough for 1985 results to match its earnings and sales of the previous year.

Sales to continue

Both GCA and OSI said they will continue with previously announced plans for selling to the semiconductor factory automation market. "Although most semiconductor manufacturers have temporarily postponed expansion plans, they are forging ahead with the next phase of factory automation," OSI Chairman and President Ken Snow said.

OSI said it expects sales in the third and fourth quarters to lag second-quarter revenue of $4.8 million.

In a related development, Wyle Laboratories, a maker of semiconductors as well as military and aerospace electronic components, reported a sharp drop in first-quarter revenue.

The El Segundo, Calif.-based firm said sales fell to $71.3 million from $93.1 million in the year-earlier quarter. Profits plummeted from $3.2 million, or 42 cents per share, in the first quarter of 1984 to $505,000, or 7 cents per share, for the period ended March 31.

AT&T, firms plan money services

NEW YORK — A joint venture to develop electronic banking and brokerage services was announced here last week by AT&T, Bank of America, Chemical Bank and Time, Inc.

The joint venture reportedly will develop, produce and market electronic banking and brokerage services as well as other electronic services to consumers and small businesses.

The services are expected to begin operation in New York and California this summer, after receiving regulatory approval, according to representatives for the companies.

Initially, the electronic banking venture will offer services to approximately 37,000 homes and small businesses that currently subscribe to Chemical Bank's Pronto service and Bank of America's Homebanking service.

Francis J. Heffron, executive vice-president of AT&T Technologies, Inc., was named chairman and chief executive officer of the venture.

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The line printer that offers you
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refuses to break under pressure

Softech to sell micro subsidiary

WALTHAM, Mass. — Softech, Inc., a mainframe and micro software firm based here, recently announced plans to sell off its microcomputer software subsidiary, Softech Microsystems.

Softech has curtailed operations of the subsidiary, pending its sale. The company claims the decision will not affect continued product sales or sales support.

"Continuing this operation would involve a more intensive marketing effort and a greater degree of risk than Softech is prepared to undertake," said Softech President Justus F. Lowe Jr.

"We are exploring possibilities for selling or licensing our microcomputer product lines to a company which specializes in this market, such as a major brand-name supplier, publisher or catalog distributor," according to Lowe.

Softech said the decision would mean a loss of $4.1 million before taxes, or 48 cents per share, to be taken as a one-time write-off for the quarter ended May 31.

Anacomp reaches accord with creditor; loan reduced

INDIANAPOLIS — Anacomp, Inc. recently announced it had reached an agreement with its creditor banks, reducing its term-loan balance to $33 million.

Under the agreement, the maturity of the term loan was extended by 15 months to Sept. 30, 1987 and the interest rate was lowered by 1¼%.

Anacomp, which ran into severe financial difficulties in its attempts to develop a comprehensive banking software package, said the agreement will reduce its annual interest expense by more than $2 million.

Louis P. Ferrero, chairman and president, said the agreement demonstrates creditor confidence in the company and "enhances our prospects [for] continued overall earnings improvements."

Cullinet, M&D bout continues

NATICK, Mass. — Round 2 is under way betwen McCormack & Dodge Corp. and Cullinet Software, Inc. over M&D's proprietary G/L Plus general ledger software.

A counterclaim has been initiated by M&D after an original suit was decided in its favor. Cullinet, which had filed the original suit, is in the process of appealing the Massachusetts Superior Court's ruling. M&D is now seeking to cancel its entire agreement with Cullinet, an M&D spokesman said.

Cullinet originally sublicensed the G/L Plus software in 1981 from M&D, which provided them with version 1.7.1 of the system. M&D, however, only agreed to allow Cullinet to sell the system to users of Cullinet's IDMS system within the U.S. and Canada, according to Frank Dodge, M&D president and chief executive officer.

The dispute centers on Cullinet's practice of selling the software overseas, Dodge said. Soon after the complaints began, Cullinet sued for a declaratory statement against M&D, claiming the 1981 deal entitled Cullinet to promise international clients the G/L Plus software as of 1986 — five years from the date of the original pact. After the court's scrutiny of this agreement, M&D emerged victorious on the merits of its original pact with Cullinet.

What will happen to users who bought the G/L software from Cullinet? "They will not be affected," said Cullinet spokesman Bob Hughes. Furthermore, Hughes said, "We will have a general ledger available for the international market." Hughes refused to comment on whether Cullinet would invest or buy its general ledger.

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Dataserve announces 5% 1984 revenue dip

HOPKINS, Minn. — Dataserve, Inc., a lessor and marketer of new and used IBM equipment, recently announced 1984 worldwide revenue of $109.9 million, down 5% from $115.9 million in 1983. The company said the decrease was primarily due to a shift in recording revenue from leases.

Profits for the year were $2.1 million, or 8 cents per share, up from $1.3 million, or 7 cents per share a year earlier, according to Dataserve.

Dataserve said it shifted its leasing business from sales-type leases to operational-type leases, resulting in revenue being recognized over the term of the contract rather than at the inception of the lease.

Of the total revenue, $45.5 million was generated by European activities, where the company operates under the name of Premier Computer.

NICKELS AND DIMES

The Telex Corp. reported revenue for the fourth quarter ended March 31 of $172 million, compared with $94.4 million in the same quarter a year ago. Profits after income taxes were $15.7 million, or $108 a share, compared with $1 million, or 60 cents per share, in the corresponding period a year ago.

■

T-Bar, Inc. announced revenue for the first quarter ended March 31 of $9.5 million, compared with $9.8 million a year ago. Profits were $310,000, or 7 cents per share, compared with $624,000, or 15 cents per share in the same quarter one year ago.

■

Uccel Corp. reported revenue for the first quarter ended March 31 of $46.1 million, compared with $39 million in the like period last year. Profits were $1.5 million, or 9 cents per share, compared with $619,000, or 4 cents per share a year ago.

■

Kearney-National, Inc. announced revenue for the first quarter ended March 31 of $51.8 million, compared with $49.7 million in the prior year. Profits from continuing operations for the first quarter were $2.4 million, or 43 cents per share, compared with $2.6 million, or 46 cents per share in the comparable period last year.

■

Symbolics, Inc. reported revenue for the third quarter ended March 31 of $18 million, compared with $10.4 million a year ago. Profits were $1.2 million, or 6 cents per share, compared with $132,000, or 1 cent per share in the like period one year ago.

■

Protocol Computers, Inc. reported a net loss for the second quarter of $325,000, or 6 cents per share, on revenue of $2.7 million, compared with a net income of $420,000, or 8 cents per share, on revenue of $4.5 million for the comparable period of a year ago.

■

Boole & Babbage, Inc. announced the final unaudited results of operations for the second fiscal quarter ended March 31. The company reported a loss of $407,000, or 13 cents per share, on revenue of $7.3 million, compared with profits of $468,000, or 16 cents per share, on revenue of $7.5 million in the comparable period one year ago.

■

Ask Computer Systems, Inc. reported revenue for the third quarter ended March 31 of $19.1 million, compared with $17.5 million in the like period a year ago. Profits were $1.7 million, or 14 cents per share, compared with $1.7 million, or 15 cents per share last year.

■

Equitable Life Leasing Corp. announced revenue for the three months ended March 31 of $38 million, an increase of 52.9% over revenue of $24.9 million in the corresponding quarter last year. Profits were $2.9 million, a 23.3% increase over $2.4 million reported in the comparable period one year ago.

MART from page 112

failures were more a matter of wrong timing, such as predictions of growth in local-area networks. However, Kutnick said, "These things are so hedged by all the research companies that any major errors are somewhat blanched."

Anderson professed a degree of frustration with the speed with which vendors and users progress technologically but admired the development of microcomputers and related software. "We are always frustrated that the users aren't making the decisions as rapidly as it becomes obvious to us that they [should]," he said.

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Honeywell adds systems service

SAN JOSE, Calif. — Honeywell, Inc. reportedly will provide nationwide service for the complete line of Convergent Technologies, Inc. computer workstations and multiuser systems, it was announced recently.

The companies signed a multiyear contract providing for on-site maintenance for all Convergent Technologies hardware products and toll-free user access to Honeywell's National Response Center.

Paul C. Ely Jr., president and chief executive officer of Convergent Technologies, said the pact will make his company's products more attractive to OEMs with limited service capabilities.

Honeywell's third-party service program has 3,700 service technicians in more than 250 locations.

Eikonex accepts Kodak stock bid

ROCHESTER, N.Y. — Eastman Kodak Co. recently announced that shareholders of Eikonix Corp. had voted to approve Kodak's proposed acquisition for $16.12 per share.

Eikonix, the Bedford, Mass.-based manufacturer of digital image processing equipment and computer-aided electro-optical systems, will operate as a wholly owned subsidiary of Kodak's Commercial and Information Systems Group. Saul Kurlat, president and chief executive officer, and Jack D. Finley, chairman and executive vice-president, will remain with Eikonix in those capacities, Kodak said.

AIM facilities shut down for two summer holidays

MILPITAS, Calif. — Applied Information Memories (AIM) recently closed its corporate offices and one manufacturing facility for one week and will close again for the week of July 1.

Donald Brosnan, president of the disk drive manufacturing company, said the action was triggered by the "need to get our expenses more closely in line with our revenues." Brosnan said that the shutdowns were an alternative to employee layoffs.

AIM's manufacturing plant, located in Round Rock, Texas, as well as the corporate offices located here were closed during the holiday week of May 27 and will close again the week of July 1 because of the Independence Day four-day workweek. Employees reportedly are being paid for the two holidays.

The three-year-old disk manufacturing firm employs 125 workers in the Texas plant and 68 workers in the offices located here. The venture capital-funded company said it has received contracts totaling more than $55 million in the past three months for its new 5¼-in. disk drive, the Dart-130.

ACM appoints Hespos director

NEW YORK — The Association for Computing Machinery (ACM) recently appointed Richard F. Hespos as executive director.

Hespos is a former vice-president of DP, strategic planning, real estate and administrative services for Continental Corp. Hespos had previously served as vice-president of technology at Dun & Bradstreet, Inc. and was a management consultant for McKinsey & Co. He is on the board of directors of Quotron Systems, Inc.

Hespos will replace Sidney Weinstein, who retired from ACM after 10 years of service.

New York-based ACM is an educational and scientific society comprised of more than 75,000 computer specialists.

TANDON

from page 111

products into the U.S.

The ITC must decide on Harris' recommendation within 90 days. Tandon said it expects the ITC to follow the judge and grant temporary relief, pending Harris' decision on permanent relief by the end of October.

In past patent infringement cases, the ITC has required accused firms to post bonds as high as twice the value of their import shipments.

The current case is the second international trade complaint filed by Tandon this year.

The Chatsworth, Calif.-based firm had earlier charged several Korean disk drive companies with misappropriation of trade secrets, industrial espionage and other unfair trade practices.

Harris ruled in April that he believed there were no grounds for the charges, but the final decision is still pending before the ITC.

Tandon has been hit hard financially in the last two quarters, losing a total of $36.3 million on sales that fell more than 20% from the six-month period a year earlier. The company has announced plans to lay off 370 employees, thereby decreasing its domestic work force 25%.

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Not all printers work with all computers. Or all software.

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NO

For most people, reading a printer manual is like hard labor. But it's important if you want to get the most out of your printer. We've been working to make our manuals as user friendly as our printers.

ASK shareholders file suit, cite misleading statements

LOS ALTOS, Calif. — Two shareholders have sued Ask Computer Systems, Inc., charging the company with releasing misleading statements about the company's financial condition.

In two separate suits filed recently in U.S. District Court in San Jose, Calif., the shareholders, Edward Fain and Stuart Wechsler, claimed that in a prospectus for a $1.6 million stock offering in February, Ask presented itself as a "healthy, growing company," and failed to include information about product shipping delays that reportedly contributed to a third-quarter revenue slip. Ask revealed in April that its third-quarter revenue would be lower than expected.

Revenue for the third quarter ending March 31 was $19.2 million, down from second-quarter revenue of $21.2 million. Third-quarter profits were $1.7 million, or 15 cents a share, compared with year-earlier earnings of $1.8 million, or 14 cents per share.

In a prepared statement Ask Chairman Sandra Kurtzig said, "The company intends to vigorously contest the action."

APPLE

from page 111

In a prepared statement released May 31, Sculley said Apple plans to streamline its operations and "create a more efficient organization" by merging its Apple II and Macintosh product divisions.

With the consolidation, Jobs, who founded Apple with engineer Steve Wozniak in the late 1970s, lost his position as general manager of the Macintosh division.

'A more global role'

Jobs, who remains chairman of the board, will take on "a more global role in new product innovations and strategies," Sculley's statement said.

Del Yocam, formerly general manager of the Apple II division, was appointed to oversee the firm's product operations worldwide. In his new position, Yocam will be responsible for manufacturing, product development, operations management and distribution for all Apple products.

Analysts predicted that the consolidation will help alleviate the negative competition that reportedly existed between the two divisions. "Obviously, anything that will take away from that internal strife is a big plus," Bajarin said.

In his announcement, Sculley said the reorganization would allow Apple to focus its resources on its two primary markets: the education market and small- to medium-size business market.

Peter Teige, an industry analyst with Dataquest, Inc., a San Jose, Calif.-based market research firm, said Apple appears to be downplaying its much-publicized attempt to break into the corporate market.

Teige said the decision is a sound one. "The reorganization is a really good move for Apple because it is pointing to its market strengths," Teige said. "The company hasn't given up on the corporate market, but at least in the short term it is emphasizing its strengths."

Company playing to its strengths

The company is also playing to its strengths by moving Jobs out of day-to-day operations, according to Teige. "I think he has shown himself to be a very able leader in managing innovative technology and bringing it to market," Teige said. "It's hard to know ego-wise what the change will mean to Jobs, but for Apple it could be very positive," he added.

Apple's recent announcement is the firm's latest move to cut costs and improve the company's management. In recent months, Apple has laid off more 1,600 workers, closed its factories for a week, discontinued its Lisa computer and closed the doors of its disk drive production plant.

In addition to coping with internal problems, Apple, like other personal computer companies, is struggling to survive the current industry slowdown, the analysts said.

"With the situation Apple is in, it needs margin and profit from wherever it can get it," said Ralph Gilman, an analyst with Infocorp, a Cupertino, Calif.-based market research firm.

"It has to get itself focused on getting its products out to market and getting its dealers selling the Macintosh Office. If this reorganization helps Apple do that, it's a positive development," Gilman said.

LAYOFF

from page 111

The company said it would furnish several services to help its dismissed workers find new employment.

James Barlage, a semiconductor industry analyst with Smith Barney, Harris Upham & Co., said the National Semiconductor announcement may bode ill for other chip companies that had also previously resisted layoffs.

"Many of the [San Francisco Bay] area companies have been reluctant to lay off people because the people tend to evaporate," Barlage said. "So this is really a lag response to what's been happening in the industry.

"I don't think we're going to see much improvement until the fourth quarter at the earliest, and we could well go through most of next year the same way," he said.

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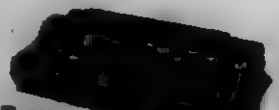

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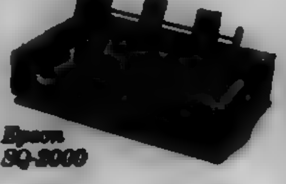

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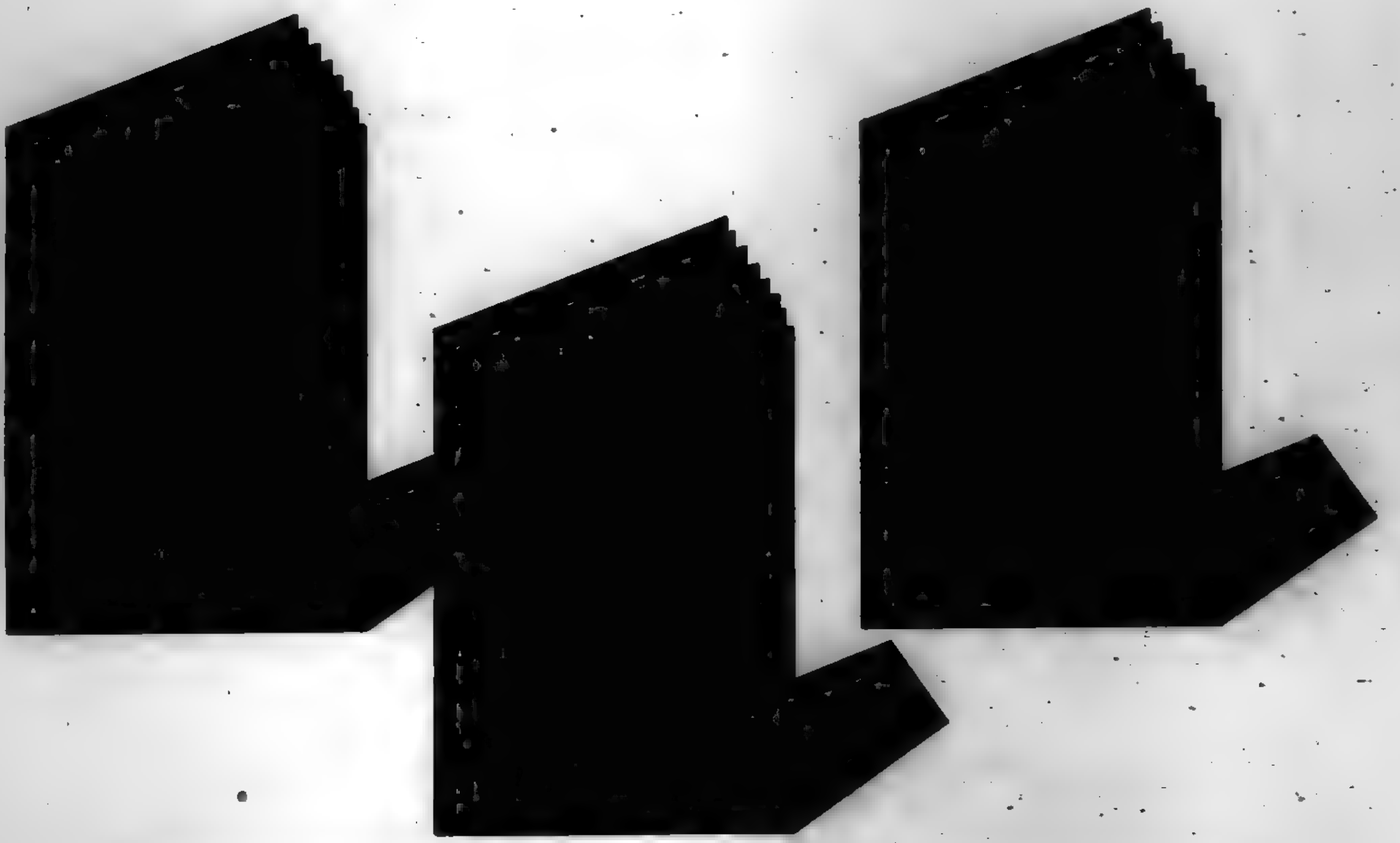

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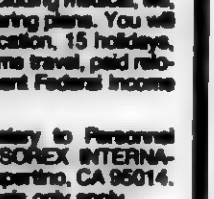

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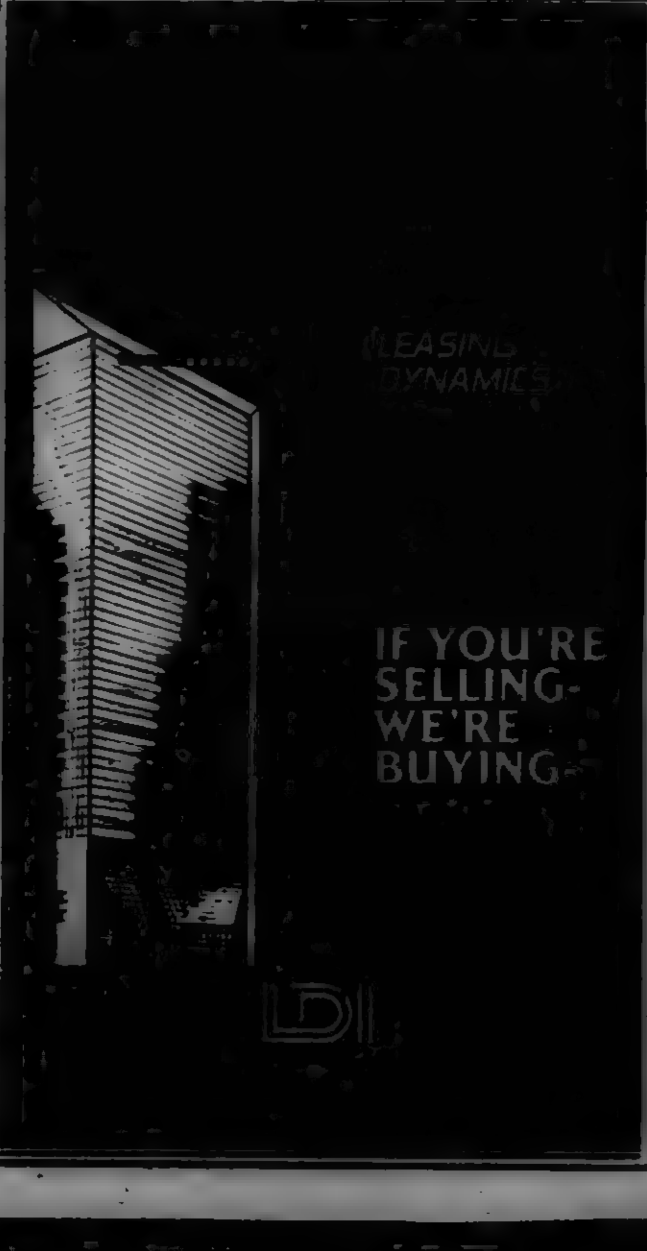

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- July 15 - **NCC Show (closes July 3rd)**
- July 22 - **NCC Wrap-Up**
- August 26 - **Software Productivity Packages**
- September 30 - **Minis & Small Business Systems**
- October 28 - **Data Communications Terminals**
- November 25 - **Protecting The Corporate Information Resource**
- December 30, 1985 & January 6, 1986 - **Forecast '86**

COMPUTERWORLD publishes every Monday with an ad deadline of 10 days prior to each issue date. You may send in copy to be pubset or camera-ready material (velox or negative) via the mail. We provide telecopier service and will also take ads over the phone.

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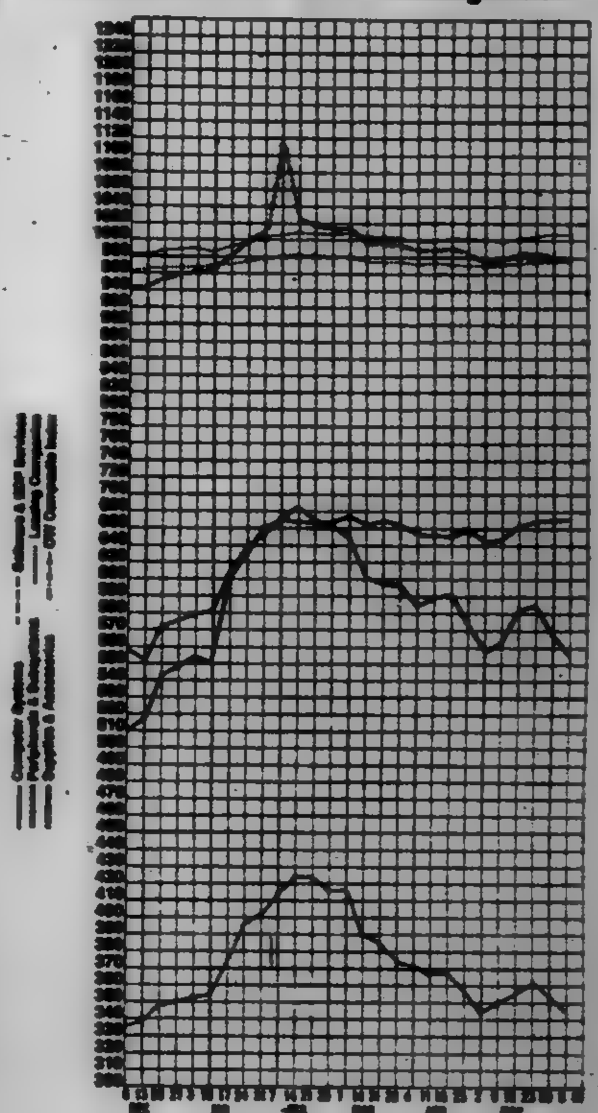

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NEWSPAPER

MMA to seek publishers' support on site licensing

By Edward Warner
CW Staff

NEW YORK — The Microcomputer Managers Association today plans to call officially upon personal computer software publishers to provide corporate users with software site licenses. The MMA said these agreements could free the micro managers from concern about software piracy.

In a press conference at PC Expo, a personal computer trade show here, the MMA will define what it calls a "negotiated license agreement" as an "unbundled agreement negotiated individually between the vendor and the [user] company," according to MMA President Allan Gross. Such agreements are often called site licenses because they permit corporate software users to license a package for use on multiple personal computers within their firms.

The MMA, which includes members from 85 New York-area Fortune 1,000 firms, will propose that three types of software licenses be made available: volume purchase agreements; limited licenses, under which the user would be able to make a specified number of copies; and unlimited licenses, under which copying would not be restricted.

Gross, a personal computer manager with an investment banking firm, said one of the micro managers' goals is to eliminate the software retailer from corporate software buying, leaving only direct vendor sales. Referring to what he called the lack of support that retailers give corporate users, Gross claimed, "We get very minimal service for such a chunk of the price [that we pay]."

In issuing a formal call for site licensing, Gross said, the MMA was also expressing frustration with the effort required to

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TOP OF THE NEWS

IBM tempered its 1985 business forecast with a less-than-positive earnings outlook, although reports indicate very heavy 3090 shipments in the fourth quarter. Page 2.

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Users of Wang's Wangnet are busily exploring applications that are available on the broadband local-area network. Page 4.

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Seek and ye shall find. The American Mathematical Society developed its own benchmark tests to evaluate a major high-end system purchase. Page 6.

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The switch is on. Some users are finding that it makes sense to add hardware to analog voice switches, rather than buy digital switches, to obtain data support. Page 7.

■

Interactive Systems/3M unveiled a local network said to be the first 10M bit/sec. product that conforms to GM's Manufacturing Automation Protocol standard. Page 33.

■

Uccel tools integrated under MVS

By John Gallant
CW Staff

DALLAS — Uccel Corp.'s Systems Software Division last week harvested the first fruits of a strategic development push aimed at tying together its complete line of systems software packages for IBM MVS shops. The product introductions came one day after rival Computer Associates International, Inc. announced the integration of its MVS systems software into a single product offering [CW, June 10].

Announced to more than 1,300 users at the company's Systems Software Conference users group meeting here, Uccel's Synova series is aimed at helping users integrate Uccel systems products and in-house-developed data center management tools through common logon, communications and command facilities. A spokesman said that when it is completed, the Synova series — whose name is a hybrid of the terms synergy and innovation — will consist of four tiers of products.

The first level is a generalized logon/logoff facility, which Uccel unveiled last week in the form of its Nova:Log package, that allows for common access to all the company's systems packages. The second is a common command language for use across Uccel's product line. The third level is a standard communications facility for data exchange across the firm's product line.

The remaining level consists of what the spokesman labeled "high-level components" handling specific data center man-

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Demand low for smart buildings

By John Dix
CW Staff

WELLESLEY, Mass. — Building developers are rushing to construct smart buildings, despite a lack of user demand and their own belief that services will not attract tenants, according to a study conducted by Telematics Resource Group, a market consultancy here.

Intelligent buildings typically enable tenants to share telephone switches, long-distance telecommunications services and computers. They may also provide for shared use of security, climate and lighting control systems.

According to Telematics, roughly 60% of building developers are currently considering, planning or implementing so-called shared tenant services, although these services are still part of a fledgling industry. "The majority of developers are planning to implement these services while admitting it won't do anything for them," according to Telematics President Marc Rudov.

Telematics contacted 55 real estate developers and asked them, among other things, where they thought tenants would rank shared services on a list of demanded features. "[More than] 90% of the firms ranked shared tenant services on the bottom of the list," Rudov said, behind concerns like price of the lease, building location, free parking and proximity to modern conveniences.

"Developers told me that even though they were installing shared tenant services, they did not believe they would gain new tenants by doing so," Rudov said. "Most of the developers considered the services an amenity."

Prospective tenants are also lukewarm toward shared services.

Of the 245 users who responded to Telematics' mail survey, 70% said they

See SMART page 10

Akers predicts IBM profit dip

By Peter Bartolik
CW Staff

YORKTOWN HEIGHTS, N.Y. — IBM President and Chief Executive Officer John F. Akers said last week the company now expects profits for the first nine months of this year to be less than profits for the first three quarters of 1984.

Akers' comments to securities analysts here last Wednesday included a downward revision of earlier projections and sent IBM stock plummeting by more than $5 per share in two hours of trading on Wall Street the same day. Earlier, the company said it expected second-quarter profits to be down slightly from the year-earlier period but that it expects the second half of the year to produce solid growth for the fiscal year.

Akers said customers are still carefully evaluating the announced 3090 mainframe products and that intermediate-size systems shipments are below expectations; Personal Computer product shipments will continue to increase for the remainder of the year but not at "the torrid pace of last year," he noted. Akers added that the company had moved up the general availability of the 3090 Model 200 from November to early October.

Charles Greco, a vice-president with Framingham, Mass.-based International Data Corp., said a recent survey of 816 sites using 3080 series machines revealed that more than 370 of the Model 200s will be installed this year, with more than 300 of those installations coming in the fourth quarter. During the next 18 months, he said, those 816 sites will accept 1,055 of the new mainframes.

IBM now projects that the rate of all shipments this year will increase by 20% over last year, Akers said, compared with earlier projections of a 30% increase. He said IBM still expects total revenue this year of more than $50 billion, up from $45.9 billion in 1984.

In the first three quarters of 1984, IBM had profits of $4.4 billion. In the first quarter of this year, the company posted profits of $986 million.

Akers said economic growth in the U.S. is "in a lull," primarily owing to massive increases in imports. "The combination of high imports and [an] unprecedented upsurge of capital spending [in recent years] has caused customers to pause [and] reassess the pace of their individual company growth and investments," Akers asserted. "It therefore has had a direct impact on our industry."

Regarding earlier projections, Akers said he had also qualified previous comments with the observation that an economic downturn would have an impact on IBM.

"That slowdown has come, and achieving the solid growth we expected then for 1985 is now unlikely," he said.

Visicalc, 5, was top spreadsheet

By Edward Warner
CW Staff

A chief catalyst of the boom in corporate personal computing died last week at the age of 5.

Announcement of the passing of Visicalc, the first popular electronic spreadsheet, was low key: a paragraph in a press release from Lotus Development Corp., Visicalc's new owner. Lotus said it would discontinue the product but would support users for two years.

For some of those who remembered Visicalc, though, its passing was regarded with a touch of regret. The spreadsheet, introduced for the Apple Computer, Inc. Apple II in late 1979, sold 600,000 copies in its lifetime and was said to have been the first to make business aware of the power of personal computing.

It was foremost, according to one user, "an easy product to use." That user, Norm Dewitt, director of the Personal Computer Industry Service at San Jose, Calif.-based market research firm Dataquest, Inc., said that when he first encountered Visicalc in 1982 — as an employee of IBM's Personal Computer Group — Visicalc was the only spreadsheet for the IBM Personal Computer.

Other users, though, had no love for Visicalc. Though he mourns the loss of the magic of the Visicalc name, senior analyst Chris Christiansen at the Yankee Group said he "never liked [Visicalc] very much, especially after [Lotus'] 1-2-3 came out."

Visicalc had been ailing ever since the introduction of 1-2-3, largely due to its failure to match the improvements in the Lotus product, Dewitt observed. Lotus' 1-2-3, for example, offers menus that spell out functions; Visicalc used letters to symbolize its commands, and "you had to know what each one of those letters meant," Dewitt noted.

To worsen its troubles, Visicalc's developer, Software Arts, Inc. of Wellesley, Mass., became embroiled in a legal dispute with Visicorp, the firm that marketed Visicalc. Software Arts eventually won rights to Visicalc but was weakened by the battle. The firm was acquired by Lotus in April.

In what may be a token of memoriam, Lotus said it will offer users of the IBM Personal Computer version of Visicalc the opportunity to upgrade to 1-2-3 for $250.

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Wangnet users exploring net's broadband applications

By Paul Korzeniowski
CW Staff

Many customers of Wang Laboratories, Inc.'s Wangnet purchased the product to solve one specific problem, and only recently have they begun to explore other applications available on the broadband local-area network.

The capacity of Wangnet is divided into five bands, each of which has a different function: the Wang Band permits communications between Wang systems at speeds up to 10M bit/sec.; the Peripheral Band connects Wang workstations and peripherals to IBM 3270 series devices; the Interconnect Band can be used to support multiple types of devices working with standard protocols; the Utility Band supplies video applications; the Professional Computer Service connects Wang Professional Computers to the network.

In 1983, Ethicon, Inc., in Somerville, N.J., attempted to determine how to add 50 terminals to its five Wang minicomputers. Rather than purchase additional systems, the company decided to install Wangnet. This enabled the company to use its existing hardware to support the additional terminals efficiently.

"If we hadn't purchased Wangnet, we would now have seven or eight minicomputers," noted Robert A. Richard, lead communications analyst at Ethicon. "Also, the network helped to reduce cable costs through our two-story complex." Another benefit is that document and file transfers are supported on the Wang Band.

While connecting Wang devices over the Wang Band was relatively simple, using the Peripheral Band to connect Wang users to Ethicon's IBM 3081 Model K mainframe has proven to be difficult. "For a month, we tried to attach a modem to the network, but it never worked," Richards said. Wang sells its Cmux DS270 modem that can be used to attach an IBM 3270 communications controller to the network's Peripheral Band.

Problems arose because the Cmux DS270 did not support Ethicon's IBM 3274 Model D controller. "I've been told that other controller models run fine," Richards stated. Ethicon expects a model of the modem to arrive in two weeks and plans to field test the unit.

The University of Wisconsin was one of the early users of Wangnet [CW, May 16, 1983]. Today, the network supports 47 Wang Office Information Systems, seven VS minicomputers, 1,200 Wang terminals and 500 other terminals on the network.

Rather than connecting IBM mainframes to Wangnet through the Peripheral Band, the University connected them through fixed-frequency channels on the Interconnect Band. Thomas Scott, manager of data communications, reported no problems attaching the users to the mainframe.

Scott is very satisfied with the network but listed a few problems. "It would be helpful if there was compatible system software across Wang's product line," he said. "Often, the microcode for some of the systems is incompatible."

Scott is not satisfied with Wang Band's transmission speed. "I don't think it works at a speed of 10M bit/sec.," he said. Also, he would like to allocate ports dynamically. Devices on some bands have to be assigned to specific ports. "We could have more users on the system if we could dynamically allocate ports," he explained.

General Foods Corp. in Rye Brook, N.Y., was most interested in Wangnet's videoconferencing capability. When the company constructed a new building in 1982, it wanted to include network wiring in the building plans. "It was a perfect time for us to lay the wires down," noted Michael Greco, manager of office systems at General Foods.

Greco stated that a baseband network would not have enough bandwidth to support a video system. "Also, we couldn't wait for a product that was being developed," he added. "Wangnet was really the only product that was available when we needed it."

Today, General Foods works with seven television channels on the Utility Band. There are 28 conference rooms and a television studio attached to the video network.

Greco concluded, "We bought the system for its video capability. Any other applications it provides [are] a bonus."

Wang reaping benefits of unclear IBM net strategy

By Paul Korzeniowski
CW Staff

Wang Laboratories, Inc. appears to be a primary beneficiary of IBM's unclear network strategy.

"IBM and AT&T are touting network schemes that may be the dominant future architecture," stated Mark Stahlman, an analyst at Sanford C. Bernstein Co., a New York investment firm. "But if a company wanted a comprehensive network today, it would probably require a broadband network. Who would a company turn to? [Sytek, Inc.? Ungermann-Bass, Inc.]? Probably not." Stahlman predicted that a company would probably have some Wang equipment and a relationship with that vendor, so it would be inclined to purchase Wangnet.

Wangnet, announced in 1981 with first shipments in 1982, created a great deal of interest. "There was a lot of hype about the product because it was billed as a cure-all," Stahlman noted. "That has not turned out to be the case."

When it was announced, Wangnet was perceived as an alternative to baseband Ethernet networks. Wang and Ethernet proponents debated the virtues and vices of the two network approaches. "The broadband vs. baseband debate has been settled," noted William Rosenberger, director of strategic planning at the Yankee Group, a Boston market research firm.

"Companies realize that both approaches are suitable for specific applications. If there is a large installation base that has to be tied together, then broadband is appropriate. However, broadband will cost more than baseband," Rosenberger said.

Rosenberger added, "There are probably more Ethernet networks sold, but there are more terminals on Wangnet. The Wangnet customers tend to have elaborate networks with a large number of terminals." Wang estimated that there have been between 300 and 400 Wangnets and an equal number of Fastlans, a scaled-down version of Wangnet, sold.

Despite the impressive number of installations, analysts listed some product shortcomings. "The network works well for Wang-to-Wang connections, and it makes sense for a company with a large number of VS or OIS systems to install Wangnet." said Kim Myhre, director of communications industry research at International Data Corp., a Framingham, Mass.-based market research firm.

"However, most large companies have substantial investments in IBM. It was only recently that Wang opened the network up so it supports capabilities in addition to simple IBM 3270 [series] terminal emulation."

Recently, Wang announced gateways to IBM's Systems Network Architecture, Distributed Office Support System and Professional Office System. The company may also add support for IBM PC Network and for a maximum of five Ethernets to the network, according to a company spokesman. The spokesman stated that only 65M bit/sec. of the product's 390M bit/sec. bandwidth are currently utilized.

Another drawback cited by analysts was Wangnet's high cost. "Wang products traditionally have been high priced," said Linda O'Keeffe, associate director of office system industry service at Dataquest, Inc., a San Jose, Calif. market research firm. "If Wang would drop the price of Wangnet, it would sell much better."

IDC's Myhre added that the introduction of Fastlan helped to spur sales of the product. "Companies would rather look at the product in a controlled way, rather than installing a complete system," he noted. Initially, Wangnet was the victim of a number of delays and product snafus. "Some early adapters had to wait to receive the product, and sometimes the parts didn't work."

How would IBM's announcement of its token-ring local-area network and evolution of its cabling plan affect Wangnet? O'Keeffe predicted, "Wang will incorporate the IBM network into Wangnet and attempt to offer superior network management facilities to stay a step ahead of its competitors."

O'Keeffe concluded, "This year represents a watershed year for local-area networks. Wang should be able to profit from an increase in these sales."

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WHODUNIT

Sortland Yard warns against "Rafflles-type sort programs."

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Ask for Inspector SyncSort!

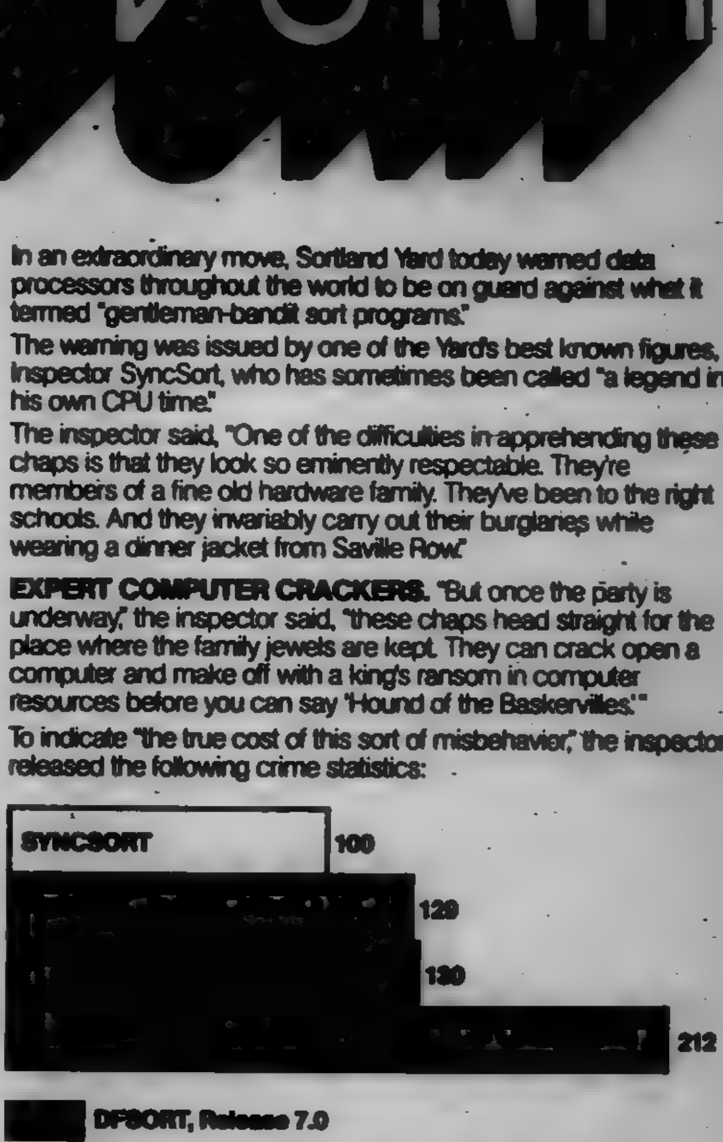
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied. "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

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Homegrown benchmarks key to system purchase

By [illegible]
CW Staff

PROVIDENCE, R.I. — Faced with the need for a system, the American Mathematical Society here designed and conducted benchmark tests pitting a machine from IBM against one from Digital Equipment Corp.

After reviewing test results, the society chose a DEC 8600-based computer system to meet its needs for the next five years. According to Samuel Whidden, director of computer services, the society developed benchmark tests from its applications for several machines, including an IBM 4381 Model 2 mainframe computer. The society runs mostly Cobol business applications and performs scientific typesetting functions, Whidden said.

The benchmarks consisted of having the machines run a version of the society's typesetting software, Cobol and Fortran compiles and one of the society's Cobol applications.

The society's search — originally encompassing eight vendors' systems — narrowed to the three following possibilities:

- A DEC 8600-based system that called for two 8600s, one to be delivered by December 1985 — with a DEC VAX-11/785 serving as a temporary fill-in until then — and the second one to be delivered in 1987.
- An IBM plan that contained an initial 4381 Model 1, to be upgraded in two years to a 4381 Model 2 and upgraded again in 1989 to a 4381 Model 3.
- An IBM option that called for a 4381 Model 1 that would be upgraded to a 4381 Model 2 in 1987 with no further upgrades.

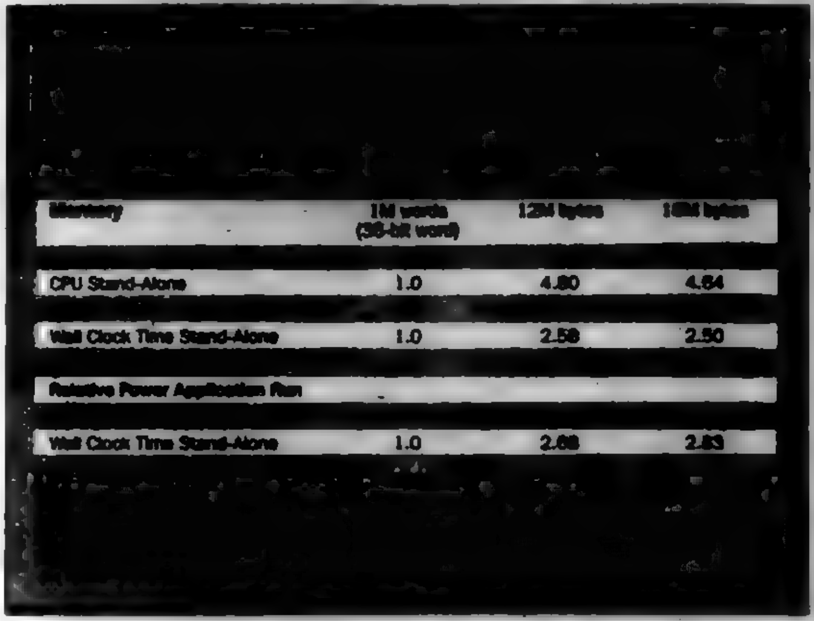
A stand-alone VAX 8600 with a floating-point processor that ran the society's benchmark tests was 4.8 times more powerful than the society's present DEC Decsystem-2060 running the vendor's Tops-20 operating system, the planning committee's final report stated. The IBM 4381 Model 2 was 4.64 times more powerful when the machines were compared in a stand-alone mode, that is, running one test at a time, according to the society's "Planning Group Report on Computer Systems Evaluation."

When loaded with several jobs in batch mode or several users in interactive mode, the DEC 8600 tested at 5.11 times more powerful than the Decsystem-2060 and the 4381 Model 2 showed that it was 4.73 times more powerful.

DEC provided Fortran Whetstone and Cobol U.S. Steel benchmarks as well, the report stated, but IBM did not include such tests for its system. "There is a lot that [benchmark tests] lack," Whidden said. "They may not be relevant to anyone else, and may not forecast well for us, but they are all we could devise to work for us."

Overall ratings (see chart above), which were calculated from the typesetting run and the Cobol application run, weighted 12:1 in favor of the application to give an accurate reflection of the society's current Cobol/typesetting load mix.

IBM was unwilling to run the benchmark tests on a 4381 Model 3 configuration, which is a tightly coupled pair of 4381 Model 2 machines, Whidden said, because the company felt the results would not be valid. The vendor said — and the society accepted as true — that a Model 3 would provide 1.7 times the performance of the Model 2, he said.



Memory	1M words (36-bit word)	12M bytes	16M bytes
CPU Stand-Alone	1.0	4.80	4.64
Wall Clock Time Stand-Alone	1.0	2.58	2.50
Relative Power Application Run			
Wall Clock Time Stand-Alone	1.0	2.68	2.83

IBM machine not as fast as 8600

The IBM system would not run as fast as the 8600 configuration, the report said. The planning group also found the IBM machine more difficult to use because of the complexity of the VM operating system.

The society's benchmark tests did not confirm the planning committee's expectation that the IBM 4381's throughput would be superior.

The stand-alone 8600 showed a 94% proportion of CPU time to real time when running the typesetting program as opposed to the 4381 Model 2's 89%, the report said. When running the same program loaded, the machines showed 58% and 49% proportions, respectively, it said.

The IBM machine showed a better throughput time in the loaded application run test, with 16% proportion; better than the 8600's 12% proportion, the report showed. In stand-alone mode running the application program test, the 8600 achieved 26% efficiency over the IBM machine's 22% proportion.

As part of the benchmark, the vendors had to do whatever conversion work was necessary to get the benchmark programs running on their hardware, the report said. The machines that were tested were configured similarly to those the society would buy, the report said.

Tandem pledges long-term network standards support

By Jeffry Beeler
CW West Coast Bureau

CUPERTINO, Calif. — In addition to introducing five software packages that promote the interchange of documents within its own network [CW June 10], Tandem Computers, Inc. recently disclosed its long-term intention to support a broad assortment of communications standards.

On the local network side, the company promised to support the IEEE 802.3 standard, which would permit Tandem networks to be interconnected with Ethernet-type networks. On the gateway side, the firm promised support of IBM LU6.2 protocol, which would enable Tandem mainframes to link to IBM hosts running IBM's Distributed Office Support System and X.400, the interface for hooking systems into public electronic message nets recommended by the Consultative Committee on International Telephony and Telegraphy.

Tandem also announced the start of internal projects to develop support for IBM's Document Content Architecture and Document Interchange Architecture, which translate the format differences between dissimilar word processors and thus enable them to exchange information.

In addition, the company disclosed a recent agreement that makes it a licensee for AT&T's Digital Multiplexed Interface standard, which enables host processors to be connected to private branch exchanges.

Tandem also announced it had signed licensing agreements with Sytek, Inc., a Mountain View, Calif.-based supplier of broadband local networks. One of the agreements calls for Tandem to support Sytek's protocols for IBM's Personal Computer Network, providing for interconnection of IBM micros with Tandem's mainframes or workstations. Another accord will result in Tandem's support of Sytek's open-architecture LocalNet product line.

About half the planned communications support will be made available by the summer of 1986, with the rest slated for readiness sometime within the following year, according to Kathryn Weiner, a Tandem product management director. However, Weiner declined to reveal any additional details about the firm's expected delivery timetable.

Announcement of Tandem's planned communications support coincided with the christening of the company's Information Management Technology (IMT) strategy, which calls for the use of the vendor's existing facilities to interconnect various incompatible machines and nets.

With the recent introduction of five electronic mail and filing programs, Tandem has already accomplished part of its objective by permitting information to be exchanged among selected multivendor terminals and micros. At present, however, the interconnection scheme applies only to devices that are connected directly to a Tandem net.

The next logical step in the evolution of IMT will be to widen the interconnectivity to ensure that information can be transmitted, not just between users in the same network type but also between different, incompatible networks. Here is where Tandem's plans for supporting a broad range of communications standards enter the picture, according to a company source.

Once support of the 802.3 standard becomes available, for example, a user whose device connects directly to a Tandem network will be able to communicate transparently with someone in an Ethernet or Starnet scheme, Weiner said.

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Add-on unit solves firm's need for voice/data support

[illegible]

There is more than one way to skin a cat. Some users are finding it makes economic sense to add hardware to existing analog voice switches to obtain data support rather than buying a digital switch.

Gould AMI Semiconductors, a Santa Clara, Calif.-based division of Gould, Inc., did just that. After serving as the beta test site for the first product from Sunnyvale, Calif., start-up David Systems, Inc., the semiconductor development firm purchased the Information Manager.

The Information Manager is a device about the size of a two-drawer file cabinet that can be used to provide integrated voice/data support over twisted-pair wire when used with analog private branch exchanges or Centrex services.

Gould AMI is using the Information Manager with its AT&T Dimension 2000 PBX, installed in September 1981, according to Don Ohler, department manager of communications. The David Manager, the heart of the system, is located in a PBX wiring closet and is connected to the Dimension — which supports nearly 1,500 extensions — through a David Gateway over twisted-pair wire.

Roughly 120 of the Dimension users are supported through the David Manager. Of these, nine are voice-only users, 40 are voice/data and 70 are data-only users, Ohler said.

Voice-only users have David telephone sets that emulate AT&T 1A2 key systems, telephones that support multiple lines that are typically used by secretaries to monitor departmental phone groups. These sets provide multiline support over a single twisted-wire pair instead of the 25-pair cable that 1A2s typically require.

Voice/data and data-only users are supported with David Links that operate at 2M bit/sec. over a single twisted-pair wire. The capacity of a David Link is divided into four channels: a 1M bit/sec. packet-switched channel, a 64K bit/sec. channel for pulse-code-modulated digitized voice, a 64K bit/sec. circuit-switched channel for data and a 64K bit/sec. channel for signaling.

For its data-only connections, Gould AMI uses David interfaces called dual asynchronous device adapters. These adapters provide two RS-232C interfaces and are connected to the David Manager through existing twisted-pair PBX wire, Ohler said.

Voice/data connections are provided through David Links and David telephone sets. The sets digitize voice to be carried over the 64K bit/sec. pulse-code-modulated voice channel and provide Gould AMI with an RS-232C interface for terminal support. The David Manager converts the digitized voice signal into analog and routes the circuit to the Dimension PBX. The data channel is routed to the desired computer resource.

Gould AMI is using the circuit-switched data channel of the David Links to support asynchronous terminal devices, Ohler said.

The David Manager is installed in Gould AMI's design center. Gould AMI customers send system engineers to the center to design custom-integrated semiconductor circuits. The engineers, who have their own soundproof offices, own their workstation devices but can access Gould AMI computer resources through the David Information Manager, according to Barbara Kalkis, a Gould AMI spokeswoman. Engineers can switch between Gould AMI computers using the Information Manager and software bridges developed in-house.

> *The Information Manager is a device . . . that can provide integrated voice/data support over twisted-pair wire when used in conjunction with analog private branch exchanges or Centrex services.*

Ohler said the Information Manager system took roughly a week to install and that few problems have been experienced from the time the system was installed for beta test.

The company reportedly briefly considered installing a digital PBX instead of the David Systems equipment, Ohler said. However, at today's average cost per station, Ohler estimated it would have cost about $2 million to replace the company's Dimension 2000.

Ohler would not divulge the cost of the Information Manager, but David Systems claimed the system costs roughly $800 per port.

David Systems is located at 701 E. Evelyn Ave., Sunnyvale, Calif., 94086.

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Adapso making progress on software protection device

By Paul Korzeniowski
CW Staff

The Association of Data Processing Service Organizations, Inc.'s (Adapso) Software Protection Committee is expected to announce within two months progress in its attempt to design a software authorization mechanism.

The Adapso mechanism consists of three parts: lock, key and key ring. The lock is code that is embedded in a program that prevents it from running. The key is a microprocessor stored on a key-like device that plugs into a key ring, opens the lock and allows a program to run. A key ring has a number of key slots and uses an RS-232 port to communicate with one or more programs.

The committee has made progress on the problem of how a key would fit into a key ring. The design is based on work by Apple Computer, Inc. engineers, a spokesman said.

"Adapso was searching for an inexpensive key, and the work at Apple helped to provide that," said Marv Goldschmitt, committee chairman and vice-president for business development at Lotus Development Corp., in Cambridge, Mass.

Apple's approach differs somewhat from the original Adapso design. The software protection committee was thinking of connecting a key to a ring through an eight-prong connector. Although this type of connector could have been used, it would have been expensive, Goldschmitt said.

The Apple design is based on a three-pronged connector much like the one used with a Sony Corp. Walkman. David Christensen, project engineer at Apple, estimated that the connection would cost $3 to $5, much less than the connector the committee was considering.

"Apple used a Walkman connector as an audio port for the Apple IIc," Christensen noted. "I don't think that any other computer manufacturer has used the connector for its products." He added that Apple has not yet chosen a connection and is considering other devices along with Sony's.

> *'Adapso was searching for an inexpensive key, and the work at Apple helped to provide that.'*
>
> — Marv Goldschmitt
> *Adapso committee chairman*

Apple had begun working on a software protection device before the Adapso committee was formed. "Apple wanted to help software companies develop a method of copy protection," Christensen said. "We were aware of the problems [that] some copy protection methods created for hard-disk system users."

A few months ago, Apple presented its work to the Adapso group. "We thought a number of manufacturers were addressing the problem of software protection," Goldschmitt said. "We were afraid that they would all build various models, and none would be compatible. The committee has helped to alleviate this problem."

Although the committee was impressed with Apple's design, it did recommend changes. "The committee thought that the Apple design limited the transmission speed from key to key ring," Goldschmitt said. "Although it would work fine with current products, it could create problems in the future. We also made other recommendations so it could support multiple-line protocols and data streams."

Christensen and Adapso committee members are modifying the design. "We should be left with one design that all manufacturers can work with," Goldschmitt said. He said he expects the modifications to be completed and placed in the public domain within two months.

Once the design is completed, vendors can manufacture software protection products. "There are a number of third-party companies interested in supplying software protection products," Christensen said. He expects these products could be available in the first quarter of 1986.

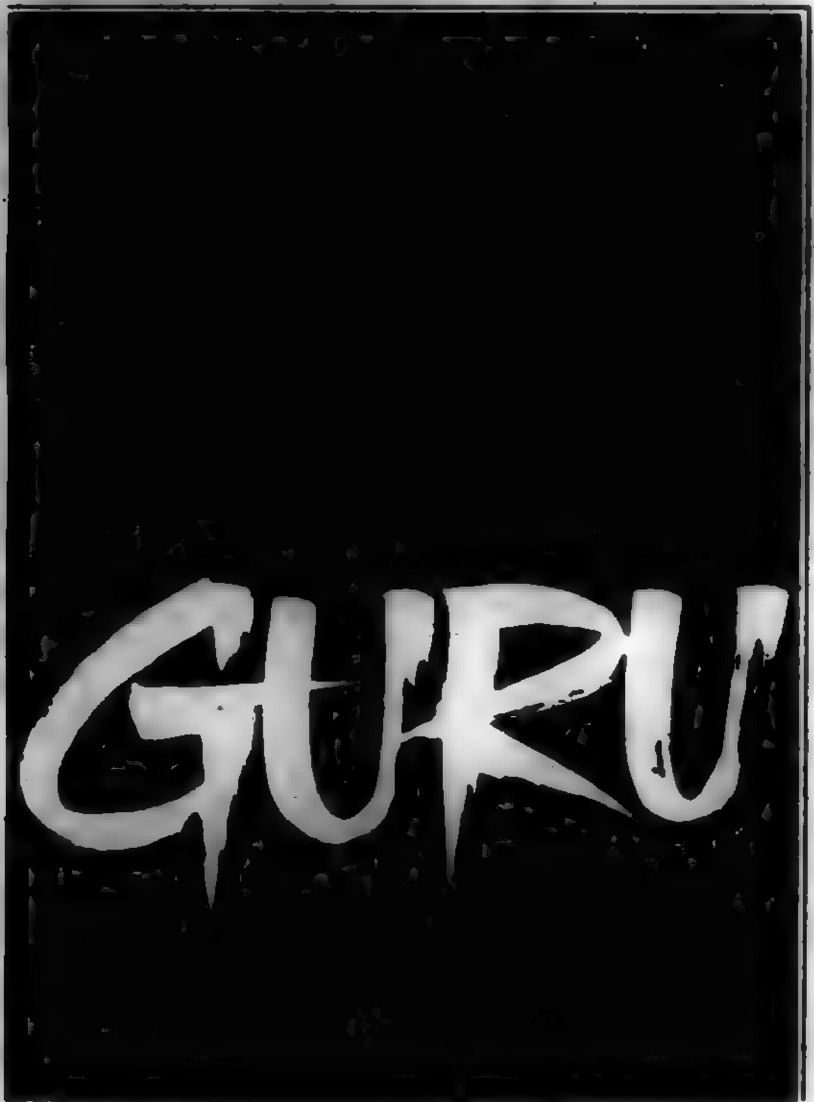
LICENSE

from page 1

police existing software licenses and the red tape that micro managers face when placing a software purchase order. The organization's proposal, Gross explained, is the result of a recent MMA poll in which members noted the items they felt would make up an ideal license. The following are items from the poll to be included in the position statement:

- The right to modify software for internal use, including serialization and the embedding of employee identification numbers. Such a feature would help MMA members keep track of software.
- The right to incorporate the vendor's software into a package that the firm is using internally.
- The right to receive regular notification of enhancements, service, product bugs and fixes. The membership, Gross said, was unanimous on that stipulation.
- The right to have source code held in escrow. This, Gross explained, would benefit users in case the vendor went bankrupt.
- The right to documentation updates for all users on site.
- An end-to-copy protection for software sold to corporations, which is another issue that Gross said had received complete support in the MMA poll.

The MMA decided to go public with the stipulations, Gross argued, because those are the points on which software vendors most often failed to act. Gross said he could point to no software vendor that performed adequately in all categories.



SIA files against Japan

WASHINGTON, D.C. — The Semiconductor Industry Association (SIA) last week charged that illegal barriers into the Japanese semiconductor market violate free trade rules, and the organization filed a complaint with the U.S. trade representative. The complaint charged that Japanese policies have continuously thwarted U.S. manufacturers in their efforts to penetrate the $8 billion Japanese market.

The SIA complaint, filed under the 1974 Trade Act (Section 301), gives the Reagan administration, and specifically the U.S. trade representative, 45 days to decide if the charges have merit and if a formal investigation should be initiated. The complaint said that for 10 years, U.S. semiconductor manufacturers have tried to penetrate the Japanese market and have failed. It also said that U.S. market share has never climbed to more than 10%.

The SIA asked the Reagan administration to negotiate immediately with the Japanese government to obtain "prompt and dramatic improvement in U.S. sales in Japan," as well as to take steps to "prevent current and potential Japanese dumping of semiconductors in the U.S. market."

The SIA complaint renews U.S. industry pressure on the Reagan administration to take concrete action against the Japanese and reflects continuing frustration over the failure to establish a foothold in the Japanese market. It comes at a time when the Japanese are capturing a large portion of the depressed U.S. market for high-technology products (see story page 12) and a large trade imbalance exists between the two countries.

The SIA said the U.S. held a 54% market share worldwide in semiconductors, which accounted for $14 billion in sales in 1984. In Japan, U.S. market share was 11% and amounted to $960 million in sales, while the Japanese held an 89% share and had $7.1 billion in revenue. Worldwide, Japan accounts for 36% of the market, and its 1984 sales reached $9.9 billion, the SIA said.

SIA's charges describe the dominance of a few large Japanese semiconductor firms — NEC Corp., Fujitsu Ltd., Toshiba Ltd., Hitachi Ltd., Matsushita Electric Industrial Co. and Mitsubishi Electronics Corp. — in the market, and the organization accuses these companies of engaging in "Buy Japan" policies.

The SIA said that policies of the Japanese government have contributed to U.S. difficulties in making sales by encouraging protection of Japanese firms.

The SIA cited a recent internal memorandum of Hitachi's that urged its U.S. distributors to "quote 10% below competition. If they requote, bid 10% under again. The bidding stops when Hitachi wins," (see story page 91).

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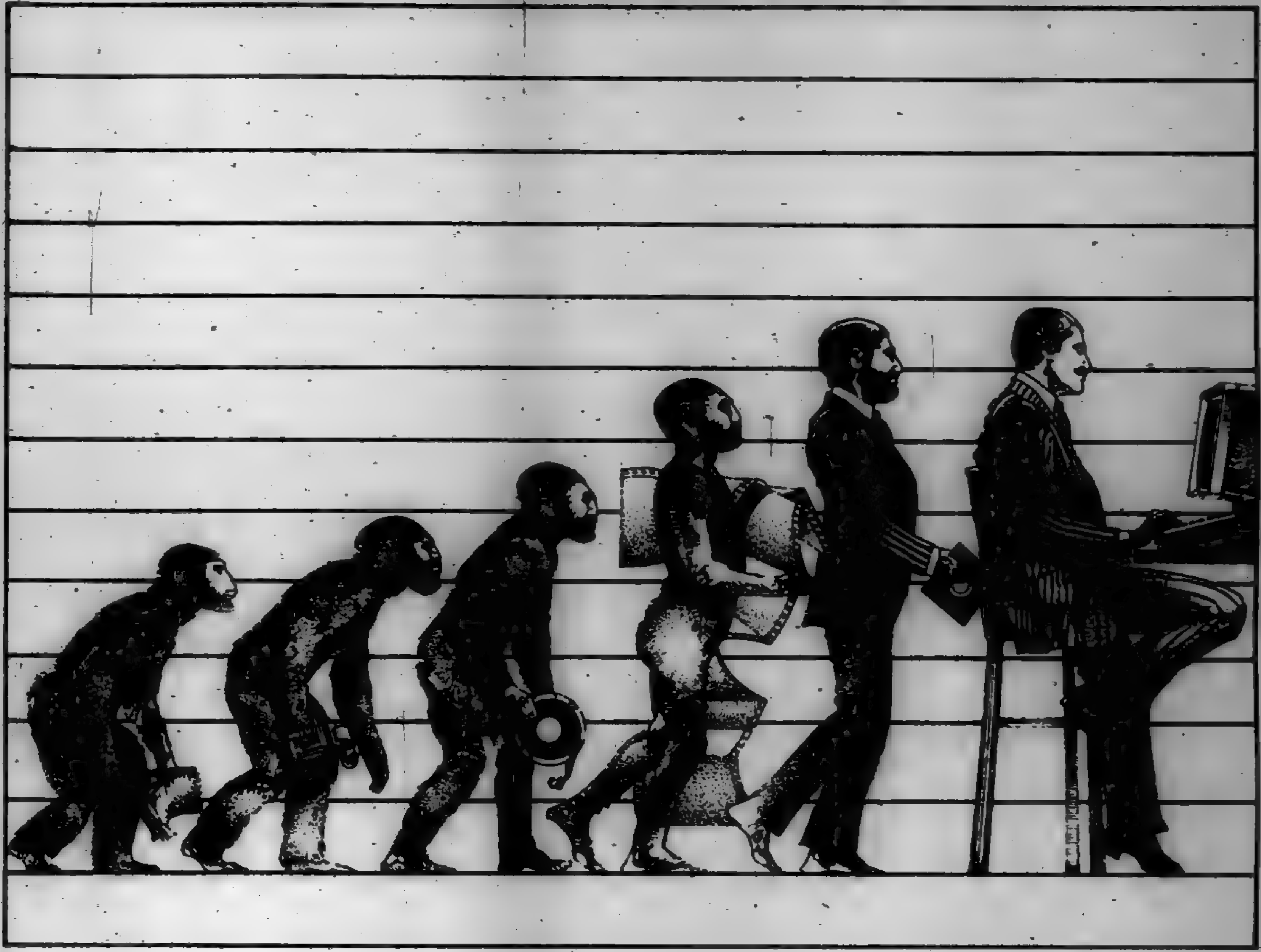

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Smart buildings hold little or no interest for tenants

Tenants express little or no interest in shared tenant services, according to real estate brokers, but some service operators claim they have signed up most residents in their smart buildings.

"Shared tenant service is a buzzword more than anything else," said George H. Keller, a partner for Jones, Lang, Wootton, a real estate consulting operation in New York. "People aren't overwhelmingly inquisitive about it, but it is a topic of discussion."

In Boston, inquiries about shared services are not even on the list of questions prospective tenants ask about real estate, said Christopher Tosti, an agent with Leggat, McCall and Werner, a commercial/industrial real estate broker with offices in Boston and Washington, D.C. "They wouldn't think to ask about the services because they're not familiar with them."

Chicago is reportedly a major center for shared services. But Edward A. Laing, a senior associate with the real estate broker and development firm of Bennett and Kahnweiler, said, "I rarely have a request for that kind of facility. Tenants are primarily concerned with location, then price. Location is by far and away the No. 1 consideration."

Where there is a scarcity of office space, price can even outweigh the importance of location. "The big problem for your average tenant who is looking in the market in New York . . . is finding space he can afford," said Jeff Bernstein, an agent with Newmarket and Co., a brokerage firm in New York.

All of the brokers contacted agreed that shared tenant services were simply a building amenity and, by themselves, would do little to attract tenants.

Companies that operate shared tenant services for building developers concede this fact. "I don't know of anyone that has signed leases simply because of shared tenant services, but I know the services have served as a final kicker to bring people into a building," said Bob Dammeyer, executive vice-president of management with Lincom Corp. Lincom is a subsidiary of Lincoln Properties, the second largest real estate developer in the country, and operates shared tenant services in eight of its parent company's buildings.

Dammeyer claimed 86% of the tenants in those eight buildings are using the shared services after a year of operation.

Tenants share telephone switching systems and long-distance telecommunications services. Lincom does not offer computer services or energy management support.

A spokesman for Sharetech, a company in Parsippany, N.J., formed by United Technologies Corp. and AT&T Information Systems to market and provide shared tenant services, admitted, "There has been slowness on the part of tenants to catch on to the idea of shared services." Sharetech reportedly operates systems in 29 buildings and anticipates the addition of 30 more buildings by the end of the year. "I've heard it said that there is yet to be a tenant that will move into a building just because of shared tenant services," the spokesman said.

And while some tenants may inquire about shared services, there is no guarantee they will use them. "Some users look to see if a building may have these capabilities, but when they get into it, they realize it might be better to have their own switch and not rely on the landlord," said Keller of Jones, Lang, Wootton.

Idea must be marketed

Tosti of Leggat, McCall and Werner thinks that the market will have to be driven by developers. "I don't think you're going to find tenants suddenly wanting to move into smart buildings which developers then start building. I think developers will have to market the idea."

Developers themselves will shy away from actual involvement with the systems, preferring to bring in third parties like Sharetech, according to Keller.

"The business of most developers is bricks and mortar. If they feel they will have a better chance to sell or lease their space by putting in more embedded plant [such as equipment tenants can share], they will do so, but they will try to get an outside vendor to do it for them," he said.

— [illegible]

SMART

from page 1

would not use shared services if they were available in their building. The most frequently mentioned reason — cited 62% of the time — was that they already own equipment. Other reasons users cited were that shared services offer inadequate cost benefits (26%); alternative services that telephone companies offer are more appealing (21%); and shared service operators cannot match the reliability of the telephone company (15%).

While users and developers are equally tepid about shared services, they differ in how they would like these services provided.

There are three basic ways to offer shared services. With the in-house method, the developer buys and installs the necessary equipment and markets the service to tenants. Some developers prefer diluting their responsibility by entering joint ventures with independent service operators. Still others farm the task out to a third party that takes on the risk and expense of the venture.

"Most users would prefer shared tenant services to be provided by their landlords," Rudov said, whereas the developers Telematics contacted said they are leaning toward the concession or third-party approach. "The concessionary approach is the most popular with developers because it affords the least involvement, the least risk and the least money up front," Rudov said.

A financial albatross

The risk can be substantial. Developers willing to shell out the capital for the necessary equipment have no way of knowing how many tenants will subscribe to the service. If fewer tenants opt for the service than are needed to cost-justify it, developers cannot make up the difference by raising their prices because this would encourage other users to jump ship, Rudov explained. It is thus impossible to calculate whether the investment will become a financial albatross.

While economically safest, the third-party approach to shared tenant services does not mean smooth sailing for the landlord. "Even though the [service operator] doesn't usually have a formal relationship with the landlord, if he makes tenants angry, the landlord is responsible," Rudov said. Developers that Telematics contacted noted the risk of getting involved with a third-party operator who later goes out of business, leaving subscribing tenants high and dry.

"The biggest problem with this whole business is that vendors suffer from 'technologica erotica,' " Rudov said. "They assume that because the technology is there, the customers are going to turn cartwheels."

The Telematics study, called the U.S. Market for Shared Telecommunications Services in Multitenant Office Buildings, costs $3,950.

Telematics is located at 277 Linden St., Wellesley, Mass. 02181.

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NEGOTIATE

from page 1

sive partner in a merger, as might be expected since the February announcement that its merger talks with ITT had been terminated, the union with Burroughs could mark the end of an era. Since 1951, the Univac product name has survived the merger of Remington Rand into Sperry Rand, Inc. in 1955 and the evolution to Sperry Corp. in 1979.

Analysts and users contacted by *Computerworld* expressed confusion about how the divergent product lines would eventually be merged. None of those contacted believed that any immediate steps will be taken to halt any product lines, and users said they hope the alliance produces a broader user base for the products of each company.

Although rumors of the discussions had surfaced earlier in the week, analysts and users reacted with surprise. "This is one [merger] that doesn't make a lot of sense," said Tom Linkas, an analyst with Goldman Sachs & Co. "The best both companies can hope for is to keep their installed base."

Dave Moschella, an analyst with IDC, noted the differing philosophies of the two companies. Sperry has actively sought a merger with other partners and was a major investor in Trilogy Ltd.'s effort to develop wafer-scale integrated semiconductors for a new generation of mainframes, he said. Burroughs, Moschella added, has been a "stalwart independent" that has resisted cooperative ventures, although it did acquire Memorex Corp. in 1982.

The two companies have established divergent strengths, Linkas said. Sperry is heavily involved in government contracts and, according to IDC figures, its share of the mainframe market has been slipping. Burroughs, however, has gained strength by revamping its high-end processor line in the past year, Moschella said.

AT A GLANCE

[illegible]

1984 revenue — $4.87 billion

Employees — 65,000

[illegible]

Large-scale 1984 shipments* and market share — 339; 9%

Stephen T. McClellan, author of *The Coming Computer Industry Shakeout* and a vice-president with Merrill Lynch, Pierce, Fenner & Smith, declined to comment on the specifics of the merger but said it was an example of the trend to consolidate in the industry. A technological glut, the need for systems integration and a shift in emphasis from hardware to software "has produced a lot of upheaval, a lot of turmoil in the industry," according to McClellan.

One MIS manager operating equipment from both companies said he was "amazed" by the news of the potential merger. "The two companies have totally different philosophies, especially in the operating systems area," said Jerry Allen Poe, MIS director with Hall's Motor Transit Co. in Mechanicsburg, Pa., which operates a Sperry 90/80 and a Burroughs B3900. "The Sperry philosophy is to run very close to IBM, but Burroughs' operating system is more user-friendly, though not as flexible."

Poe said he doubted there would be any immediate impact on product lines and that it could result in combined maintenance of both companies' products. He said his company has been considering replacing the Sperry machine with an IBM product but may reconsider if the merger goes through. "We might stay with them and become, essentially, a one-vendor shop," he said.

AT A GLANCE

[illegible]

1984 revenue — $5.68 billion

Employees — 77,000

[illegible]

Large-scale 1984 shipments* and market share — 119; 3.1%

Howard Dix, manager of data services with the Orange County, Calif., administrative office in Santa Ana, Calif., operates three Sperry 1100/70 mainframes and said he would be concerned if the merger resulted in elimination of any Sperry products. On the positive side, he said, "We might be able to get equipment more quickly if the merger expands Sperry's manufacturing facilities."

Similar concerns were expressed by Burroughs' customer Donald Silva, a data services manager with Sun-Diamond Growers of California in Stockton, Calif. "If they try to force us to change equipment or move to Sperry products, it could be a real problem," said Silva, who operates a Burroughs A-9 and a B6810. He added, "If they say convert, or [if] they introduce a new product line more closely linked to the Sperry philosophy, we will certainly explore further than Burroughs and Sperry; we may even go to Big Blue."

Silva said the move could be positive, "depending on who becomes the controlling force."

Similarly, John Jervinis, DP manager for the city of Waltham, Mass., said he would feel more confident about Burroughs after a merger. "It would make Burroughs more secure as a company and allow [it] to offer more service and expertise," said Jervinis, who operates a Burroughs B1900.

This report was compiled by CW staff members Peter Bartolik, John Gallant and Tom Henkel.

IBM Entry Systems to split base between N.J., Fla.

BOCA RATON, Fla. — IBM announced last week that its Entry Systems Division (ESD), based here, will move a portion of its headquarters to Montvale, N.J., in July 1986 "to work closely on a day-to-day basis with other IBM headquarters."

Some 200 members of the ESD headquarters staff will be involved in the move, which signals continuing efforts to tie ESD's operations into overall IBM product strategy. ESD is the division that produced the successful Personal Computer.

ESD President William C. Lowe made the announcement and remarked that the division "has grown from a small business unit with a stand-alone product to a large division with products that are strategically significant to IBM's future."

Since midway through last year, IBM has taken several steps to bring ESD activities more in line with those of the rest of the company. Earlier this year, IBM reassigned ESD founder Philip D. Estridge to a corporate staff position [CW, March 18].

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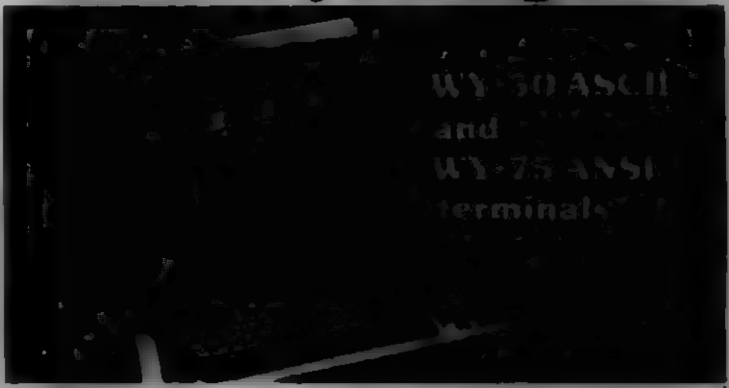

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Consultant prescribes cure for medical center's DP ills

CW AT UCCEL

By John Gallant
CW Staff

DALLAS — The diagnosis was simple: The Queen's Medical Center Information Services Department in Honolulu had sacrificed control for productivity.

The bad news was not entirely unexpected, according to the department's director, Gordon Bruce, who had contracted with Uccel Corp. Systems Software Division's Consulting Services for a data center checkup.

Bruce, speaking at Uccel's Systems Software Conference users group meeting here last week, knew his department was understaffed. He was also painfully aware that his 42 staff members were working in a less-than-palatial environment, jammed into the basement of the 500-bed hospital. Queen's Medical Center, which has a staff of some 1,000 doctors and 2,000 other employees, was founded 125 years ago by Queen Emma and King Kamehameha IV of Hawaii.

But the department's past failures and the downturn in the health care industry had made it difficult for Bruce to get much sympathy, let alone increased funding, from the Queen's Medical Center board of directors, which tightly controls Information Services, he said.

In 1975, the board had mandated the implementation of a fully on-line patient management system. But by 1979 the system was still incomplete. That, Bruce said, prompted a restructuring of Information Services. Since 1981, a variety of major systems, including patient management, financial, information center and physician business applications, have been implemented. Work on nearly 20 other applications was also undertaken. But the speed with which Information Services transformed its operations exacted a toll in inefficiency and control.

Sought suggestions, analysis

Bruce asked Uccel's consultants for suggestions on trimming unnecessary costs and obtaining the resources to meet business plans. He also wanted an analysis of the strengths and weaknesses of the department and a comparison of Information Services performance with other data centers.

"Failures in the past had made it very difficult for us to get money from the board," Bruce said. "We were hoping the Uccel study could help us swing the pendulum in the other direction."

The Information Services department operates an IBM 3083B mainframe under MVS that supports 150 terminals and 100 linked micro workstations. Its on-line systems handle roughly 300,000 transactions and 500 batch jobs daily. Over a span of 2½ days, Uccel consultants conducted a variety of studies on the data center's operations.

According to a Uccel representative, the one-CPU data center checkup cost roughly $9,000. It included a review of such objective measures as hardware utilization and performance, Dasd performance, production and test work loads and exception handling. Consultants also reviewed the department's standards and procedures and conducted personnel interviews and work flow analysis, among other things.

At the conclusion of the checkup, which also gave Bruce a look at how his shop's performance measured up to other data centers across the U.S., Uccel consultants outlined more than 30 major problems and recommendations for solving them. The problems ranged from poor tape management to understaffing to the need for IBM CICS tuning.

"I was certain they would not tell me anything I did not already know," Bruce said. "But there were surprises. The data center checkup provided me with the information I needed to restructure our organization."

Bruce is currently at work implementing Uccel's recommendations, and he said he feels he has greater support from upper management. "The third-party objectivity gave us more leverage with management," he said. "In addition to helping me manage better and address new issues, it has helped us get more money and more recognition for the work we do."

Now that he has seen how Uccel conducts a data center checkup, could Bruce undertake one of his own? "We already do parts of the checkup on our own. That helps us stay on track," he said. "But you really need that objective opinion and the interpretation of the findings."

UCCEL

from page 1

agement functions. One such component, the Nova:Save PC Data Protection Facility, was introduced along with the Synova series concept and Nova:Log last week.

Product-level integration

According to the spokesman, most of Uccel's current line is integrated at the product level, meaning that packages have certain limited, predefined interfaces. The Synova series reportedly is designed to allow for full integration of the packages by providing a layered architecture through which all commands and requests for data are controlled.

The spokesman said Uccel is currently developing the remaining modules that will allow its current products to operate within the Synova environment.

The first layer of the architecture, Nova:Log, scheduled for September availability, will provide for a single logon point to all systems products. It is said to manage multiple product sessions without intermediate logon/logoff and it preserves the context of an incomplete session while other sessions are being conducted.

The spokesman said it provides a single point of access to any IBM Vtam application and allows users to move easily between applications. Nova:Log has an introductory price of $18,500.

Facilitates backup

Nova:Save is designed to facilitate the automatic backup of data stored on an IBM Personal Computer hard disk. The micro must be equipped with Digital Communications Associates, Inc.'s Irma board and must be connected to an IBM mainframe under MVS/CICS.

Nova:Save automatically saves micro data to a mainframe disk on a timed basis, the vendor said. The product is available immediately at an introductory price of $9,500.

According to Maria Smith, vice-president of marketing with the Systems Software Division, "Synova represents a new approach to a controlled environment for IBM shops.

"Systems software products, whether from one vendor or many, have always had unique features, such as different command structures. They were automated but not integrated. Synova is the architecture that will integrate all our products into a total environment."

According to Paul Newton, senior vice-president of software products, the first Synova products are the result of a nearly two-year research and development effort.

Future announcements

He said other components of the Synova series, such as the command and communications facilities, will be announced later this year and in early 1986. He said Uccel's own offerings will be augmented by upcoming product acquisitions, some of which are currently in the works.

"We have been building an integrating techpology," Newton said. "The real world is demanding integration and we are launching products based on that demand."

Uccel is located at Uccel Tower, Exchange Park, Dallas, Texas 75235.

Intel eyes further cost cuts, layoffs

SANTA CLARA, Calif. — Intel Corp. confirmed last week that it is considering further cost-cutting actions, including additional layoffs, due to the continued sales slump in the semiconductor industry.

According to Intel spokeswoman Glynis Kaye, the semiconductor manufacturer is "looking at all kinds of options," including layoffs, temporary shutdowns and plant closings.

The company is "drafting contingency plans" in the event that the slump continues. "Business still is definitely down," she explained.

'A lot of rumors'

Asked about reports that within the next two weeks the company will announce layoffs of from 12% to 15% of its work force, Kaye said that "a lot of rumors are going around" and that final plans have yet to be formulated.

Earlier this year [CW, Feb. 25], in its first layoff since 1974, Intel said it was dismissing 900 workers, or 4% of its work force.

That action included dismissal of 500 workers at Intel's systems and components division in Hillsboro, Ore., and 100 at its Phoenix manufacturing plant.

Test facility phased out

Also included was the phasing out of a components test facility in Santa Cruz, Calif., and workweek reductions for wafer fabrication plant employees.

Also last week, the Semiconductor Industry Association (SIA) revealed that average monthly orders for semiconductor sales in March through May were down 57% from the same period in 1984 and down 9% from the February through April period.

Shipments of semiconductors in 1985 will be 20% below the 1984 level, the SIA predicted.

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User warns against using multiple data dictionaries

CW AT UCCEL

By John Gallant
CW Staff

DALLAS — When David James asks other users how many data dictionaries they have in place, they are often puzzled by the question.

After pondering for a moment, those users are likely to reply, "Why, one, of course."

To that, he responds, "Are you sure?"

According to James, data administrator for Riggs National Bank, the largest bank in the Washington, D.C., area, users often have a variety of dictionaries operating — even though they may think all their data is under the control of one central system.

Speaking on the future of data dictionaries at Uccel Corp.'s Systems Software Conference users group meeting here last week, James said many software products, especially fourth-generation or information-center-type systems, contain their own dictionaries.

James listed Information Builders, Inc.'s Focus, Martin Marietta Data Systems' Ramis, Applied Data Research, Inc.'s Roscoe and Artificial Intelligence Corp.'s Intellect as examples of software boasting built-in data dictionaries of one type or another.

"Those dictionaries come in many guises," James said. "But they all specify a file definition in front of a file. What you wind up with are a lot of dictionaries in a lot of different products. You end up with many dictionaries, whether you want them or not."

To ensure data control and integrity in an environment of multiple dictionaries, James cautioned, users should centralize their "metadata" — the data about their data. The primary data dictionary, he said, should be linked to all others so it can act as a central directory of data definitions and their locations. At Riggs National Bank, James said, Uccel's UCC-10 dictionary under IBM's IMS performs that task.

"The [central] dictionary should interface directly or via a link to each and every information resource," James said. "There should be one source of control over all the data dictionaries. The main dictionary needs to know what other dictionaries do and what is contained in them. Without that control, you will have multiple data definitions and may be required to do multiple updates."

Cautioned against overloading

James said no new application or information-center-oriented data base extract should be brought online without a link to the main data dictionary. But he also cautioned users against overloading the central dictionary.

"There is no sense in trying to load all other data dictionary information into the main dictionary," he said. "The central dictionary should just point to where the definitions lie in the other dictionaries. Make the main dictionary your reference library."

According to James, data dictionaries in software products fall into six main classes:

- The active dictionary, which ensures that programs and the data base management system will not function unless data definitions are recorded in it.
- The passive dictionary, which maintains data descriptions and usage information but does not drive programs or DBMS.
- The dependent dictionary, which relies on other software, such as a DBMS or operating system, to run.
- The independent, or standalone, dictionary that is able to run on many systems.
- The logical dictionary, in which the business functions of a corporation are defined from a user perspective. This dictionary provides a business view of data, James said.
- The physical dictionary, in which program I/Os and DBMS controls are defined. This class of dictionary provides an applications view of data.

In the future, James said, many organizations will migrate to what he called a "human data dictionary," which will maintain data definitions in common user terms. "The dictionary of the future will know what users are saying," he said. "It will be driven by another data dictionary that links the user definitions with the required DP definitions."

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CW AT UCCEL

Ramblings from the floor at Uccel Corp.'s Systems Software Conference users group meeting last week:

- Was it just coincidence that Computer Associates International, Inc. (CAI) unveiled its CA-Unicenter [CW, June 10] system just one day prior to Uccel's introduction of its Synova series software? The announcements appear to signal a convergence of strategies on the part of systems software vendors.

Paul Newton, senior vice-president of software products with Uccel, said CAI's strategy of linking users through CA-Unicenter to CAI's Jericho, N.Y., headquarters was a good idea but one that Uccel was not, at least for the time being, planning to embrace.

Asked about the earlier availability of the full CAI system, Newton responded, "They are saying, 'Here it is right now.' We are saying, 'Here is this portion for right now, and there will be a lot more to come in the future.' "

Newton said that, despite the moves toward product integration on the part of the leading systems software vendors, there will always be a place for exceptional, standalone systems packages. But, he added, those vendors that want to remain major players in the industry will have to integrate their products eventually.

- Prior to the press briefing on the Synova series software, one senior Uccel official commented that applications pricing is something the Dallas-based software and services company is monitoring carefully. The remarks came in the context of a discussion on rumored price wars between applications vendors that, some industry observers claim, are cutting prices by as much as 75% to outbid competitors. In many cases, the official said, software prices are artificially high and may change dramatically in the future.
- General session speaker Jack Jackson, a noted lecturer on strategic planning, chided Uccel about the hoopla surrounding the company's announcement of its Synova series software to the more than 1,300 users in attendance. Actually, Jackson's good-natured jabs were aimed at software vendors in general that, he said, tout their products as panaceas that can transform even the most problem-riddled manager into a "leading-edge executive."

Jackson also took more than a few whacks at airline companies for failing to prepare for the forces currently restructuring that industry and for neglecting to use DP resources to get immediate feedback on the implementation of their strategies.

DP security course set for July

SANTA CLARA, Calif. — A three-day course, "Recent Advances in Computer Security," is scheduled for July 16-18 at the University of California Extension Conference Center here.

The course is intended for security managers and others interested in computer security issues. It will provide an overview of computer technology and discuss recent advances in security products.

James Arlin Cooper of Sandia National Laboratories will conduct the course. He is adjunct professor of electrical engineering with the University of New Mexico at Albuquerque.

The registration fee is $645.

University of California Extension Center is located at 2223 Fulton St., Berkeley, Calif. 94720.

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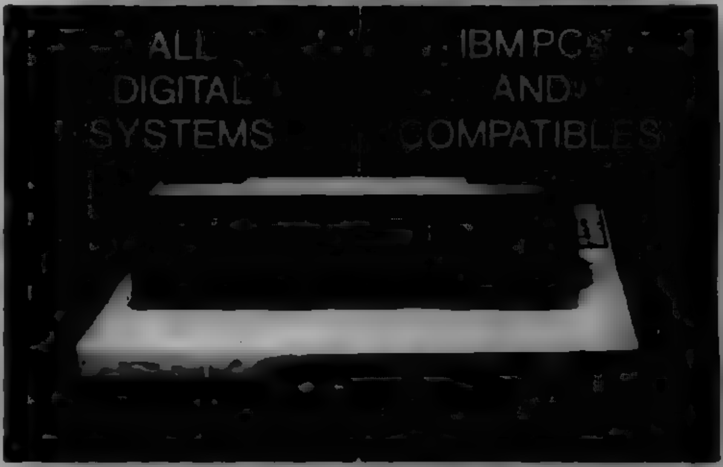

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Technology advances to propel AI into micro arena

CW AT FUTURE COMPUTING

By Eric Bender
CW Staff

DALLAS — As artificial intelligence technology spreads from research and development into the real world, what role will be played by the personal computers now found on millions of desktops?

"If AI is going to happen, the bulk of the applications will be on personal computer-type machines," predicted David Squire, AI program manager at Tektronix, Inc.

Speaking last week at the Future Computing, Inc. Forum on AI and Personal Computers here, Squire said that near-term hardware advances, including microprocessors optimized for AI applications, will accelerate AI's move into the micro arena.

"AI-optimized general [microprocessors] will exceed the performance of customized AI processors now," Squires forecast. "We think that will happen within 1½ to two years."

As one example, Squire said, during a recent trip to Japan he saw a demonstration of a Motorola, Inc. 68000 coprocessor plugged into a NEC Corp. personal computer "that runs Smalltalk with about the same performance as a [Xerox Corp.] Dolphin."

AI-optimized chips will begin filtering into personal computers as add-on boards within about a year, said Future Computing chairman Egil Juliussen. "In the 1987-1988 time frame, we see them built into the product," he said, speculating that about half the personal computers shipped might be so equipped.

However, "It's a lot easier to have [personal computers] embedded inside AI machines," said Beau Shiel, product development manager at Xerox Artificial Intelligence Systems.

Optimized to handle resource-intensive tasks, such as function calls and "garbage collection," AI machines may keep standard micros off their turf longer than did dedicated systems for other uses such as computer-aided design, according to Shiel.

Current AI machines typically offer at least 2M bytes of internal memory, high-resolution graphics, "a reasonable amount of raw speed and a significant size of virtual memory," Shiel said. "Some of this is just luxury, but not all of it," he said.

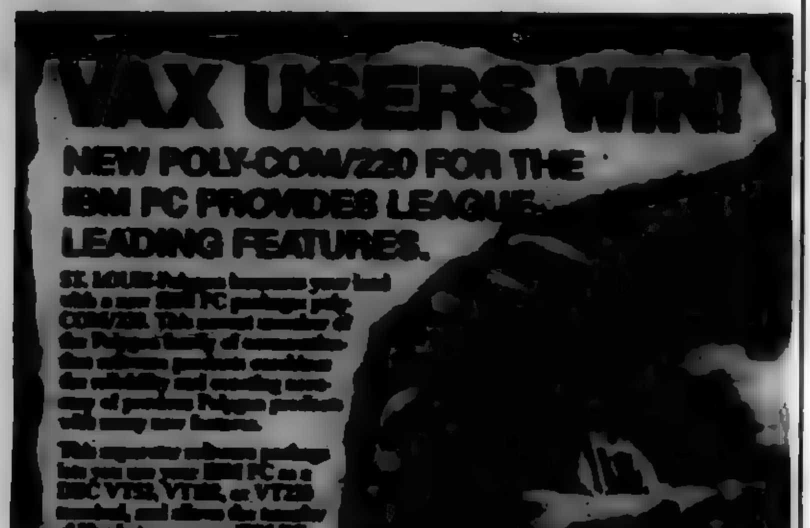
While many expect widespread use of microcomputers as AI delivery vehicles, Shiel pointed out that "a lot of AI applications are as demanding in their machine resources as the development effort [is]."

Although personal computer hardware is evolving rapidly, "It's clear today that the power isn't there," said Jim Spoerl, group manager for product marketing at Symbolics, Inc. in Cambridge, Mass.

However, Spoerl added that he considers personal computers a "major factor in continuing the advance of AI into the real commercial world." Suitable roles will include training, delivery of small AI applications as stand-alone machines and acting as workstations on distributed networks, he suggested.

Meanwhile, other vendors insisted that AI software can do useful work on personal computers today. Paul Robertson, president of Artelligence, Inc., claimed that his firm's implementation of Digital Equipment Corp.'s OPS5 language allows applications to run as quickly on an IBM Personal Computer XT as they do under OPS5 on a DEC VAX.

"The barrier is not the computational power," Robertson said. "With improvements we see in the pipeline, I don't think that's critical."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CW AT GOVERNMENT COMPUTER EXPO '85

Ramblings from the floor of last week's Government Computer Expo '85 in Washington, D.C.:

■ The exposition's keynote speaker urged government DP managers to be more cost-conscious when buying computer hardware and software to avoid the bad publicity on overpricing that has been hitting the Pentagon and its contractors. Maj. Gen. John T. Stihl, the U.S. Air Force's assistant chief of staff for information systems, said that if government managers can build up their credibility with the public, Congress and the White House, the problem of overregulation of computer procurement will be reduced.

■ Stihl also strongly urged government DP managers to evaluate user requirements for information before acquiring computer systems, in part to avoid giving decision makers a case of information overload. "In this world of ever-expanding requirements, we should think about what psychiatrists tell us: Decision makers, under pressure, discard information, avoid bringing in more information and stop exploring new alternatives," he said.

Consequently, he noted, "Information technologies that tend to inundate decision makers with useless data are not a positive influence."

■ The use of integrated software for microcomputers apparently is popular among bureaucrats. In a special program, the 500-member Integrated Software Federal Users Group sponsored workshops on government-oriented applications of integrated packages and in-depth discussions of such products as Lotus Development Corp.'s Symphony.

■ U.S. Rep. Charles Rose (D-N.C.) was one of four people awarded the *Government Computer News* Annual Award for Excellence at the exposition. Rose, who reportedly uses an Apple Computer, Inc. Macintosh, was cited for encouraging other members of Congress to use microcomputers in their offices. He is chairman of the House Subcommittee on Office Systems and founder of the Policy Group on Information and Computers.

Other award winners were James H. Burrows, director of the Institute for Computer Sciences and Technology; Donald J. Herman, executive vice-president of NCR Corp.; and Joseph R. Wright Jr., deputy director of the U.S. Office of Management and Budget.

■ The exposition had a long list of sponsors, all with long names: the Federation of Government Information Processing Councils, the Graduate School of the U.S. Department of Agriculture, the National Association of State Information Systems and the Information Resources Administration Councils. In a letter from the White House, President Reagan sent best wishes to them all.

EMA conference slated for Sept. 4

WASHINGTON, D.C. — The Electronic Mail Association (EMA) has announced that a conference, "Electronic Mail and Messaging: A Preview of the Next Decade," will be held Sept. 4 at the Mayflower Hotel here.

Discussion will include the X.400 international standards, which have been ratified by the Consultative Committee on International Telephone and Telegraph. Speaking will be Sen. Patrick J. Leahy (D-Vt.), a congressional leader on computer privacy and security issues.

The chairman of both the conference organizing committee and the EMA is Richard W. Coughenour.

The registration fee is $175. EMA is located at Suite 300, 1919 Pennsylvania Ave. N.W., Washington, D.C. 20006.

Firms in 'embryonic' AI mart pin hopes on growth

CW AT FUTURE COMPUTING

By Eric Bender
CW Staff

DALLAS — Although real-world applications of artificial intelligence technology are increasing rapidly, "the business is extremely embryonic," said Ralph Kromer, president of Intellicorp in Menlo Park, Calif.

"We're really in the technology transfer business," Kromer remarked at a Future Computing, Inc. conference on AI and personal computers here earlier this month. "We have to provide a considerable amount of training, consulting and applications support, and we can't tolerate very many failures."

No AI software firm has reached $10 million in annual sales, and "we're all fighting for survival," Kromer commented.

Other speakers at the Future Computing meeting also underlined the industry's immaturity. "Most of us in this market are in a cascade of vendors, all selling to each other," said Beau Shiel, product development manager at Xerox Artificial Intelligence Systems in Palo Alto, Calif.

"This isn't an industry so much as a bunch of hardware and software technology trying to get to the market," said Tim Williams, senior analyst at Future Computing. Among Fortune 1,000 firms, "even those who are spending hundreds of thousands or millions of dollars are just beginning to come out of the prototype stage."

But the conference presentations emphasized the AI market's tremendous long-term growth potential as well. Kromer noted that the installed base of system licenses for Intellicorp's Knowledge Engineering Environment product, which stood at only 40 last September, has doubled or better in each succeeding quarter.

Art Beane, manager of product management at Digital Equipment Corp.'s Artificial Intelligence Group, estimated that the value of the AI market will rise from $30 million in 1983 to between $190 million and $300 million this year and between $720 million and $11 billion in 1990.

"I can count over a thousand applications being developed by companies for vertical markets," said Larry Geisel, president of Carnegie Group, Inc., a Pittsburgh-based software vendor. The aerospace, automotive, electronics and defense industries "are all making major, major commitments to AI," he said.

Among hardware advances that will help to drive the market for resource-hungry AI applications, executives said, are 32-bit general-purpose microprocessors, multiprocessor architectures, 1M-bit random-access memory chips and very large-scale integration processors customized for AI applications.

One example of upcoming AI silicon is a 32-bit chip being developed by Texas Instruments, Inc. that executes Common Lisp, designed as a functional replacement for the company's Explorer machine and funded by the U.S. Department of Defense's Defense Advanced Research Projects Agency, noted Joe Watson, TI's vice-president for digital systems.

The experts also sounded a general note of caution against raising customer expectations too high. "What I fear the most are exaggerated product claims," said Future Computing Chairman Egil Juliussen.

> ”
>
> *'Most of us are in a cascade of vendors selling to each other.'*
>
> — Beau Shiel
> Xerox Corp.

Simulation meet planned for July

CHICAGO — The Society for Computer Simulation is sponsoring the Summer Computer Simulation Conference July 22-24 at the Westin Hotel here.

The keynote address, "Computer Simulation and the Demand Reality," will be given by Edward E. David Jr., president of Exxon Research and Engineering Co. in Annandale, N.J. There are a number of full-day sessions scheduled on several topics.

Registration for the conference costs $175 for society members and $200 for nonmembers. Additional fees are $400 for the expert system seminars and $150 for the panel discussions. The Society for Computer Simulation can be reached through P.O. Box 17900, San Diego, Calif. 92117.

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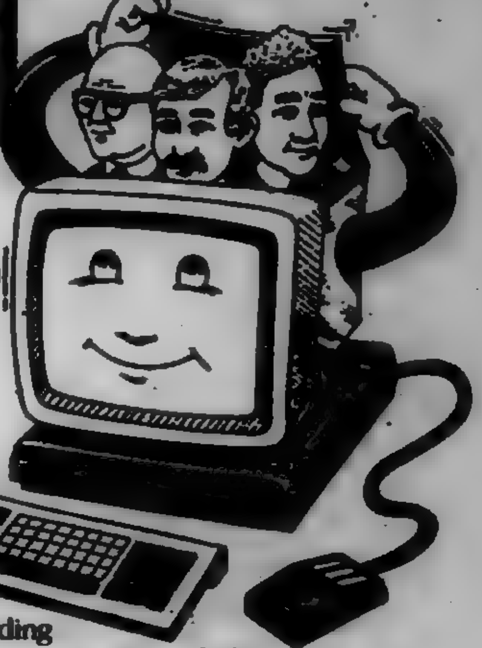

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Kurzweil introduces word recognition peripheral

KVS 3000 vocabulary includes 1,000 words

WALTHAM, Mass. — Kurzweil Applied Intelligence, Inc. last week announced a programmable computer peripheral, or board-level device, that reportedly recognizes up to 1,000 spoken words with an accuracy of approximately 96%.

Marketing Director Robert Joseph said the Kurzweil Voicesystem 3000 (KVS 3000) can be used in data entry applications, for command of financial and word processing software and for medical and insurance form reporting.

Joseph said Xerox Corp. and Wang Laboratories, Inc., both investors in the Kurzweil speech recognition enterprise, may market the KVS 3000 along with their own systems. No final agreement, however, has been reached with the two companies, he said.

Compares words with speech tokens

The KVS 3000 is said to compare words spoken into a microphone with a memory of 3,000 sample speech tokens. To program the memory, a user types in 1,000 chosen words. In response to prompts, one or more users then repeats each word into the machine three times.

At that point, the programmed memory will contain 3,000 speech tokens, three for each word. The machine displays the utterances in its memory that most closely match the spoken words. The word recognition process takes an average of 50 msec, the vendor said.

The KVS 3000 is scheduled for third-quarter availability. Shipments to beta users are scheduled for this month, a spokesman said.

Increments of 3,000 tokens

The KVS 3000 reportedly can be expanded in 3,000-token increments to a total of 15,000 tokens by adding more memory boards. The expanded configuration offers a total of 5,000 words of speaker-dependent recognition, enough vocabulary to support limited text dictation applications, according to the vendor.

The KVS 3000 is available either as a board set for use with host systems compatible with Intel Corp.'s Multibus or as a self-contained 18-lb desktop package with RS-232 output, a spokesman said. The KVS 3000 will also be offered with Microsoft Corp.'s MS-DOS software for standard microcomputer systems, Kurzweil said.

The product includes three boards: an audio processor for handling analog signal conditioning and analog-to-digital conversion, a pattern processor that stores acoustic patterns and provides real-time recognition processing and a speech processor for coordinating the activities of the audio and pattern processor.

The hardware is said to include a Motorola, Inc. 68000 microprocessor, 640K bytes of random-access memory for program and data storage and the company's programmable digital filter chips, which aid the signal processing and conditioning task, according to Kurzweil.

Adapts to user speech patterns

The system's software is designed to adapt itself to a user's speech patterns, with improved performance over time. The system reportedly continues to collect samples of speech during actual work.

The company refers to the KVS 3000 as a building block for a 10,000-word speech-to-text system, which is scheduled for delivery in the fourth quarter of 1986. The company said that there are distinct differences between voice recognition and speech recognition systems.

A voice system discriminates between words but not homonyms. A speech system, however, has linguistic software that recognizes homonyms and punctuation, Joseph said.

Word recognition vs. speech recognition

The 10,000-word Voicesystem will be a word processing system, but the KVS 3000 is a word recognition system and not a speech recognition system. Joseph said the average executive can meet 98% of letter- and report-writing needs with a 10,000-word vocabulary. Shakespeare, he said, used 39,000 words in all his writing.

The KVS 3000 is sold as a self-contained package with RS-232 interface for $6,000. With the IBM Personal Computer XT or AT interface, the price of the package is $6,500. As a Multibus-compatible board set, the system sells for $5,000, with discounts for OEMs.

Additional memory boards with a 3,000-token capacity each will be sold for $2,000 each, or $3,000 each in a package with RS-232 output. The additional boards are scheduled for fourth-quarter delivery.

Kurzweil is located at 411 Waverly Oaks Road, Waltham, Mass. 02154.

Poll finds DP hiring up

CLEVELAND — Job seekers in data processing should expect their chances to improve moderately in the second half of this year, according to a recent poll by Management Recruiters International, Inc., a recruiting firm here.

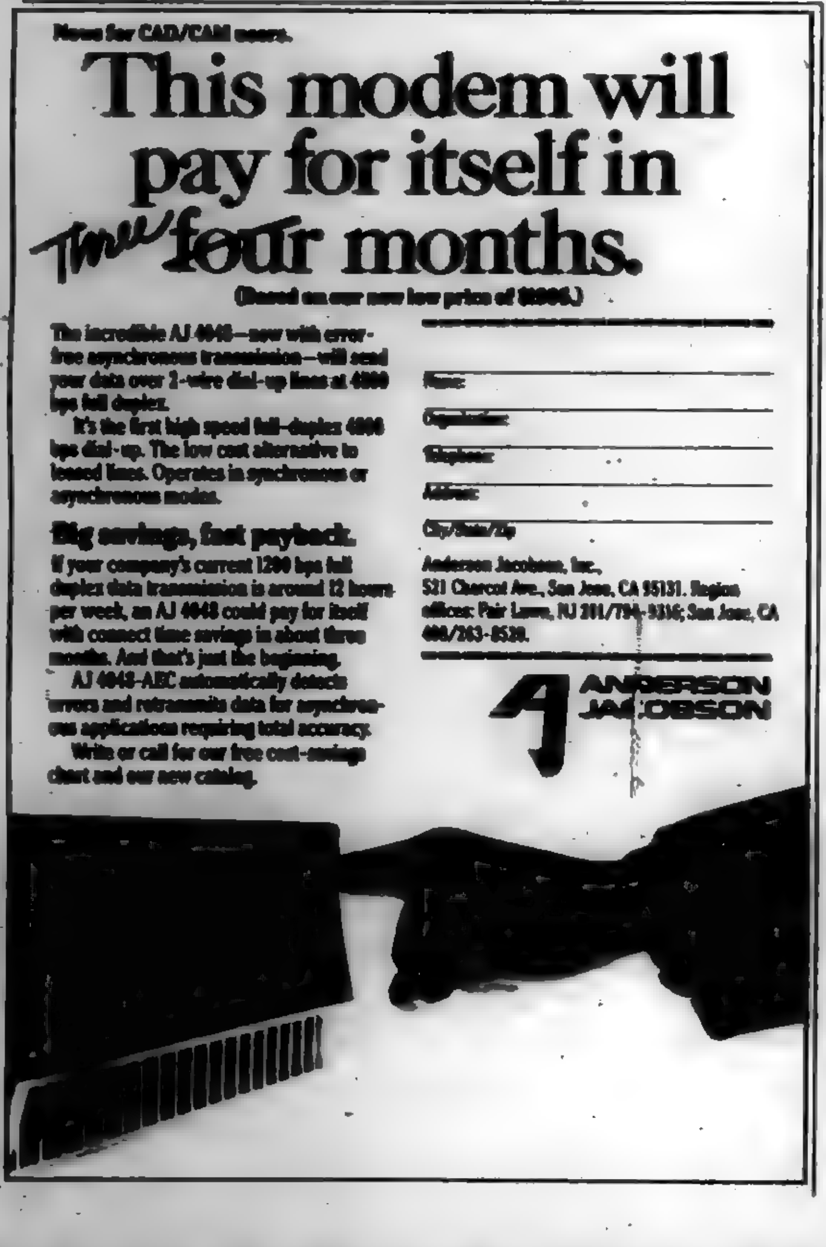
The survey found 41.7% of the 436 firms polled would increase their hiring in the next six months. For the first six months of 1985, an earlier poll taken by the same firm had found 35.8% of respondents expected to increase their hiring, a projection 5.9% less than the current one.

Only 7.1% of the latest poll's respondents said they would decrease hiring, while 50.7% said they would maintain their current levels, Management Recruiters said.

As for which areas of the country will do best, the poll singled out the South Central states, including Georgia, Alabama and Tennessee, and the North Central states, including Illinois, Wisconsin, Ohio and Michigan. Fifty percent of the companies responding from the South Central region said they would increase their data processing staffs.

When the responding firms were grouped by industries, the winners — those firms that would increase their hiring — were the electrical industry and the transportation and communications sectors.

The losing firms were the construction, lumber and wood, fabricated metal products and machinery industries.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U.S. agency faces probes, boosts security after audit

Interior questioned lottery procedures

By Mitch Betts
CW Washington Bureau

Computer security is being strengthened at the U.S. Bureau of Land Management's (BLM) computer center in Denver, following an internal investigation that indicated inadequate controls could jeopardize the integrity of the BLM's computerized lotteries for oil and gas leases.

In March, the inspector general of the U.S. Department of the Interior issued an audit report citing the Denver Service Center for inadequate controls over passwords, a lack of audit trails and faulty operating procedures.

Because of the inadequate security, the Office of the Inspector General reported that it could not vouch for the integrity of the BLM's computerized lottery and could not determine whether the lottery had been manipulated to favor certain energy companies, the audit said.

In response, Bobby Hooker, the BLM's computer security officer in Denver, said, "We're developing stricter management features to better control access to the system." He indicated that the stricter controls cover audit trails, passwords and access to the system.

Questions about BLM's computer security surfaced last October when the BLM awarded drilling rights on federal land tract W-698 in northeastern Wyoming to Seco Energy Corp., the same firm that had requested that the tract be included in the lottery. The bimonthly lottery is supposed to pick winners at random.

The Federal Bureau of Investigation, the Interior Department and the U.S. House of Representatives' Committee on Interior and Insular Affairs reportedly are investigating the lottery to determine whether Seco's win was a coincidence or not.

The inspector general's audit concluded that, "because of poor internal controls and the lack of audit trails in the automated process, we could not prove that the [lottery] system was manipulated to the benefit of one or more applicants. However, because of the same weaknesses and other deficiencies, we do not have confidence that the [lottery] was not manipulated."

The audit, conducted in November and December, cited the following problems:

- Passwords for most leasing programs and data were changed only once in the past year. Also, passwords, when entered at a VDT, were not automatically deleted or rendered illegible, thus allowing unauthorized persons to obtain them through observation.
- Keywords used to access the most sensitive computer programs also were not changed frequently or periodically. "Responsible personnel informed us that the last date of change was unknown but estimated the keywords had not been changed in the last two years," the audit said.

> *Because of weaknesses and other deficiencies, we do not have confidence that the [lottery] was not manipulated.*
>
> — U.S. Department of the Interior audit report

- The computer center did not use the system's activity log as an audit trail, and no one was assigned to monitor the activity log for irregular or suspicious activity. The random number assigned to the lottery winner was not kept for confirmation.
- Computer programs and subsequent changes to them have not been documented. Also, there was no validation testing of the random-number algorithm in the last five years, prompting doubts about the randomness of the numbers generated.
- The "computer files were accessible and could easily be displayed by any user of the BLM computer system. This feature of the system further reduces confidence that the [leasing] programs and data files are free from unauthorized use or manipulation," the audit said.
- Computer programmers develop and test computer programs for the lottery in the same working area as the computer running the lottery. This could result in the wrong computer program being executed in the lottery, the audit said.

Hooker said the BLM is implementing the security improvements recommended in the audit report. He declined to discuss the additional security measures.

Other BLM officials said the reforms include changing the password at least four times a year, ensuring that passwords are not displayed on the VDT screen and monitoring an audit trail. However, documenting the computer programs will be difficult, according to Delmar D. Vail, director of the Denver Service Center, because of problems in recruiting qualified workers to do the job.

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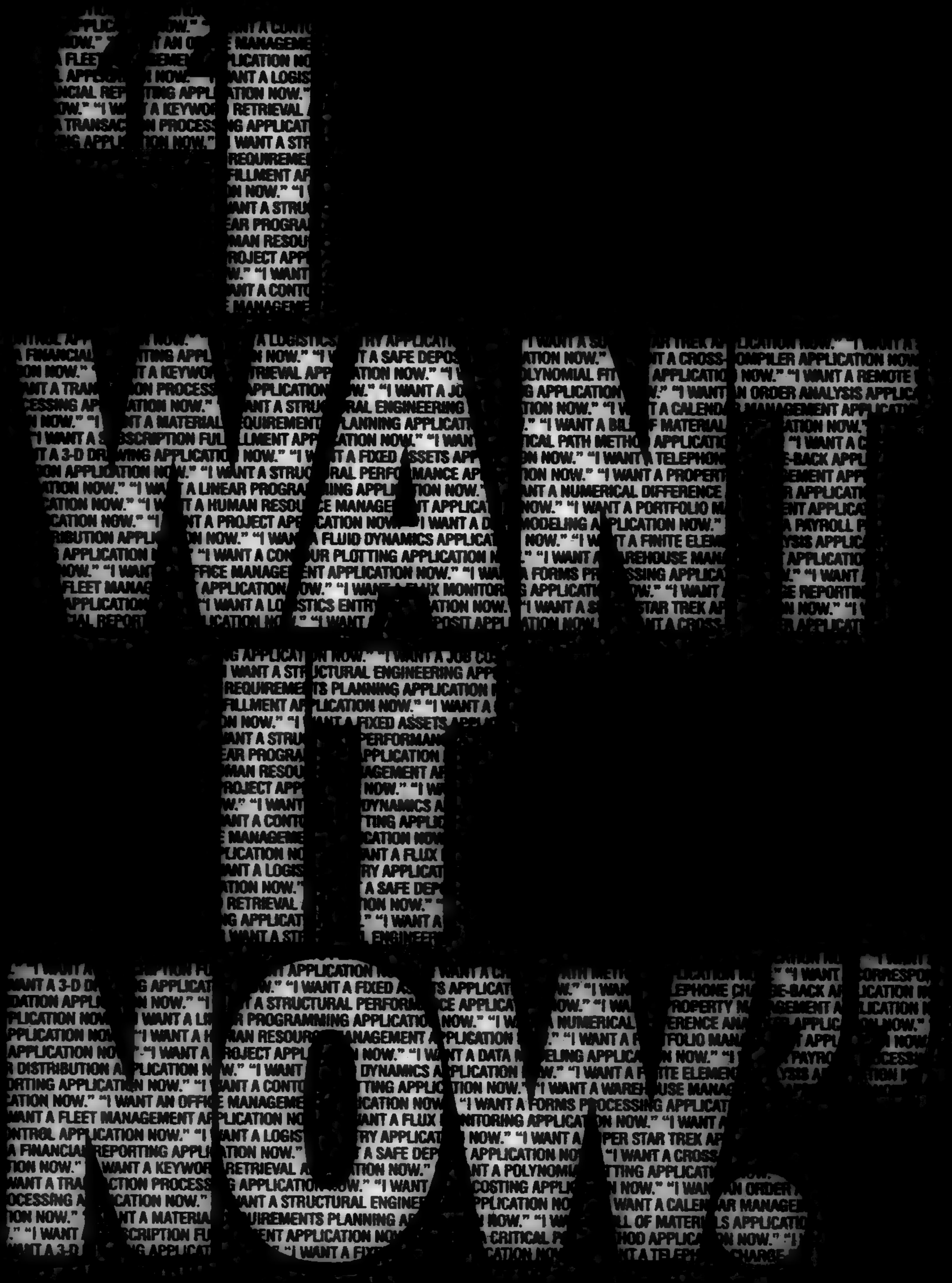
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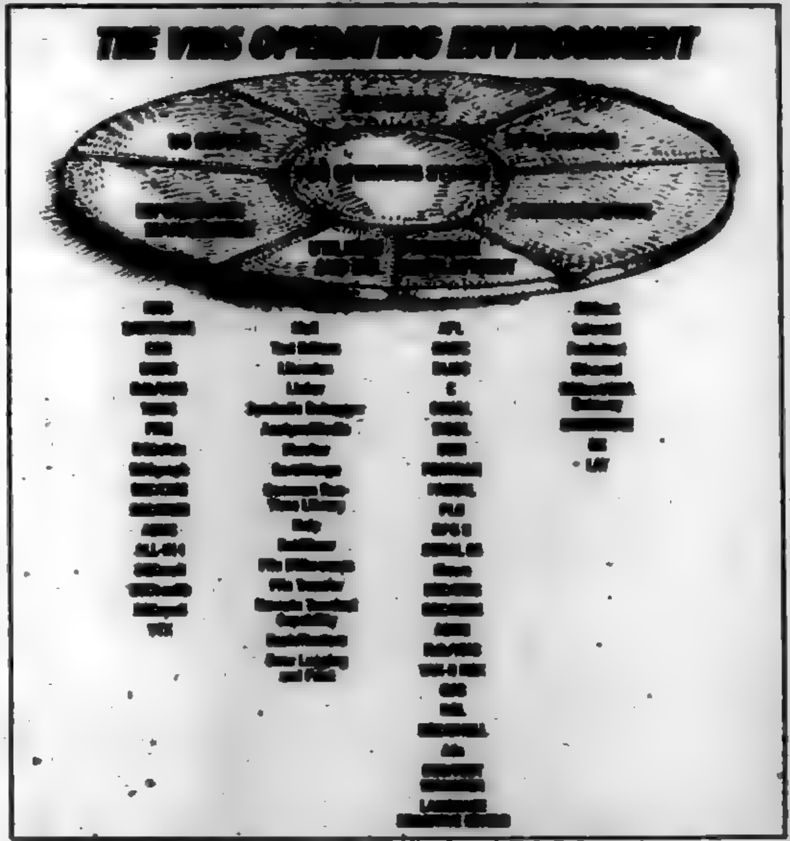

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Congress ponders ban on sales to South Africa

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Congress is on the verge of passing legislation that would ban the sale of computers, computer parts and software to South Africa's government. The legislation is part of a package of economic sanctions against that country's apartheid policy.

The U.S. House of Representatives and the Senate Foreign Relations Committee already have passed slightly different versions of the legislation. Sometime before Congress' July 4 recess, the Senate is expected to approve the committee bill, according to Claude Allen, spokesman for the Senate panel.

Section 7 of the House bill (H.R. 1460) states: "No computers, computer software or goods or technology intended to service computers may be exported, directly or indirectly, to or for use by the government of South Africa or any corporation, partnership or other organization which is owned or controlled by the government of South Africa."

Certain exemptions

The provision does not apply to donations of computers to primary or secondary schools. The bill levies stiff penalties on violators, including a $1 million fine for businesses and a five-year jail term for company officials.

The House legislation, which also bans new investments in South Africa by U.S. businesses, was approved June 5 by a 295 to 127 vote.

Rep. Howard L. Berman (D-Calif.) is the author of the computer export ban in the Anti-Apartheid Act of 1985. Berman said U.S. companies supply 70% of the computers sold in South Africa and argued that these computers help the government to enforce its racial policies.

Take computers out of their hands

"The only way that we can ensure that no American computers are used to enforce apartheid is to take computers out of the hands of all South African government agencies," according to Berman.

Berman said that detailed dossiers are kept on South Africa's blacks to monitor their movements and activities. "Computers are used to collect, retrieve and employ this information in the repression of those who fight to eliminate apartheid," he asserted.

The Senate Foreign Relations Committee's bill (S. 995) has a somewhat more limited scope than does the House bill. S. 995 bans the sale of computers and software to those agencies of South Africa's government that enforce apartheid. The committee approved the bill on June 4 by a 16 to one vote.

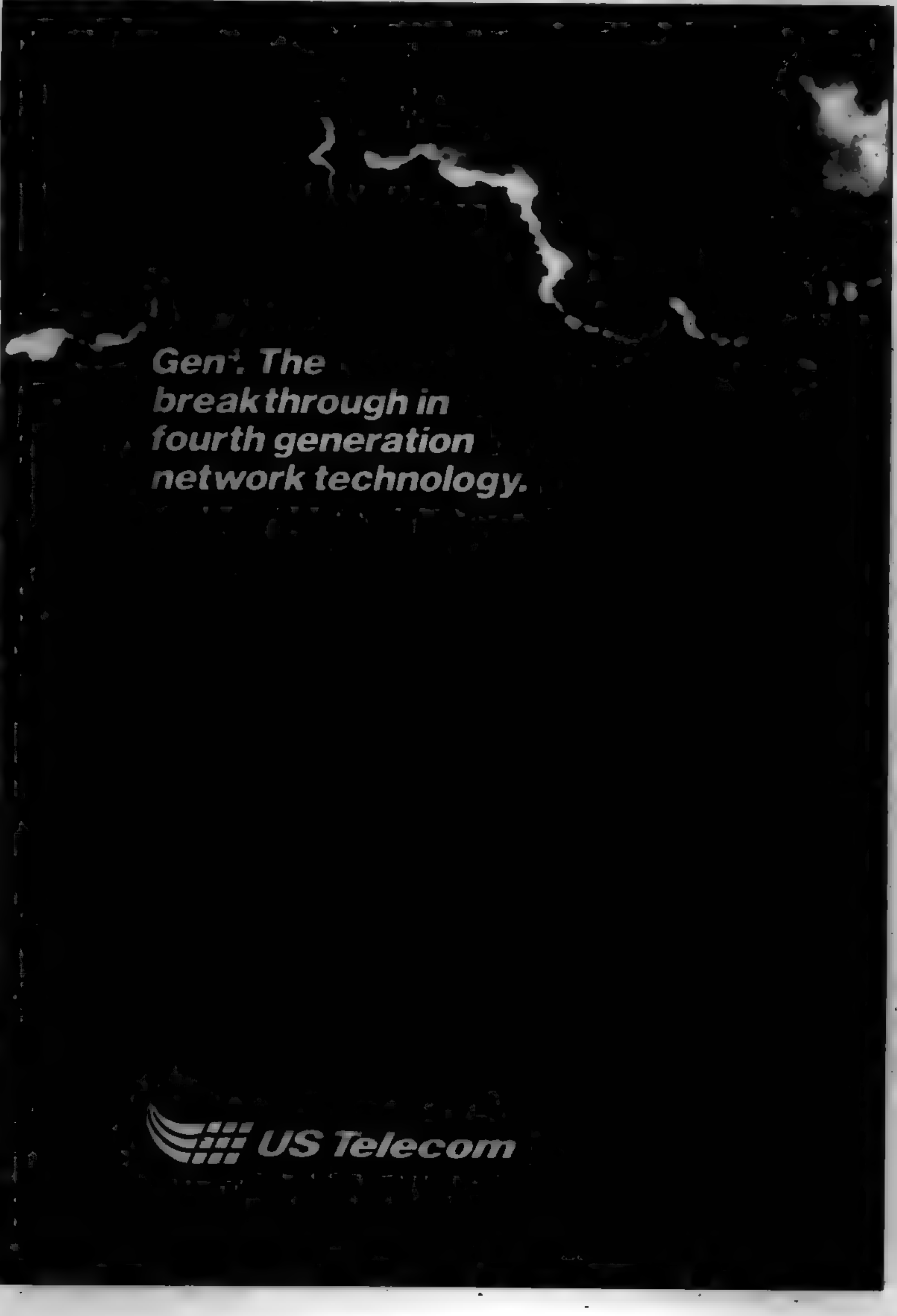
Rep. Berman, opposing this approach, said it would be fruitless to try to distinguish between "good" and "bad" agencies. "Many [computers] have been purchased through the government's central purchasing agent, the State Tender Board. It is all but impossible to track the use of an American computer once it has been sold to the central purchasing office," he said.

Cbema supports Senate bill

The Computer and Business Equipment Manufacturers Association (Cbema), based here, supports the Senate approach and strongly opposes the broader House bill, according to Cbema spokeswoman Charlotte LeGates.

She said that S. 995 correctly limits the ban to the apartheid-enforcing agencies that need to be sanctioned. The House bill, on the other hand, is too broad, will have no effect on apartheid and will allow U.S. competitors to jump into the market, LeGates said.

The Reagan administration opposes both versions of the legislation, raising the prospect of a possible presidential veto. Administration officials said the legislation would discourage U.S. businesses — some of which provide jobs to South African blacks in desegregated workplaces — from remaining in that country.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Feedback '85 fall meet set

TOPEKA, Kan. — Feedback '85, the 10th annual conference for users of the Ken Orr and Associates, Inc. Data Structured Systems Development method of software and systems design, will be held Oct. 8-10 at the Holiday Inn Holidome here.

The conference theme will be computer-aided software engineering. Speakers will discuss trends, problems and the potential future of automated software engineering and knowledge engineering tools.

Master of ceremonies will be Nastec Corp. President Jim McGuire, whose company has developed a computer-aided systems development environment, the Nastec Design Aid.

Cost of the conference is $500 before Sept. 6 and $550 after that date, according to the sponsor.

For additional information, Ken Orr and Associates is headquartered at 1725 Gage Blvd., Topeka, Kan. 66604.

Copyright council formed

WASHINGTON D.C. — Several trade organizations and businesses recently announced formation of the American Copyright Council, which will begin a public education campaign about the importance of copyright protection for creative works, such as computer software.

Charter members include the Association of Data Processing Service Organizations, Inc., the Computer and Business Equipment Manufacturers Association and the Information Industry Association, as well as publishing, entertainment and art organizations.

Council officials said that without copyright protection many creative industries could disappear, hurting the economy of the U.S. "Copyright is the wellspring of a $141 billion industry," said Stanley Gortikov, chairman of the council. "Yet copyright is more and more at risk these days. It is becoming an endangered species," he said at a recent meeting here.

Copyright is threatened by new methods of duplicating copyrighted works, such as photocopiers, tape recorders, videocassette recorders and personal computers, officials said. "The revolution in computer and telecommunications technology provides storage and instantaneous transmission of copyrighted works on a scale not previously known," a council statement said.

The council's Declaration of Mission and Principles stated that copyrights provide the marketplace with creative works at reasonable prices, compensate creators for their efforts, encourage creativity and induce public dissemination.

Copyright principles are neither outmoded nor are they obstacles to advancement in technology, the statement said. "Copyright can, as it has in the past, coexist with technology," it said.

The council is located at 1300 New Hampshire Ave. N.W., Washington, D.C. 20036.

N.J. court strikes down law banning Sunday system use

By Charles Babcock
CW New York Bureau

PARAMUS, N.J. — Companies that want employees to operate computers on Sunday are no longer breaking the law in here.

The borough's blue law prohibiting "worldly employment" on Sunday has been struck down by an appeals court.

"This decision will relieve the stigma on Paramus. It will help us fill some of our office space," said Ralph Henig of Mack Co., an office building developer who challenged the law.

Paramus Mayor Joseph Cipolla, a defender of the blue law, said, "It isn't a dead issue," and has directed attorneys to petition the N.J. Supreme Court to review the case.

While conceding that the blue law hurt office space rentals, Cipolla said the borough allowed exceptions. The American Bureau of Shipping, a sea freight company, was told by the mayor and council prior to the court decision to move into a Paramus office building. It would be allowed to have an employee work on its computers on Sundays by notifying police when doing so, he said.

Paramus' interpretation of worldly employment was so strict that its police once arrested a lawyer for writing a brief at his office on Sunday and a graduate student for working on her degree at her place of employment, an IBM Product Center.

Cipolla said the blue law was never intended to single out computer work but was construed in the strictest sense possible to keep retailers closed. Paramus is a crossroads community a few miles from the George Washington Bridge leading into New York's borough of Manhattan, and the residents wanted a day's relief from traffic, the mayor said.

MIT's Rockart to address SIM conference slated for Sept. 8-12

BOSTON — The director of MIT's Sloan School of Management will be the keynote speaker at the Society for Information Management's (SIM) annual conference here Sept. 8-12.

John F. Rockart will speak on management strategies of end-user computing, SIM said. Also scheduled to speak is James Martin, an author and lecturer.

The conference will focus on managing the end-user computing explosion and will include coverage of such topics as managing the marketplace for end-user computing, integrating office automation with other systems and investigating the emerging software technologies.

The conference will feature eight workshop sessions and the national SIM research paper presentation. Conference and workshop registration costs $1,175 for members, $600 for faculty members of SIM and $1,295 for nonmembers. Conference-only registration is $895 for members, $450 for faculty members of SIM and $995 for nonmembers. Workshop-only registration is $350 for members, $250 for faculty members and $395 for nonmembers.

The SIM Conference Office is located at Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Japanese chip designs granted protection by U.S. patent office

WASHINGTON, D.C. — The U.S. Patent and Trademark Office recently granted copyright-like protection for Japanese semiconductor chip designs.

The Semiconductor Chip Protection Act of 1984, which provides special legal protection against the copying of original chip designs, also makes foreign chip designs eligible for protection in the U.S. under certain conditions.

"The record supports the conclusion that the Japanese government is making good-faith efforts and reasonable progress toward enacting legislation that would be in compliance with the U.S. law," according to Donald J. Quigg, acting U.S. commissioner of patents and trademarks.

The order was the first one that involved chip protection for another nation since enactment of the U.S. law in November (CW, Oct. 10, Jan. 21).

The law provides a 10-year term of protection for original "mask works" either from the date of registration with the U.S. Copyright Office or from the date of the first commercial exploitation.

The order is retroactive to Nov. 8, 1984, and it terminates on June 6, 1986.

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COMPUTERWORLD

VDT-related laws pass in two states

Two more states recently added laws pertaining to the use of VDTs.

In Rhode Island, the nation's first VDT bill to become law this year requires the state's Department of Labor to produce a brochure on VDTs in the workplace and to conduct workshops and training sessions on VDT operation.

Although not directed specifically at VDT workers, a new Maine law now mandates 30-minute rest breaks for every six hours of work for all state and private employees. The bill applies to all workers in the state, including VDT operators.

This year, VDT-related legislation was filed in more than 20 states.

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INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

CANBERRA — Promises made were promises kept when the federal government approved a 150% tax write-off for research and development efforts here. The legislation delivered by Australia's Ministry for Industry, Technology and Commerce goes into effect July 1.

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SYDNEY — The first system crash happened at the New South Wales Health Department before the agency even switched on its brand-new Digital Equipment Corp. VAX 8600. After delivery to the site, the VAX 8600 system crashed through the floor of the computer room and narrowly avoided plunging out a window, sources reported. The department, which had the computer room built by a third party rather than DEC, fortunately had opted for DEC's insurance plan. DEC Pty. Ltd. replaced the damaged machine within a week, a spokesman said. The embarrassed health department is presently conducting an investigation into the cause of the accident.

•

SYDNEY — A newspaper publisher here is so confident of Facom Ltd.'s reliability that it will upgrade its current dual system with a single M3800 mainframe. "We've never had a reliability problem where the whole show is off the air during the six years we've been using the two smaller Facom M160s," said Frank McMahon, DP manager for John Fairfax and Sons Ltd. The paper had used one system for on-line processing and the other for batch purposes and for backup in emergencies, but an emergency never occurred, McMahon said.

BELGIUM

BRUSSELS — Europe will capture roughly 30% of the world market for new technologies, which translates to 10 million new jobs, according to industry guru Etienne Davignon.

The European Economic Community, which will consist of twelve member countries as of January 1986, can combine in an open market 25% larger than the U.S. market, Davignon claimed. It is not the technology that will spell success for the European high-tech community, Davignon argued, but rather Europe's political infrastructure.

•

BRUSSELS — Belgium's Postal Telephone and Telegraph (PTT) agency is planning to extend its videotex service to up to 10,000 subscribers this year. The system runs on Videogate front-end computers, which are manufactured by British Microscope, and has a current user base of 5,000, a spokesman said.

The network conforms to European videotex standards and is able to support French Teletel and the UK's Prestel videotex services. Belgian videotex subscribers reportedly have access to public and private information services and to international networks. The Belgian PTT's videotex service is expected to improve its financial standing. The agency posted profits of $5 billion for 1984 and losses of $500 million in 1983.

ENGLAND

LONDON — Japan's biggest micro manufacturer has turned its back on IBM, vying to become the No. 1 alternative supplier here. NEC Corp. has launched the APC III in the UK, with a promise to work closely with British software houses to develop products for its micro. The product is a single-user, stand-alone system priced at $3,300 for a monochrome

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Second, [illegible] highly [illegible]

screen and $3,800 with a color screen. It comes with the NEC Foundation Package, a system with word processing, telecommunications and calculator/clock functions, the vendor said.

■

LONDON — Dealers who guarantee the systems they sell are taking unreasonable risks, according to a high-tech insurance company here. Wigglesworth Insurance Ltd. has introduced a policy to cover dealers' maintenance contracts because it believes these dealers are "dabbling in insurance without reinsurance," resulting in an average of one dealer going into liquidation every week, a spokesman said.

FINLAND

HELSINKI — Digital Equipment Corp. is the first vendor to sell an integrated cluster solution here. DEC sold two VAX-11/785 systems, a collection of Microvax II machines, PDP-11/73 systems and its Ethernet communications network to Oy Kaukas Papermill to provide the company with production management, quality assurance, marketing and MIS capabilities.

The implementation, valued at $1.5 million, is slated for next January, according to a company spokesman. The paper manufacturer is located 10 miles from the Soviet border.

FRANCE

PARIS — Bull has signed a tentative agreement with Japan-based NEC Corp. that will reportedly enable the French group to extend the power of its DPS 7 line of medium-size processors with NEC equipment. The agreement calls for Bull to purchase NEC's Acos 750 CPU, which is said to be similar in architecture to that of the Bull machines.

Meanwhile, Bull announced five additions to its line of DPS 90 systems, similar in configuration to those recently announced by Honeywell Information Systems, Inc., Bull's U.S. affiliate. The Bull announcements include the following systems: a single processor, a dual processor, a fully redundant processor, a triple processor and a four-processor configuration.

■

PARIS — Gould, Inc. introduced a clustered computer configuration, called the SCI-Clone 32, during the recent International Aeronautical Exhibition here. The product, based on the vendor's SCI-Clone 32 line of superminicomputers, is intended for real-time and simulation applications, a spokesman said. It reportedly operates at 30 million instructions per sec., consists of a host and up to eight nodes, with each node composed of one to four CPUs.

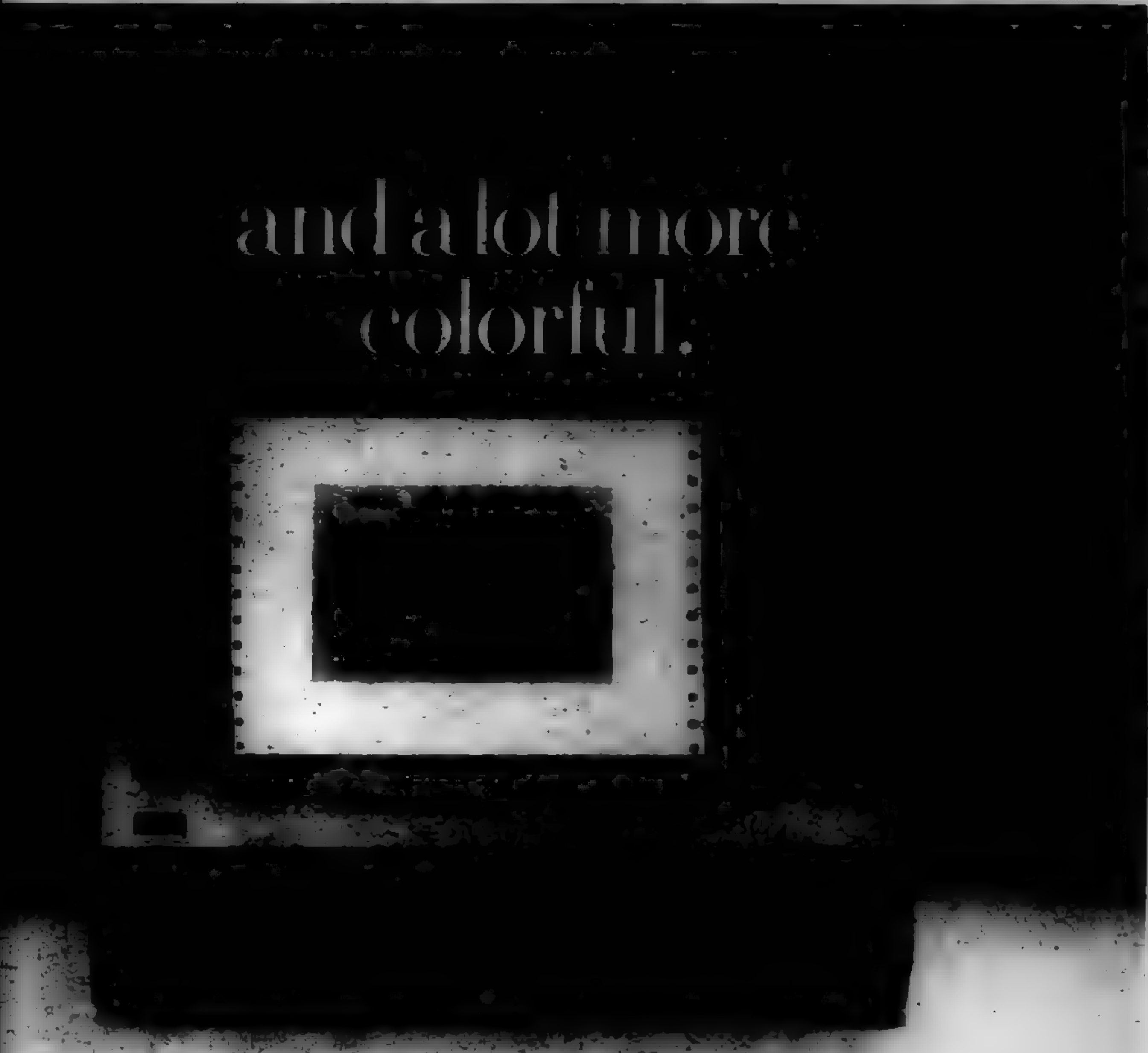
The network is connected via a communications bus working at 26M bit/sec., the vendor said. A basic configuration of the SCI-Clone 32 will cost about $150,000. The product will be announced in the U.S. at a later date, the vendor said.

JAPAN

TOKYO — IBM Japan and Computer Service Corp. (CSC), an independent software firm here, have established a company called Japan Information Engineering Company Ltd. The joint venture is expected to begin operations in October. IBM Japan, holding 35% of the company, will provide technical assistance in the design and construction of large-scale information systems. CSC will handle the bulk of applications development, a spokesman said.

NETHERLANDS

EINDHOVEN — Philips Information Systems, Inc. has acquired a division of the Computer Center of Limburg, a major Digital Equipment Corp. systems house here. In the recent takeover bid, Philips beat the large Dutch group Minihouse, one of the largest DEC systems houses in Europe, according to sources.



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Software saves ambulance firm from billing trauma

COVINA, Calif. — "Hurry up and wait" was the status quo at an ambulance service here until the firm automated its billing and collection procedures.

"Our job is to make sure our patients are transported as quickly as possible from the scene of an accident to the nearest hospital," said Jim Decker, president of Crippen Ambulance Service, Inc. But Crippen often had to wait months to get paid for its services.

"Being in the ambulance business, we can't control the types of patients that we pick up at the scene of an accident," Decker said. "We can't run a credit check to see if a patient has the ability to pay us — that's not our job."

The company answers about 1,500 ambulance calls a month and sends bills for its services to a variety of third-party insurance companies, to Medicare and Medicaid and to individual patients who have no insurance. The volume and variety caused record-keeping problems.

"It was extremely hard to track where all our money should have been coming from," Decker said. In addition, 40% of Crippen's billings went to Medicare, which sometimes took up to 60 days to turn around claims and to issue payments. Crippen installed two software packages, both from Lion Computers, to tackle its billing and collection problems.

In 1980, it installed Lion's Ambulance Billing and Collection System (ABCS), which Crippen helped the vendor put together. The system generates bills, based on coded information keyed into it from ambulance attendants' reports, and also produces reports that help Crippen track its billings and manage its business.

When an ambulance driver or attendant returns from a call, he fills out a worksheet that includes information such as the patient's name and address, his doctor's name, the type of medical service provided, the type of insurance the patient holds, the mileage on the call, whether the call was a night call that carries a surcharge and whether it was an emergency or not.

Employees in Crippen's billing department enter the information into a 196K-byte Data General Corp. Nova 3, where the ambulance call data is run against Crippen's service rates, which are maintained on the machine. The system then generates itemized bills for customers or their insurance agents.

ABCS also generates operational and revenue reports on demand that the company uses to help manage its business.

Operational reports break down information by different variables to show how efficiently the company is using its resources. Geographical reports, for example, show how many calls are made in the different areas Crippen serves. If two areas are near each other and one generates twice as many ambulance calls as the other, Crippen will shift each area's boundary to make the volume more equitable, according to John Wilson, the firm's general manager.

Revenue reports track the firm's profitability and help it adjust its rates. If one area consistently has a large number of customers who do not pay their bills, Crippen may choose either to stop serving the area or to raise its rates there. This way, Wilson said, "Those who do pay you make up for those who don't pay you."

Crippen installed its second software package in 1983 to help it recover Medicare payments as quickly as possible. The software, Lion's Electronic Billing, pro-

See TRACK page 31

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Insurer uses electronic billing

Cuts claims load, turnover time

LOS ANGELES — For the insurance firm that administers Medicare monies in most of Southern California, electronic billing to health care providers like Crippen Ambulance Service, Inc. has eased the crunch between a staff shortage and a growing Medicare claims load.

"We can't hire enough [people] to keep up with the claims volume," said Stan Kirkham, Transamerica Occidental Life Insurance Co.'s manager of electronic media claims operations.

Transamerica's Medicare claims processing doubled in 1980, when the Medicare administration redrew the boundaries of the areas in which its carriers operated. Carriers like Transamerica are authorized to draw on a Medicare trust fund in order to pay health care providers in a given region for services they administer to Medicare recipients.

Since the redistricting in 1980, Transamerica's claims processing has increased 10% a year. Along with this, the U.S. Department of Health and Human Services' Health Care Financing Administration, which administers the Medicare program nationally, has cut back on money it provides carriers for Medicare processing. The cuts affect staffing levels.

Electronic billing helps Transamerica reconcile the gap between claims volume and its staff shortage by allowing individual staff members to handle more claims. Eight claims examiners can process 150,000 to 175,000 claims per month electronically, Kirkham said. With claims that come in on paper, the same monthly volume would require the services of between 45 and 50 examiners.

The insurance firm began to develop computerized processing for the health care providers it serves in 1979, when a mandate from the government directed it to do so. That mandate said insurance firms that administer Medicare money to physicians, clinics, ambulance companies and other health care providers had to computerize their operations.

Transamerica responded with a two-pronged approach: First it offered automated claims processing by magnetic tape, then it opened up the service to health care providers who had telecom-

See CLAIMS page 31

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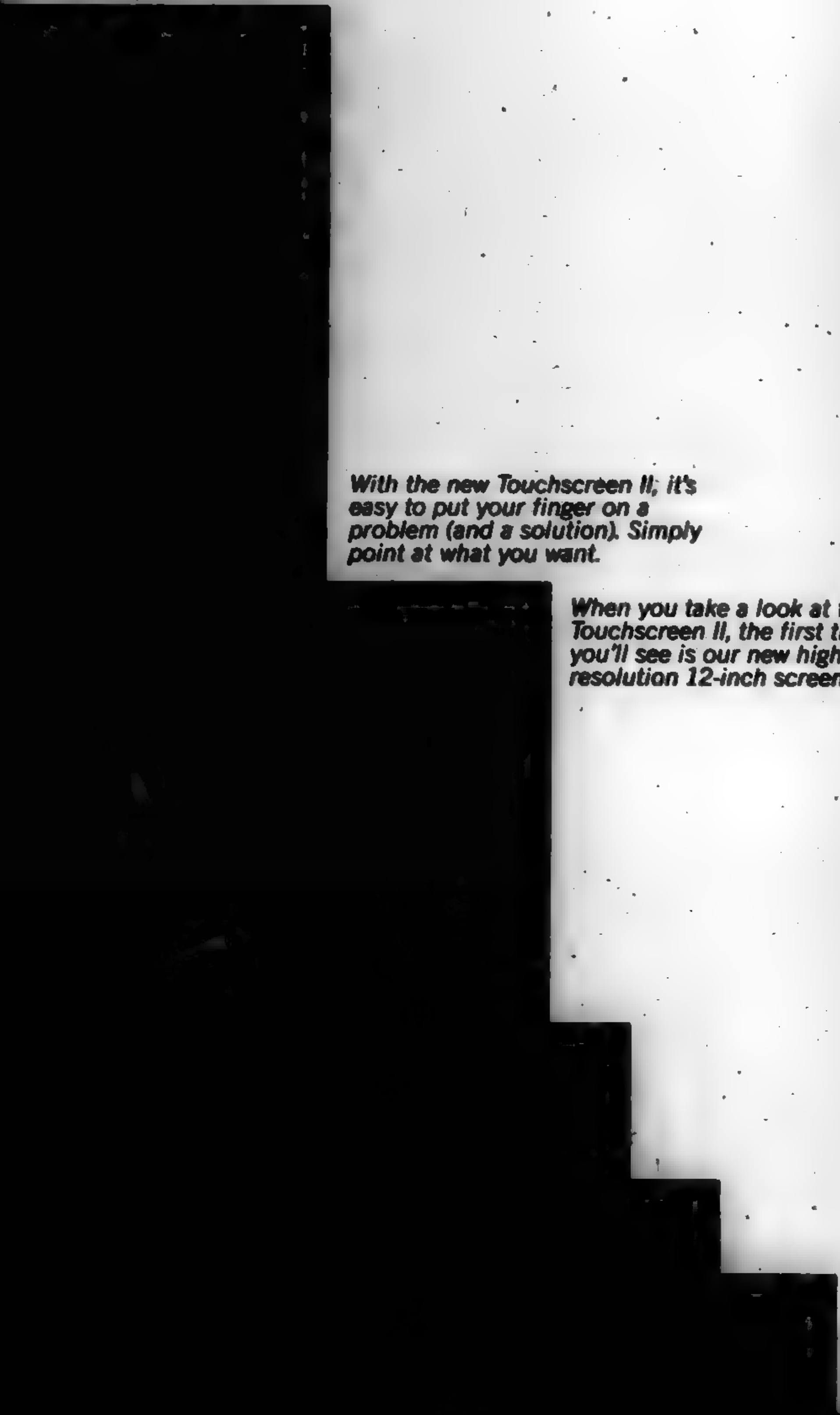

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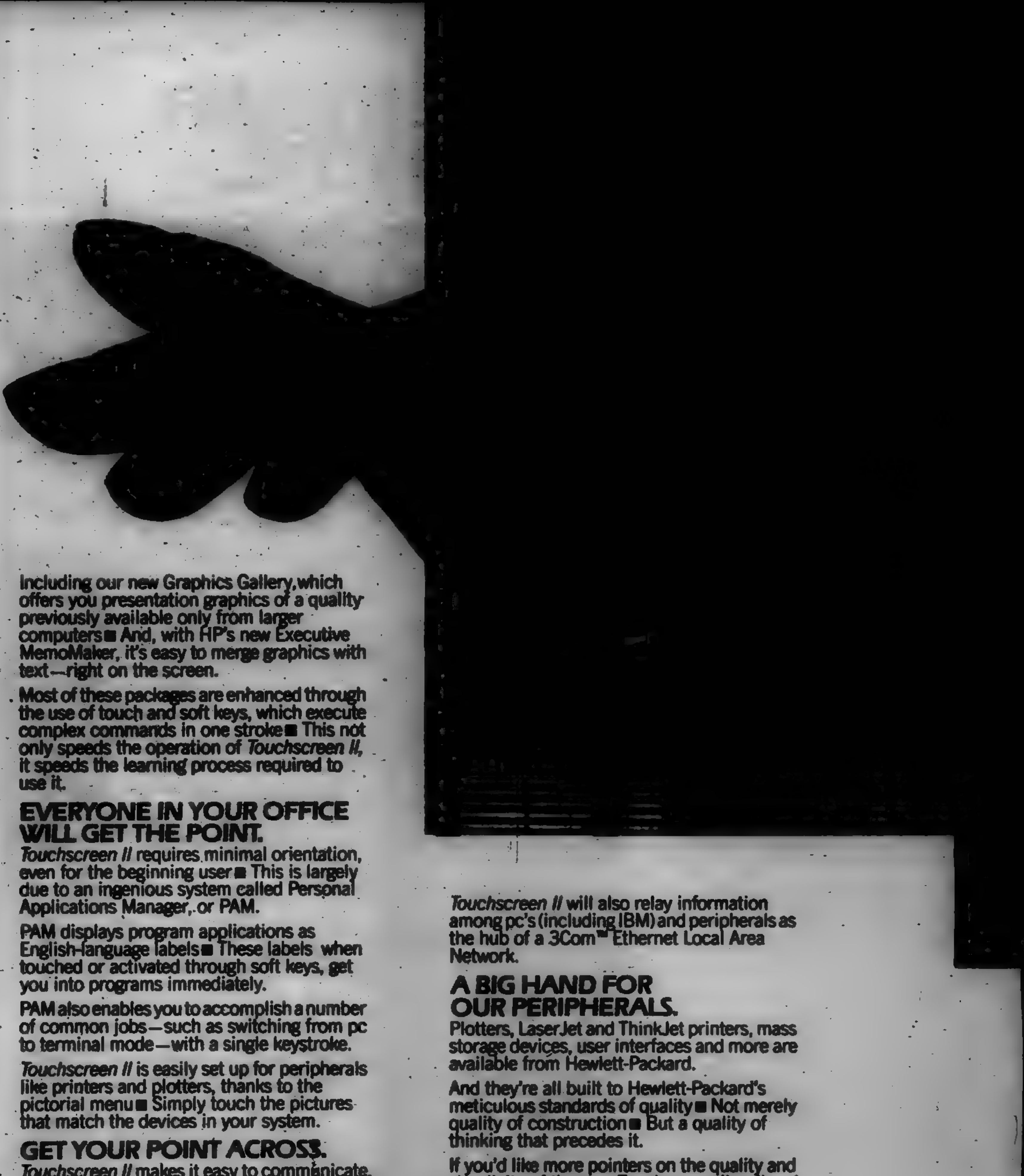

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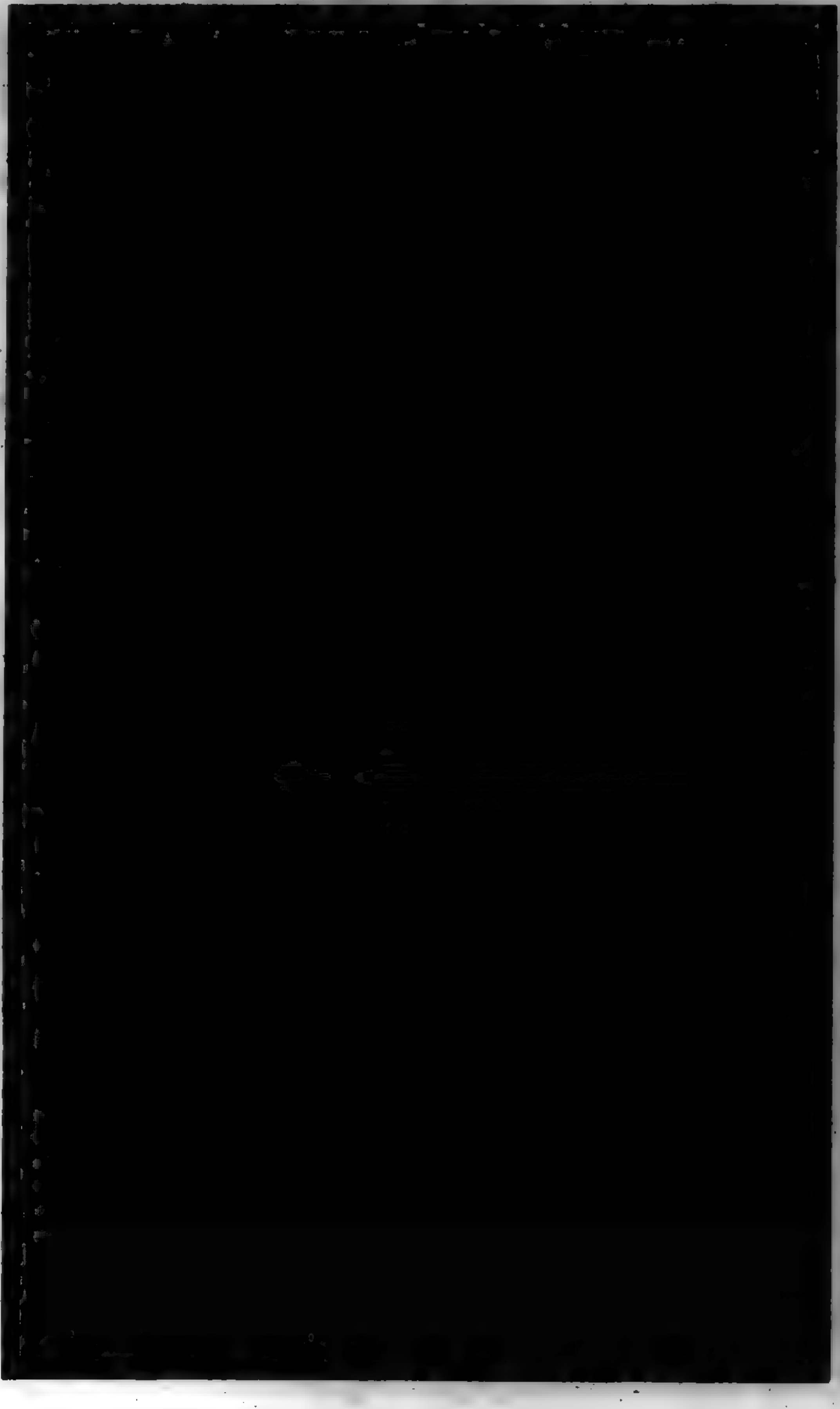

AT&T
Teletype Corporation

CLAIMS

from page 26

munications capabilities.

In 1980, Transamerica developed a format for automated claims processing that met guidelines Medicare had established for its program. The firm then began talking with doctors about its plans to automate its processing with magnetic tape. "We had to allow information to filter into the medical community that this was the way we were headed," Kirkham said.

He sent questionnaires to the doctors and to service bureaus, which at the time provided most doctors' data processing. The forms asked the recipients what kind of computer capabilities they had, and Transamerica used the answers to set up its system.

The information helped Transamerica fit its system to doctors' needs. "If they had to buy a new system to process claims electronically, it wasn't worth it," Kirkham said. The firm had planned to use tape with a 6,250 bit/in. density, for example, but found that 1,600 bit/in. tape was what most doctors used. It changed its plans and went with the 1,600 bit/in. tape.

Transamerica brought its magnetic tape claims processing up on an IBM 3081 in November 1981. At first, only one service bureau agreed to sign on. "No one was willing to venture forth into an unknown venture at that point," Kirkham said.

Once the system proved reliable, more organizations started using it. Today, 44 service bureaus send health care providers' Medicare claims to Transamerica either on magnetic tape or over telephone lines. Some providers bypass the service bureaus and deal directly with Transamerica.

In 1982, Transamerica began offering electronic claims processing via telecommunications. As it did during its venture into magnetic tape processing, the firm asked doctors what kind of equipment they had in order to find out how to set up its system.

Data transmitted at different speeds

Because doctors transmitted their data at different speeds, for example, Transamerica set up its claims processing to accept information coming in at 1,200, 2,400 and 4.8K bit/sec. Now, Kirkham said, "We can deal with anyone who's capable of telecommunicating the data to us."

Users send their data to the insurance firm through modems over voice-grade telephone lines. The data enters a Datapoint 8800 at Transamerica, which massages it and passes it to the 3081 for processing.

To be accepted as participants in either the magnetic or the telecommunications claims processing services, users must propose the software they plan to use to record their claims to Transamerica. The insurance firm has authorized 22 vendors' software packages for use with its system, Kirkham said. Some large clinics and other health care providers that have programmers in-house have also had programs accepted.

The electronic setups allow Transamerica to turn claims around in seven to 10 days, as opposed to an average 15- to 30-day cycle the firm needs to process paper claims, Kirkham said. Of the 26,000 health care providers who file Medicare claims with the insurance firm, approximately 3,500 make use of electronic processing.

TRACK

from page 26

vided a setup through which Crippen could send its Medicare claims and receive payment electronically rather than manually.

The firm uses the software to prepare its claims according to Medicare's electronic billing guidelines. Data from the claims is captured on magnetic tape.

Each week, Crippen sends a claims tape by courier to Transamerica Occidental Life Insurance Co., which pays out Medicare monies to ambulance services, doctors and other health care providers in Southern California.

Payments received more quickly

Transamerica offers computerized claims processing as a means for health care providers to receive Medicare payments more quickly than they would if they used paper forms.

The firm runs Crippen's tapes on its own machine, which generates payments and a magnetic tape record of those payments.

Sending claims on tape rather than paper has cut the time Crippen must wait for Medicare payments from between one and two months to seven days, Wilson said. "What I bill this week, I will get paid for next week, he said."

Courier drops off tape, picks up checks

When Crippen's courier drops off one week's tape, he picks up checks generated from the last week's tape along with a tape on which Transamerica has recorded the amounts it has paid on each claim.

The ambulance service then runs this tape on its DG minicomputer. The data from the tape distributes payments to client records and updates the firm's accounts receivable files. Wilson said the payment tape runs in about 20 minutes, whereas manual posting would take between four and six hours.

Medi-Cal, California's Medicaid service, recently began offering computerized services similar to those Transamerica Occidental provides for Medicare, but Wilson said that Crippen's Medicaid volume is too low to justify investing in automated processing.

The only additional automation the firm anticipates during the near future is a point-of-sale system, scheduled to be up and running soon in a medical equipment shop that Crippen operates, according to Wilson.

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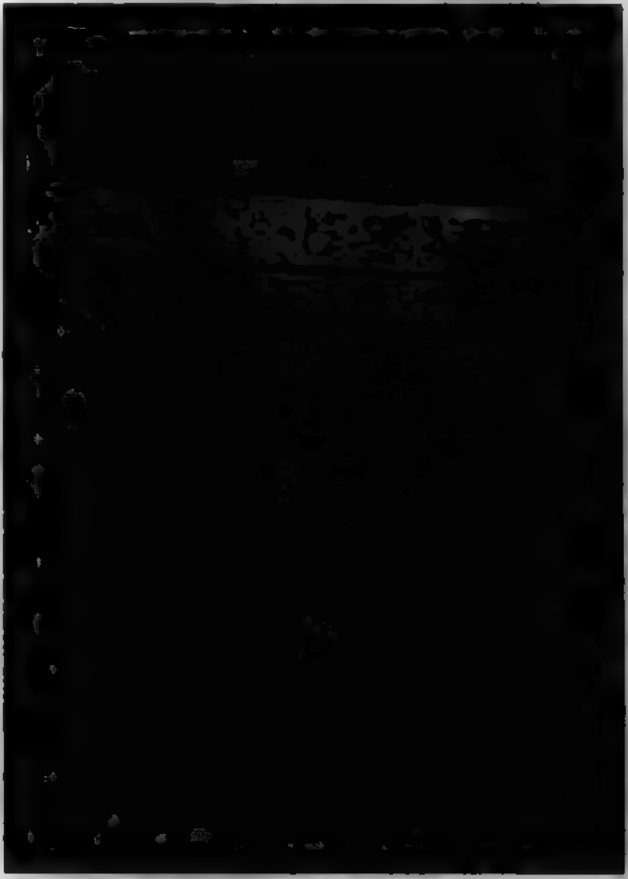

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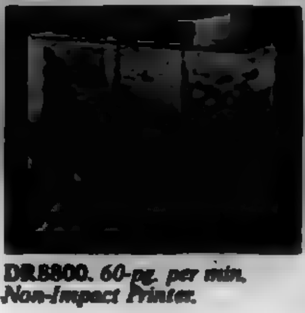

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   - 50 Business Service (except DP)
   - 60 Government—State/Federal/Local
   - 65 Public Utility/Communication Systems/Transportation
   - 70 Mining/Construction/Petroleum/Refining
   - 75 Other User ____________

   Vendors
   - 80 Manufacturer of Computers, Computer-related Systems or Peripherals
   - 85 Computer Service Bureau/Software/Planning/Consulting
   - 90 Computer/Peripheral Dealer/Distributor/Retailer
   - 95 Other Vendor ____________
2. **OCCUPATION/FUNCTION (Circle One)**
   - 11 President/Owner/Partner/General Manager
   - 12 VP/Assistant VP
   - 13 Treasurer/Controller/Financial Officer
   - 21 Director/Manager/Supervisor DP/MIS Services
   - 22 Director/Manager of Operations/Planning/Administrative Services
   - 23 Systems Manager/Systems Analyst
   - 31 Manager/Supervisor Programming
   - 32 Programmer/Methods Analyst
   - 35 OA/WP Director/Manager/Supervisor
   - 38 Data Comm Network/Systems Mgmt
   - 41 Engr/Scientific/R&D/Tech Mgmt
   - 51 Mfg Sales Reps/Sales/Marketing Mgmt
   - 60 Consulting Mgmt
   - 70 Medical/Legal/Accounting Mgmt
   - 80 Educator/Journalist/Librarian/Student
   - 90 Other ____________
3. **COMPUTER INVOLVEMENT (Circle all that apply)**
   Types of equipment with which you are personally involved either as user, vendor or consultant
   - A. Mainframes/Superminis
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems

3310-01

Micro-to-mini link saves building firm $3,300 a month

EVANSVILLE, Ind. — Traylor Brothers, Inc., an international construction firm headquartered here, is now using a micro-to-minicomputer link in its efforts to attack high communications costs and low productivity rates.

Installing IBM Personal Computers in three of its construction site field offices has saved Traylor $3,300 a month in telecommunications bills, according to Charles H. Sparrenberger Jr., Traylor's DP manager. The micros link up to the IBM System/34 at corporate headquarters here via AST Research, Inc. 3780 synchronous communications cards and Racal-Vadic, Inc. Autodial VA212 modems.

At Traylor construction sites in Louisiana, Utah and Kentucky, IBM Personal Computers and Epson America, Inc. FX100 printers replaced permanently on-line dumb IBM Model 12 terminals. Traylor Brothers developed software in Basic for the Personal Computer to allow entry of payroll and accounts payable transactions and also to allow printing of payroll checks and associated edit reports, Sparrenberger said.

The company went to a manual-call manual-answer communications system to allow file transfer between the minis and microcomputers, according to Sparrenberger.

Saving $3,300 a month

Because Traylor field users only need to access the System/34 when entering or calling up data, on-line time and its resulting communications cost has been cut by 90%, according to Sparrenberger. "We save roughly $3,300 a month," Sparrenberger said. "So I've done all right."

Traylor was one of the System/34's first customers, having purchased it in the summer of 1978. On the mini, IBM's construction software package, Cmas, is used as the nucleus of the accounting system.

Traylor Brothers has developed numerous packages in-house for equipment costing and billing, estimating and insurance management. Several of the Cmas programs have been modified in the areas of data entry and management reporting to give the company data in a custom format. "We [Sparrenberger and another DP employee] wrote reports based on Cmas' files and bells and whistles," Sparrenberger said.

The decision to choose the IBM Personal Computer essentially grew out of Sparrenberger's satisfaction with his initial Personal Computer experience.

"We had bought one for the Evansville office in the fall of 1982 and were exploring ways we might use it in the business," Sparrenberger said. "We came up with this idea to replace our on-line terminal system."

In addition to lower communications costs, the micros give Traylor's remote site employees the opportunity to enhance local productivity with microcomputer software programs. The project manager in Duchesne, Utah, for example, purchased Microsoft Corp. Microsoft Project to manage better the construction of an 8½-mile irrigation viaduct tunnel for the U.S. Bureau of Land Reclamation.

"The micro helps him keep track of what's left to do on the project, scheduling and target dates," Sparrenberger said. "That's productivity."

At Traylor's permanent southern marine division office in Baton Rouge, La., employees use Peachtree Software, Inc. Peachtext word processing software to compose and print subcontractor application forms and paychecks.

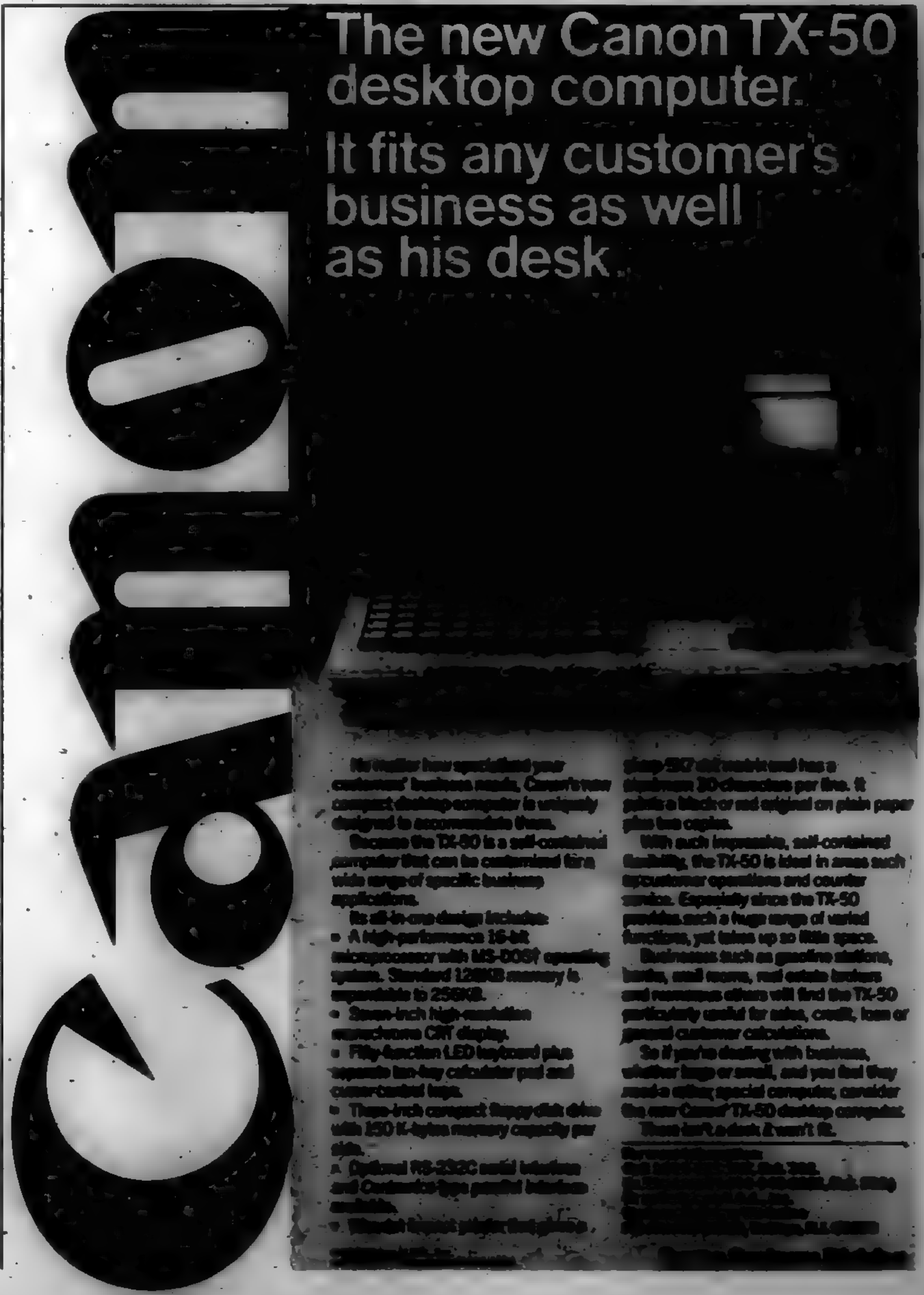
Renee Muir, a computer operator in Baton Rouge, said the Personal Computer-System/34 link allows her to interact with accounts receivable and payroll information stored on the mini at headquarters here. "I can do much more now," she said. "I can get into the memory and make necessary changes where I couldn't before. I'm only human — I do make errors — and when I can get in and change them right away, I'm happy."

Sparrenberger said the micros ease demand on the mini's CPU, because resources of the System/34 are not being taxed by data entry being done in a field office. And the field offices' processing time is not dictated by the time schedule of the office here. For example, Utah is one hour behind the office here, and site employees at Traylor's dam project in Greenup, Ky., are one hour ahead. When the office here shuts down at 4:30 p.m. CST, the Utah office is able to process until closing time in that time zone.

"Basically, our two goals for the Personal Computers were to cut communications costs and to keep the same amount of interactive editing available in the field offices that we had before," Sparrenberger said. "We've accomplished both."

The Personal Computer used in Kentucky was formerly used on a Traylor sewer project in Anchorage, Alaska. Sparrenberger said he will not hesitate to transport any existing micro to a future construction site office or to purchase a new unit for the location.

"In the past, we had to call AT&T to install special connections for the terminals when we set up a new field office," he said. "Now we can just take the [Personal Computer] to the office and plug it right in."



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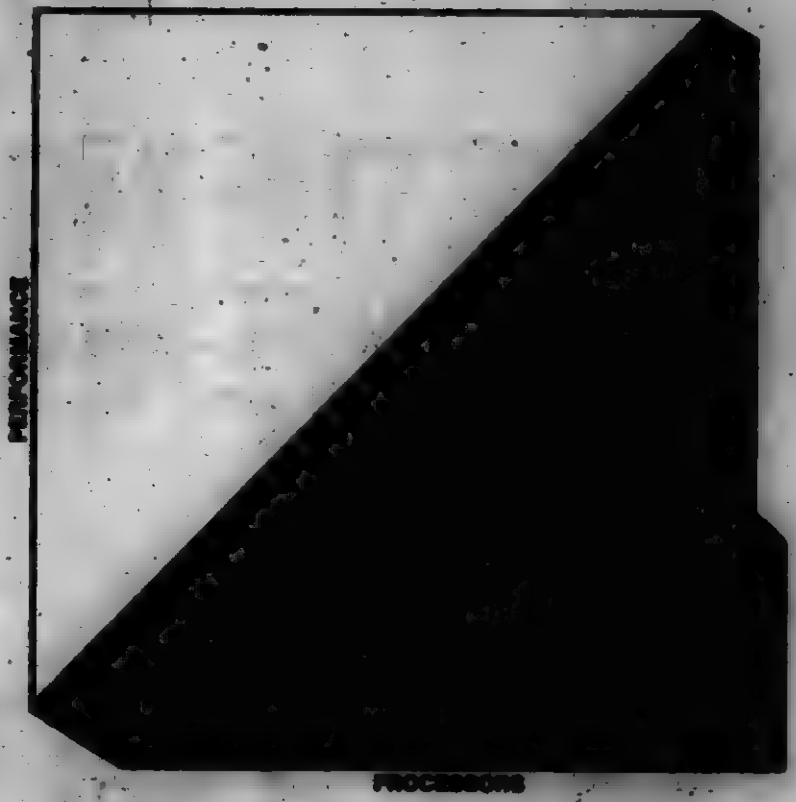
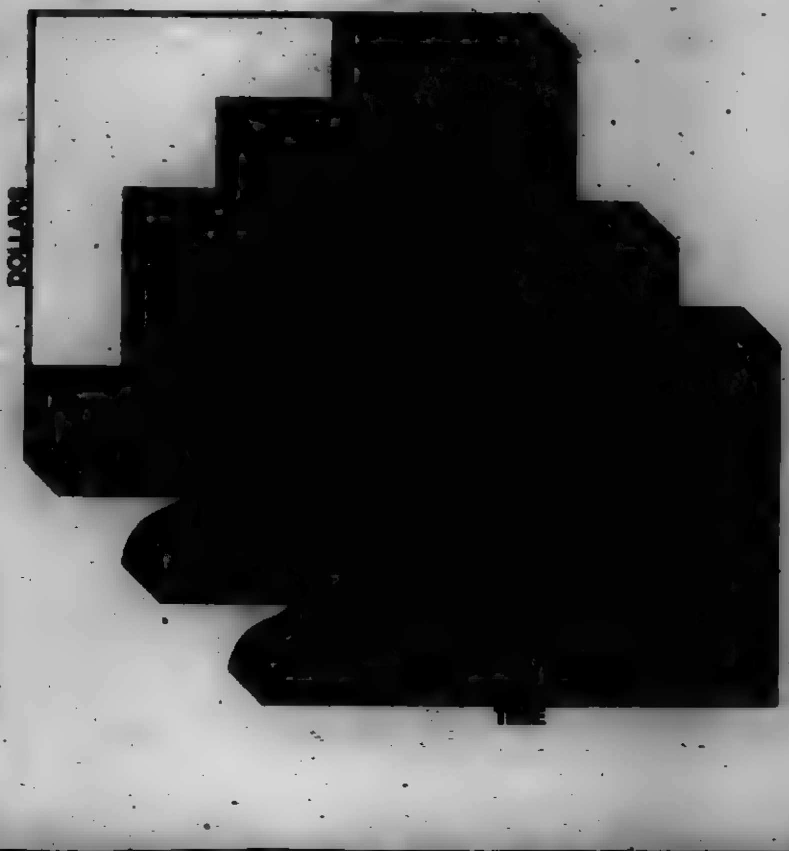
The performance cost. With conventional computer architecture, doubling your processors does not double your performance. With Tandem, each incremental increase in processing power provides matching performance.



The dollar cost. With conventional computer architecture, growth is convulsive. You must continually over-invest to assure sufficient processing power. With Tandem, growth matches need. You never invest more than you have to.



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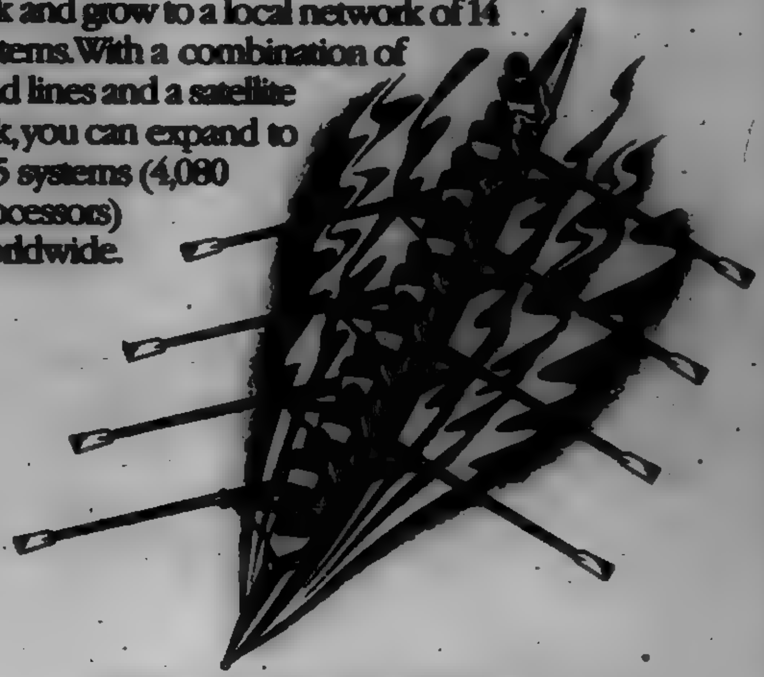

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CALL FOR PAPERS

SIR/DBMS' SECOND ANNUAL CONFERENCE
Chicago, Oct. 20-22

Papers are now being sought for this second annual conference. Special interest groups and panel discussions of where current hardware trends are leading the industry are scheduled for the conference. For more information about the conference or to submit an abstract, contact Judy Eftekhar, Director of Communications, Sir, Inc., 5215 Old Orchard Road, Skokie, Ill. 60077; or Dave Hall, Chairman, Users Group Board of Governors, Florida International University, Serdac/PC 549, Tamiami Campus, Miami, Fla. 33199.

INFORMATION SYSTEMS ASSESSMENT
Noordwijkerhout, The Netherlands, August 27-29, 1986

A call for papers has been issued by the conference chair. Possible issues to be addressed are scientific foundations for information systems assessment; methodologies for information systems assessment (methods, techniques and procedures); relevant dimensions of information systems assessment, measurement problems for information systems assessment performance; stakeholders and interest groups in information systems assessment; evidence of information systems benefits and evaluation criteria for implementation success; and present standards and practice (state of the art) for information systems assessment.

Letters of intent (due July 1), full papers (due Nov. 15) and requests for information should be addressed to Niels Bjorn-Anderson, Program Committee Chairman, Institute of Informatics and Management Accounting, 60 Howitzve, DK 2000 Copenhagen F, Denmark.

COMPUTER GRAPHICS '86
Anaheim, Calif., May 11-15, 1986

A call for papers has been issued by the National Computer Graphics Association (NCGA) for their seventh annual conference and exposition. Tutorials and technical sessions at the conference will focus on the application of computer graphics to a wide variety of business and industry situations. Individuals interested in proposing a tutorial or technical paper for Computer Graphics '86 should contact the NCGA for a copy of the official call for papers brochure. Abstracts are due to the NCGA no later than Sept. 15. For information and copies of the brochure, contact the Education Coordinator, NCGA, Suite 200, 2722 Merrilee Drive, Fairfax, Va. 22031.

THE 16TH CONFERENCE ON COMPUTER AUDIT, CONTROL AND SECURITY
Fort Worth, Texas, April 28 to May 2, 1986

A call for abstracts has been issued for this 16th annual conference. Examples of subjects of interest are networks and data communications; audit, control and security of user-developed systems; information security in advanced environments; coping with microcomputer proliferation; auditing on-line systems; detecting fraud in computer systems; advanced DP audit techniques; controlling office information systems; auditing in a data base environment; getting the most out of DP audit resources; measuring the effectiveness of controls; experience with computer security products; and technology updates.

No written paper is required for this meeting.

Send at least a one-page abstract of what you propose to present and a brief biography. Abstracts and biographies must be received no later than Sept. 20. Send abstract to the Program Chair, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60188.

1986 INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC. CONFERENCE ON ROBOTICS AND AUTOMATION
San Francisco, April 14-17, 1986

Papers are solicited in all areas of robotics and automation, including flexible manufacturing, materials handling, scheduling and control, system design and control, modeling and simulation and economic evaluation. Papers describing novel theory and/or applications are invited.

Four copies of papers, 15-20 double-spaced pages, should be sent by Oct. 1 to Rajan Suri, University of Wisconsin at Madison, Department of Industrial Engineering, 1513 University Ave., Madison, Wis. 53706. Further information is available from Robotics and Automation, c/o Harry Hayman, 736 Whitaker Terr., Silver Spring, Md. 20901.

INTERNATIONAL FEDERATION FOR INFORMATION PROCESSING (IFIP) CONGRESS '86: THE 10TH WORLD COMPUTER CONGRESS
Dublin, Sept. 1-5, 1986

Papers are now being sought for this congress. All submitted papers should concentrate on addressing a wide class of real-world problems; relating different, alternative or complementary approaches to design and development; filling gaps between different fields; and explaining to the interest groups the rationale of the approaches taken.

Five copies of each paper should be submitted to the Congress Secretariat, Ifip Congress '86, 44 Northumberland Road, Dublin 4, Ireland. The submission deadline is Nov. 1.

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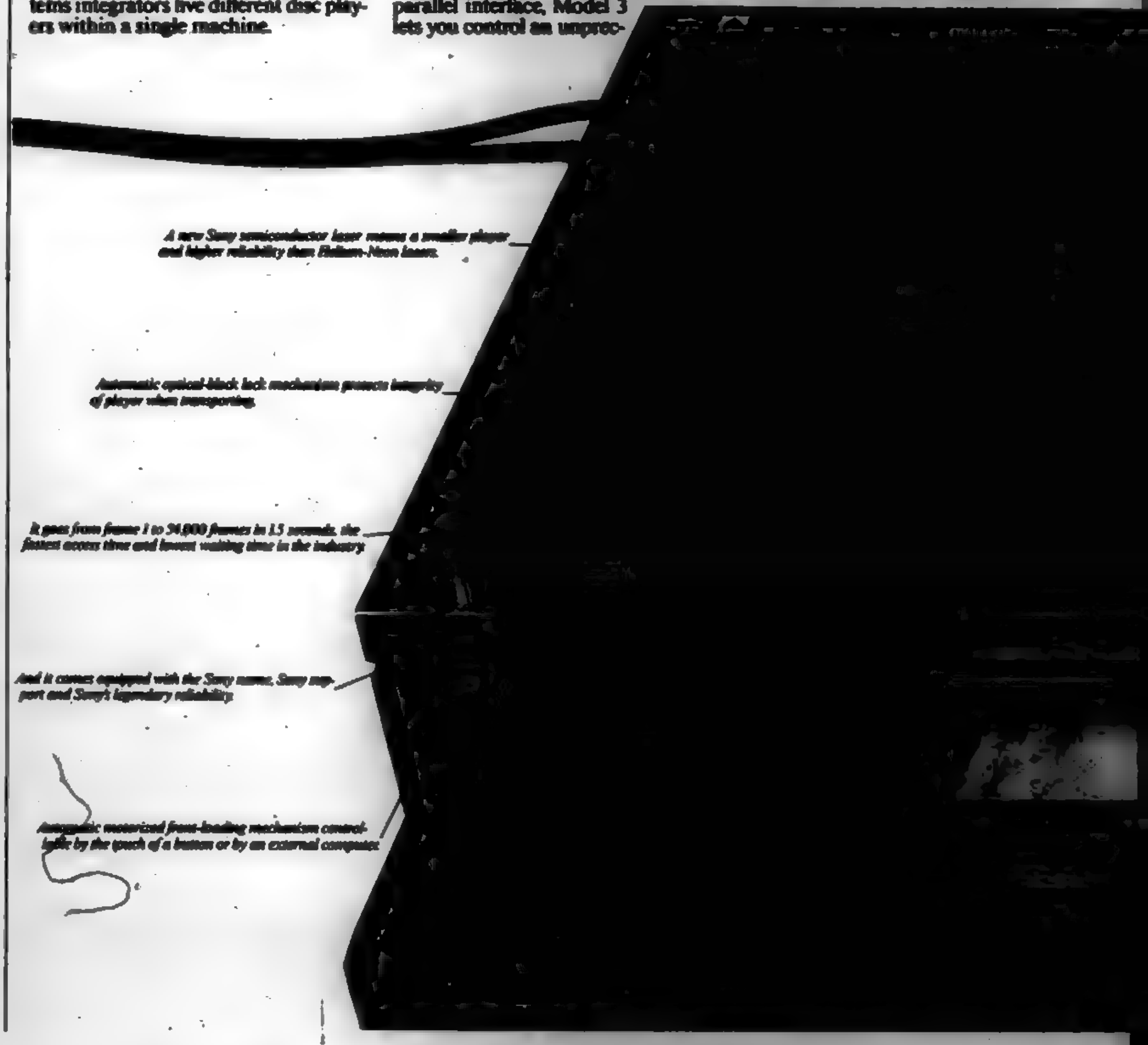
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CALENDAR

WEEK OF JULY 14

JULY 15-16, ARLINGTON, VA. — **Micro Security '85.** Contact: Conference Registrar, Computer Security Institute, 43 Boston Post Road, Northboro, Mass. 01532.

JULY 15-16, AVON, COLO. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

JULY 15-16, DENVER — **U.S. West and Telecommunications in the Northwest and Rocky Mountain States.** Contact: Telestrategies, Inc., P.O. Box 811, McLean, Va. 22101.

JULY 16-17, PARSIPPANY, N.J. — **MVS Dump Debugging.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 16-17, ATLANTA — **Standard Network Protocols: International and National Packet-Switching Networks.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

JULY 15-18, CHICAGO — **The 1985 National Computer Conference.** Contact: Helen Mugnier, American Federation of Information Processing Societies, Inc., 1899 Preston White Drive, Reston, Va. 22091.

JULY 15-18, FORT LEE, N.J. — **IMS/DC (Data Communications) Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JULY 15-18, BOSTON — **CICS/VS Application Design.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 22-25 in Atlanta and July 29-Aug. 1 in Chicago and Los Angeles.

JULY 15-18, SAN ANTONIO — **Vsam: Its Structure and How to Use It.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 15-18 in Fort Lee, N.J.

JULY 15-18, LOS ANGELES — **CICS/VS Logic and Debugging.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JULY 15-18, WASHINGTON, D.C. — **Vsam From Start to Finish.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 22-25 in Los Angeles and Fort Lee, N.J.

JULY 15-19, FORT LEE, N.J. — **CICS/VS Internals.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 15-19 in Los Angeles, July 22-26 in Boston and San Antonio and July 29-Aug. 2 in Atlanta and Denver.

JULY 15-19, ATLANTA — **CICS/VS Application Programming — Command Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 22-26 in Chicago and July 29-Aug. 2 in Fort Lee, N.J., Los Angeles and Washington, D.C.

JULY 15-19, SAN FRANCISCO — **Systems Workshop II.** Contact: Ware Associates, P.O. Box 948, Groton, Conn. 06340.

JULY 15-19, SAN FRANCISCO — **Structured Systems Design Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2900 N. Loop W., Houston, Texas 77092.

JULY 16-17, LOS ANGELES — **Local-Area Networks.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 16-17, WASHINGTON, D.C. — **Software Defined Network and Alternatives.** Contact: The Yankee Group, 89 Broad St., Boston, Mass. 02110.

JULY 17, CHICAGO — **Intel Corp.'s Irmx Users Group Annual International Conference.** Contact: Catherine Moon, Intel Corp., MS/HF2-57, 5200 N. E. Elam Young Pkwy., Hillsboro, Ore. 97123.

JULY 17, PARSIPPANY, N.J. — **Introduction to the Personal Computer and Personal Computer Software for DP Professionals.** Contact: Chubb Institute, 8 Sylvan Way, P.O. Box 342, Parsippany, N.J. 07054.

JULY 17-18, SAN FRANCISCO — **Financial Analysis for Telecommunications Equipment Acquisition.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 17-19, AVON, COLO. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

JULY 18-19, BOSTON — **International Arms and Technology Transfer.** Contact: Technology Marketing Society of America Seminars, c/o Technology Training Corp., Department IATT, P.O. Box 3608, Torrance, Calif. 90510.

WEEK OF JULY 21

JULY 22-23, FORT LEE, N.J. — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 29-30 in Boston.

JULY 22-24, CHICAGO — **1985 Summer Computer Simulation Conference.** Contact: Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

JULY 22-24, CARY, N.C. — **SAS Micro Language.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

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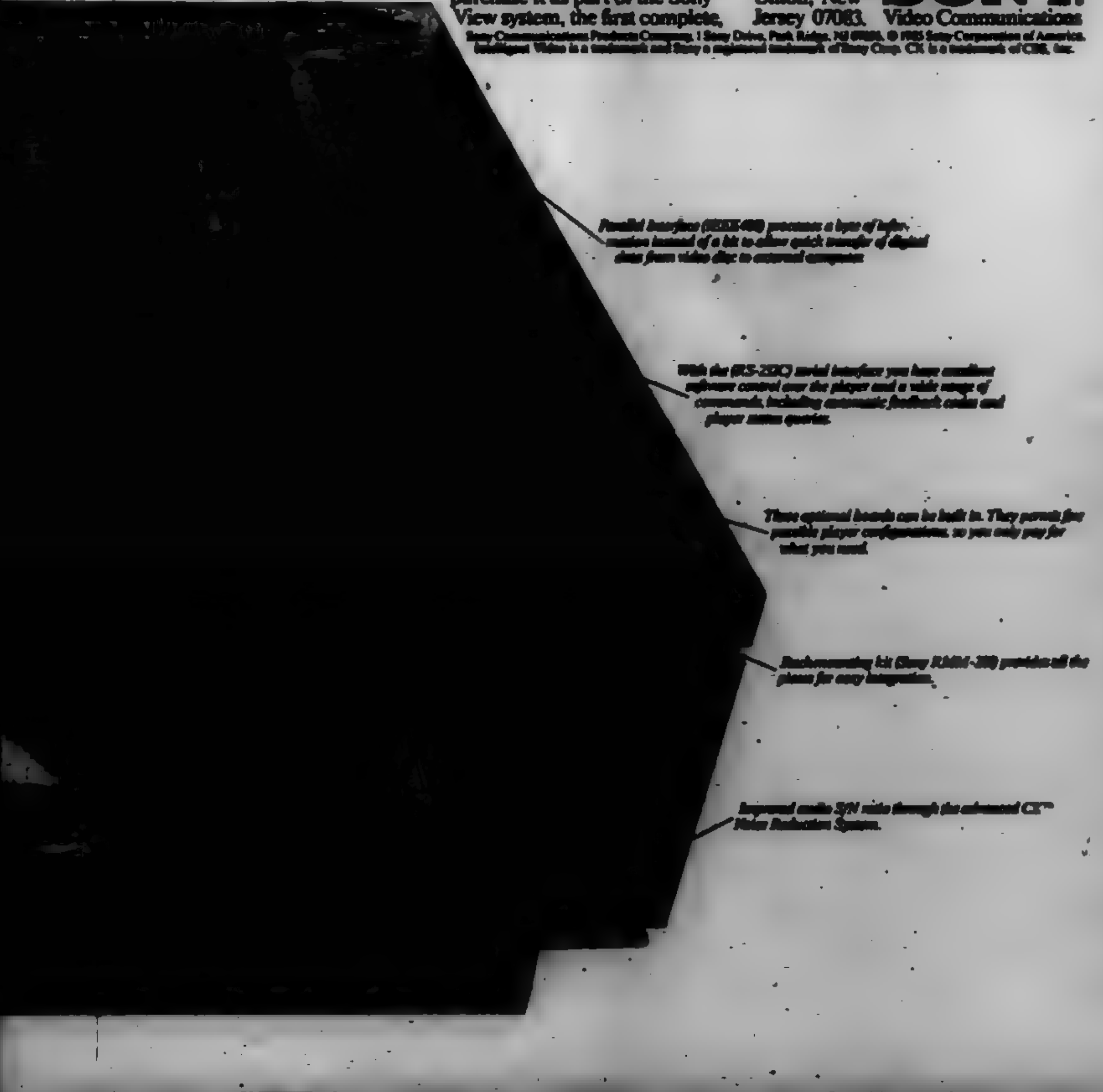
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Cost Management Call privileges can be granted or withdrawn as you see fit. Call detail can also be recorded and allocated by department, project, or individual to help you keep a tight rein on expenditures and abuse.

Facility Management You determine how you want your calls routed so you'll be sure you're always using the least expensive lines available. This function also optimizes network performance by giving you the power to administer its many features, like Automatic Route Selection and Trunk Group Translation.

Traffic Management This is a set of tools that collect, summarize and report on system performance and usage. Data concerning the operation of your system can be stored on disk files, and called as needed.

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EDITORIAL

MIS security a risky gamble

MIS executives, beware. If your system is hit by a computer criminal whose identity is discovered, the odds are better than nine to one that he is a company insider.

That was one message from a recent survey of Data Processing Management Association members [CW, June 10].

Although the odds are favorable that your system will not suffer some form of abuse, the survey's statistics may be painting an unrealistically optimistic picture. Companies are admittedly reluctant to divulge system abuses — that's the survey's second message. Out of 56 abuses outlined in the study, just 2% were reported to authorities. In addition, more than half of the respondents who were victims of abuses said they believed the abuses occurred either because the employees were ignorant of proper professional conduct or as a result of the perpetrators' "misguided playfulness."

The number of computer crimes written off because of embarrassment, the potential for bad publicity and the corporate funds needed for legal fees if a decision to prosecute is made is any expert's guess. And more than half of the survey's respondents apparently don't believe the problem has become serious enough to warrant any sort of data security staff.

If you are optimistic and believe computer crime couldn't happen in your organization, consider the following:

- The same issue of *Computerworld* in which the DPMA survey was reported also carried a story on two former employees of the Social Security Administration who were charged with computer fraud to gain SSA benefits. It is still unclear exactly how much money the defendants obtained, but Assistant U.S. Attorney Henry Wingate referred to the theft as a "large sum."
- Wilson Jones Co., a subsidiary of American Brands, Inc., recently had to come up with hard cash for Micropro International Corp. to obtain an out-of-court settlement of a suit charging that Wilson Jones employees had engaged in unauthorized copying of three Micropro software products. Although the amount of the settlement was unspecified, the original suit requested damages of $225,000 and the return of any profits earned as a result of the alleged copying [CW, June 3].
- A Houston programmer was charged earlier this year with the theft of $100,000 for alleged fraud involving the illegal tapping of a credit bureau's computer system [CW, Jan. 14].
- In 1983, the banking industry paid premiums totaling $11.6 million for overall DP insurance policies and an added $4.7 million for separate computer crime policies [CW, Jan. 14]. Although more recent figures have not been compiled yet, chances are good that those premium charges have not gone down.
- *The New York Times* and *The Washington Post* both recently reported that the U.S. Department of Justice is expanding the Federal Bureau of Investigation's national computer system to include information about persons suspected of committing white-collar crimes. It's a case of using modern technology to detect and prosecute the criminals who use the same technology to commit fraud, according to Associate Attorney General D. Lowell Jensen.

If computer abuse takes place in your shop — whether committed by an employee or an outsider — it will be expensive. It's also clear that both the banking industry and the FBI (neither of which are known for fast-moving reactions to change) are taking computer fraud very seriously. Isn't it high time you did the same?

LETTERS

Cable search an unrealistic scenario

Perhaps I missed the point completely, but I came away from reading the column "The cable quest: Abracadabra in Akihabara" [CW, May 13] and the conclusion to it [CW, May 27] with the impression that a large amount of high-visibility magazine space was wasted. Aside from stating the all-too-obvious fact that the hardware manufacturers are insensitive to the needs of the user, the column illustrated only that users show too much forbearance in waiting for things to be done for them.

A cable is a piece of wire with a connector at each end. An RS-232 cable, by definition, is terminated with miniature 25-pin connectors. The main differences between cables is in the number of signals used: from three to a maximum of 25. In many cases, an off-the-shelf, 25-conductor cable will do nicely. In rare cases, you may have to swap the second and third pins (transmit/receive) to get it to work.

All the parts necessary for the column's author to make the missing cable were readily available. If an off-the-shelf cable wouldn't work, and if the specifications for the cable were not supplied as part of the operator documentation, they were probably available by making one phone call to the manufacturer. And, if all else failed, you just pull out some wire, two plugs and a soldering iron and try different hookups until you get it right.

If you get into deep trouble, call the nearest junior high school student and he'll have you up and running in 15 minutes.

Wendell C. Putney
Greensboro, N.C.

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VIEWPOINT

Alternative jobs for the frazzled MIS manager

THE DATA CENTER
John P. Murray

Sometimes — probably not more than three times a week — when things get a little hectic and clients become unusually irate — often over matters of little consequence, such as project delays, the delivery of incorrect reports, slow network response times or the unavailability of the system — some of us think about putting our talents to a more effective use in some other area.

It seems reasonable to assume that many of us in the information processing profession share a number of similar skills, knowledge and interests. In addition, I suspect that because we are attracted to the work we share a number of personality traits.

Therefore, as a public service, I would like to present some viable options for career changes. I will add what I believe are pertinent comments to these various options to help you better analyze each opportunity given your particular interests and skills. I hope this material will benefit you in some way.

Some of these suggested new occupations may not readily come to mind and may indeed be considered somewhat unorthodox, but please bear in mind that you did not become an information processing specialist overnight. The application of effort and diligence will help you carry the day in any of these new areas.

Brain Surgeon. As I understand it, this line of work requires a large ego, and I think most of us in information processing would qualify. Also, as I understand it, this is a somewhat complex trade to master. You may want to start out nights and weekends and continue with your present occupation for a few weeks until you become comfortable. The pay is pretty good, and you get to work in a place that is clean and well lighted. True, some of you may consider spending your working hours with sick people depressing. However, considering that you have spent years with information processing clients, this is something to which you should be able to grow accustomed.

Symphony Conductor. The skill set required here, aside from some ability to read music — which is no real problem; anyone who can read a Cobol program can learn to read music really fast — involves being able to bring together a number of people and to mold them into a harmonious group working together to produce a high-quality end product. Well, on second thought, perhaps this may not be an ideal choice after all.

Hair Dresser. This may be the one for me. After all, people will always need their hair fixed up. The expense required to get started should be low: Rent a storefront; put in some glass, chrome and pink chintz; buy a hair curler and some home permanent stuff; and the business is extant. You do need a degree of manual dexterity, not as much as you would for brain surgery, however. The years I spent handling punch cards made my fingers very supple, so that is not a problem.

From computers to curlers

The more I consider this occupation, the better it looks. I have picked the name "Mr. Jonnie's Hair Boutique." So, if you desire to get started in this line, pick some other name. However, don't despair, I may decide to make this a franchise operation — it could become the McDonald's of hair salons. If so, we can arrange to set up a "Mr. Jonnie's" in your area. Let me know soon if you are interested because I expect choice locations to go fast.

These are some career alternatives for us to consider when things get difficult. It is necessary that we become and remain aware of the requirement to carry out the appropriate planning, set goals and adopt a phased approach to this project so that success will at least be a reasonable prospect.

This list was designed to encourage those of you thinking of going across the street for a few dollars more to consider the full range of your options, to raise your sights, to broaden your horizons and to better appreciate the value of your special skills and experience so that you can at least consider some other profession where you can make a significant contribution.

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

IBM whets OA mart appetites, but when will it deliver?

WOHL STREET JOURNAL
Amy Wohl

Confusion reigneth. The office automation customers who thought they had a secure strategy last year have been reading their tea leaves, reexamining any convenient crystal ball and stopping soothsayers in the streets, hoping to find out what to do.

The confusion stems from IBM's strong entry (IBM would say reentry, or continuing presence, I suspect) into the OA market last fall with new, additional or enhanced products, plus promises of a rosy future. IBM's marketing stance for these new produts (especially the System/36 with Personal Computer workstations and software, but also PC Network and other products) has been aggressive enough to evoke howls of pain from competitiors, cries for mercy from users and giggles of glee from consultants asked to explain the whole thing.

On the surface it's simple enough. Consider the following:

- IBM has a game plan for "well-behaved" user organizations: They should start hooking their myriad personal computers together using System/36s to provide interconnection and systems-level OA functions. This strategy is limited by a number of factors — software that hasn't hit its delivery date yet, the lack of integration across functions — but it is, at last, IBM's strategic OA product. Presumably, additional announcements this year and next will offer more workstations (a mysterious melody of "PC/2" wafts through the air), additional workstation and systems-level software and, eventually, attachment to the yet-unannounced IBM Token-Passing Daisy Ring network via Big Blue cables.
- There is a nonstrategic (nonstrategic to IBM, that is) but fairly popular IBM alternative: attaching IBM Personal Computers to the IBM PC Network and using Microsoft Corp.'s DOS 3.1 and IBM Personal Computers as servers to create a local-area network. Sounds modern. But customers tell us IBM definitely downplays this alternative and, in fact, actually tries to convince customers that this is a short-term Band-Aid, aimed only at small groups of users who don't need a real OA system. In fact, we've never seen this actively proposed to a customer; it seems to be a fallback product for stubborn customers who insist on a local-area network installation now, not later.
- Some IBM customers continue their Professional Office System (Profs) experiments under the VM banner. Although IBM has promised to hook Profs and the Distributed Office Support System together, the Profs world continues to attract mainly DP managers looking for easy-to-implement, low-level (low function, that is) OA solutions. Profs passes nearly no OA committee's eagle eye if delivered function is the measure of product selection.
- The older IBM solutions still on the market are now perceived as ended games. The 8100 has never been a popular solution, and the 5520, as a nonprogrammable system, never really played in the OA world. Displaywriter will go "poof" as soon as IBM finishes the Displaywriter III software announcement for the Personal Computer with a secretarially acceptable keyboard. In any case, these products are not causing the commotion.

So what's going on?

In many cases, IBM has used the announcement of the System/36 OA Strategy to convince customers to reopen already-made OA decisions. This has wreaked havoc with competitors' revenue plans — to say nothing of their morale. There is nothing wrong with customers having one more look at the marketplace before making an important decision, but competitors claim IBM is having a chilling effect on their ability to market available and superior products. Meanwhile, IBM finishes making a series of announcements with delivery dates for a completed IBM product far in the future. (Industry analysts estimate that delivery of the IBM Token-Passing Daisy Ring network, for example, could be several years away, and so is the case for big pieces of the integration of function within the System/36.)

In fact, every major OA vendor is already offering a strategy similar to IBM's. They are attaching their own and IBM's personal computers as alternative, high-function workstations to minicomputers offering interconnection and systems-level functions: This is Digital Equipment Corp.'s VAX with All-in-One, Data General Corp.'s MX plus CEO, Hewlett-Packard Co.'s HP 3000 with Interactive Office and Wang Laboratories, Inc.'s VS line with the Wang Office. All offer IBM Personal Computer support, although with a somewhat less functional integration than they can provide within their own personal computer offerings. These are mature OA products, with the normal accretion of software and software enhancements. All appear regularly on user organizations' short lists of preferred vendors.

The appearance of an IBM OA solution (strategic or not, final or not) seems like manna from heaven to users who are anxious to pick a vendor with whom to do business and to start installing something (anything) now — preferably something compatible with the de facto IBM Personal Computer standard that nearly every user organization has adopted. Users are once again saying, "No one ever got fired for picking IBM." And that, in itself, is soothing.

But will IBM offer users — especially large organizations with significant OA experience — satisfying solutions to meet their needs and high expectations? And when will these solutions arrive? Is a bird in the hand better than two bluebirds in the bush? Users are confused. IBM's competitors are harried and angry.

The story is still without an ending, but in a world where the ending can always be changed with a keystroke, permanence is an unexpected quality. Both IBM and its competitors will somehow muddle through this latest battle and live to fight another day.

Wohl is president of Wohl Associates in Bala-Cynwyd, Pa., and editor of the "The Wohl Report on End-User Computing" newsletter.

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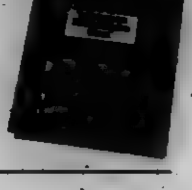

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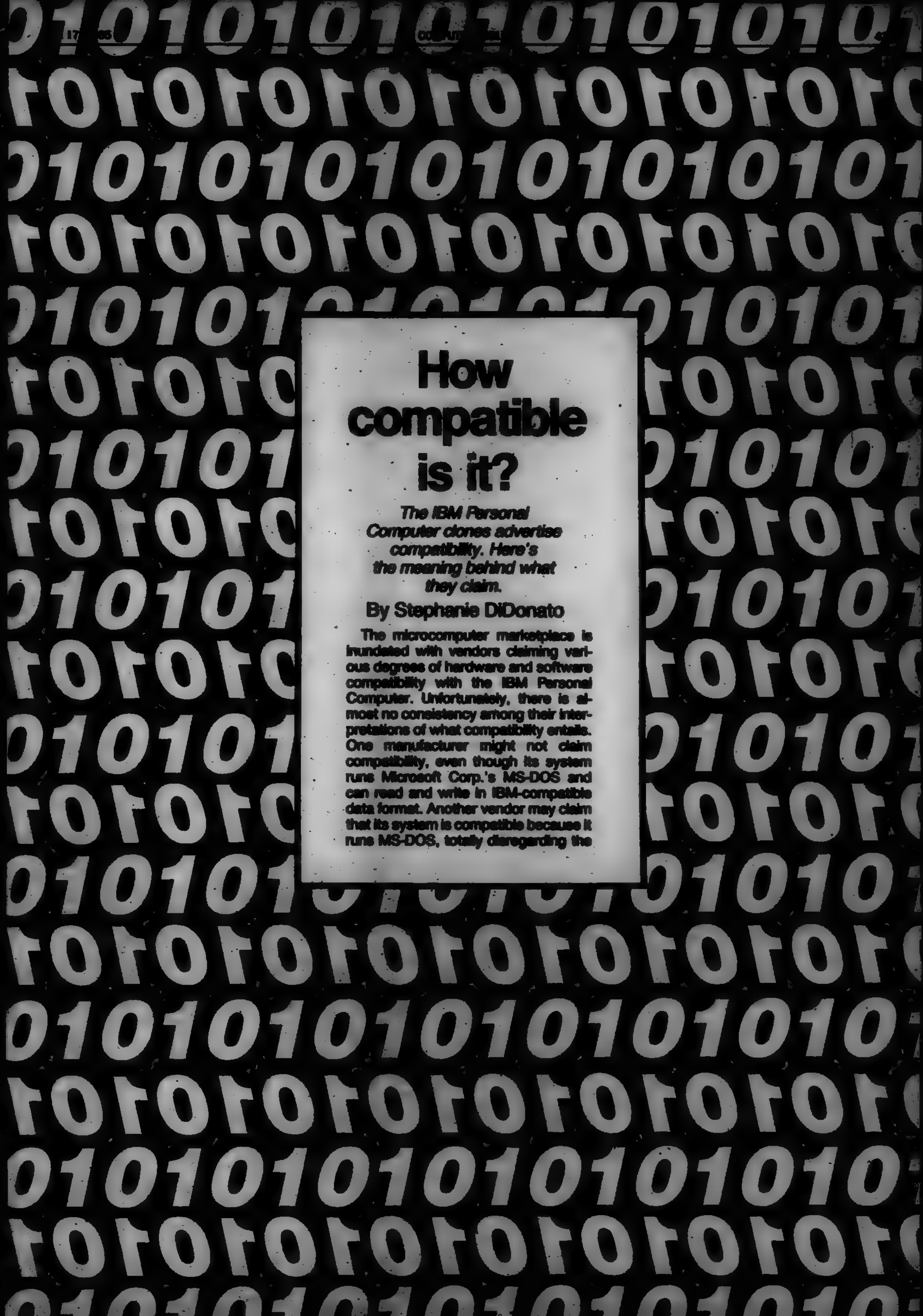

How compatible is it?

The IBM Personal Computer clones advertise compatibility. Here's the meaning behind what they claim.

By Stephanie DiDonato

The microcomputer marketplace is inundated with vendors claiming various degrees of hardware and software compatibility with the IBM Personal Computer. Unfortunately, there is almost no consistency among their interpretations of what compatibility entails. One manufacturer might not claim compatibility, even though its system runs Microsoft Corp.'s MS-DOS and can read and write in IBM-compatible data format. Another vendor may claim that its system is compatible because it runs MS-DOS, totally disregarding the

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fact that data is read and written in a different format on different capacity diskettes.

Users need to ask the following questions in order to assess a system:

- Can I run all versions of IBM's PC-DOS on the compatible system?
- Are the central processors in the two systems compatible? Are they based on the same or related microprocessors?
- Can I take an IBM board or a board-level option, such as the color graphics display adapter or the expansion box, and plug it into my compatible system?
- Is the compatible's keyboard identical to the keyboard supplied by IBM? If the compatible features additional keys, how do they affect the compatibility of programs or data generated with/without the use of these keys?
- Can I take IBM programs that use the Personal Computer graphics features and run them on my system?
- Will the compatible system read from and write to diskettes taken from the IBM Personal Computer without changes or conversion first? Will the IBM Personal Computer read from and write to diskettes taken from the compatible without first making alterations?

Software compatibility

Microcomputer operating software tends to be closely related to the CPU and I/O structure of a system; therefore, it's not completely portable.

When buying a software program designed to run, for example, under MS-DOS, make sure to find out which implementation of MS-DOS. IBM's PC-DOS is just one of many.

There are significant differences in capability among the four major upward-compatible software levels available to users of the Personal Computer — between systems controlled by read-only memory (ROM) Basic without MS-DOS or any other operating system, PC-DOS 1.1, PC-DOS 2.0 or 2.1 and PC-DOS 3.0 or 3.1.

PC-DOS 2.1 is very similar to (and replaces) PC-DOS 2.0; it includes several fixes and extensions of enhancements introduced for 2.0. DOS 3.0 is an enhancement over DOS 2.1 and is being replaced by DOS 3.1. DOS 3.1 will provide all 3.0 capabilities and support the IBM PC Network. Neither replaces DOS 2.1.

These four levels are largely upward compatible. Programs designed to run on a Basic system can usually run on a DOS system but not the reverse; programs designed to run on DOS 1.1 systems can usually run under DOS 2.X and DOS 3.X but not the reverse. Furthermore, DOS 1.1 cannot handle hard disks and consequently cannot run on the Personal Computer XT; it also is not supported by the Personal Computer AT.

DOS 2.0 runs on the IBM Personal Computer and Personal Computer XT diskette-based or hard disk-based models. It has been replaced by DOS 2.1, which runs on PCjr diskette-based systems as well as on the other Personal Computers and the Personal Computer AT. DOS 3.0 and 3.1 support the Personal Computer AT as well as all other IBM personal computer models.

Other operating environments, such as CP/M86 and Concurrent CP/M are also available for the Personal Computer, but the primary focus of IBM and its competition has been the development of PC-DOS versions of the MS-DOS environments.

Can I run all versions of IBM's PC-DOS on the compatible system?

IBM's PC-DOS is a modified version of Microsoft's MS-DOS. MS-DOS is a fairly transportable generic operating system designed to run on the Intel Corp. 8088/8086 microprocessors or their 80188/80186 and 80286 counterparts. Because it must adapt itself to an individual architecture, incompatibilities are likely to arise between one MS-DOS system and another. These incompatibilities can conceivably be circumvented, however, through software and/or firmware adjustments, if the vendor wants to put in the effort.

MS-DOS has its own Basic I/O subsystem (Bios), which was designed to be implemented in user ROMs in a manner consistent with the vendor's developing architecture. A compatible vendor must implement this Bios in such a way that it is not identical to IBM's proprietary ROM Bios code, yet provides the same functionality and interfaces in a manner totally transparent to the user's hardware and software.

The Bios contains code for the operating system bootstrap, for system checkout and testing, for interrupt vectors allowing Bios-level interfacing for I/O manipulation and for the initialization of memory, interrupt vectors, scratchpad, I/O and flag values. It is particularly important that ROM Bios interrupt vectors are initialized to point to the same functions found on the Personal Computer.

As is the case with the more advanced Basic interpreters for diskette- and disk-based systems, IBM uses the existing (cassette-level) ROM Bios together with a tailored software Bios to achieve the equivalent of all the software Bios-supplied with MS-DOS. A vendor can implement this in various combinations of ROM and random-access memory (RAM) as long as certain addressing, interrupt and memory constraints are respected.

Another essential problem in trying to achieve software compatibility is that the vendor is always shooting at a moving target. As the primary vendor improves on or expands the system's capabilities, new operating system releases (or new Basic releases) may be needed to exploit fully the expanded capabilities. A program designed to run under the old operating system release may not run under the new one without modification.

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For example, IBM's PC-DOS 2.X releases were developed with the introduction of the Personal Computer XT and PCjr respectively, while PC-DOS 3.X was unveiled with the Personal Computer AT, but all will run on the original Personal Computer. When IBM announced PC-DOS 2.1, it stopped selling PC-DOS 2.0 altogether and later PC-DOS 1.1. Yet certain programs developed for operation under PC-DOS 1.1 will not run without modification under PC-DOS 2.0 or 2.1; IBM published a list of these when it announced PC-DOS 2.0.

> *The issue of compatibility might not be so difficult to resolve if compatible hardware and software vendors would be more precise as to the specific operating system versions for which compatibility is claimed.*

The issue of compatibility might not be so difficult to resolve if compatible hardware and software vendors would be more-precise as to the specific operating system versions for which compatibility is claimed.

Hardware compatibility with the Personal Computer is manifested in several ways — through the CPU, the expansion slots, the disk drives, the keyboard and the display. If any of these areas don't conform with the Personal Computer, then the system will not be completely compatible.

Are the central processors in the two systems compatible? Are they based on the same or related microprocessors?

The CPU in a microcomputer system is usually equated with the primary microprocessor used to execute the primary instruction stream. For the Personal Computer, the primary microprocessor is an Intel 8088, which is part of a compatible family that includes 8085, 8086, 80188, 80186 and 80286 8-bit and 16-bit chips.

It is conceivable that a fully Personal Computer-compatible microcomputer system could be designed with any of these chips by firmware or software programming around differences in implementation of essential functions. The 80188 was specifically designed as an upgrade to the 8088; the 8086's difference in data bus width is compensated for by almost identical interfacing to the bus.

The Personal Computer AT implementation of the 80286, however, is experiencing some compatibility problems. Nevertheless, almost all currently delivered systems that claim full compatibility (hardware, code, disk, keyboard, I/O, software) use the 8088 as a base. It seems logical that a company primarily interested in marketing a highly compatible system would choose the 8088, which is identical to IBM's microprocessors, and thus cut back on the compatibility adaptations needed. On the other hand, if a company wants to implement an MS-DOS system with disk/data compatibility and enhanced features over what IBM offers, the logical choice is the more powerful 8086, 80186 and 80286 processors.

The compatibility of the basic microprocessor component is only the first issue. If a vendor says a system is based on an Intel 8088, he does not usually mention that the interrupt control logic, CPU timer, direct memory access control and so on are on separate microprocessor chips. The user is presented with a system having numerous hooks for direct interaction with basic peripherals and systems software.

The software as it is currently implemented is also open to some adaptation and alteration by the user. The variety of entrances and exits to and from the IBM code and the possibility of implementing changes that IBM may later implement in a different manner means that developing a highly compatible personal computer is difficult. The systems cannot be identical and do not have to be, but they should function as if they were.

Can I take an IBM board or board-level option, such as the color/graphics display adapter or the expansion box, and plug it into my compatible system?

The question of whether a compatible system can add board-level options and I/O slots is easy to determine because there is an obvious physical interface that probably would not be implemented without associated logic support. In the most compatible systems, the basic system unit can accept IBM boards, including the board that allows attachment of the IBM expansion unit for adding hard disk and additional I/O slots. Corona Data Systems, Compaq and Columbia Data Products, Inc. are examples. (Columbia Data Products recently filed for protection under Chapter 11 [CW, May 13]).

At a second level, the compatible system does not itself accept IBM add-on boards but instead attaches to a special expansion unit through a compatible bus interface. The expansion unit accepts the IBM boards. This method of attachment is used by the Seequa Computer Chameleon. In this case, the 8288 bus controller chip and the 8237 direct memory access controller chip or their compatible counterparts would be likely control modules.

At another level, the presence of a compatible physical interface (in other words, parallel printer port) does not mean that a device can be attached and run. A compatible I/O driver for the specific device must exist in the system or be added.

The physical attachment of I/O devices can incur unexpected obstacles. For instance, when IBM unveiled the Personal Computer XT with eight slots (as opposed to five slots in the Personal Computer), the slots were positioned more closely together in the XT system unit than in the Personal Computer. IBM boards fit, but some boards made by third-party vendors were too thick, especially if they had a piggyback option.

Is the compatible keyboard identical to the keyboard supplied by IBM? If there are additional keys on the compatible system, how do they affect the compatibility of programs or data generated using these keys?

The consideration of keyboard compatibility between the Personal Computer and its look-alikes has two facets — the man-machine interface and the system compatibility interface.

The 83-key, Personal Computer keyboard deviates from the familiar IBM Selectric keyboard in a number of ways that many users find annoying. Most irritating is that the left shift lock is not in its traditional place next to Z, but is one key over, after a backslash key. Some users don't like the function keys placed in a pad to the left; they would prefer them in a row across the top of the keyboard.

The issue of what a single user prefers, however, is complicated further when multiple systems are used in a business setting, and people find themselves using different micros at different times. If each has a different keyboard layout, the user's conditioned responses are snarled, and error rates and irritation rise while throughput goes down.

To combat this problem, vendors aiming at compatibility usually supply a keyboard identical to IBM's in spite of known problems. If alternative layouts are supplied, they usually move toward the standard Selectric layout. Some vendors supply more than one alternative.

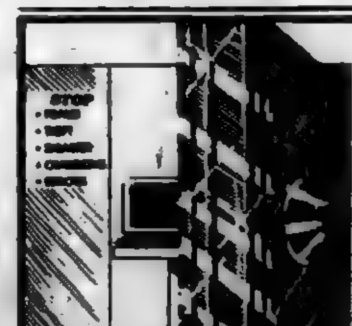
To what extent are alternative layouts likely to be incompatible? The answer is that a change in position is unlikely to cause problems, but the addition of new functions may or may not. IBM's method of implementing keyboard-to-CPU communications is highly amenable to software alterations. No individual key produces a single code that is translated directly to an Ascii equivalent; instead, two codes are produced, one as the key is struck and one as it is released.

The codes are collected in a 20-char. buffer that is controlled by a separate microprocessor chip, the 8048, as well as ROM Bios. Bios processes the single keystrokes or keystroke combinations that generate legal Personal Computer codes — a 256-byte-extended Ascii character set plus 40 function key codes.

The 8048 monitors and reports keyboard activity, generates a Bios interrupt for every key action, notifies the user if the buffer is full and the system isn't responding to interrupts and performs diagnostics.

This indirect path between the keyboard signals and the generation

(Continued on Page 50)



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A guide to the chart

Many vendors claim IBM Personal Computer compatibility, and there are various levels of compatibility. The Data Decisions chart on the opposite page points to products with specific capabilities.

When examining this information, it's important to bear in mind the three levels of Personal Computer compatibility:

Personal Computer compatibility. These systems run most IBM Personal Computer software packages, use the Intel Corp. 8088 microprocessor, accept IBM peripheral cards, can read/write IBM disks and have the same user interfaces for the display, keyboard and sound. This group can be subdivided into the highest degree of compatible systems, which includes machines that run 98% of Personal Computer software, and lower levels, which include systems that have problems running some of the programs, mostly in the graphics area. These lower level systems also may accept most, but not all, of the Personal Computer expansion boards.

Data compatibility. These systems usually don't run major IBM programs. They can't use IBM expansion cards and have different user interfaces. What they can do is either read or read/write IBM data files.

MS-DOS compatibility. Systems in this group can't even swap data disks without converting the disk media.

The chart presents an overview of the most popular Personal Computer-compatible systems on the market. Many of the systems have not yet been fully tested by Data Decisions. Therefore, their level of compatibility is based solely on vendor specifications and claims.

If you plan to purchase a compatible, you should test the system for yourself before making a final decision.

The column headings going across the top of the chart address issues of hardware compatibility and system configuration.

Compatible expansion slots. If a system accepts Personal Computer expansion cards, the number of available compatible slots is shown. A "0" indicates that although the system isn't board compatible, it has slots for noncompatibles — or that it does not have expansion slots in the unit but can attach a compatible expansion chassis. The Comments section indicates which is the case.

Graphics compatible. This category shows what systems utilize the same graphics capability as the Personal Computer, either as a standard feature or system option.

CPU speed. This shows the CPU speed in MHz. If a system has more than one speed, the fastest speed is shown, and the Comments section will indicate that it is switch selectable.

Processors. Indicates what CPU a system runs under, what systems use an 8-bit co-processor for running CP/M applications and whether a system has an 8087 socket for implementing an Intel 8087 for faster numeric processing.

Memory. Shows the amount of memory a system comes with in its base configuration, how much memory can be placed on the mother-board before having to use expansion slots and the maximum amount of memory a system can handle.

Ports. Shows how many serial and/or parallel ports a system provides as part of its base configuration.

Hard disk. Shows which systems include a hard disk in their base configurations.

Bundled software. Indicates what type of software is included in the system price.

Base configuration. Shows what components are included in a system's entry-level model.

Price range. Indicates a system's base price range.

Comments. Any relevant information not presented in the chart is shown in this section.

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									—	—●———	—●●	●●——
IBM Personal Computer	5	0	4.77	●———●	●——	—●—	——●—	00	●	—●———	—●●	——●—
IBM Personal Computer XT	8	0	4.77	●———●	—●—	—●—	——●—	10				
IBM Personal Computer AT	8	0	6.00	——●——	——●	———	———●	00	●	●————	—●●	—●●—
AMA PC, PC Plus	3	S	4.77	●———●	—●—	—●—	——●—	21				
								21	●	●●●●—	—●●	—●—●—
Anderson Jacobson Passport MBA, PHD	5	0	4.77	●————	——●	———	———●	11	●	●●———	●●●	—●●——
Applied Digital Data Systems PC/1, PC/II	3-4	S	4.77	●———●	——●	—●—	——●—	11	●	————	●●●	—●—●—
AT&T PC 6300	6-7	S	8.00	—●———	—●—	—●—	——●—	11	—	●●———	●●●	—●———
Canon Personal Computer A-200	2	S	4.77	—●——●	——●	———	—●——	11	—	————	●●●	—●———
Colby PC 3 Portable	4	0	4.77	●———●	—●—	——●	———●	11				
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Columbia MPC Series	5-7	S	4.77	●———●	——●	—●—	——●—	21	●	●●●●●	●●●	—●●——
Columbia VP Portable	1-2	S	4.77	●———●	——●	—●—	——●—	11	●	●●———	●●●	—●—●—
Compaq Portable, Plus	2-3	S	4.77	●———●	—●—	———	——●—	01	●	————	●●●	—●—●●
Compaq Deskpro	4-6	S	7.14	—●——●	—●—	———	——●—	11	●	●●●——	—●●	—●—●—
Corona PC 400	3-4	S	4.77	●———●	——●	——●	—●——	11				
									●	●●●—●	—●●	—●●——
Corona PC-12, PC-22, PCHD-2	3-4	S	4.77	●———●	——●	——●	—●——		●	●●●—●	●●●	—●—●—
Corona PPC-12, PPC-22, PPCXT	3-4	—	4.77	●———●	——●	——●	—●——	20	—	●————	●●●	—●———
Data General/One	0	S	4.77	●————	—●—	———	—●——	11	—	●●●●●	●●●	—●———
Docutel/Olivetti M-18 PC, Portable PC	4	—	4.77	●———●	——●	——●	—●——	21	●	●●———	—●●	●—●——
Eagle PC Plus Series	1-3	—	4.77	●———●	—●—	———	——●—					
									●	●●———	●●●	—●●——
Eagle PC Spirit, Spirit XL Portables	1-2	S	4.77	●———●	——●	———	——●—	21	●	●●———	—●●	——●—●
Eagle PC Turbo XT, GT	5	0	8.00	—●———	——●	———	—●——	01	●	●●———	—●●	——●—●
Ericsson PC	5	S	4.77	●————	——●●	———	——●—	11	—	————	———	●————
Fortune 1000	4	0	4.77	●———●	—●—	—●—	——●—	21	—	●————	—●●	●————
[illegible] Technologies System 2	7	0	4.77	●———●	——●	—●—	——●—	00				
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[illegible] Express PC, XT	5	—	4.77	●———●	——●	———	——●—	21	●	●●———	●●●	—●—●—
[illegible] Unisystem PC, XT	2-3	S	4.77	●———●	——●	———	——●—	21	●	●●——●	—●●	●●●——
ITT Xtra	5	0	4.77	●———●	—●—	—●—	——●—	11	●	●————	●●●	—●—●●
Ivy Portables	6	S	4.77	—●——●	——●	——●	—●——	21	●	●●●——	●●●	●—●——
Leading Edge Personal Computer	3-5	S	7.16	●————	—●—	●——	——●—	11				
									—	●—●—●	●●●	●————
Morrow Pivot	0	—	5.28	—●———	——●	———	——●—	11	—	●●———	●●●	—●———
NCR Model 4	8	0	4.77	●———●	—●—	—●—	——●—	11	●	●————	—●●	—●—●—
Nelma Persona 16, 16XT	8	0	4.77	●————	—●—	———	——●—	11	●	●————	●●●	—●●—●
OSM Zeus PC Family	4-6	0	4.77	●————	——●	———	—●——	11	●	●●●●●	●●●	—●●——
Panasonic Senior Partner Portable	2	S	4.77	●———●	——●	——●	—●——	11				
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QD-16	5	0	8.00	●———●	—●—	———	●———	11	—	———●	●●●	—●———
Quadram Datavue 25	—	S	4.77	●————	—●—	———	●——●	11	—	————	—●—	●————
[illegible] Tava PC	5	0	4.77	●———●	——●	—●—	——●—	01	—	●●●●●	●●●	—●———
Sanyo MBC 775 Portable	2	—	4.77	●————	——●	—●—	——●—	11	—	●●●●●	●●●	—●———
Seequa Chameleon Plus Portable	0	S	8.00	●———●●	——●	—●—	———●					
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Seequa [illegible]	6	6	8.00	—●——●—	——●	———	——●—	11	●	●●●●●	—●●	●—●——
Seequa PC and XT	4	S	8.00	●——●●	—●—	—●—	——●—	11	●	●●———	●●●	—●●●●
Sperry Personal Computer	3-4	S	7.16	●————	——●	—●—	——●—	11	●	●●———	●●●	—●●●—
Sperry Portable	4	—	4.77	●———●	——●	—●—	——●—	11	—	●———●	●●●	—●●——
STM PC Desktop and Portable	6	6	8.00	——●——	——●	——●	—●—	21				
									—	●—●●●	—●●	●————
Tandy Model 1000	3	S	4.77	●————	—●—	———	——●—	01	●	————	—●●	—●———
Tandy Model 1200 HD	5	S	4.77	●———●	——●	———	——●	01	●	●●●●●	●●●	—●—●—
Televideo Tele[illegible] PC, XT	1	S	8.00	●————	——●	———	——●	11	●	——●●●	●●●	—●●——
Televideo Tele-PC Plus, Tele-XT Plus	1	S	4.77	●———●	——●	—●—	——●—	11	—	——●●●	●●●	—●———
Televideo TPC III, TPC IID Portables	1	S	4.77	●———●	—●—	—●—	——●—	11				
Wang Professional Computer	6	—	8.00	—●——●	——●	———	——●—	11	—	●●———	—●●	—●———
Wyse 1100-1100-2	2	S	4.77	●———●	——●	———	—●——	21	●	●●———	—●●	●—●——
Zenith Z-150 Desktop & Z-160 Portable	4	S	4.77	●———●	—●●	———	—●●—	21	—	————	—●●	—●———
Zentec WS1000	5	—	4.77	●———●	—●—	———	———●	31	—	●————	●●●	—●———

(Continued from Page 47)

of characters means that the keyboard character set can be easily redefined; changed key positions can be coded by means of software and new function codes entered.

The problem with this flexibility is that if a vendor makes use of it to assign unique functions to unused code combinations, the software can become incompatible if IBM assigns a standard function. The bright side is that compatible vendors are unlikely to have great difficulties designing compatible keyboards or implementing a fix for a bug.

Can I take IBM programs that use the Personal Computer graphics feature and run them on my compatible system?

When IBM introduced the Personal Computer, it also offered two graphics boards for use with the system. The monochrome board provides a resolution of 640 by 200 pixels while the color board offers 320 by 200 pixels in four colors. Because the boards were from IBM, they quickly became the standard to which most graphics packages were written.

Many people felt that these graphics capabilities were less than the best possible considering the current state of the art. Consequently, many vendors that preserved compatibility in most respects chose to implement a system with better but incompatible graphics resolution. Adding more pixels per square inch creates a sharper character image and plotline, but it creates problems for software that addresses either 640 or 320 by 200 pixels.

This type of incompatibility is common among IBM competitors that otherwise call themselves compatible; they provide incompatible enhancements. Some manufacturers have found solutions that combine the best of both worlds. The Corona personal computer, for example, features 1,280 by 325 pixels but addresses 640 by 325; each X-axis instruction parameter relates to 2 pixels, which is easily adapted to IBM compatibility.

That still leaves compatibility problems on the Y-axis. The logic provided by Corona manipulates all 325 pixels independently and, therefore, it is incompatible. To compensate, the system was designed so that someone who wants to run a program that uses compatible graphics can add one of the IBM graphics boards; the display is then manipulated as if there were only 640 or 320 by 200 pixels.

Will the compatible system read from and write to diskettes taken from the Personal Computer without changes or conversion first? Will the Personal Computer read from and write to diskettes taken from the compatible without first making alterations?

IBM offered cassette storage connection capabilities on the original Personal Computer but never supplied a drive; the ability to connect a cassette drive is not even offered on the other Personal Computer models.

Even on systems with larger fixed hard disks, the diskette drive is used to load programs, store data off-line and back up the fixed disk. A streaming tape drive might be more logical for backup, but a tape drive is usually more expensive and not as flexible as the diskette drive because diskettes can be accessed randomly and are easier to mail.

Data on the diskette drive, moreover, is usually recorded in the same format or a subset of the format used on the hard disk; each is preformatted and generally accessed through the same basic logic and tables that control the fixed disk. When inquiring about disk compatibility, the user refers to both disk and diskette media and tends to focus on the removable, exchangeable diskette.

For diskettes from different systems to be fully compatible, they must be compatible in four ways. First, they have to be the same size. Second, the data records have to be recorded in the same machine code (Ascii, Ebcdic) and use the same basic file and record organization with the same headers and pointers. Third, the way the data track is formatted on the diskette has to fit the operational characteristics of the drives on both systems. Fourth, the access logic in the system and running program must match the organization of the directories on the diskette or the system can hang up.

Physical compatibility

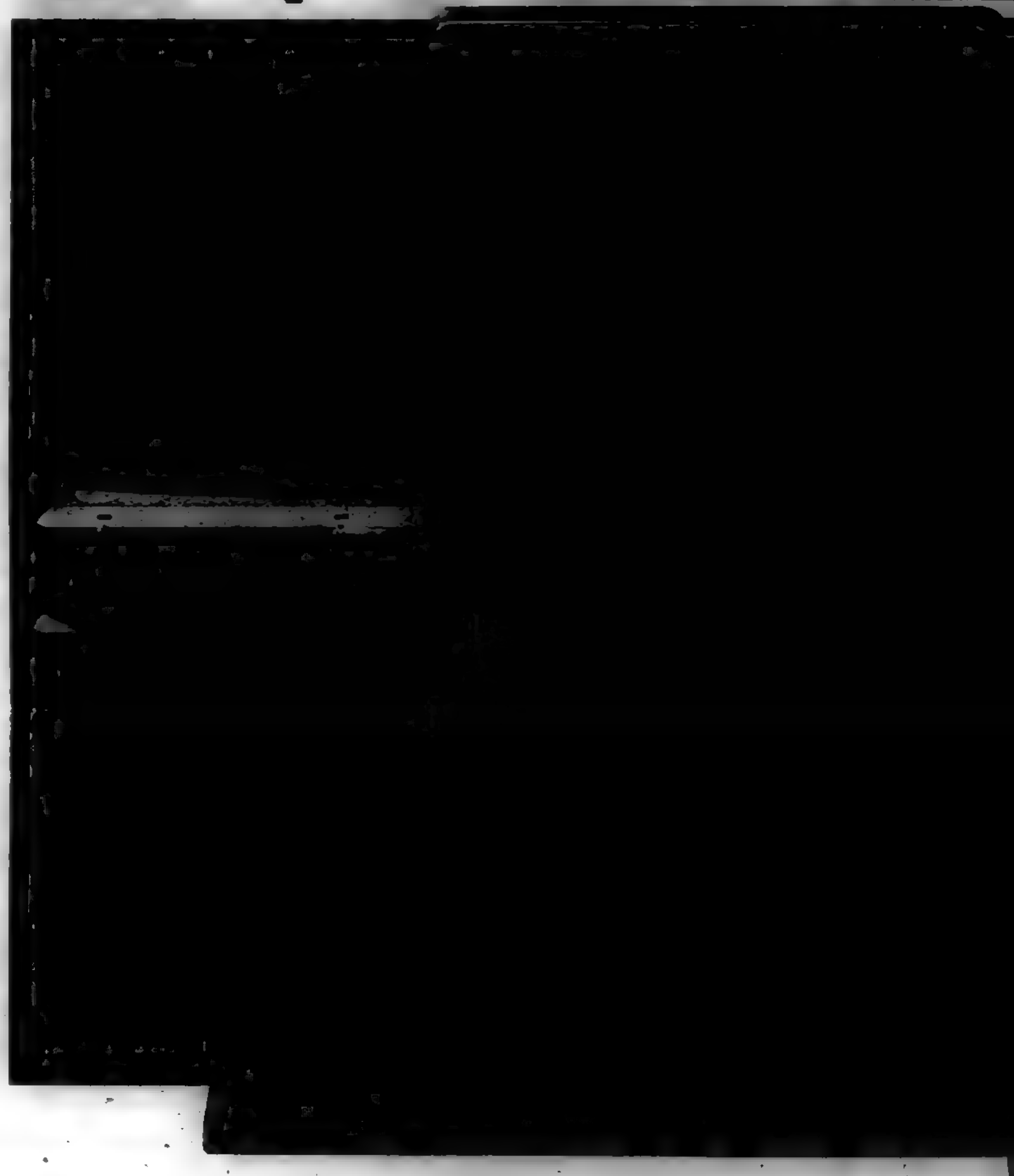
IBM Personal Computers store data on 5¼-in. floppy disk media, but many other systems use higher capacity 8-in. or more portable 3½-in. media. The first level of diskette compatibility is easy to determine — whether both systems can read diskettes of the same size.

Because PC-DOS is a variation of MS-DOS, both systems use the same Ascii code set and organize records in a similar manner, which is reflected in the diskette records. Headers, trailers, record delimiters and so on are common to both systems, and the same basic instruction types are used to manipulate files.

PC-DOS and MS-DOS have comparable features for user manipulation of files, tracks and sectors. A notable difference is that the IBM Personal Computer stores elements of the Basic I/O system, including most of the disk handling logic, in a proprietary ROM. This ROM's functions must be duplicated, preserving the same entry points without duplicating the IBM codes exactly — a tricky but not impossible proposition.

Because the read/write operations for the diskette drives were designed to be firmware- and software-controlled and are accessible to the user, it is possible to manipulate the recording format and density to some extent without sacrificing compatibility. In fact, IBM itself has done so. Under DOS 1.1, diskettes are formatted at eight sectors per track, 40

INTELL



tracks per side, whereas under DOS 2.X and 3.X there are nine sectors per track.

In all cases, 128K-, 512K or 1,024K bytes can be set as the sector size, with the result that diskettes recorded under DOS 2.X and 3.X can have a capacity of 360K bytes, whereas DOS 1.1 diskettes have a maximum of only 320K bytes. DOS 2.X and 3.X were designed to recognize automatically how the diskette has been formatted and to read it accordingly.

The 80186-based Pronto 16 MS-DOS system attaches disk drives designed to record 5¼-in. diskettes at twice the number of tracks per inch as the IBM personal computers. Instead of the 48-track/in. Personal Computer spacing with 40 tracks for recording data, the Pronto 16 was designed to record at a 96-track/in. spacing with 80 tracks for recording data.

The controller identifies the 96 track/in. recording as a double-density mode and can also record in a single-density, 48 track/in. mode. By skipping the odd-numbered tracks, the controller can read or write in compatible format, and the manufacturer can provide twice the capacity without sacrificing IBM media compatibility. The Pronto 16 user can read IBM diskettes without difficulty, all other things being equal, and can write equally compatible diskettes by using single-density mode. However, if the double-density mode is used, that diskette cannot be read into an IBM system — it will have to be copied onto two single-density diskettes.

Each diskette and disk contains a directory of its contents. The logic for control of the directories is included in generic MS-DOS-Bios, but with PC-DOS, most of it resides in IBM's proprietary Bios ROM. DOS 1.1, equivalent to MS-DOS 1.25, was oriented toward systems with diskette storage but no hard disk. Diskette files were accessed through a single directory, an adequate access structure for that medium.

On the other hand, PC-DOS 2.0 and higher, as well as their MS-DOS counterparts, supply a combined partitioning and hierarchical-free structure for disk access. The partitioning allows a disk to be divided among multiple operating systems. The tree structure provides for multiple subdirectories, and it can define a variety of access paths through the directories. This routing mechanism allows a sharing of common code and data (with some limitations) and a flexible upper limit to the virtual partition size created by the path.

Unfortunately, software for PC-DOS 1.1 that has not been updated to support the hard disk won't recognize pointers that lead to subdirectories. The program often can run on the hard disk but must use the single-level type of directory, which is usually unwieldy for a storage medium the size of the fixed disk.

PC-DOS 2.0 and higher can run on diskette-based systems using the ROM chip originally delivered for the Personal Computer. However, if an expansion unit with hard disk is added to the system, one of the elements of the installation package is a new ROM chip with the fixed disk driver on it. A user could buy the expansion box fixed disk and plug it into a compatible system, but it wouldn't work unless it was running under the newer IBM-supplied chip. Third-party vendors still supply fixed disks with software drivers that run in conjunction with the original Personal Computer ROM chip rather than the new one.

Preliminary assessment

The micro user is faced with a marketplace that has not yet developed comprehensive, clear-cut standards — or even traditions that serve as substitutes for formal standards. In some cases, however, de facto standards have been formalized because of widespread implementation. For example, most systems have a standard RS-232C interface and a Centronics Data Computer Corp.-compatible parallel printer port. On the other hand, CP/M, MS-DOS and Unix may be highly portable, but their implementation is hardly standardized.

If they are to stay in business, compatible vendors at any level of the market must offer the user price advantages and equivalent or better reliability vs. the Personal Computer. And the most successful usually offer more prompt delivery and more responsive service as well.

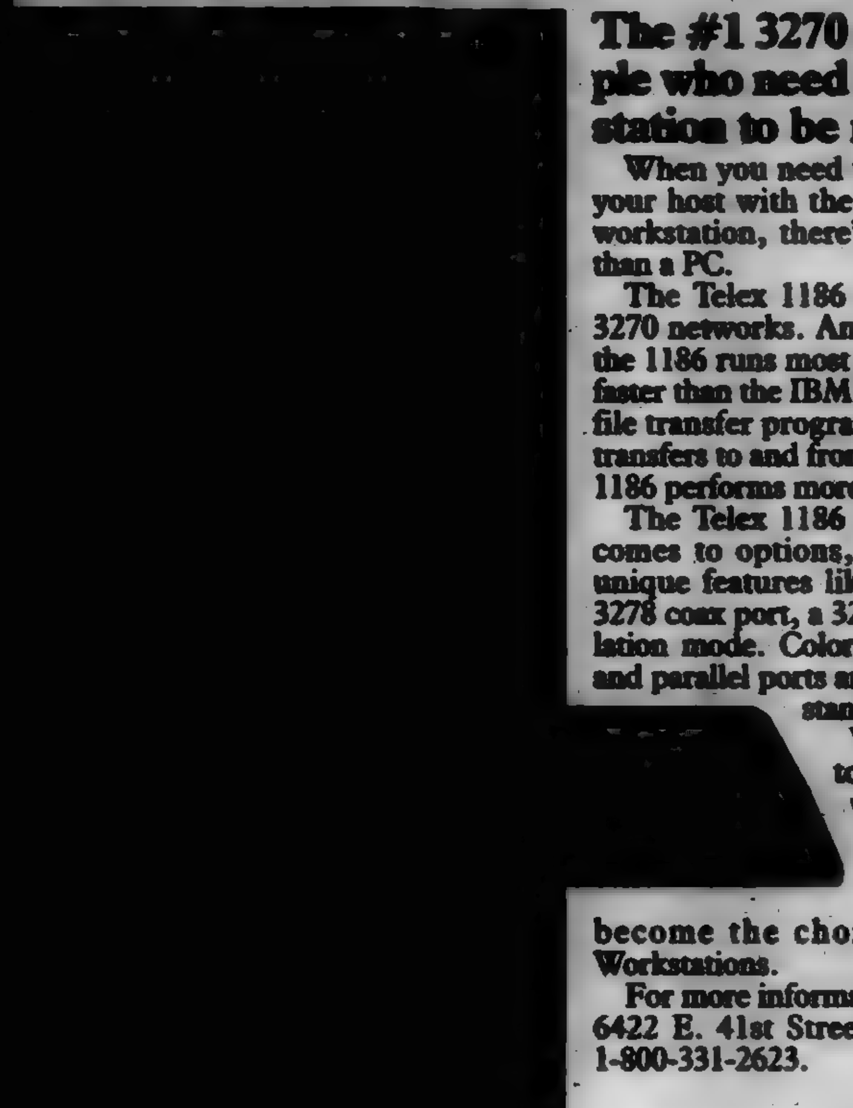
Compatible vendors must establish an identity for their product, so they offer additional attractions. Some features do not affect compatibility; others might. The following discussion of typical enhancements focuses on their impact on compatibility:

Portability or other physical packaging alterations. A number of vendors offer portable systems complete with display, diskette drives, keyboard and system unit. Portability doesn't have to affect compatibility at all, nor does any other alteration to the physical housing.

Improved ergonometric display design. The background, color and manipulative characteristics of the display, as well as nonglare features and physical size of the screen, do not affect compatibility.

Increased resolution of display. The display resolution can be improved by increasing the number of picture elements (pixels) per square inch, which makes alphabetic and numeric character shapes clearer and more distinct. Unfortunately, this enhancement can and usually does affect compatibility. However, if the change involves a fixed formula that automatically changes IBM's 640- by 200-point addressable graphics matrix (into a 1,280- by 400- or 1,280- by 600-point matrix, for example), it can be manipulated. This distinction is an important factor when evaluating compatibility.

LIGENCE



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Increasing CPU clock speed. This practice is fairly common and only creates problems for time-dependent programs.

Increased memory capacity. Increasing the memory in the basic system doesn't change the compatibility of a vendor's product, but increasing memory beyond IBM's limit might do so. The Personal Computer allows addressing up to 1M byte, but some of those addresses are used for system functions that are not supposed to be accessed directly by the user. The 640K-byte Personal Computer limit for user memory is large enough for a single-user/single-tasking system, and most alternative vendors do not exceed it.

Increasing diskette capacity. The Personal Computer line handles 160K, 320K or 360K bytes of diskette capacity, depending on the drive model and operating system release. In almost all cases, any change in diskette size, capacity, file handling, formatting or directories will affect media compatibility. The exception is when a drive and its supporting software are engineered to read and write Personal Computer densities as well as the larger density.

Changes in keyboard design. Changes in a keyboard's physical characteristics, such as touch sensitivity, shape of keyboard top, color coding of key caps, positioning of keys and movability and tiltability of the keyboard unit, do not affect compatibility. Adding function keys may or may not affect compatibility and probably won't because they are entered into the system by a two-level process that lets the user manipulate the software and translate the keyboard input into standard system instructions.

Adding to the number of slots, RS-232C or parallel printer ports. In and of themselves, these changes do not create problems, provided the devices can be addressed. However, there may be problems with the software that directly addresses machine elements.

Combining logic cards. Many compatible vendors provide a display control card that combines the functions of the monochrome and graphics display control cards, which are separate for all Personal Computer systems except the 3270 PC. This doesn't affect compatibility and saves I/O slot positions; in fact, this compaction is a favorite device of vendors competing with IBM.

Implementing a RAM disk. PC-DOS 2.0 and higher and MS-DOS 2.0 and higher implement a RAM disk, but PC-DOS 1.1 and MS-DOS 1.25 do not. Certain compatible vendors include RAM disk capability in their version of MS-DOS 1.25. This addition may or may not affect compatibility with programs designed to run under PC-DOS 1.1; in the case of Columbia Data Products and Corona systems, for instance, it does not.

Current compatibility

Users and industry analysts tend to divide the compatibles marketplace into three broad divisions and assume that the systems run some version of MS-DOS and are based on an 8088, 8086, 80186 or other compatible member of the Intel 8088 family of microprocessors. These divisions are MS-DOS compatible only, disk/data compatible and Personal Computer compatible.

MS-DOS compatible only. This

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broad group of systems runs MS-DOS, but there is no particular effort to be compatible. Certain programs that run on the Personal Computer can run on these systems because they use only the code common to MS-DOS and PC-DOS — in other words, they are highly device-independent. They will not directly address ROM, for example, and usually do not use graphics.

Because certain Personal Computer programs do run on the system, the vendor may claim some compatibility. Usually, however, the specifications for these systems show differences in diskette media size or capacity, differences in graphics pixels, a different keyboard or different character capacity and format on displays. These systems do not attach IBM peripheral cards; if these vendors were interested in that degree of compatibility, they would have included disk/data compatibility — which is easier to implement.

This level of compatibility has been labeled MS-DOS compatible or incompatible. Only a stray manufacturer or two calls the system compatible because most manufacturers of this type of system see a marketing advantage in having a distinct identity. These vendors will usually say that their product is not a "me-too" product.

Disk/data compatible. The second large group of systems can read and write disks in the format used by the Personal Computer and use the same physical size diskette. They will produce 5¼-in. diskettes with a capacity of 160K, 320K or 360K bytes depending on the MS-DOS version implemented and whether or not the diskette is single- or double-sided. Sectoring will be the same. Headers, trailers and directories also will be the same, with the qualification that certain compatibility problems will arise among diskettes with multiple subdirectories recorded under MS-DOS 2.0/3.0 or PC-DOS 2.X/3.X and single directories recorded under MS-DOS 1.25 or PC-DOS 1.1.

This level of compatibility has been labeled disk compatible, data compatible or media compatible and, of course, Personal Computer compatible. It is a level that is fairly easy to implement because the basic software structures are already in place in MS-DOS. The manufacturer only needs to add a 5¼-in. diskette drive and some coding to implement it in addition to features already on the system.

Personal Computer-compatible systems. Systems that are fully or almost fully compatible with existing hardware and software include the ability to attach Personal Computer expansion boards and run Personal Computer software. The keyboard may be identical as well as compatible; the disk is compatible; the system runs most nongraphics and some graphics software; it usually can run interpretive Basic with graphics as well as compiled Basic; and it can run all versions of PC-DOS. If the system doesn't quite meet these standards, the point of variance usually is with the graphics capabilities and the ability to run interpretive Basic with graphics. Systems with this level of compatibility have been labled system compatible, operationally compatible, truly compatible and naturally Personal Computer compatible.

Clearly, PC-DOS has a lot of capability for supporting machine-dependent features, and even the most compatible system could hang up on a program that directly calls ROM — even if the compatible system has all ROM entry points at the same locations as IBM's. It is also possible for a compatible vendor to design ROM code to function like the Personal Computer ROM code without violating IBM copyrights.

The Compaq Portable, the first compatible to achieve a sizable installed base, is considered the compatibility standard. Corona Data Systems, another veteran in this market, has also achieved excellent marks on compatibility. The Corona system has incompatible graphics features but can operate in a fully compatible graphics mode if the IBM graphics board is installed.

Wang Laboratories, Inc. recently announced four desktop machines offering software compatibility with the IBM Personal Computer [CW, May 13]. The models add IBM monochrome display emulation capability to standard Wang Professional Computer configurations. The desktops feature an 8086 processor, 256K bytes of RAM, MS-DOS 2.1 and Basic. Expansion slots are compatible with Wang's Professional Computer. Wang also announced an IBM Personal Computer color and graphics emulation option and an Intel 8087-2 numeric coprocessor.

Word of caution

Whenever we talk about compatibility, we include MS-DOS systems that are disk/data compatible and those that can attach Personal Computer boards. Both these levels can run more Personal Computer software than systems supporting MS-DOS compatibility. Compaq, the system generally accepted as the most compatible, runs PC-DOS and IBM-supplied systems software.

However, it would be wise to test every program, even on a Compaq.

The two favorite testing vehicles are Microsoft's Flight Simulator and Lotus Development Corp.'s 1-2-3.

About the author

Stephanie Di Donato is a senior editor/analyst for Data Decisions, a market research firm. The material in this article was taken from "Microcomputers Systems," a three-volume monthly updated reference service that provides hands-on evaluations of micro communications hardware and software products. Microcomputers Systems is published by Data Decisions, 20 Brace Road, Cherry Hill, N.J. 08034.

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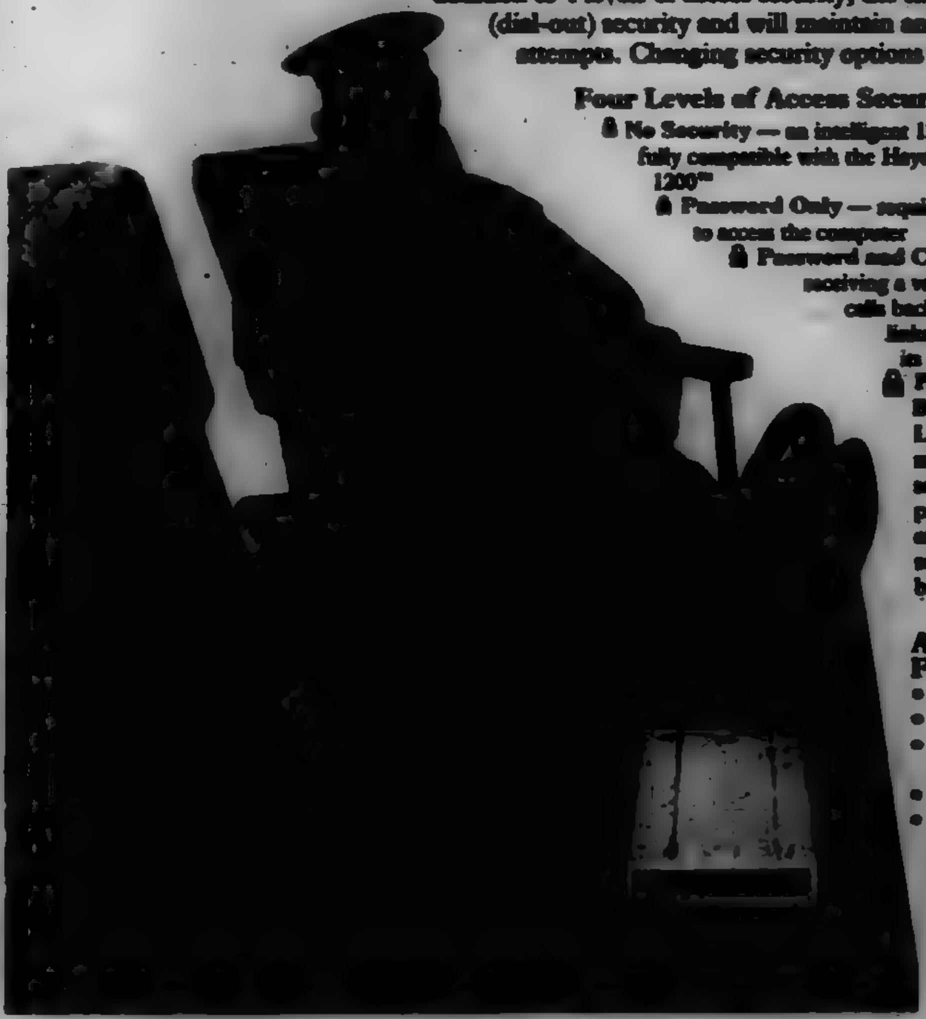

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SOFTWARE & SERVICES

SQL users give mixed reviews

By John Gallant
CW Staff

NEWBURY, England — Overall, users gave high marks to IBM's SQL relational query system, but they questioned its usefulness to non-DP professionals — the very audience to which IBM targets the product.

That was the finding of a recent Xephon Technology Transfer Ltd. study of SQL users at 37 U.S. sites. According to Xephon, headquartered here, SQL is most commonly used by applications programmers and least used by senior managers. Many respondents commented on end-user difficulties encountered when using SQL.

"IBM aims its relational query system squarely at non-DP professionals — DP professionals are not listed among the primary users suggested for SQL in IBM's "Systems and Products Guide," Xephon stated. "But [the survey] casts some doubt on the package's suitability for end users without DP training."

In addition, the survey indicated, SQL performance was a problem for users, particularly terminal response time and processor overhead. Users cited faster systems development as the primary benefit of SQL use, and they listed its lower cost, compared with functionally similar products, and reliability as top benefits.

Xephon also asked users to list the factors that influenced their selection of SQL. The most commonly expressed factor was that SQL is an IBM product, benefiting from Big Blue's "strength, support and di-

See SQL page 66

A program for teamwork

SOFTALK
John Gallant
CW Senior Editor

What do programmers, engineers and certain athletes have in common?

According to J. Daniel Couger, they are intensely individualistic, thrive on challenge, have a lower need for social interaction and are motivated by their work rather than such factors as pay, fringe benefits or job security. But despite their solitary, self-motivated nature, they are usually required to work within a team structure.

Couger, distinguished professor of computer and management science at the University of Colorado at Colorado Springs, is involved in research into the workings of programming teams and the hazards that befall them.

"Professionally, engineering is the closest thing to programming," Couger said "In athletics, the equivalent to the programming

See TEAM page 71

[illegible]

'Artificial intelligence as a term sounds kind of intriguing, a little mysterious and maybe even a little eerie. It has that kind of peculiar fascination and allure that words like supernatural, phantasm, occult and martian have — things fathomable but still otherworldly. AI makes perfect cocktail conversation if you know the right buzzwords.'

Harvey Newquist III
DM Data, Inc.'s 'AI Trends' newsletter

- CDBC unleashed a remote micro link to its mainframe financial applications/58
- Iskra Software International gave DEC minis an applications generator/58
- Linkware extended its communications software to AT&T's Unix and IBM's MVS operating systems/58
- Future Software unveiled an IBM mainframe spreadsheet dubbed FutureCalc/59

INSIDE

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SOFTLINE/SHAKU ATRE

Will the real fourth-generation languages please stand up?

Has the era of fourth-generation languages already arrived, or is it just approaching?

A critical look at the evolution of programming languages shows that first-generation software supported sequential processing of one instruction at a time. Today, software supports sequential instruction-by-instruction processing but at a much faster rate than 10 or 15 years ago.

First-generation software came into existence in the late 1950s and early '60s. It was characterized by machine-oriented languages and assembly languages such as Basic Assembly Language.

Second-generation languages, which became popular in the early 1960s, can be described as compiled programs that run using a command language. For example, early versions of Fortran were dependent on JCL for the IBM 360.

Third-generation languages with data abstraction capabilities and control of asynchronous processes also arrived during the early '60s. These languages included Cobol, PL/1 and Pascal.

Each generation of languages has improved on the ease of use and capabilities of its predecessors. Since the third generation, generation 3.5 languages

See SOFTLINE page 70

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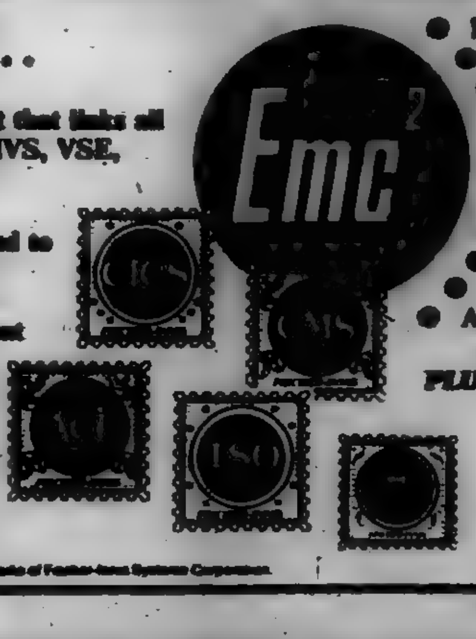

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CDBC unveils link tool for IBM micros

GREENWICH, Conn. — Control Data Business Centers, Inc. (CDBC) has announced microcomputer-mainframe link software that gives remote personal computer users access to accounting and financial applications running on CDBC's mainframes.

Dubbed Orchestrator, the software gives IBM Personal Computer AT and XT users a two-way link to CDBC's mainframes running payroll, accounts receivable and payable and general ledger systems. Orchestrator reportedly provides user companies with a common data base that can be accessed by different departments through micros. Applications of Orchestrator include payroll processing, payroll tax filing, automatic tax changes and benefits administration.

Orchestrator consists of a telecommunications program, user security software, four data entry modules, automatic file translation, backup and restoration programs, printer support software and report backup, restoration and deletion. It requires 320K bytes of random-access memory and an RS-232 serial port. It comes with four 5¼-in. diskettes that work under IBM's PC-DOS 2.0. Telephone hookup requires a 1,200 bit/sec. asynchronous modem with autodial capabilities.

The spokesman said the product can be used to communicate with CDBC mainframes at any time of the day and transmits and disconnects automatically.

The menu-driven software automatically edits entered data, the spokesman said. Data is available after processing by the host for downloading, storage and manipulation in the micro. Processed work, including reports and payroll checks, reportedly is available the next day.

Orchestrator is available through two basic options: a one-time license fee of $3,600 or a monthly payment of $150. CDBC also charges a software maintenance fee of $35 per month. Host processing rates vary, based on volume of processing.

CDBC can be reached through P.O. Box 7100, 600 W. Putnam Ave., Greenwich, Conn. 06836.

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DEC systems get Formatix

PARMINGDALE, N.Y. — Iskra Software International has introduced an applications generator for Digital Equipment Corp.'s VAX and PDP-11 processors.

Formatix generates documentation as it develops the application, a spokesman said. The menu function allows users to combine programs generated by Formatix with programs written in other languages.

Users can begin application generation by describing the features they need generated. Menus can be formed to create, review, update, generate reports, make inquiries and provide help.

Formatix is priced from $1,700 on DEC's Microvax to $9,900 on the VAX-11/780.

Iskra Software International is located at 222 Sherwood Ave., Farmingdale, N.Y. 11735.

Linkware versions debut for MVS, Unix

WALTHAM, Mass. — Linkware Corp. has announced that its micro-mainframe software now runs under IBM's MVS/TSO and the University of California at Berkeley's Unix operating systems. The company also announced Version 1.5 of its PC Connection product.

The Linkware Information Server, formerly available for IBM VM and Digital Equipment Corp.'s VMS operating systems, includes Linkware's data transformation facilities that transform host files into personal computer formats, according to a spokesman.

The MVS and Unix versions of Linkware Information Server each include command line interfaces to allow host-terminal users to exchange files via Linkware's Central Server with dissimilar personal computers.

A security facility allows management to control user access privileges and generates an audit trail of user requests to Linkware, the spokesman said.

The MVS/TSO version of the Linkware Information Server costs $35,000 per CPU. Unix versions range from $6,000 to $18,000, depending on configuration.

Linkware's PC Connection Version 1.5 is now available for Data General Corp.'s DG/One and Wang Laboratories, Inc.'s Wang Professional Computer.

The product, formerly available for the DEC Rainbow and IBM Personal Computer and compatible machines, automatically reformats information being transferred between the mainframe and microcomputer. Logon features have also been enhanced, the vendor said.

Linkware's PC Connection costs $10,000 for each make of hardware running it.

Linkware is located at 77 Rumford Ave., Waltham, Mass. 02154.

SYSTEMS SOFTWARE

■ Datamate Co. has announced that its Fastfile data base system is now available for users of NCR Corp.'s Imos 3 and Imos 5 operating systems. The product had been available for users of NCR's IRX, ITX and RM/COS systems.

Fastfile allows users to set up information storage and retrieval systems in minutes. The product uses precompiled code to allow the user to set up a customer filing system by responding to menu prompts.

From a central menu, Fastfile allows users to create up to 32 data bases, which look like standard Cobol applications, a spokesman said. Data retrieval is carried out by a customized version of the firm's Enquery English-language report writer.

According to the vendor, Fastfile is priced at $1,995 on all NCR I series computers. Prior to Sept. 30, the product is priced at $1,495. Enquery is included with the system.

Datamate, Suite 128, 4135 S. 100th East Ave., Tulsa, Okla. 74146.

■ An integrated forms facility, support for Digital Equipment Corp. VAX clusters and a tools library have been added to Version 4.0 of Software House, Inc.'s System 1032 data base management system.

The System 1032 forms facility reportedly simplifies data input and display. Automatic layout produces forms directly from data set definitions. Fields and prompts are aligned in vertical columns, and centered headers and boxes indicate data groups.

An automatic applications generator reportedly develops prototype screen-based applications using the system's fourth-generation language.

The 1032 Vaxcluster software selects between the VAX/VMS Distributed Lock Manager and an internal lock management module, the vendor said. A tools library includes data base utilities as well as Help facilities.

System 1032 Version 4.0 is priced from $8,000 for the DEC Microvax I to $60,000 for the VAX 8600.

Software House, 1105 Massachusetts Ave., Cambridge, Mass. 02138.

■ Sir, Inc. has added a graphics component to the Digital Equipment Corp. VAX version of its Sir/DBMS relational data base management system.

The graphics component, Graph, allows users to create business charts and graphs and create subsets of a larger data base on a table file. With Sir's SQL+ query language, users are able to manipulate and format data, generate histograms, bar charts and pie charts, as well as graphs and store the data for later use, the vendor said.

Graph is compatible with more than 70 graphics devices and can use any charting capabilities provided by the user's hardware.

Reportedly, Sir/DBMS is available on a variety of hardware and operating systems ranging from AT&T Unix-based supermicros to mainframes.

Prices for Sir/DBMS range from $10,000 to $75,000, depending on the hardware that is used, Sir said.

Sir, 5215 Old Orchard Road, Skokie, Ill. 60077.

■ Boole & Babbage, Inc. has announced Dasd Response Manager, an on-line tool for direct-access storage device subsystem analysis with I/O service-measuring capability. The product is available for IBM MVS/370 and MVS/XA environments.

Dasd Response Manager supplies management and technical users with information to control and improve Dasd response time, tune the Dasd subsystem, determine the best use of added Dasd and evaluate the impact of configuration and work load changes on response time.

At the system level, users can view Dasd service time and individual service time components. When contention is resolved, system summary reports verify the improved service. Node and path reports can be

Continued on page 63

Future Software releases spreadsheet for IBM CPUs

SALT LAKE CITY — Future Software, Inc. has announced Future-Calc, a spreadsheet application for multiuser IBM mainframe environments. The product is a component of the company's Future-System fourth-generation language and application development system.

Reportedly, Future-Calc allows spreadsheet models to be run in seconds and permits users to access existing files and data bases interactively and move data. The product includes capabilities for systemwide sharing of spreadsheet models.

The product features modularity, which allows any spreadsheet to be used simultaneously in any spreadsheet model by any number of users. Future-Calc spreadsheets can be attached or removed at any time.

Future-Calc runs on IBM mainframes under CICS and TSO. Spreadsheets created under TSO can be run under CICS and vice versa.

The DOS/CICS version of Future-Calc costs $12,000. The OS1/MVS/CICS and TSO versions are each priced at $15,000.

Future Software is located in Suite 9, 2525 S. Main St., Salt Lake City, Utah 84115.

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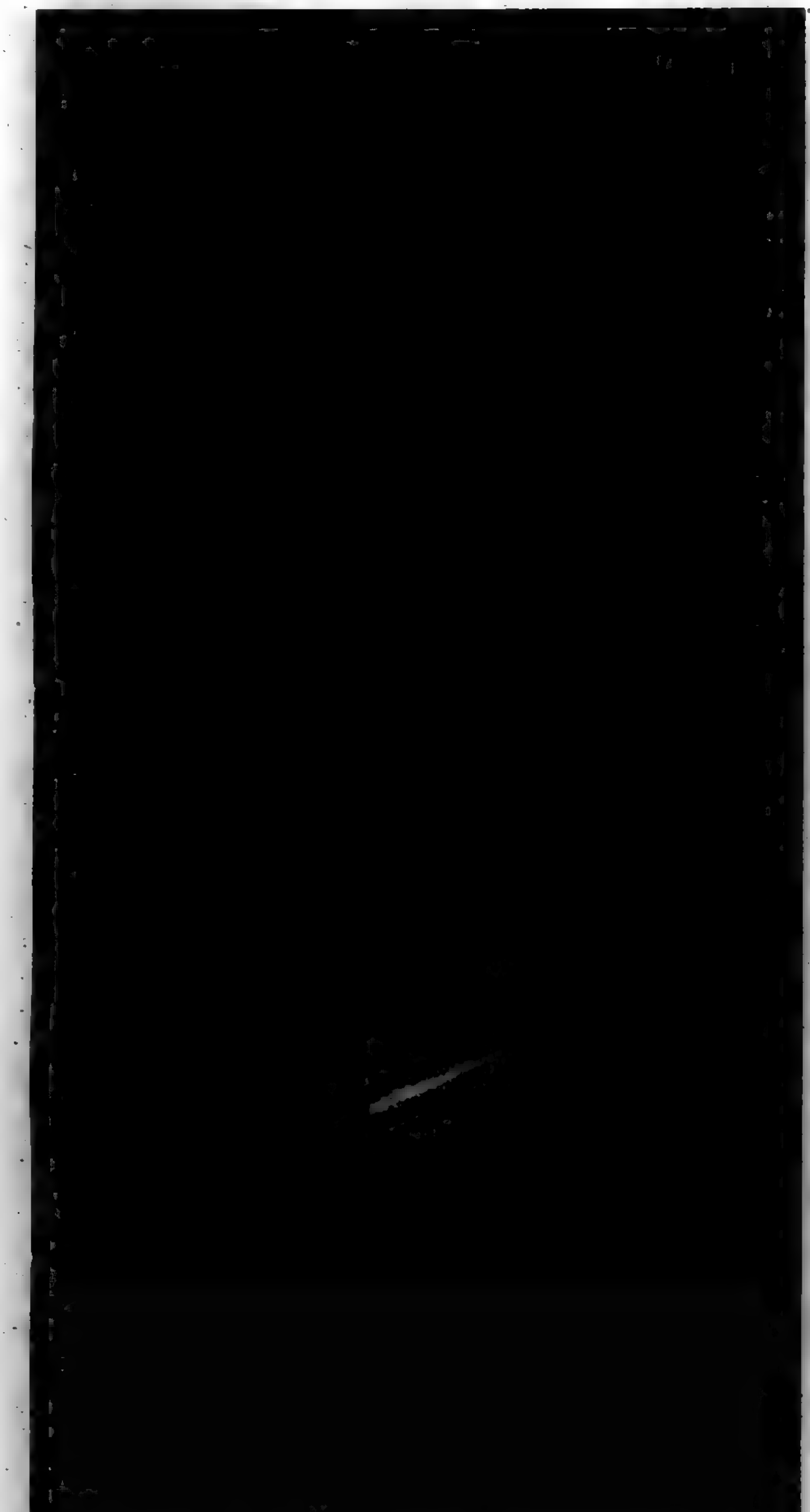

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Continued from page 60

generated at any point in the Daad subsystem, the vendor said.

Prices for Daad Response Manager start at $11,000 for MVS/370 and $16,500 for MVS/XA systems.

Boole & Babbage, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

■ Mt Xinu has announced that its Network File System (NFS) is now available for Digital Equipment Corp. VAX superminicomputers running systems software based on the University of California at Berkeley's Unix 4.2 operating system.

The NFS allows transparent sharing of files, peripheral resources and utilities. It was developed by Sun Microsystems, Inc. and has been licensed by Mt Xinu for marketing.

NFS increases the capabilities of networks by creating a distributed file system, a spokesman said. To access files with standard Unix networking tools, a user must know where the file is located on the network. With NFS, the collection of public files on various systems appears as one local file.

NFS is machine and operating system independent.

Mt Xinu provides NFS for VAXs either as an addition to its More/BSD Berkeley Unix 4.2-based binary system software or as a set of linkable binary modules for sites running Berkely 4.2 source code.

NSF as an add-on for the DEC VAX-11/750 costs $4,000.

Mt Xinu, Suite 150, 2910 Seventh St., Berkeley, Calif. 94710.

PRODUCTIVITY AIDS

■ Henco Software, Inc. has announced the availability of its Info fourth-generation applications development software for the recently announced Digital Equipment Corp. Microvax II processor.

Info incorporates data entry, data updating, document retrieval and text management, a query facility and a report writing system with computation capabilities.

Info on the Microvax II costs $8,600.

Henco Software, 100 Fifth Ave., Waltham, Mass. 02154.

■ Systems & Software, Inc. has announced XPC-86 for development of software that runs on IBM Personal Computers and compatibles. XPC-86 operates on Digital Equipment Corp. VAX machines running VMS or DEC's version of AT&T's Unix operating system.

The program also operates on any Motorola, Inc. 68000-based processor running Unix.

According to a spokesman, the XPC-86 cross-development package includes an optimized C-86 cross-compiler that supports a range of memory models, a runtime library for Microsoft, Corp.'s MS-DOS environment, an Intel Corp. ASM-86/87/186-compatible macro assembler with Intel 8087 numerical coprocessor support, a library manager and a linker that produces executable files in an MS-DOS-compatible format.

The XPC-86 package also includes a communications software module that allows Ascii and binary files to be transferred between the personal computer and its host. The communications package provides DEC VT100 terminal emulation.

Available immediately, the XPC-86 is priced at $9,950 for the DEC VAX and $6,750 for the Motorola 68000-based machines running Unix.

Systems & Software, Suite C-11, 3303 Harbor Blvd., Costa Mesa, Calif. 92626.

APPLICATION PACKAGES

■ Logicraft, Inc. has announced an enhancement to its Cardware software that allows graphics generated on an IBM Personal Computer to be displayed on Digital Equipment Corp. VT240 or Tektronix, Inc. 4010 terminals linked to DEC minis.

The Cardware graphics display package runs on DEC minis equipped with the Cardware board. The board converts IBM PC-DOS programs into a format compatible with the DEC VMS operating system.

The package is said to support both the 320- by 200-pixel and 640- by 200-pixel graphics modes used by Personal Computer applications programs.

The package costs $200 for an individual user license and $1,500 for a site license.

Logicraft, 3 Graham Drive, Nashua, N.H. 03060.

■ Rockkind Software Corp. has announced AT&T Unix versions of its Ride programming language for Digital Equipment Corp.'s VAX line, AT&T's 3B2 supermicros and Unix Personal Computer and Tandy Corp.'s Model 16 and TRS-6000.

Ride also runs under Microsoft Corp.'s MS-DOS. Ride features data processing functions and data base features, a spokesman said.

Ride for the VAX-11/780 runs under the University of California at Berkeley's Unix 4.2 and costs $1,495. The product runs under AT&T's Unix System V for AT&T's Unix Personal Computer and 3B2. Ride for Tandy's Model 16 and TRS-6000 computer runs under Microsoft's Xenix. Unix versions of Ride for Tandy and AT&T microcomputers sell for $495.

Rockkind Software, 3080 Valmont Road, Boulder, Colo. 80301.

■ Sperry Corp. has announced the Municipal Financial System (MFS),

Continued on page 64

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Continued from page 63

based on the Sperry Mapper applications development system, for Sperry System 11 processors.

The menu-driven MFS was developed by Adirondack System Associates in Saratoga Springs, N.Y. Designed for small- to medium-size governments, MFS consists of Municipal Accounting, Municipal Payroll and Municipal Fixed Assets integrated applications packages.

According to a spokesman, the Municipal Accounting package controls and records the processing of purchase orders, invoices, cash receipts and miscellaneous transactions.

The Municipal Payroll package provides for multiple payroll cycles, multiple funds and fiscal periods, exempt and nonexempt employees and calculating payroll from gross to net with labor distribution.

The Municipal Fixed Assets package accounts for all capital assets and will accommodate multiple accounts and multiple funds.

Separately, the accounting package is priced at $46,250, the payroll package at $15,000 and fixed assets at $11,000. Together, the packages are priced at $58,500.

Sperry Information Systems Group, P.O. Box 500, Blue Bell, Pa. 19424.

■ **Marc Software International, Inc. has announced Wordmarc Author and Wordmarc Composer word processing programs for minicomputers.**

Both programs are new versions of the company's Wordmark word processing program introduced in 1981. The programs operate on minicomputers from Digital Equipment Corp., NCR Corp., Hewlett-Packard Co., AT&T, Harris Corp., Prime Computer, Inc. and Apollo Computer, Inc. The programs are also available for microcomputers running Microsoft Corp.'s MS-DOS operating system.

Wordmarc Author is for users concerned with the content of letters. Wordmarc Composer is for users editing complex documents.

Both products are scheduled for September availability. Prices range from $495 for the micro version to $8,900 for the DEC VAX 8600 series.

Marc Software, No. 300, 260 Sheridan Ave., Palo Alto, Calif. 94306.

■ **Environmental Systems Research Institute (Esri) has announced Network, an additional component in the company's ARC/Info geographic information system, which runs on Prime Computer, Inc. and Digital Equipment Corp. processors.**

Network is used to manage geographic networks like city streets, railroads, rivers and utility lines. The program allows users to create, analyze and display the time, space and impedance relationships common to geographic design. Analysis tools include optimum routing, address matching, facility allocation and intersection districting.

Functions that Network performs include parcel address matching, coding of street addresses to street segments and polygons, calculation of address coordinates and selection of optimum path routes.

Network is priced at $15,000, including one year of maintenance.

Esri, 380 New York St., Redlands, Calif. 92373.

■ **Digital Equipment Corp. has announced that Interleaf, Inc.'s composite document processing software is available on DEC's Vaxstation I and Vaxstation II processors under the MicroVMS operating system.**

The Interleaf Workstation Publishing software enables users to prepare and edit documents containing multiple proportionally spaced typefaces, graphics and data-driven business charts.

A mouse or menu-driven interface allows users to access editing and formatting routines needed to produce typeset-quality originals, a spokesman said.

Interleaf Workstation Publishing software will be available this summer through Digital's Classified Software program. It is priced at $3,000.

DEC, 146 Main St., Maynard, Mass. 01754.

■ **Network Solutions, Inc. has announced Maintenance/1, an on-line maintenance system and parts inventory control for fleet vehicles. The product runs on IBM System/36 minicomputers.**

A spokesman said the package can accommodate preventive maintenance scheduling, provide status reports and update repair orders and parts inventory. It can also track costs associated with the ownership of the vehicle. Maintenance/1 consists of six modules, which can be purchased separately or as a package.

The product costs $30,000.

Network Solutions, 401 Jefferson Blvd., Warwick, R.I. 02886.

DATA BASE MANAGEMENT SYSTEMS

■ **BTI Computer Systems, Inc. has introduced a relational data base management system and fourth-generation applications development language for its BTI 8000 32-bit multiprocessor system.**

The Multiple Access Retrieval System II (Mars II) DBMS includes an ad hoc query facility, a user-directed screen formatter and data dictionary. Mars II costs $25,000.

BTI Computer Systems, 870 W. Maude Ave., Sunnyvale, Calif. 94086.

See DBMS page 66

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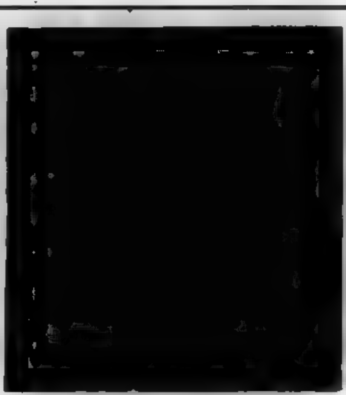

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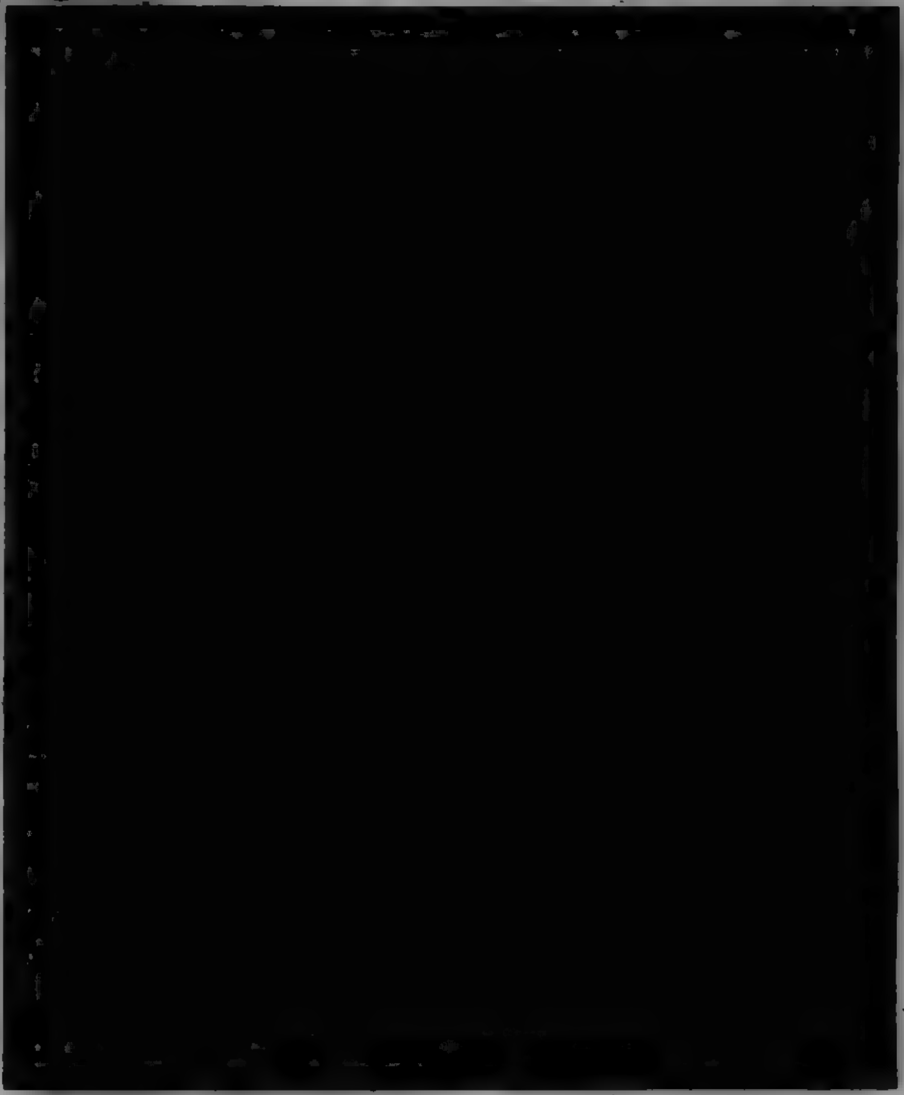

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TOP SECRET VM will be available October, 1985.

DBMS

from page 64

■ Sir, Inc. has announced that its Sir/DBMS relational data base management system is now available for Sun Microsystems, Inc.'s AT&T Unix-based technical workstations.

The window management facilities of Sun workstations allow users to run several programs concurrently, according to a spokesman. Reports and tables from the data base reportedly can be cut from one window and pasted directly onto another window on the same screen.

Sir/DBMS uses the SQL+ nonprocedural query language, the company's version of IBM's Structured Query Language. It reportedly also offers a procedural language for data retrieval, analysis and application development. Other components of Sir/DBMS include Forms, a screen-oriented data entry and retrieval system; Host, a language interface; Help, an on-line user assistance facility; and Graph, an interactive system for high-resolution business and statistical graphics.

Sir/DBMS for Sun Microsystems workstations costs $10,000 for up to four Sun nodes and $1,250 for each additional node up to 20. Site licensing is available for users with over 20 nodes.

Sir, 5215 Old Orchard Road, Skokie, Ill.

■ Honeywell, Inc. has introduced a relational data base management system for its DPS 8, DPS 88 and DPS 90 computer systems running the Gcos 8 operating system.

Magna 8, developed by Magna Business Systems, incorporates a relational join technique that allows users to access up to 20 data sets simultaneously, a spokesman said. An integrated data dictionary defines and documents new information.

The Magna 8 uses near-English commands for developing and maintaining applications, accessing and modifying the data base and preparing reports.

Magna 8, scheduled for fourth-quarter availability, costs $120,000.

Honeywell, P.O Box 8000/A-79, Phoenix, Ariz. 85066.

■ Micro Data Base Systems, Inc. has announced that its Knowledgeman relational data base management system and report generator is now available on Digital Equipment Corp.'s VAX-11 systems running the Ultrix operating system.

Knowledgeman was previously available under IBM's PC-DOS, Microsoft Corp.'s MS-DOS and Digital Research Inc.'s CP/M 86 operating systems.

Besides the DBMS, Knowledgeman includes text processing and statistics, report generation and forms management functions. Security includes data encryption, user passwords and read/write access codes.

Knowledgeman for the DEC VAX-11 costs $24,000.

Micro Data Base Systems, Suite 400, 85 W. Algonquin Road, Arlington Heights, Ill. 60005.

SQL

from page 57

rection." The other primary determinant in users' selection was the low cost of SQL. Software AG's Adabas, Applied Data Research, Inc.'s Datacom/DB, Information Builders, Inc.'s Focus, Martin Marietta Data Systems' Ramis and IBM's Query-By-Example were listed as the products most often considered before SQL.

Despite the fact that SQL is touted as an end-user-oriented product, Xephon said, only a handful of respondents said they run the product on a separate information center machine. "Although some believe it is wiser to run information center systems on a separate machine and not let them interfere with production," the study stated, "all but three respondents specified that SQL run on a shared machine at their sites."

Respondents said they used SQL most often for ad hoc queries and reporting and simple applications. Not surprisingly, Xephon said, it is not used often for transaction processing. Users said large, complex or high-volume applications presented problems for SQL.

Xephon found applications programmers were the largest group of SQL users, followed by professional staff and "clerical task workers." Those using SQL least were senior management and DP staff other than applications programmers. "Only applications programmers in practice seem to be making significant use of the product," the study said.

"To offer SQL to real end users," it stated, "an installation must provide a framework such as QMF [IBM's Query Management Facility] or [Artificial Intelligence Corp.'s] Intellect to allow the user to concentrate on turning data into information without being bogged down by the internals of running the query and handling the output. The user [also] needs a simple way of saving queries or reports for later use. The user should only specify *what*, not *how*."

Although there was no consensus on what users saw as SQL's most troublesome feature, several users cited the lack of a facility for job accounting and difficulties with table joins as problem areas. Twenty-one users said data base locking was a problem.

Highest rated benefits

The highest rated benefits of SQL were its reliability, value for the price, IBM's support and ease of installation. Most respondents said they were happy with SQL, and only six users said they were considering switching to another product.

"With most respondents," the study stated, "the main benefit is that they can develop systems much faster, the investment is smaller to begin with, and the returns start accruing much sooner. Even if the same application would eventually run more efficiently under a more traditional system, it might never catch up, economically speaking, with the SQL version."

The study, "SQL in Practice," is available for $45 from Xephon, c/o WPWS, P.O. Box 1704, Winter Park, Fla. 32790.

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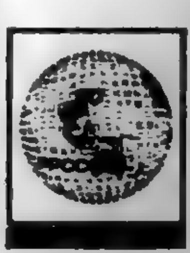

CW Communications, Inc. — the world's leading publisher of computer-related newspapers and magazines — is proud to announce its sponsorship of the very first international computer-generated art contest.

All entries must be computer-generated, mounted, and suitable for display. Entries will be judged primarily on their artistic merit, but execution will also be taken into account. Two prizes will be awarded. The winning individual will receive $1,000 (U.S.). The winning organization will receive a trophy.

Winners will be announced during the First Pan Pacific Computer Conference (in Melbourne, Australia, this September 10-13). All entries will be put on display in a special exhibit at this conference.

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SOFTLINE

from page 57

have emerged.

The latest languages can be described as applications-programmer-friendly. These languages are not as procedural as the generation 3.5 languages and can be considered professional-friendly. Microcomputer versions of these languages provide almost the same functions as their respective mainframe versions.

Generation 3.9 languages are nonprofessional-friendly and are used to build expert systems. Each statement consists of a condition and an action. If more than one condition is true, then the consequences are executed in either parallel or random order.

For the past few years, people have spoken of these post-third-generation languages as fourth-generation languages. But before a language can be considered fourth generational, it should contain the following nine features:

■ Applications generators. Applications generators currently exist in the form of structured, data base-oriented, inquiry/update transaction processing applications programs. They will probably continue to exist but will give way, in part, to the information generators.

■ Information generators. The information generators will support less structured, user-defined information requirements, dynamic data access paths and reporting formats.

■ Prototype construction. Prototypes are working models of systems that can be changed quickly and easily. A successful prototype gives a view of the system that allows end users to visualize what they will be getting; it also must be only a working model so that it can be easily changed to accommodate end-user requests.

■ Screen mapper. This feature designates the positions of the screen for fields, text and other elements. While all fourth-generation languages may not have this feature, it will be an integral part of most of them.

■ Specifications generator. A specifications generator will represent specifications in a formal way and replace the traditional writing of specifications in English. Specifications are generally imprecise and require a great deal of human interpretation by the applications programmer when creating the code.

■ Nonprocedural DBMS language. A procedural language requires programmers to follow a rigid series of steps to perform an operation. The same result could be achieved by performing the steps in any sequence using a nonprocedural language. A forgiving nonprocedural language permits a great deal of flexibility in performing the steps and is user-friendly. The nonprocedural language can be used in conjunction with a DBMS to perform data entry, storage, maintenance, selection, retrieval and data analysis.

■ Report generator. The generation of reports is always going to be an integral part of any fourth-generation language. The report generator can retrieve data from either conventional files or from data bases under the control of DBMS and can create reports in various forms. The report generator may or may not have updating capabilities.

■ Decision-support languages. A decision-support system consisting of a business model and a data base model must be included in a fourth-generation language.

■ Query language. The major priority of a query language should be fast response.

A true fourth-generation language should also be transparent to the operating system, menu-driven with a prompting system, user friendly, controllable through a data dictionary, supported through at least one DBMS and a usable tool for third-generation language programmers.

With those criteria clearly in mind, will the real fourth-generation languages please stand up?

Atre is president of Rye, N.Y.-based Atre International Consultants, Inc., and a regular contributor to Softline.

LANGUAGES

■ **Foothill Research, Inc. has announced that its Style high-level programming language is now available for AT&T's Unix System V operating systems.**

Style is intended to replace Cobol for business and financial applications development, although Style-based programs can coexist with current Cobol applications, a spokesman said. Style includes a data management system for business, and financial applications development is also available for Digital Equipment Corp.'s VAX series running VMS; Stratus Computer, Inc.'s FT-200, XA-400 and XA-600 superminicomputers; and Data General Corp.'s MV series superminis with the AOS/VS operating system.

Style can access Cobol programs, files and previously collected data. The features reportedly allow users to continue to use their Cobol programs and data while developing new applications with Style.

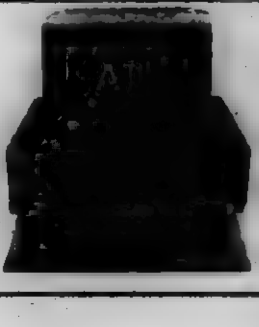
Style costs from $17,500 to $45,000, depending on the system.

Foothill Research, Suite 300, 1301 Shoreway Road, Belmont, Calif. 94002.

■ **Hewlett-Packard Co. has introduced Fortran 77 for the HP 9000 system.**

HP Fortran 77/9000 is based on the Ansi Fortran 77 language standard and is compatible with Fortran 77 on HP 9000 and HP 1000 computers. According to a spokesman, the language includes generalized I/O statements, an include statement

COMPAQ could have stopped here



that allows insertion of program text from another file and statements that eliminate the need for program labels and GOTO commands, the spokesman said.

HP Fortran 77/3000 is compatible with the HP 3000 Multi-Programming Executive operating system.

The product is priced at $5,000, the vendor said.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

■ Green Hills Software has announced two compilers, the Optimizing Fortran-32000 and Optimizing Fortran-68000, both globally optimizing compilers for Ansi standard Fortran 77.

The products run on Digital Equipment Corp. VAX series superminicomputers as cross-compilers, Sun Microsystems, Inc. Workstations and the National Semiconductor Corp. Sys-32.

According to a spokesman, the compilers implement mainframe compiler optimization techniques and feature full IEEE standard floating-point support.

The SKY floating-point board is supported with in-line code for performance on Motorola, Inc. 68000 systems, according to Green Hills Software.

AT&T Unix calling conventions are also supported.

Native compilers for single-user Sun Microsystems systems are available for $2,000.

Sys-32 Genix compilers cost $3,000, and VAX/Unix cross-compilers are available for $6,000.

Green Hills Software, 55 N. St. John Ave., Pasadena, Calif. 91108.

TEAM

from page 57

team would be to get, say, all your high jumpers together to discuss techniques to make them exceptional high jumpers. They are really individual performers, however, and they have to do their work on their own."

The dual character of the programmer's professional environment, Couger said, can sometimes spawn frustration. Large systems development requires coordination and cooperation, but a team leader walks a fine, easily crossed line between supporting a programmer's individual efforts and stymieing his creativity and productivity.

"Many managers overlook a key factor that interferes with a team's successful operation," Couger said. "That is the very low tolerance for team activities on the part of programmers and analysts. They are willing to participate in group activities and meetings to do something they cannot do alone, to accomplish a goal. But our studies have shown that programmers don't need the social interaction other workers derive from meetings. They would rather be off at their desks doing analysis, design and programming."

Failure to prepare leaders

Couger said he is amazed at how little formal training most team leaders receive before being sent to the development front, so to speak. He said colleges, other than his own, also get poor marks for failing to prepare students to participate in or lead programming teams. The ill-prepared team leader faces a hostile audience.

"If the team leader cannot control the meeting or has not organized it properly, programmers can become very impatient," he said. "They show very little tolerance for poor leadership. That is why so many programming teams fail to meet their objectives."

Couger warned against the assumption that programmers don't appreciate the importance of the team approach to systems building. On the contrary, he said, programmers are eager to discuss group concerns, to learn new techniques and to have their work critiqued by their peers. But their self-motivation, the very characteristic that makes them valuable employees, is chilled in a poorly run team.

"The programmer sees the need for a team and coordination," Couger said. "But he thinks back to teams he was involved with that were inefficiently run, and he comes to the conclusion that, overall, teams are not very effective. His feelings are more about the way teams are run than about their purpose. The programmer has a drive to be in control of his destiny, and when he is involved with a poorly run team he becomes very frustrated."

Team tonic — training

The tonic for the teams, Couger said, is better training of leaders. Also, he said, companies should avoid a management structure that requires a team leader to report to more than one manager.

"The matrix organization, where a leader must negotiate and interact with middle managers, makes it difficult for a team leader, only a newcomer to management, to succeed," he said. When nurtured by just one upper manager, the team leader learns more quickly and coordinates team efforts more efficiently.

Finally, Couger said, teams often fail because management fails to understand what motivates the individual team participants. The work itself is the programmer's primary motivation, Couger's studies indicated. But the work motivation is composed of several other motivators.

Couger uses the following terms to describe them: autonomy, the freedom to do the work required; task significance, the knowledge that the individual job is significant to the entire project; skill variety, being presented with a mix of tasks; task identity, the ability to relate the task at hand to the whole; and feedback on performance. Of those, Couger said, management most often fails to give programmers autonomy.

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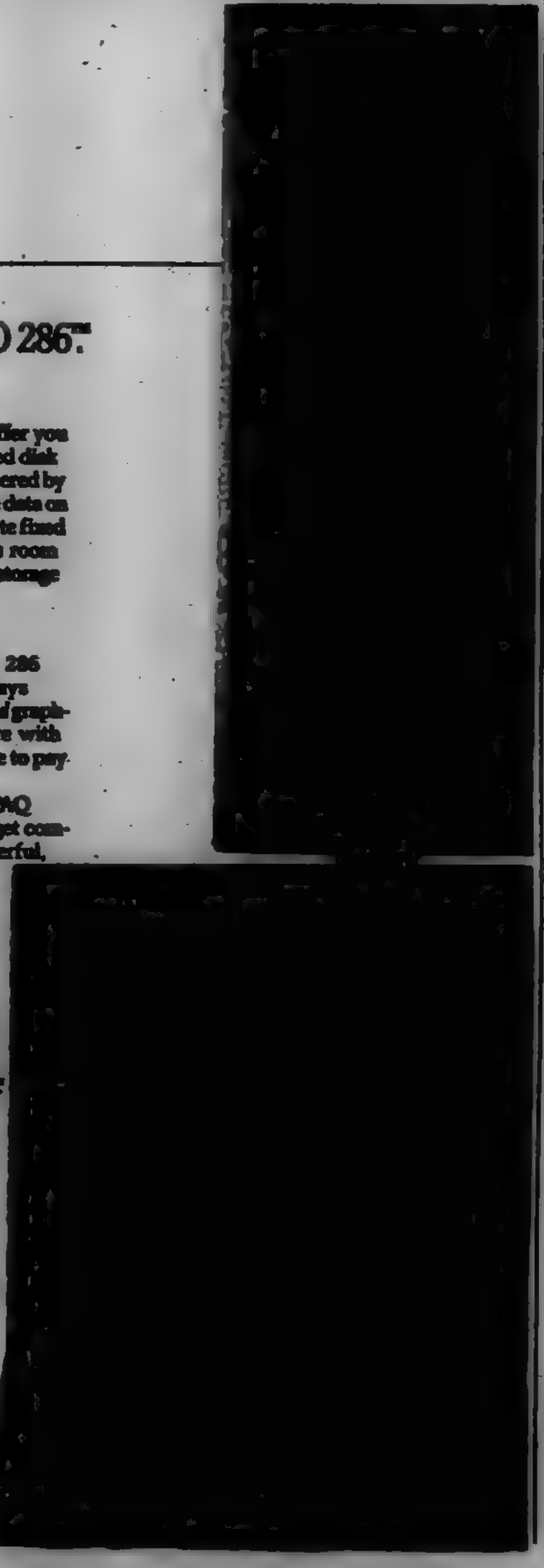

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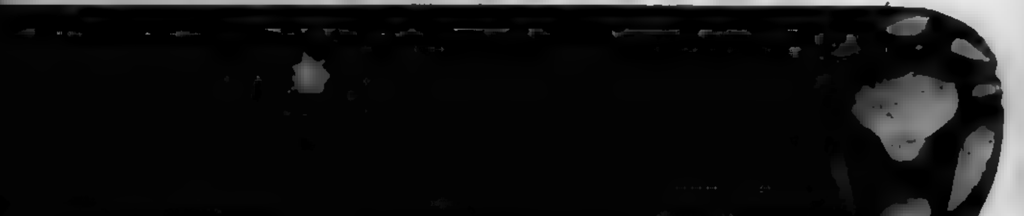

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MICROCOMPUTERS

Tandy reduces 1000 cost, offers hard-disk version

FORT WORTH, Texas — Tandy Corp. has announced a price reduction for its Tandy 1000 personal computer, a machine said to be compatible with the IBM Personal Computer. It also introduced a hard-disk version of the machine and an external 10M-byte hard disk drive.

Under the new pricing scheme, the cost of the Tandy 1000 is reduced from $1,199 to $999 for the standard version, with 128K bytes of memory, one 360K-byte diskette drive, video and graphics interfaces and ports for joysticks and a light pen.

The hard-disk version of the Tandy 1000 reportedly includes those features and a 10M-byte disk. It carries a $1,999 price tag, the same as the Tandy 1200, an IBM-compatible unit, which also has a 10M-byte internal hard disk.

Asked to explain the similarity, Ed Juge, director of market planning for Tandy's Radio Shack Corp. subsidiary, said the two "are totally different machines." The 1200 has an IBM-style keyboard but no graphics card as standard equipment, while the 10M-byte version of the 1000 provides a keyboard like that of the Tandy 2000 personal computer and includes a graphics card.

The Tandy 1000 comes with Deskmate software, an integrated package containing WP functions, a spreadsheet, scheduler, dialer and telecommunications.

The external 10M-byte hard disk drive unit being offered requires a hard-disk controller; a Tandy hard-disk controller is priced at $399. The hard-disk unit itself costs $699.

Tandy is located at 1800 One Tandy Center, Fort Worth, Texas

Symphony aid announced

NEW YORK — The PC Productivity Center of the Center for Advanced Data Processing, Inc. has introduced Symplify, software that adds desktop utility features to Lotus Development Corp.'s Symphony integrated package.

Symplify, priced at $50, is said to aid users by permitting them to access address files, a calendar and an electronic expense report form while working with Symphony. The package is retrieved as a Symphony file and is run with a command sequence familiar to Symphony users. Other features are said to include a simplified data base and report generator, both of which keep Symphony readily available for calculations. Automatic dialing is available for users with a Hayes Microcomputer Products, Inc. internal modem.

The Center for Advanced Data Processing is located in Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

Wizdom XS package out

NEW YORK — Software Intelligence Laboratory, Inc. has introduced Wizdom XS, an expert system for commercial and financial applications, which runs on the IBM Personal Computer under PC-DOS 2.0 or higher.

Wizdom XS, priced at $1,250, is said to be a generic expert system capable of acquiring knowledge bases through being programmed by users. Once the knowledge base is built, users can invoke Wizdom's inference engine to solve problems.

Suggested uses include bank teller assistance, financial investment advisement, sales and marketing support, problem diagnostics and program debugging.

The software, written in C, reportedly has no limit on the number of rules that may be included.

Software Intelligence Laboratory is located at 50 Broad St., New York, N.Y. 10004.

MICRO BITS/BRUCE J. DUNN

Implementing a micro center

Once a microcomputer center has been established as an organizational function, what is needed to implement the center?

Anything fancy, like local-area networks, programming services and specialized applications of the microcomputer (i.e. computer-aided design, voice capabilities or mainframe hookups) will not be covered here. Instead, I'll discuss three topics: the necessities, the near necessities and training. All items included are based on actual experience in operating a microcomputer center.

The necessities

The following items are necessities for a microcomputer center.

- Printers. Most users will need a printer. Any attempts to share them between users will probably not work. The center should have the following printers available: letter-quality, dot matrix, near-letter-quality/dot matrix and even a laser or high-speed printer. They will all be needed at one time or another.
- Printer supplies and accessories. It is amazing how easy it is to forget to order supplies of paper, forms, ribbons, sheet feeders, tractor feeds and cable at the same time the printers are ordered. Most printers do not come standard with any of these items.
- Sound covers. Because most people do not work well in a noisy environment, and because most printers are noisy, sound covers are a necessity. Stand-alone sound covers are available for printers that are not placed on of-

See CENTER page 82

Dunn is an assistant director of data services for the city of Dallas. As the assistant director he manages the systems programming, data base, office systems, information center and microcomputer groups.

Intex Solutions's X-Y-Z software consolidates data in Lotus' 1-2-3 work sheets/74

- Micro Focus introduced Co-Maps, software for creation of IMS/MFS and CICS/BMS mainframe maps on IBM microcomputers/74
- Office Solutions enhanced its Officewriter software for the IBM Personal Computer/74

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Local Area Networks For Large Organizations
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Intex unveils X-Y-Z aid for 1-2-3 consolidation

NEEDHAM HEIGHTS, Mass. — Intex Solutions, Inc. has introduced its X-Y-Z software for use in consolidating multiple data sheets produced under Lotus Development Corp.'s 1-2-3 package on the IBM Personal Computer.

X-Y-Z is said to offer the ability to move, merge or summarize any specified rows or columns of data from as many as 255 1-2-3 worksheets. It can let 1-2-3 users create multidimensional worksheets and imposes no additional command structures on the user.

It also is said to permit customized consolidation procedures, such as weighted averages, and to provide users with quick comparisons of data from separate worksheets.

It costs $145 for a 12-worksheet version and $395 for a 255-worksheet version.

Intex Solutions can be reached at P.O. Box 183, Needham Heights, Mass. 02194.

Office Solutions enhances tools

MADISON, Wis. — Office Solutions, Inc. has announced enhancements to its Officewriter and Officespeller software for the IBM Personal Computer.

Officewriter 3.5 is said to offer pagination within the package's editing function, which allows users to invoke a special-function menu from within the edit session with a single keystroke. Also included is automatic footnoting, which allows the user to create and edit up to 999 footnotes per document, the vendor said.

Officespeller reportedly is now able to detect typographical errors and offer the correct spelling from a list of alternatives. Based on the *Merriam-Webster Dictionary*, Officespeller contains 80,000 words and the capacity for users to add customized words. The custom dictionary can be reviewed and modified at any time using the software's custom dictionary maintenance function.

Officewriter features are said to include the ability to adjust text automatically and constantly, permitting users to see exactly what they will print on paper. Officewriter also stores boilerplate language and inserts it into documents, spools up to 10 documents for printing and lines up columns of numbers by their decimals. The product allows data from Lotus Development Corp.'s 1-2-3 to be imported into documents, according to the vendor.

Officewriter costs $325; with Officespeller the price is $445. Officespeller alone costs $165.

For additional information, Office Solutions is located at 2902 Coho St., Madison, Wis. 53713.

Data switching: Equinox makes it simple.

Introducing the Equinox Data PBX; a port selector that makes switching terminals between computers as simple as dialing a phone number.

Installation is simple; do-it-yourself using regular telephone PBX-type cabling and connectors.

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for an on-site demonstration.

Co-Maps software out

PALO ALTO, Calif. — Micro Focus, Inc. has announced software that reportedly allows programmers to create IMS/MFS and CICS/BMS mainframe maps on IBM microcomputers.

Co-Maps is said to include a screen painter and other development tools to generate IMS/MFS and CICS/BMS macros and associated Cobol source statements on the IBM Personal Computer, Personal Computer XT and AT and 3270 Personal Computer.

Used with the vendor's VS Cobol Workbench, a mainframe Cobol applications development program for micros, Co-Maps reportedly allows micros to function as fully integrated mainframe workstations.

Co-Maps also is said to allow existing BMS macro definitions to be loaded on the micro, then modified to produce new maps and map sets. This function allows users to convert CICS applications screens to IMS quickly. The product also allows images created on Micro Focus' Forms micro-based screen painter to be converted into MFS and BMS maps.

The product's development tools are said to include single-keystroke map set, map and field definition and Help, Directory and Copy functions.

Co-Maps requires a minimum of 256K bytes of random-access memory, two 360K-byte disk drives and IBM's PC-DOS 2.0, 2.1 or 3.0.

The product costs $500 and will be available July 1.

Micro Focus is located at 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

Zilog supermicros get Macintosh access

CAMPBELL, Calif. — Zilog, Inc. has announced software that reportedly allows supermicrocomputers in the Zilog System 8000 series to serve as host processors, file servers and communications gateways for the Apple Computer, Inc. Macintosh.

The Ultra-Talk software, developed by Lutzky-Baird Associates of Culver City, Calif., is said to be the first product of the Ultra-Office series, which is based on Apple's Appletalk network.

As a central host, Ultra-Talk reportedly allows multiple Macintosh users to execute programs directly on the AT&T Unix-based System 8000.

According to the vendor, the product gives Macintosh users access to between 52M bytes and 672M bytes of mass disk storage on the System 8000. As a communications gateway, the System 8000 provides access to networks such as IBM 3270 Systems Network Architecture/Synchronous Data Link Control, 3270 Bisynch and 2750/3780, Xerox Corp. Ethernet and X.25.

The Unix-based Zilog System 8000 series is composed of the Model 12, Model 22 and Model 32. The Model 12 is said to support up to 16 users and the Model 22 and Model 32 up to 40 users.

Ultra-Talk costs $2,000 per Unix supermicro and $300 per Macintosh.

Zilog is located at 1315 Dell Ave., Campbell, Calif. 95008.

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SOFTWARE

■ Logicraft, Inc. has introduced a graphics software package for use with its Cardware software, a product that reportedly permits all Digital Equipment Corp. minicomputers to run IBM Personal Computer applications.

The graphics package reportedly enables DEC VT240 and Tektronix, Inc. 4010 graphics terminals to display Personal Computer programs running on DEC minis. The package consists of a software-installable driver that converts the bit-mapped image for the Personal Computer into Tektronix command sequences.

The package costs $1,500 for a site license and $200 for individual users.

Logicraft, 3 Graham Drive, Nashua, N.H. 03060.

■ United Software Security, Inc. has announced a corporate license and an annual site license plan for its Privacyplus data encryption software for personal computers.

The license would allow companies to distribute the software to all employees at one site or, under a corporate license, throughout all of their locations. The software, which runs under Microsoft Corp.'s MS-DOS, reportedly requires use of only two commands — LOCK or UNLOCK — to secure software on hard disks or diskettes.

A corporate license costs $2,400 per year, and an annual site license is $800. A site is defined as a customer location with a specific street address, the vendor said.

United Software Security, Suite 100, 6867 Elm St., McLean, Va. 22101.

■ Powerbase Systems, Inc. has announced a version of its Powerbase data base management system software for the Wang Laboratories, Inc. Professional Computer.

The menu-driven Powerbase Version 2.1 for the Professional Computer is said to include a choice of two templates for task-specific applications, including job costing, human resources management, fixed assets, inventory control and sales prospect tracking.

Powerbase 2.1 resides in 320K bytes of random-access memory on the Wang microcomputer.

Powerbase 2.1 costs $595.

Powerbase Systems, 12 W. 37th St., New York, N.Y. 10018.

■ Century Analysis, Inc. has announced Officeware, an integrated and networking software package for the IBM Personal Computer, Personal Computer XT and AT.

The single-user version of Officeware is said to provide window-based, integrated word processing, spreadsheet, business graphics, records management, calendar, electronic filing and other functions. It also reportedly provides terminal emulation for IBM mainframe access.

The network version reportedly can connect Personal Computers to a central Personal Computer AT running Microsoft Corp.'s Xenix or provide interdepartmental networking and mainframe access in a local-area network. The network can be directly connected or gateway attached to non-Officeware host computers, depending on their interface capabilities.

Both versions reside in 512K bytes of memory on each micro.

The single-user version of Officeware, available in July, costs $795. The network version, available in August, costs $995.

Century Analysis, 114 Center Ave., Pacheco, Calif. 94553.

■ Financial Decision Systems, Inc. has announced the Corptax Linx package for its Corptax family of tax preparation software.

Corptax Linx is a corporate, tax-oriented trial balance system that runs on the IBM Personal Computer family equipped with a hard disk and at least 512K bytes of random-access memory.

Corptax Linx will import information from the company's Corptax Mainframe for the posting of tax reclassifications and Schedule M-1 adjustments, a spokesman said. The system features data-entry verification and the ability to produce customer reports using multiple general-ledger account structures.

Corptax Linx integrates data with Corptax Mainframe, Micro Corptax and other standard spreadsheets. Corptax Linx, coupled with Micro Corptax, is said to allow for the preparation of all federal and state tax returns — from books to producing tax forms ready for signature.

Corptax Linx costs $850.

Financial Decision Systems, 28035 Dorothy Drive, Agoura, Calif. 91301.

■ BG Software Systems, Inc. has enhanced its PC Tracker inventory management software for the IBM Personal Computer, Personal Computer XT and AT.

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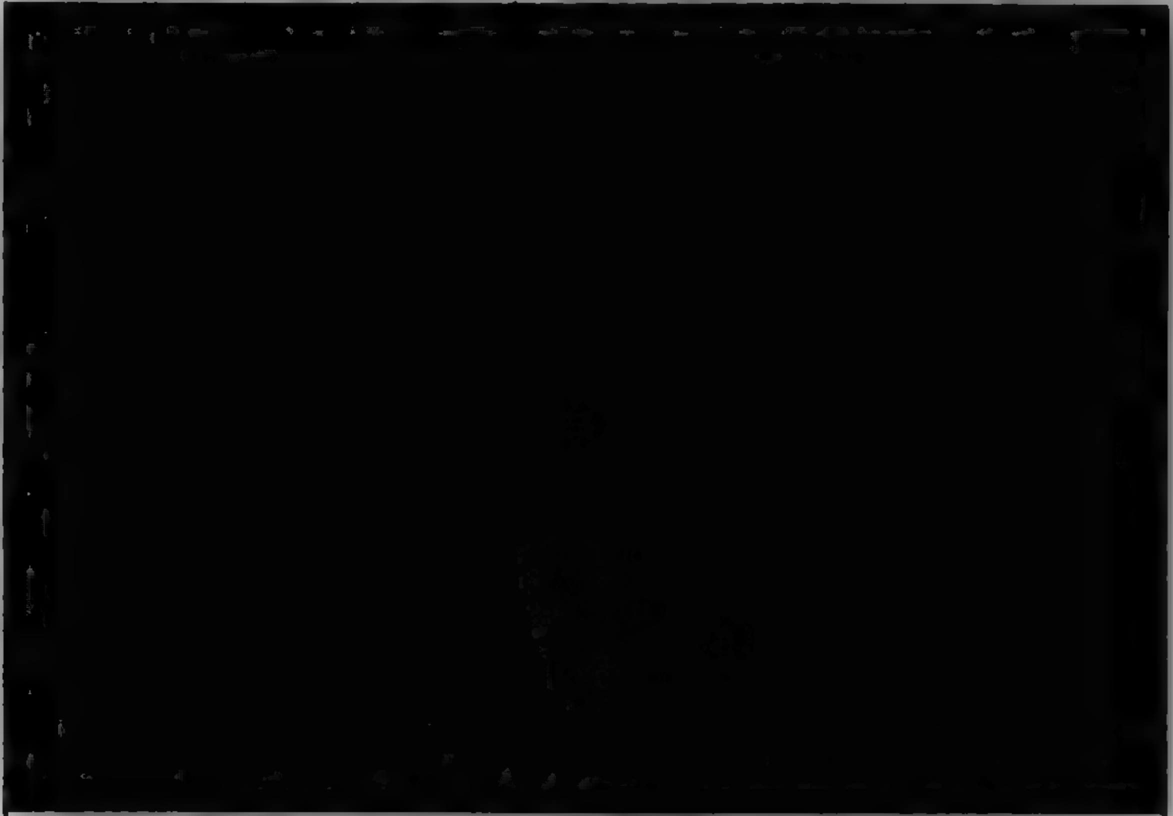

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Portability. Few organizations today use only IBM mainframes. So why buy a DBMS that runs only on IBM mainframes?

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Capability. DB2 and SQL/DS are relational DBMSs. Period. ORACLE is a relational DBMS plus an integrated set of 4th generation tools for application generation, report writing, graphics and networking. Together, ORACLE's relational DBMS and tools reduce and often eliminate traditional programming.

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What about Goldengate, dBASE III and pfs:File?

Connectability. The problem with Goldengate and the other PC packages is that they are completely incompatible with the software on your minis and mainframes. This incompatibility makes it difficult to share data, impossible to share programs, and forces users to learn multiple interfaces: One for the PC and another for the mini or mainframe. ORACLE is your standard software solution. All your machines - PC, mini and mainframe - run the same software and have the same user interface. And ORACLE's communications software lets you connect those machines in a network to easily share data and distribute the processing load.

ORACLE

Make your next DBMS inquiry your last. To attend the next free, half-day seminar in your area or receive additional information, write Oracle Corp., Dept. C3, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 1969.

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IBM Software Notes
News for the DP professional

Rail car leasing is just one of the financial services supported by the GE Credit Corp. network. IBM's Information/Management helps GECC identify network problems fast.

Information/Management Helps GE Credit Keep Network On Track

"We have happier customers," says Tom Dixon, manager of computing and telecommunication services for General Electric Credit Corporation (GECC) in Stamford, Conn. He is describing the use at GECC of IBM's Information/Management, Version 2—a licensed program that helps manage large data networks.

With assets of $17 billion, GECC is one of the country's largest commercial lenders—active in retail credit, commercial leasing and mortgage banking.

And GECC operates a very large network: one with more than 2,000 terminals. The users, Mr. Dixon's customers, are in GECC field offices, retail stores and GECC client offices. They operate workstations, point-of-sale terminals and credit authorization terminals.

IBM's Information/Management program helps Mr. Dixon's staff use its computer to provide better service to customers. It enables the staff to record and retrieve all the data relevant to any network operating problems: the list of equipment at each site, the details of every communication link, a complete record of every problem occurrence at each site, complete data on every type of equipment used in the network, and a detailed file on each vendor.

These data files can be searched to learn, for example, the history of a particular incident or of all previous occurrences of similar problems.

"We know our customer's environment," Mr. Dixon says. "Over the telephone from GECC's customer support center, we can provide procedures to identify or correct the problem. We can see every change made to the telephone circuit serving that site. We can see all problems on that circuit, year to date. And we can talk to the telephone vendor in specific, geographic terms.

"We're automating ourselves so that our present staff can handle a much larger network and a much greater rate of network change," Mr. Dixon continues. "We're already handling about ten times more devices than two years ago. And we're eliminating paperwork and becoming more responsive.

"Our next step will be to automate the management of network change with Information/Management." ▪

Pacific Northwest Bell Creates Online System Fast

"This is a very large and complex system," says John Osterfeld of Pacific Northwest Bell Telephone Company. "Yet we were able to implement it with 12 programmers—half of them brand-new to programming—in a total of 13 months from preliminary design to an online production system.

"It would have taken at least twice as long without ADF."

Mr. Osterfeld, a system analyst for Pacific Northwest Bell, is referring to IBM's Application Development Facility (ADF). Designed for users of the IMS/VS data base/data communication system, ADF greatly reduces the amount of programming required to create an application.

The programmers, under the technical guidance of Mr. Osterfeld, worked with ADF to develop a new version of the Customer Account Retrieval System (CARS) used by Pacific Northwest Bell representatives to call up account histories while answering customer telephone inquiries.

"We were up against a hard deadline. The application had to replace an older version within 13 months," he continues.

"Fortunately, ADF simplified the IMS programming to the point where we could meet the deadline using some people with no programming experience at all.

"CARS now has several thousand users," Mr. Osterfeld points out, "and a very large data base. In our largest center, CARS handles 350,000 transactions a day—12 per second at peak times. So it is an application with a lot of demand on it. Execution has to be very efficient.

"And this version handles 28 I/O calls per transaction, compared to 20 or less in our previous system.

"In other words, the system as written with ADF is actually more efficient in execution than the conventionally programmed system it replaces." ▪

IBM Software Experts Answer the Call to Keep Systems Running Smoothly

To consult a data base of software symptoms and solutions, IBM representatives at customer sites talk by phone to these specialists at the IBM support center in Chicago.

It's 2:00 a.m. You're testing a new application on a tight deadline. Suddenly, something—you don't yet know what—triggers an "abend."

With software, that happens. Each new hardware configuration, new application, or different combination of software releases is a unique environment that may cause a previously hidden problem to surface.

So, to keep IBM intermediate and large system customers up and running, the skills of more than 1,500 software service professionals are always on tap. Part of the IBM National Service Division, these professionals have the full power of special data bases at their fingertips.

You just call a special 800 number. At any time, 24 hours a day, seven days a week, you reach an IBM support center in Chicago, Boulder or Tampa. These locations service IBM's MVS, MVS/XA, DOS/VSE, VM and VS/1 system products and the licensed products associated with them. The centers also service licensed products for the Series/1 and the 8100.

Often the IBM Program Support Representative (PSR) taking the call recognizes the problem and gives the customer a remedy. To help the PSR, IBM maintains a data base of symptoms and solutions for known problems. If the problem requires a revision to the code, the PSR has a Program Temporary Fix (PTF) sent to the customer by the fastest possible method—in some cases, by a telephone link.

Over 50 percent of problems are solved by the PSR. But when a problem is a new one, the customer is put in touch with a program specialist, who often is located near the actual developers of the software product.

On the most severe problems—those which have halted processing—the first goal is to find some remedy, such as a bypass, that allows work to resume. The objective is to complete this within 24 hours.

The second goal for the program specialist is a permanent solution. When this requires a new PTF, the objective is to develop and test it within 14 days. The specialist re-creates the problem, functionally tests the new PTF, and then runs "regression tests" to be sure the fix is reliable.

To close the loop, IBM periodically makes available service updates which combine all recent program changes. ■

Cross System Product Set–Version 2 Recently Announced

With the recent announcement of Version 2, the IBM Cross System Product Set becomes a strategic productivity tool for large systems, as well as for intermediate and distributed systems. This application generator includes three licensed programs: one for creating applications, one for executing them and a third that permits end users to query the VSAM or CMS files.

The Cross System Product Set runs under all operating systems for 30XX and 4300 systems and under DPPX/SP in the 8100. With this version, support is added for IMS/VS/DB and DL/I as data bases for CICS/VS. In addition, it has been enhanced to run in systems with large networks of terminals.

Simplify MVS Installations

The IBM Custom-Built Installation Process Offering (CBIPO) is a simplified packaging of MVS. A CBIPO can cut the time to install an MVS system or subsystem from weeks to days.

Conventionally, a major system change involves a separate tape, documents and installation procedure for each program product.

With CBIPO, you first select the program products you intend to use with MVS. Then, with an automated process, IBM custom-builds an MVS system consisting of the ordered products in the form of distribution data sets.

The CBIPO also includes customized documentation that provides a step-by-step single installation path.

IBM Software for your Business Professionals...

If you're interested in the growing information needs of business professionals, you'll be interested in *IBM Software Notes for the Business Professional and Manager*, an advertisement in recent business publications that featured these products:

- IBM's Query Management Facility (QMF). QMF is part of Dow Corning's end-user computing program. QMF lets employees do ad hoc queries on relational data bases.
- The Information Facility (TIF). Pratt & Whitney manufacturing experts create computer applications quickly, easily and in plain English.
- Info Center/1 is a new functionally integrated decision support product, combining and enhancing three popular IBM products: ADRS, APL/DI, and FPS.
- The IBM Personal Decision Series (PDS) lets PC users perform a variety of tasks on corporate, departmental or personal data bases.

For literature on these products, check "Business Professional Software" in the coupon at the right.

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IBM

MICROCOMPUTERS

Continued from page 76

Version 2.0 is said to allow ad hoc file searches and reporting for improved development of queries regarding inventories of micros, peripherals, software and accessories. Another enhancement reportedly makes summary report formats available for an improved overview of inventory. PC Tracker Version 2.0 resides in 256K bytes of memory and requires two disk drives.

The product costs $495. Current PC Tracker users may obtain a Version 2.0 upgrade free of charge.

BG Software Systems, P.O. Box 436, Fort Washington, Pa. 19034.

■ Micro Concepts, Inc. has announced hard disk drive management software for the IBM Personal Computer XT and AT.

The Master Menu uses a series of menus to permit users to find and run programs stored on a hard disk. Passwords are said to allow owners or system managers to assign varying levels of security to users.

The software's File Commander function reportedly gives users the ability to execute IBM PC-DOS operating system commands with a single keystroke. Personal productivity tools reportedly include a personal time manager, a scratch pad to store notes and information and a group notice board to post messages among users groups.

The Master Menu requires a hard disk drive system and minimum memory of 192K bytes. It costs $142.50.

Micro Concepts, 4307 Arden Drive, Fort Wayne, Ind. 46804.

■ Schacher, Greentree & Co.'s Greentree Software Division has announced two software products designed to aid decisions made by purchasing managers. Both products run on the IBM Personal Computer and Personal Computer XT.

Purchasing Electronic Notebook (PEN) is a menu-driven data base management and report generating product. The report generator includes a predefined format for item or vendor history reports.

Computer-Aided Purchasing (CAP) is said to be a decision support package designed for the purchasing environment. CAP includes all the features of PEN and uses the same data files but supports decisions through cost comparisons and tracking of discount break points or trigger item thresholds. CAP also features a template to assist the user in preparing customized print purchase orders for existing company purchase order forms.

Both products reside in 256K bytes of memory and require the Microsoft Corp. MS-DOS operating system.

PEN is priced at $295 and CAP at $695.

Schacher Greentree, 122 E. 42nd St., New York, N.Y. 10168.

■ Interchart Software, Inc. has announced enhancement of its Talkshow/PC graphics software for the IBM Personal Computer.

Release 2.0 of the software reportedly offers support for the Tecmar, Inc. Graphics Master graphics display board. It also includes software to support emulation of four graphics terminals, the Tektronix, Inc. 4027, 4010 and 4100 series and the Hewlett-Packard Co. 7221.

In addition, Talkshow/PC is said to include communications, file transfer, off-line recall of mainframe generated charts and the ability to output to a plotter or to produce an electronic slide show. It costs $395.

Interchart Software, 104 Carnegie Center, Princeton, N.J. 08540.

■ Omtool Corp. has announced a version of its Softbol language system that runs under Microsoft Corp.'s Xenix Release 3 on the IBM Personal Computer AT.

The new version is said to allow applications written in Digital Equipment Corp.'s Dibol to be transferred to the Personal Computer AT and other micros. The Xenix-based version also reportedly runs on other micros using Xenix, such as the Intel Corp. 286/310 and the Visual Computer, Inc. 2000.

Xenix-based Softbol is priced at $625 for a single micro system.

Omtool, P.O. Box 477, 1445 Main St., Tewksbury, Mass. 01876.

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The FutureCom LS2000 Local Server provides access for computer or terminal devices to an Ethernet LAN for efficient local resource sharing. The RS2000 Remote Server provides wide area connectivity via multiple RS-232 composite links (up to 4 per node).* Both servers support up to 32 channels and provide local and remote switching, port contention and advanced security features.

FutureCom Integration The key to the Integrated Area Network is the NS2000 Network Server, a bridge between Ethernet and RS-232. The NS2000 consists of one Ethernet link and up to four RS-232 links. Use it to connect multiple LANs across standard leased telco lines, and/or integrate FutureCom LANs and WANs into a single network.

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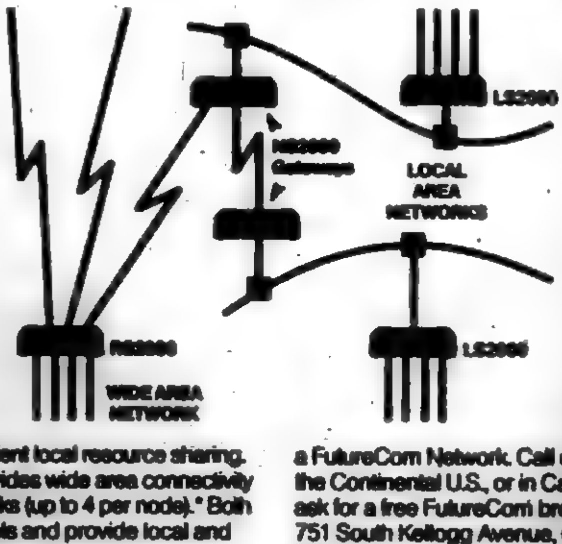
*X.25 and other networking capabilities are currently under development.



MICROCOMPUTERS

■ **Raima Corp. has announced an enhanced, multiuser version of its DB Vista data base management software for applications development in the C language.**

Version 2.0 is said to feature multiuser capability and shared file protection, transaction processing and the ability to import and export Ashton-Tate's Dbase II and Dbase III and Ascii files. The enhanced version reportedly includes interactive data base access utilities, one menu driven and the other command driven. The software can handle 16,000 records per file, according to the vendor.

DB Vista 2.0 requires the Microsoft Corp. MS-DOS or Xenix or AT&T's Unix operating system, 128K bytes of random-access memory and a hard disk drive.

Cost of the product is $990 with source code and $495 without source.

Raima, 11717 Rainier Ave. S., Seattle, Wash. 98178.

■ **IBM has introduced a version of its PC/Videotex software for its Personal Computer line.**

PC/Videotex B1.10 reportedly supports the IBM Enhanced Graphics Adapter, allowing 16-color graphics to be produced on the IBM Color Graphics Display in a 320- by 200-pixel, medium-definition graphics format. Under PC/Videotex, users can access videotex services that use the North American Presentation-Level Protocol Syntax.

The software is priced at $250. Subscribers to IBM's extended support program will be able to update to the Version B1.10 for $30. Nonsubscribers with the previous version will be able to update for $55.

IBM Information Systems Group, National Accounts Division, 1133 Westchester Ave., White Plains, N.Y. 10604.

■ **Artelligence, Inc. has announced the Artelligence OPS5+ implementation of its OPS5 language, a high-level language designed to implement forward-chaining artificial intelligence programs. OPS5+ runs on the IBM Personal Computer.**

OPS5+ is intended to allow novice programmers to apply AI methods for expert systems development. The product features a window-based mouse/menu environment. Multiple windows reportedly allow a continuous display of separate information. Source code and interactions are handled in a large window, while other windows display messages, state-of-the-system information and a command menu, the vendor said.

OPS5+ is coded in the C language.

OPS5+ is priced at $3,000.

Artelligence, Knowledge Engineering Department, Suites 212-252, 14902 Preston Road, Dallas, Texas 75240.

■ **Macmillan Software Co. has enhanced the first three modules of Asyst, its software for scientific calculation, using the IBM Personal Computer, and added a fourth module that reportedly simplifies the General-Purpose Instrument Bus (Gpib)/IEEE 488 protocol.**

The enhancements to Asyst are said to include expanded analysis capabilities and support for Gpib hardware. Also included are analysis of variance support and support for axonometric and contour plotting and plotting with error bars. Asyst's expanded color graphics ability reportedly allows easier interpretation of overlaying plots.

The fourth module is said to support more than 10,000 Gpib-compatible instruments and to enable commands to be modified and combined for specific applications.

The modules reportedly can analyze and reduce data, communicate with laboratory equipment and analog signal sources and offer basic mathematics, descriptive statistics and array manipulation.

The price of the modules ranges from $495 to $1,995. The entire package is priced at $1,895.

Macmillan Software, 866 Third Ave., New York, N.Y. 10022.

■ **RSA Security, Inc. has introduced its Mailsafe security software for electronic mail systems. The software runs on the IBM Personal Computer.**

Mailsafe reportedly can authenticate both the source and the content of electronic documents, permitting them to be used as legal contracts in place of signed papers. It gains this capability, the vendor said, through use of a digital signature that is unique for each document.

Other abilities are said to include verifying the source of a received message, assuring the integrity and authenticity of received data and electronically sealing sensitive data.

The software is priced at $350 and will be available in the third quarter.

RSA Security, 1717 Karemont Drive, Sunnyvale, Calif. 94087.

■ **Scitor Corp. has introduced its Project Scheduler Network, a project management software package for the IBM Personal Computer line.**

Project Scheduler Network reportedly offers spreadsheet-style data input templates and interactive graphics. Its project management capabilities include network diagrams, multilevel Gantt charts, work breakdown structure project organization and multiproject analysis.

The software is said to enable resources under its control to be allocated at any time within a job, to enable fractional resources to be assigned and to enable the user to use a mouse to select jobs from a pop-down menu. It is priced at $495.

Scitor, 256 Lincoln Centre Drive, Foster City, Calif. 94404.

■ **Henco Software, Inc. has introduced a version of its PC Info software for the Digital Equipment Corp. Rainbow 100+ and Rainbow 190 personal computers.**

PC Info, the personal computer version of Henco's fourth-generation relational data management system,

Continued on page 80

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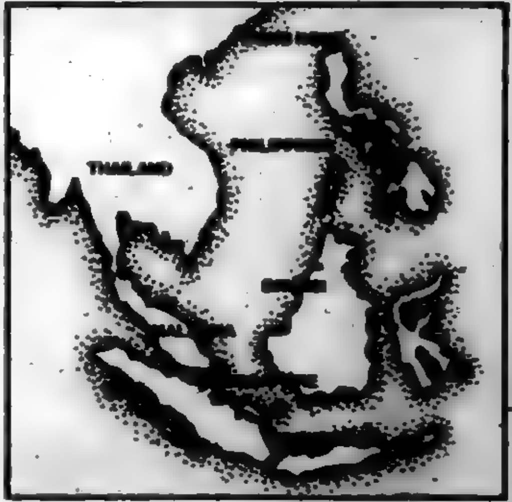

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MICROCOMPUTERS

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reportedly lets users access existing Info applications, reports and files running on DEC VAX-11 series minis, Prime Computer, Inc. 50 series minis and on IBM Personal Computer XT and Personal Computer AT models in addition to the DEC Rainbow models.

The software reportedly uses a conversational language that enables users to create and maintain information in an accessible format.

PC Info requires 512K bytes of internal memory and Microsoft Corp.'s MS-DOS Version 2.1. It costs $1,200.

Henco Software, 100 Fifth Ave., Waltham, Mass. 02154.

SYSTEMS

■ Tektronix, Inc. has announced the 32-bit Tekstation AT graphics workstation based on the IBM Personal Computer AT.

The workstation can concurrently support Utek, the firm's version of the University of California at Berkeley's 4.2 Unix, and IBM's PC-DOS operating system, a spokesman said. It is also packaged with CAE Systems, Inc.'s CAE 2000 design software.

The system supports applications ranging from CAE-based design capture, to software development. The system offers a maximum of 4.5M bytes of random-access memory, 16M bytes of virtual memory and 280M bytes of local disk space. The system adds a National Semiconductor, Inc. 32016 coprocessor to the IBM AT.

Tekstation AT prices start at $25,000. A file server configuration is available for $40,000 and an Ethernet interface for $1,400.

Tektronix, CAE Systems Division, 1333 Bordeaux Drive, Sunnyvale, Calif. 94089.

■ Micro Five Corp. has announced a microcomputer that is said to be fully compatible with the IBM Personal Computer AT.

The Micro Five Series 5000 is said to offer improved speed over the AT with direct memory access controllers to off-load the CPU, allowing the hard-disk subsystem to read and write a data track on a single revolution. The Series 5000's average disk access time is 30 msec or less.

The Series 5000 is available with Microsoft Corp. MS-DOS 3.1 or Xenix 3.2.

The Series 5000 Model 100 configuration is said to include 512K bytes of memory, a 1.2M-byte floppy disk drive, an RS-232 serial port, a Centronics Data Computer Corp. parallel printer port, nine expansion slots, a clock-calendar with battery backup and an AT-compatible keyboard. It is priced at $3,395. The Model 200 configuration also includes a 27M-byte formatted 5¼-in. hard disk. The Model 200 costs $5,215.

Micro Five, P.O. Box 5011, 3560 Hyland Ave., Costa Mesa, Calif. 92626.

COMMUNICATIONS

■ GSD Systems, Inc. has introduced the Mac/5251, an interface between the Apple Computer, Inc.'s Macintosh and Apple II line of personal computers and IBM's System/34, 36 and 38 minicomputers.

The Mac/5251 reportedly permits the Apple machines to connect via their serial port over twinaxial cable. It provides both cable-through and address selection. When terminal emulator software is used with the interface, the Apple computers reportedly can emulate an IBM terminal.

Mac/5251 is priced at $1,591.

GSD Systems, Suite 505, 600 S. Dearborn, Chicago, Ill. 60605.

■ Anderson Jacobson, Inc. has announced three communications packages that run on an IBM Personal Computer and transmit data at speeds up to 2,400 bit/sec.

AJ Connection II Model 2412-2RA1, consists of an IBM Personal Computer plug-in modem, card guide, Software Synergy, Inc.'s Respond software and a phone cord with modular jack connector. Respond enables a user to store logon and setup procedures for 26 numbers and provides concurrent functions so that users can run a WP or spreadsheet program with the communications package.

The product works with Hayes Microcomputer Products, Inc.'s AT command language and offers full or half-duplex communication at speeds of zero to 2,400 bit/sec.

AJ Connection II Model 2412-2B01 includes the same hardware and Communications Research Group, Inc.'s Blast software, which supports asynchronous file exchanges in block mode. The software reportedly works with 110 types of computers.

A third package, AJ Connection II Model 2412-2C01, includes Microstuf, Inc.'s Crosstalk software.

The packages cost $795 each.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

■ Data General Corp. has introduced PC Liaison, a software package that enables users to transfer files between DG's Data General/One laptop computer and an IBM Personal Computer or Personal Computer XT.

PC Liaison also permits programs that are not copy protected to be run on the DG/One from the Personal Computer drives, the vendor said.

The software runs on any DG/One and any Personal Computer running under IBM's PC-DOS 2.0 or 2.1 with 192K bytes of internal memory, a floppy disk drive and an asynchronous port.

The package includes a 5-ft cable and is priced at $180.

DG Desktop Division, 4400 Computer Drive, Westboro, Mass. 01580.

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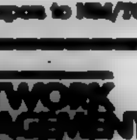
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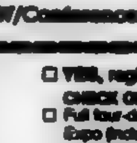
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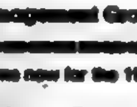
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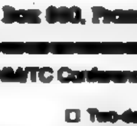
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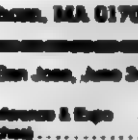
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Registrations cancelled later than June 14 are subject to a [illegible] service charge. Registration may be transferred at no charge.

MICROCOMPUTERS

■ Digital Communications Associates, Inc. (DCA) has announced that its Irma micro-to-mainframe interface is now available for use with the Data General Corp. Data General/One portable computer.

The new version reportedly enables the DG/One to emulate an IBM 3278/79 terminal, allowing the micro to communicate with a mainframe in an IBM 3270 environment. Irma allows users to transfer data to and from TSO, CMS and CICS mainframe environments, according to the vendor. The Irma board is said to fit into the expansion chassis of the DG/One.

The vendor reportedly modified Irma's terminal emulator program, E78, to be compatible with the DG/One keyboard. E78 revision 1.42 is said to remap the DG/One keyboard to include the numeric keypad found on the IBM Personal Computer.

Cost of the Irma board is $1,195.

DCA, 303 Technology Park, Norcross, Ga. 30092.

■ Racore Corp. has announced a local-area network that can reportedly link up to 16 IBM Personal Computers, Personal Computer XTs or ATs in any combination.

Racore-Net is said to use IBM Personal Computer Network software and the PC-DOS 3.1 operating system. The product reportedly uses token-passing ring architecture and has a 2M bit/sec. data transfer rate. Maximum distance between nodes is 200 ft, and an optional RS-232 data communications gateway is said to allow connection to remote networks.

The network can reportedly be installed in one full-length expansion slot of an IBM Personal Computer, Personal Computer XT or AT. It requires 256K bytes of memory.

Racore-Net is available for $250 per node.

Racore, 10 Victor Sq., Scotts Valley, Calif. 95066.

■ Mead Data Central, Inc. has announced an enhanced version of its software that allows IBM Personal Computers and other microcomputers running Microsoft Corp.'s MS-DOS to access its Nexis news retrieval and Lexis legal research data bases.

Version 1.3 of Lexis/Nexis Communications Software reportedly includes the capability to create, save and recall searches from a user's micro file and is said to support additional models of 1,200 bit/sec. modems.

The Mead software is said to run on the IBM Personal Computer, Personal Computer AT and XT as well as on micros from AT&T, ITT, NBI, Inc., NCR Corp. and Compaq Computer Corp.

Cost of the software is $225.

Mead Data Central, P.O. Box 933, 9393 Springboro Pike, Dayton, Ohio 45401.

■ The Wollongong Group has announced networking hardware and software that reportedly links the IBM Personal Computer, Personal Computer XT or Personal Computer AT to Digital Equipment Corp. VAX series minicomputers running DEC VMS or AT&T Unix operating systems.

Wollongong Integrated Networking/Personal Computer (WIN/PC) reportedly conforms to Department of Defense Transmission Control Protocol/Internet Protocol communications standards. WIN/PC is said to run on either Xerox Corp. Ethernet V1.0 or IEEE 802.3 local-area networks operating at

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CENTER

from page 73

fice furniture. Desktop sound covers are available for the printers that are placed on existing furniture. If sheet feeders are used, care should be taken to make sure the sound covers fit. This is simple logic, perhaps, but it is often overlooked.

■ Other supplies. Diskettes are used quickly, so a good supply should be on hand. Ensure that they are a reliable brand; they are used for valuable departmental data, so don't scrimp. Diskette boxes are a must if the diskettes are to survive storage and occasional transit. Storage boxes help organize disks and can be purchased with locks.

Price agreements for each item mentioned should be implemented prior to the delivery of the first microcomputer. Once you open the doors of the microcomputer center and begin delivering equipment, holding training classes and answering questions, little time will be left for getting supply agreements in place.

The near necessities

These near necessities are dependent upon the condition of the building and staffing expertise.

■ Power conditioners. These range from simple surge protectors to line-conditioning systems and are needed to protect against power surges or outages. Line conditioning systems are the more expensive, but they are also more effective.

■ Maintenance agreements. These ensure that, despite occasional equipment failure, adequate backup and a method for fixing the equipment is available. It is important that equipment be repaired quickly as users can become very reliant upon these machines. A rule of thumb to remember is that warranty work often takes longer than does regular, nonwarranty repairs.

■ An inventory system package. This will help support personnel keep track of all microcomputer center software and hardware.

■ An evaluation methodology. Setting up a methodology of this nature will help the staff evaluate new software or hardware offerings.

■ Consulting services. Consultants are available for evaluating software, writing custom programs, giving intensive guidance to a user or developing a complete system.

■ Additional phones. Microcomputer center phones tend to be in use constantly. This can be because users are asking for help, vendors are asking for sales or staff members are asking vendors for information or help. A second, less publicized phone can be helpful. If dial-up data base services are to be used often, the center even may need a third or fourth phone line.

■ Plotters. Plotters provide an excellent way to present microcomputer usage reports to upper management. Taking surveys of the existing microcomputer users is a good method for keeping track of the organization's need, and a presentation made with a plotter can be effective. If a plotter is to be purchased, so must plotter supplies such as pens, paper, transparencies and cable-switcher boxes.

■ Equipment training. The microcomputer center manager should not assume that everyone knows how to use a microcomputer. Classes should be held regularly, and they should be mandatory for employees with microcomputers on their desks. Classes should instruct users on how to set up the the equipment, load the operating system, protect and handle the diskettes, how to get to the tutorials and what a microcomputer can and cannot do. Classes should also clue users in on how to know when they are doing something wrong and when (and whom) to call for help.

■ Software training. This refers to four- to eight-hour classes that cover one software package. These courses should be provided frequently and should support a core of standard software packages including a spreadsheet, a word processing package and a data base. Using actual company-related data or spreadsheet samples will help. Training also should include refresher courses and roundtable discussions to assist the advanced user.

A last suggestion for the microcomputer center staff is to support a company users group to facilitate the advanced education needs that will develop once the equipment has been around for awhile.

Continued from page 81

10M bit/sec.

The product is said to give the micro full DEC VT100 terminal emulation capability, allowing users to transfer files to and from the VAX and create virtual circuits on local- and wide-area networks. Files reportedly can be copied in either text or binary mode.

The WIN/PC hardware and software package is priced at $1,375, according to the vendor.

The Wollongong Group, P.O. Box 51860, Palo Alto, Calif. 94303.

■ Micro Business Applications, Inc. has announced a network interface that allows its IBM PC-DOS and Microsoft Corp. MS-DOS accounting software to run on all networks that use the Netware operating system by Novell, Inc.

The Network Interface program is said to support file and record locking and automatic print spooling. It also synchronizes data and index file updates to ensure data base integrity. With the interface, Micro Business Applications' accounting packages will support multiuser and networking features.

The Network Interface costs $595.

Micro Business Applications, 12881 Nicollet Ave. S., Burnsville, Minn. 55337.

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COMMUNICATIONS

Pin the tail on the market

DATA STREAM
John Dix
CW Senior Editor

A person with AT&T Communications called last week looking for a contact within the vendor of Starlan, a personal computer network made by sister company AT&T Information Systems.

The caller said he had seen a recent article in *Computerworld* describing the ability of AT&T Information Systems' mainstream local network to support Starlan. After making a few calls to AT&T, he hadn't been able to reach anyone that knew much about the personal computer network.

Laughing, the caller said "AT&T is still, after all, a big company."

Yes, big, and with some serious problems yet to overcome. This incident is further evidence of organizational and marketing hurdles facing the corpulent grande dame of telecommunications.

To be fair, AT&T Information Systems is a nonregulated separate subsidiary of AT&T and, as an arm's-length subsidiary, there is supposed to be little interaction between the companies. This separation is stipulated by the Federal Communications Commission's Second Computer Inquiry decision, which deregulated new customer premises equipment. The decision required AT&T to separate Information Systems from AT&T Communications, the only long-distance communications carrier that is still regulated.

AT&T has been vigorously fighting the separate subsidiary ruling on Capitol Hill, saying it hinders the company's ability to compete. The classic reasoning behind the restriction is to keep AT&T from cross-subsidizing its competitive equipment business with revenue made from regulated long-distance services.

See AT&T page 85

Interactive Systems/3M unveils 10M bit/sec. MAP net

ST. PAUL, Minn. — Interactive Systems/3M has introduced a local network that it claims is the first 10M bit/sec. product to conform to Release 2.1 of General Motors Corp.'s Manufacturing Automation Protocol (MAP) factory network standard.

Called LAN/II, the MAP network is said to support multiple-rate synchronous and asynchronous data links and meet both the IEEE 802.3 baseband and 802.4 broadband network standards.

In a broadband factory implementation LAN/II is a 10M bit/sec. network configured in a tree topology and accessed using a token-passing method. The required Headend Control System, a remodulator that is also used for and known as the Network Monitor Unit, costs $27,740.

Terminals and hosts are connected via terminal servers. Several are available: asynchronous servers range from $509/port for a 16-port broadband server to $1,463/port for a four-port box; a single-port High-Level Data Link Control (HDLC) server costs $5,950; a two-port HDLC, $7790; and a three-port HDLC server costs $9590.

The MAP version of LAN/II for the office uses the IEEE 802.3 baseband version of carrier-sense multiple access with collision detection and Ethernet-type cable.

Baseband system components include a $967/port four-port terminal server, a $524/port eight-port box and a $386/port 16-port server. Similar versions of the HDLC servers — with one to three ports — cost, respectively, $4,950, $6,790 and $8,590.

The networks can be interconnected us-

See MAP page 85

Net vendors to do battle at meet

By Mark Bannister
Special to CW

More than 12 major networking companies will square off in New York June 18 to compete in the first Local-Area Network Olympics.

The business people attending the event will not be treated to the spectacle of one Ethernet vendor wrestling with another, nor will crowds roar as an AT&T Starlan vendor breasts the tape inches ahead of a IBM PC Network proponent.

Instead, the hyperbolically named event will actually be a day of written and oral reports on case studies of local-area networking problems. But for the 200 to 400 MIS and DP managers expected to attend, the event may, in its own way, be as gripping as any horse race.

The Local-Area Network Olympics is an attempt by vendors to show direct comparisons between their systems, using the same environmental conditions to show how each firm can solve the complex and expensive problem of linking personal computers in a network. In the convoluted world of networks, such baldly direct comparisons are hard to come by.

Each network competitor will present his hardware solutions to three case-study problems sent to him in advance by the Personal Computer Corporate Forum, the program's host. The solutions should show exactly what hardware — including cabling, network cards and system software — is required to solve each problem and at what cost.

Each program participant will give a ½-hour oral presentation and supply written material documenting specific products, prices and installation procedures. Eight of the network companies will give both oral and written presentations; late enrollees will present their cases in written form

See OLYMPICS page 85

Bannister is a reporter for Infoworld, *a sister publication of* Computerworld.

- Concord Data Systems slashed the prices of its 2,400 bit/sec. full-duplex modem when it added two products to the modem family/84
- Icot announced a hardware fix to facilitate the sharing of data bases on IBM hosts/84
- Western Union reduced its rates by up to 35% for its voice-grade, satellite private-line services/84

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*Trade-ins must be V.29, 4-wire, [illegible] line modems [illegible].

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Concord Data lowers price

WALTHAM, Mass. — Concord Data Systems, Inc. has lopped nearly a third off the price of its 2,400 bit/sec. full-duplex modem and introduced two other modems, a version of the product that was reduced in price and a card modem for micros.

Concord Data's 224 Autodial, 2,400 bit/sec. asynchronous/synchronous, full-duplex two-wire modem reportedly has been reduced from $795 to $495. The standard Model 224 without autodial now costs $450.

The 224 Series II models are based on a Rockwell International Corp. chip set, as opposed to the Intel Corp. set used with the older series.

The stand-alone 224 Series II is an asynchronous/synchronous, full-duplex modem that operates at 300, 1,200 and 2,400 bit/sec. It supports Concord Data's command set as well as the command set of Hayes Microcomputer Products, Inc.'s smart modem. The modem can autodial up to 10 numbers and supports the error-correcting Microcom, Inc. Networking Protocol (MNP). It will be available in August for $595.

Concord Data also announced the 224 PC Modem, a single-card modem for internal use in IBM Personal Computers, Personal Computer XTs and ATs. The full-duplex, two-wire PC Modem is also based on the Rockwell chip set. It is an autodial, asynchronous/synchronous device and operates at 300, 1,200 and 2,400 bit/sec. Like the 224 Series II, the PC Modem supports Concord Data's own command set and that of Hayes. Available in June, the $695 modem will not be available with the error-correcting MNP until August.

Concord Data Systems is located at 303 Bear Hill Road, Waltham, Mass. 02154.

Western Union rates reduced

UPPER SADDLE RIVER, N.J. — Western Union Corp. has reduced its rates by up to 35% for its yearly voice-grade, satellite private-line services.

Cities included in the program are Atlanta, Chicago, Dallas, Los Angeles, San Francisco and New York. The company is also granting an additional 15% discount for companies that order 48 satellite voice channels for two years.

Western Union reportedly is offering free installation and echo cancelers on any of 154 city-pair routes for customers placing one-year orders by June 30.

For example, a New York-Los Angeles link would cost $590 per month for a channel under the volume discount program, $695 per month for a year-term order or $965 on a monthly basis, according to Western Union. These prices are subject to approval by the Federal Communications Commission.

Western Union is located at One Lake St., Upper Saddle River, N.J. 07458.

Icot units ease data exchange via hardware

MOUNTAIN VIEW, Calif. — Icot Corp. has announced two communications processors that facilitate the task of sharing data bases on IBM hosts by providing the capability through a hardware fix instead of through software, according to the vendor.

The Crystalink 5220 Inter-Host Processor is reportedly the first communications processor to allow data exchange between two IBM hosts under the 3270 Binary Synchronous Communications (BSC) multipoint control protocol without any software modifications.

The processor has two 3270 BSC multipoint tributary lines and appears to both hosts as an IBM 3271 cluster controller supporting 32 terminals. Interhost message exchange is said to be handled by the device so that each host acts as if it is communicating with its own 3271. Up to 32 transactions can be conducted simultaneously at speeds up to 19.2K bit/sec. with a single physical connection. The communications processor supplies traffic flow and buffer occupancy status to the host, the vendor said.

The other device announced in the company's Crystalink 5000 series is the 5210 BSC Host Processor. This product is said to provide protocol conversion to enable a 2780/3780 batch-oriented IBM host to appear as a 3270 BSC device to an IBM 3270 BSC host. The product features user-modifiable time-outs and poll parameters and line speeds of up to 9.6K bit/sec.

The 5220 is reportedly being used by the Dow Jones News/Retrieval service for its Focus personal banking network. The 5210 is in use at Mellon Bank to link an automated teller machine network of small regional banks to Mellon's Cashstream network, Icot reported.

Prices for the 5220 Inter-Host Processor range from $5,200 to $6,300. The price for the 5210 BSC Host Processor ranges from $4,000 to $6,300.

Icot can be contacted through P.O. Box 7248, 830 Maudin Ave., Mountain View, Calif. 94039.

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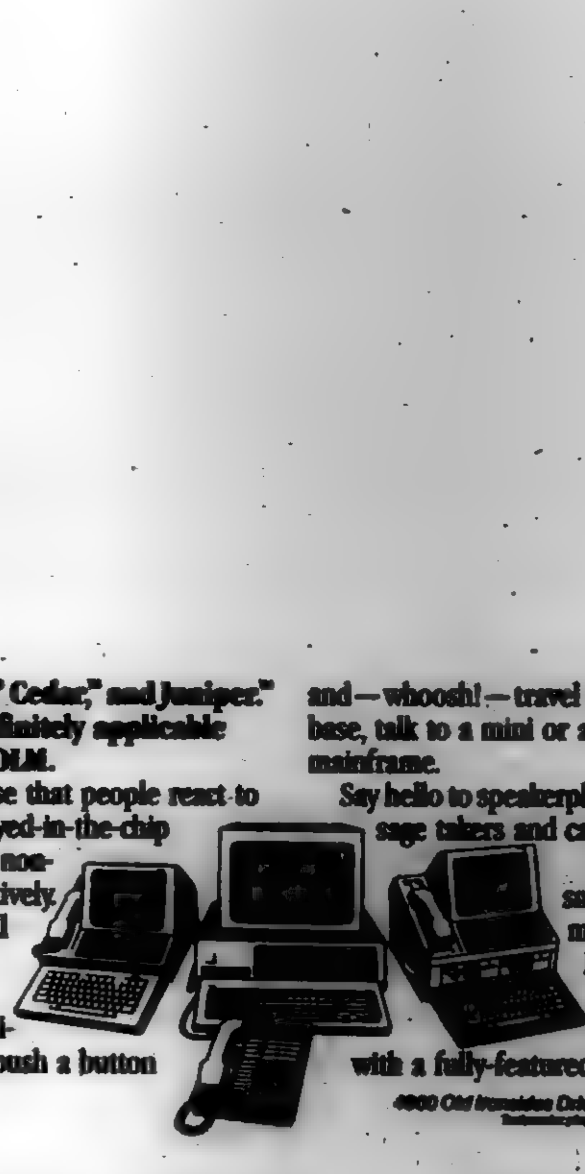

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[illegible]

OLYMPICS

from page 83

only. At the end of the program, each member of the audience will receive a copy of the written presentations.

The case study problems were designed by Ira Cotton, a consultant with Booz, Allen & Hamilton, who formerly worked for the National Bureau of Standards where he established networking standards for government and White House hardware procurement.

According to Norman Dolph, president of the Personal Computer Corporate Forum, Cotton designed the network problems as three distinct scenarios intended to encompass a range of practical problems. The corporate department problem entails hooking together 12 to 18 personal computers at a multifloor location. The general goal is resource sharing and mainframe interfacing. The solution emphasizes wiring strategies.

The manufacturing/industrial problem involves hooking nine personal computers within a harsh working environment split between two separate buildings. The rapidly expanding small-business problem requires participants to link six personal computers from different manufacturers, keeping economical resource sharing in mind.

'Design time bombs'

According to Dolph, to solve the problems, participants will have to negotiate around "design time bombs that many companies haven't begun to deal with," such as large file sizes that challenge standard hard-disk configurations and long-wire runs that might or might not demand repeaters. Dolph said, "This is Outward Bound for [local-area network] vendors."

Participating companies include AST Research, Inc. of Irvine, Calif.; Corvus Systems, Inc. of San Jose, Calif.; Fox Research of Dayton, Ohio; IBM's Entry Systems Division in Boca Raton, Fla.; Network Development of Malvern, Pa.; Novell, Inc. of Orem, Utah; Quadram Corp. of Norcross, Ga.; 3Com Corp. of Mountain View, Calif.; Televideo Systems, Inc. of Sunnyvale, Calif.; and XComp of San Diego.

"Vendors will have to put their money where their mouth is," said Marilyn Capell, public relations manager for Novell.

Attendance at the Local-Area Network Olympics costs $325. More information is available from Personal Computer Corporate Forum, 279 E. 44th St., New York, N.Y. 10017.

AT&T

from page 83

Equipment competitors favor the separate subsidiary requirement because it keeps AT&T from marketing products below cost and making up the difference with long-distance revenue.

They also like the ruling because it helps limit AT&T Information Systems' access to AT&T customer histories and curtails the flow of customer leads between the companies.

But even if the separate subsidiary requirement were lifted tomorrow, it would take AT&T a long time to circle its wagons to create a cohesive front.

Create forward movement

Rectifying duplication of effort — AT&T Information Systems and AT&T Network Systems market similar products developed from the same technology — would be time-consuming but not as hard as orchestrating the movement of corporate limbs to create forward motion.

A speaker at a recent conference chastised AT&T's marketing efforts and was later told by an AT&T person in the audience that he was right. The sales offices are being deluged by product information, the person said, but no one is sure what it all means or how it all fits together.

The inquiry from AT&T Communications is an indication of that confusion. And separate subsidiary ruling or not, AT&T must start coalescing the pieces and focusing the direction of the company.

MAP

from page 83

ing a broadband/baseband LAN/II gateway that costs $7,250. Wide-area network gateways cost $7,590 for broadband nets and $5,590 for baseband implementations, according to the vendor.

All products reportedly support layers one to four of the MAP network model, which is styled after the International Standards Organization's Open Systems Interconnect network model.

LAN/II, which can be bridged together with Interactive Systems' LAN/I, is slated to be available in August.

More information is available from Interactive Systems/3M, which can be reached through P.O. Box 33600, St. Paul, Minn. 55133.

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User: Quick installation for NAS 8083

By [illegible]
CW Staff

OAKBROOK TERRACE, Ill. — One of the first users of National Advanced Systems, Inc.'s (NAS) 8083 multiprocessor said the system was installed in one weekend and has maintained a 99.9% uptime in the month and a half since then.

May & Speh, Inc. — a service bureau that provides time-sharing, direct marketing and custom programming to customers — bought the $4.2 million machine in order to double its computer resources and add fault tolerance to its operations, said Kathleen Speh, marketing consultant to the company. May & Speh has a customer base of 1,000 clients, and more than half of them — most of the time-sharing clients — are now using the 8083, she said.

The NAS 8083 multiprocessor consists of two NAS 8063 machines tightly coupled in a multiprocessing configuration running as one machine under IBM's MVS/JES2 operating system, said Don Marquardt, the service bureau's data center manager.

The system has 32M bytes of main memory and 32 channels, he added. It is connected to a disk storage system that includes 72 IBM 3350-type drives from Memorex Corp. and 32 IBM 3380-type devices from NAS — a total storage configuration of 45G bytes, he said.

> *'We can run 30 batch jobs at the same time.'*
>
> — Don Marquardt
> May & Speh, Inc.

When searching for a new computer, the company considered IBM's 3081 Model KX processor and an Amdahl Corp. 5780 multiprocessor, Marquardt said. IBM could not deliver the system the company needed until nine or 10 months after it needed it, he said, and Amdahl was having trouble with its machine and delivery dates.

IBM's single-processor 3081 Model KX operates at 15 or 16 million instructions per second (Mips), and the NAS 8083 consists of two 8-Mips machines, so the difference would be in having one job running at 15 Mips or two jobs running at 8 Mips. "It's a toss-up as to which system would have been faster," he said.

Under MVS/JES2, the company runs IBM's CICS, TSO, ISPF and batch environments, Marquardt said. "We can run 30 batch jobs at the same time," he added. A typical daytime load is 80 to 85 TSO users, six CICS regions and 22 batch jobs running simultaneously, he said. The system operates around the clock all week, with no time scheduled for maintenance, he said.

Installation of the system was accomplished on a weekend at the end of April, Marquardt said. "I powered down at 9:00

See NAS page [illegible]

- MDB Systems unwrapped a pair of enhanced storage module drive disk controllers for DEC equipment/[illegible]
- BDS released a laser printer that is compatible with Diablo's 630 printer protocols/[illegible]

INSIDE

Data Storage/[illegible]
Terminals/[illegible]
Printers/Plotters/[illegible]

Memorex fights DOD performance criteria

HARD TALK
Tom Henkel
CW Senior Editor

Does the government have the right to impose quality and reliability sanctions on computer suppliers who bid on multimillion-dollar government contracts?

That is a stone Memorex Corp. overturned last week when it went before the General Accounting Office (GAO) with a complaint about the restrictions that the U.S. Department of Defense's (DOD) Defense Logistics Agency has imposed on a $14 million to $16 million request for proposal for IBM 3380-type disk drives and controllers. The complaint claims that the restrictions, in effect, exclude Memorex from any hope of successfully bidding on the contract.

The outcome of the Memorex complaint will have an impact on the way government agencies procure computer hardware, and it may ultimately influence the way every MIS decision maker evaluates hardware.

Two issues

The Memorex complaint centers on two issues. First, the Defense Logistics Agency has stipulated that 3380-type disk drives must be able to process, on the average, roughly 35 million I/O starts before a failure. That limit is based on monthly reports generated by a hardware reliability package offered by University Computing Co. (UCC) in Dallas.

Memorex's 3680 disk drive has consistently come in last in the UCC rating, well below the 35 million I/Os between failures. The Memorex drives are operating at about 8 million I/O starts between failures. Memorex does not contest the validity of the UCC hardware reliability monitoring service. In fact, a Memorex vice-president praised the service as one of the better methods of monitoring hardware performance.

The crux of Memorex's complaint is that the company feels the UCC service fails to take into consideration some extenuating circumstances. For example, the bulk of Memorex's 3680s have been installed fairly recently, compared to competing vendors' products. Therefore, Memorex contends it has a higher failure

See PROCURE page [illegible]

SHOP TALK/WAYNE HEIMSOTH

Developing friendly systems key in manufacturing

Configuring the hardware for a manufacturing system is only one part of the process. Another, sometimes difficult, aspect of developing a manufacturing system is creating a system that gives operators the necessary words and images to allow them to do their jobs, such as building parts, effectively.

Of course, the better the words and images are presented, the faster and more accurately operators will be able to perform their jobs. This is often referred to as user-friendliness, which consists of the following:

- Eliminating the need for operators to search for a document referenced by another document.
- Not requiring an operator to make judgments about which section in a document the manufacturing process really should follow.
- Eliminating the need for an operator to interpret a blueprint or to determine the step-by-step tasks to be followed, and so on.

Lockheed Missiles and Space Co. is currently developing such a system. In addition to the features mentioned above, defense contractors also need to record specifically how the part was built. This is often difficult, because the development effort can sometimes change on a daily basis.

So, as a defense contractor, Lockheed must be able to get timely, revised instructions out to the shop floor to improve or correct a problem found in an earlier design. The company must also know how parts produced earlier were built in order to analyze a situation or problem found when that final product — a missile, for example — is tested.

After evaluating 14 different vendors, Lockheed decided upon a Hewlett-Packard Co. system consisting of an HP 3000 superminicomputer using HP's HPword word processing software, TDP electronic publishing software and a digitizing camera. The HP system turned out to be the least expensive system of those evaluated.

The system Lockheed currently is developing takes text and data from a computer-aided manufacturing system and combines it with images and data from other systems into one work instruction package. In other words, the operator would not have to find and use numerous documents to follow the steps needed but would have one document with all required information merged together.

A generative planning system can be used to begin the process of work instruction creation and will be the controlling source for operational sequence statements and reference call outs. If any change is made, causing a revision to the instructions, the manufacturing engineer will return to this source system and make the change, guaranteeing that a new revision level is generated and that all systems needing this data receive the same data.

The output from this system will feed the HP 3000 and any other system that will need the

See LOCKHEED page [illegible]

Heimsoth is project leader for factory automation systems, manufacturing, for Lockheed Missiles and Space Co., based in Sunnyvale, Calif.

SYSTEMS & PERIPHERALS

DATA STORAGE

■ MDB Systems, Inc. has released two enhanced storage module disk drive controllers for Digital Equipment Corp.'s PDP-11 Unibus and VAX series systems, with data transfer rates of up to 1.8M byte/sec.

The MDB-DK11-RM and MDB-DK11-RP hex-size controllers are said to operate disk drives with a storage module drive interface that can operate at the standard data rate of 1.2M byte/sec. as well as at the 1.8M-byte rate of the Fujitsu Ltd. Eagle disk drive.

When used with Control Data Corp. 9762 or 9766 disk drives, the disk controller generates packages that are media compatible with DEC's RM02 and RM05 systems, according to the vendor.

Each version costs $3,900 in single quantities, and OEM discounts are offered, according to the vendor.

MDB Systems, Box 5508, 1995 N. Batavia St., Orange, Calif. 92667.

■ EMC Corp. has announced add-on memory boards for Hewlett-Packard Co.'s HP 3000 computer systems.

The EMC HP-401 provides 1M byte of main memory for the HP 3000, models 39 through 48, according to the vendor.

The product is reportedly installed in the HP 3000 system without modification to the CPU or operating system.

The EMC HP-401 costs $5,400.

EMC, 12 Mercer Road, Natick, Mass. 01760.

TERMINALS

■ Logicraft, Inc. has announced components of an integrated color graphics workstation that works with the company's Cardware system, a combination of hardware and software that gives IBM PC-DOS or CP/M 86 functionality to Digital Equipment Corp. computers. The DEC computers include the LSI-11 and VAX series machines like the Microvax I and II.

The color graphics workstation provides Cardware users with the color graphics capability of the IBM Personal Computer, the vendor said. The system is said to include a color display with 320- by 200-pixel (color) or 640- by 200-pixel (black-and-white) resolution. When not being used for Cardware, the workstation reportedly emulates a DEC VT100 series terminal.

The workstation has two components: a daughterboard that is installed into a slot on the DEC equipment and a workstation pedestal, to which the user must add an IBM Personal Computer-compatible keyboard and monitor. The two components are connected using standard television-grade coaxial cable.

The daughterboard and workstation pedestal cost $900.

Logicraft, 5 Graham Drive, Nashua, N.H. 03060.

NAS

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p.m. Friday, and at 10:00 p.m. Saturday, it was up and running. We completely replaced the 8063 CPU that we had and added a bank of 3380-type drives and a [Hewlett-Packard Co.] laser printer in 25 hours," he said.

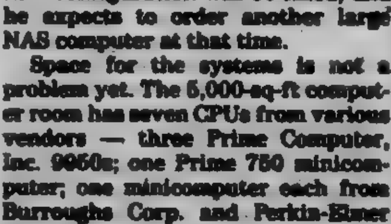
The company's TSO Trivial Command response time, normally 0.2 sec., has remained about the same, and the normal 0.5 sec. response time for CICS did not change, Marquardt said, but batch jobs run about 25% faster than before. May & Speh ran no benchmark tests because they bought the machine before it was actually on the market, he said. "We knew our business needed it, and we've been very satisfied with other NAS equipment that we owned," he said.

The 8083 multiprocessor configuration will run at 190% of the functionality of two single processors, Marquardt said, and on the first production day, he attained a 180% function rate. The system generally runs at 140% because the company has not placed enough work on it yet, he said. In two to three months, the new configuration will be filled, and he expects to order another large NAS computer at that time.

Space for the systems is not a problem yet. The 5,000-sq-ft computer room has seven CPUs from various vendors — three Prime Computer, Inc. 9950s; one Prime 750 minicomputer; one minicomputer each from Burroughs Corp. and Perkin-Elmer Corp. that belong to customers; and the NAS 8083.

"We call the 8083 the world's longest computer," Marquardt said. The 6-ft high, 3-ft wide machine stretches out 30 ft long, he said, just for the processors and main memory. A staff of 20 operators and tape librarians and four systems software people support the conglomeration of equipment, and 100 applications programmers write software for customers, he said.

For the $4.2 million it spent, May & Speh received the CPUs, two operator consoles, a console printer and three power distribution units that convert 220 volts into 440 volts so the system can take power directly from the power company, Marquardt said. The system is air cooled by a standard computer room air conditioner, he said.



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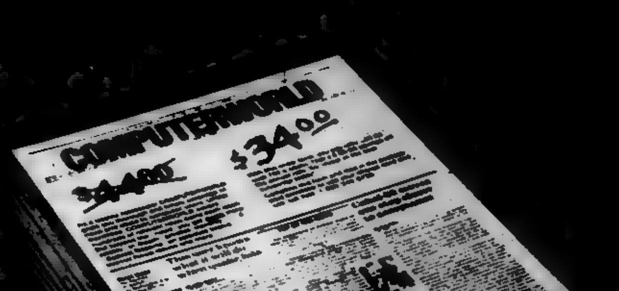

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PRINTERS/PLOTTERS

■ North Atlantic Industries, Inc. has announced that two members of its 7000 family of printers have been modified to meet the U.S. government's North Atlantic Treaty Organization's Communications Security Information 5100A (Tempest) specifications.

The models 7020 and 7035 have been renamed 7020T and 7035T, respectively. The printers feature emulation of Diablo Systems, Inc. 630 daisywheel printers for word processing applications, an electrically alterable read-only memory for storing printer parameters and an extra 8K bytes of random-access memory for a total of 16K bytes to allow multiple fonts to be downloaded, the vendor said. The printers reportedly have both parallel and serial interfaces.

The 7020T costs $3,590 per unit, and the 7035T costs $3,990 per unit.

North Atlantic Industries, 60 Plant Ave., Hauppauge, N.Y. 11788.

LOCKHEED

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same data and serve as the source of intelligence to assemble all the other parts needed to create a work instruction.

Documents that are referred are to be created on the HP 3000 using HPword and TDP for text and HPdraw and the digitizing camera system for images. Printed output, including images, can be sent either to a 12 page/min or 45 page/min printer.

The application programs that Lockheed will develop will take the intelligence out of the source data and combine the reference text and images from the other documents into one output document — the work instruction.

The result of this will guarantee that operators have all the necessary documentation at their fingertips to build a given part. Lockheed is also trying to ensure that incorrectly referenced documents can not be used, since the computer will merge the correct version of the text and image into the work instruction under automatic control.

Lockheed also hopes to build features into the system that provide for controlled changes and work status monitoring.

Any changes that can be made overnight will be done through the normal processing steps. There will be a procedure, controlled by computer, through which an authorized person can prepare and issue a change physically from the shop floor. Those changes that must appear in all subsequent revisions of the work instructions for that part number, will be tracked so their incorporation into the control system is ensured.

This same system will be used to give status to the preparation of work instructions. When a revised work instruction needs to be prepared, it will be logged as outstanding work and given a revision code. When the preparation has been completed, that part number and edition number will be locked out for changes (computer-controlled) and held in an approval status until all approvals are obtained. Finally, the work instruction will be computer-released for use when all approvals are obtained.

PROCURE

from page 87

rate because most of its users are either testing and debugging their new Memorex drives (Memorex claims users deliberately allow multiple hardware failures in efforts to identify a system problem) or have not ramp-tested 3680s into full production.

The DOD said it would consider Memorex's arguments if the reliability ratings on the 3680s were getting better over time. But a spokesman said the 3680s seem to remain consistently in the basement of the UCC reports.

The second complaint Memorex has with the DOD is the department's stipulation that at least 25% of the disk control units purchased in its contract have either 16M or 32M bytes of cache storage. Memorex currently does not offer a disk controller with cache memory. Consequently, a Memorex bid for the DOD contract will be assessed a monetary penalty for not being able to meet the cache memory requirements. The financial penalty will make almost any bid by Memorex less attractive than bids from the competition.

The upshot of the Memorex complaint is whether a government agency can impose highly restrictive demands on bidders for specific contracts.

In a time when government agencies are facing public pressure over unwise purchases, such as hammers and ashtrays that cost several hundred dollars each, the DOD Defense Logistics Agency seems to have set a series of guidelines that it hopes will ensure the purchase of reliable products that adequately meet its needs.

The question Memorex appears to be raising is whether the statistical information used to develop the criteria for the DOD contract evaluates all vendors fairly.

Herein rests an issue that faces virtually all buyers of hardware: Statistics can be manipulated, misunderstood and misused. Marketing and sales people seem to have an inborn knack of doing all three, choosing only those statistics that put their products in the best light. All other statistics always seem to be either invalid or not to apply to one's particular situation.

Consequently, it is getting progressively harder to get straight answers out of vendors — that is all vendors, not just Memorex. The result has been a growing distrust of the information presented by vendors.

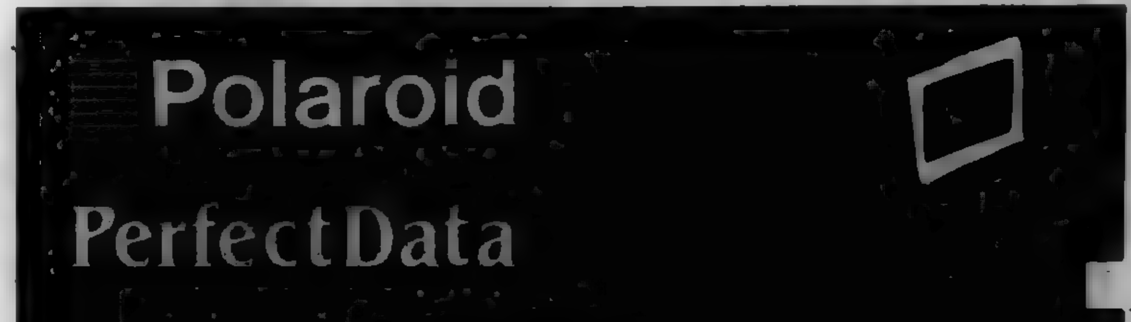
Perhaps the hardest tasks facing DP executives charged with making large hardware purchases today is sifting through tons of vendor hype, trying to find usable information with which to compare competing products. If users cannot fully believe the information provided by the vendors, what's left?

Benchmark often a luxury

It is clear that products and services that claim to analyze products objectively will increase in popularity — and with good cause. It has already become impossible for users to run benchmark tests on every piece of hardware dragged into the data center. For many DP executives, an adequate benchmark on a mainframe, let alone on peripherals, is often a luxury.

If the GAO rules in favor of the DOD, Memorex will have forced the government to put a stamp of approval on third-party hardware evaluation services, and the services will flourish. If the ruling falls in Memorex's favor, the GAO may have hamstrung every government agency trying to cope in the increasingly hype-oriented computer marketplace.

Whatever the decision, there will be ramifications for commercial users. Third-party product evaluation services that are widely used by the government can quickly become standards in the private sector as well. Likewise, if the government bans use of such services, it shakes their credibility for everyone.



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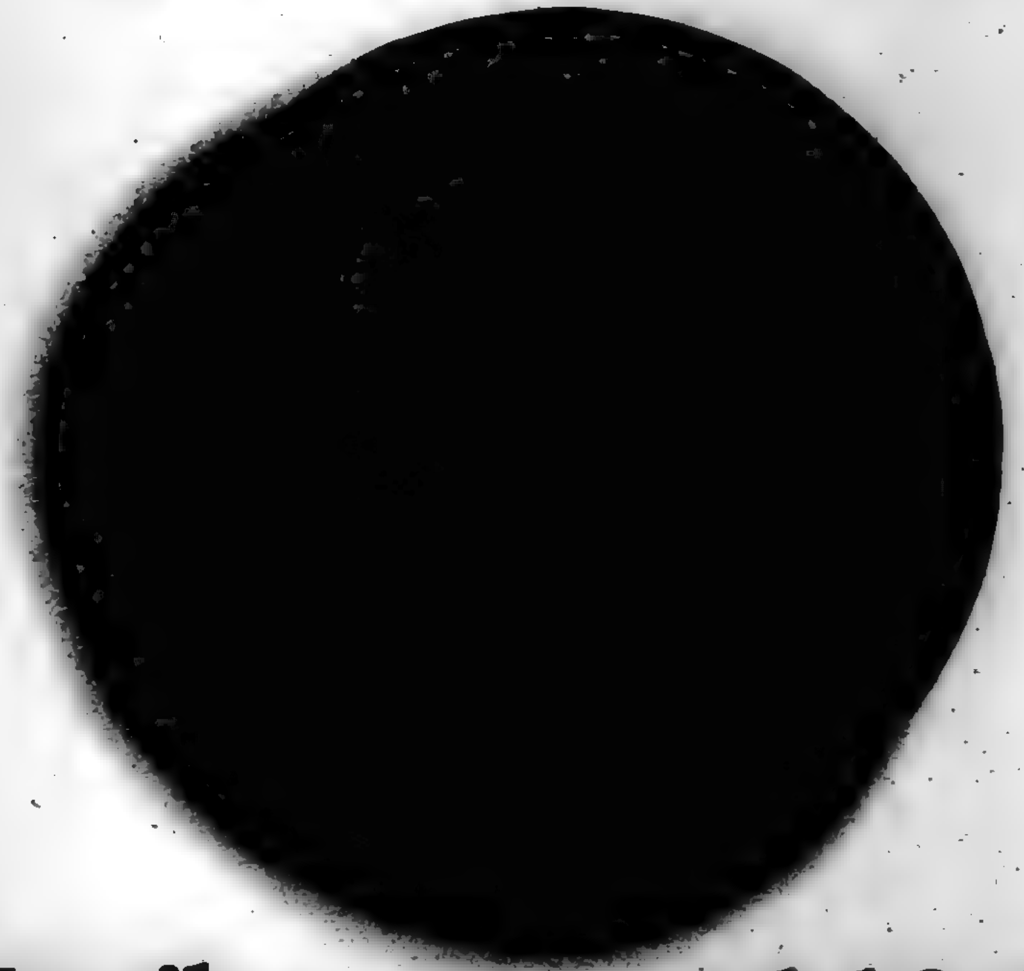
Every software creator hopes to get great reviews.



Bob Hamilton got a medal for Enable.

"When PC Magazine's editors first saw Enable, we yawned. 'JAIP,' we said (Just Another Integrated Package). Okay, the spreadsheet was powerful. And yes, the graphics were sharp. And the word processor wasn't bad. Then the demonstrators took a graph and merged it into a text file. Not bad. Then they edited it. That was too much. 'You can't do that,' we said. 'Enable can,' they replied. And that's the real story behind Enable: Its creator, Bob Hamilton, was determined not to introduce a me-too product to a field that was soon to be swamped by lookalikes."

Comments by Bill Machrone, the editor of PC Magazine, during the presentation of the magazine's First Annual Awards for Technical Excellence, Comdex, May 7th, 1985.

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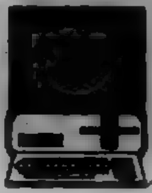
COMPUTER INDUSTRY

Wall Street style helps Gartner grow

SECOND OF A FIVE-PART SERIES

By John Desmond
CW Staff

STAMFORD, Conn. — The phone in the marketing department of the information industry consulting firm rings repeatedly without being answered. The man making the call, the firm's president, scowls. He is not pleased. He tells his secretary to scold the marketing people for not answering the phone.



A high-paying client might have been making the call, not just Gideon Gartner. High-paying clients of the Gartner Group, Inc. expect instant responses to inquiries. The company prides itself on having senior analysts answer client inquiries directly on the telephone. That is one of a number of services offered by the six-year-old firm, which has shown impressive growth figures.

While the Gartner Group is not publicly held, its president freely offers the following revenue figures:

- $600,000 in 1980.
- $1.6 million in 1981.
- $3.2 million in 1982.
- $5.2 million in 1983.
- $8.8 million in 1984.
- $14 million in fiscal 1985, ended in March.

Grigsby Markham, the Gartner Group's senior vice-president of finance, said the firm was profitable in fiscal 1985 and broke even in fiscal 1984.

The company's growth has averaged 60% to 65% each year. The firm now has more than 140 employees and claims a 95% client renewal rate. "There is tremendous momentum," Gartner said. He projects revenue of more than $22 million in fiscal 1986. The figures are consistent with a survey published in *Inc.* magazine in December, although a former Gartner Group employee suggested the latest figures may be slightly inflated.

The company claims it has some 1,000 individual clients. The breakdown by company is approximately 250 user firms, 125 vendors and 250 institutional investors, a spokesman said.

Funded by venture capital, the firm is bound to see changes in the future. "It's obvious that a company like ours, which is funded by venture capitalists, at some point either has to go public or has to sell itself. At some point, the shares get liquefied," Gartner said, but he did not indicate when that would happen.

At the Gartner Group's headquarters here, phrases like "net it out," "value added" and "bottom line" are frequently spoken. What distinguishes the Gartner Group from its competitors is its Wall Street style and staff experience, according to Gartner. Gartner worked for seven years gathering information for IBM before moving to Oppenheimer & Co., a Wall Street brokerage house where he worked in research until 1979. Gartner called this Wall Street style the firm's heritage. "The whole style of our company is a business style, whereas the styles of our competitors tend to be very data oriented, without

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- AT&T Information Systems continued cost-cutting moves begun last year by recently announcing the elimination of 1,650 positions/96
- Bruce T. Coleman, former president of Informatics General, was recently named president of Walker Interactive Products/96
- Fujitsu recently realigned its U.S. microsystems division/101

U.S. firm calls for quotas on Japanese chips

By Clinton Wilder
CW Staff

SUNNYVALE, Calif. — A leading U.S. semiconductor manufacturer has called for quotas to limit Japanese imports in the wake of recent charges that Hitachi Ltd. is selling chips below cost to gain U.S. market share.

A spokesman for Advanced Micro Devices, Inc. (AMD), the No. 2 American maker of 256K-byte erasable programmable read-only memory (Eprom) chips, said the recent allegations against Hitachi represented the proverbial last straw in the battle for market share. Hitachi is currently the leading supplier of 64K-byte Eprom chips in the U.S., while two other Japanese chip makers, Mitsubishi Ltd. and Fujitsu Ltd., are second and third, respectively.

"It's time to fight back," said AMD Vice-President of Communications Elliott Sopkin. "We've been slapped one time too many and [Jerry Sanders, AMD president and chief executive officer,] is outraged. We think we have to have a quota system. [Japanese vendors] have 17% of our 256K Eprom market, and the U.S. has 10% of the Japanese [market], so we should limit their dollar imports to even them up. It's that simple."

The latest skirmish in what appears to be an inevitable U.S.-Japan high-tech trade war was touched off earlier this month when a U.S. trade official indirectly charged Hitachi with dumping, or selling below cost, 256K-byte Eprom chips in the U.S. Published reports indicated that Hitachi's Integrated Circuit division in San Jose, Calif., circulated a memo advising its distributors to offer chip prices 10% below those of AMD and Intel Corp., the leader in the 256K-byte Eprom market, with profit margins guaranteed by Hitachi. Efforts to obtain a response from Hitachi were unsuccessful. Retiring U.S. Undersecretary of Commerce for International Trade Lionel Olmer made the charges at a Tokyo farewell dinner in his honor.

Sopkin said AMD's sales force has found the 256K-byte Eprom prices offered by Japanese vendors have fallen much faster than the industry standard over the past several months. "It's obvious that the

See QUOTA page 100

Margin for error shrinking

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

If there is a bright light to the current computer industry slowdown, it is hidden far, far over the horizon.

When an industry is growing at an average rate of 20% to 30% annually, companies caught up in the hectic pace can get by with some minor problems. A seemingly insatiable demand for products serves to insulate management from the penalties of miscalculations.

But when the party is over — and it certainly looks like the last guests are heading for the door — those minor problems become monumental obstacles to a corporation's continued good health.

A case in point — Wang Laboratories, Inc.

One year ago, the company seemingly could do no wrong. Revenue had climbed above $2 billion and the office automation giant seemed headed for $3 billion and beyond; some even figured that eventually Wang could quite possibly displace Digital Equipment Corp. as the No. 2 manufacturer.

Those aspirations have come crashing down. And it is the small problems that are now hampering the company most.

When its compound annual growth rate was 30% or better, Wang could afford not to worry about complaints concerning service; the MIS manager could be suffered, if not ignored, because Wang owned the department that made the decisions; and if development schedules slipped, too bad, because customers were chomping at the bit

See WANG page 96

Inventor suing Wang, IBM for patent infringement

MIAMI — A 30-year-old Fort Lauderdale, Fla., inventor has added Wang Laboratories, Inc. to his list of patent infringement lawsuit targets and is expected to sue more computer industry giants in the coming weeks.

Robin Elkins last week filed a federal lawsuit against Wang in U.S. District Court here, claiming that the store-and-forward system in Wang's Digital Voice Exchange illegally uses analog-to-digital conversion technology that Elkins patented in 1978. Last month, Elkins sued IBM and its subsidiaries, Rolm Corp. and Rolm Corp. of Florida, on the same charge, citing IBM's Audio Distribution Systems and Rolm's Phone Mail products.

IBM was expected to file a formal response by today. IBM spokesman Lyle McGuire declined to comment on the suit until a formal response was drafted.

Elkins and his attorneys have filed patent infringement notices against some 50 companies in the past several years, but the actions against IBM and Wang are his first lawsuits. Don Feldman, an attorney for Elkins, said legal action is now being considered against several more companies.

Feldman said several companies rejected Elkins' technology as useless when the inventor tried to sell it to them in the 1970s, then later used the technology in their products. "As long as the industry continues to stonewall us and reap the rewards of Elkins' invention, we will continue to seek redress in the courts," Feldman said. "It would have been a much happier situation if the companies had negotiated with us in good faith, but it appears they have never taken us seriously."

The named plaintiff against IBM

See SUIT page 93

Marketers beware: Bundling can violate antitrust laws

OUTSIDE LINES
A. D. Saunders

After litigation lasting some four years, a U.S. District Court of Appeals determined that Data General Corp.'s bundling of the Nova Rdos operating system with its Nova CPU and other peripherals violated the antitrust laws (Digidyne Corp. v. Data General, U.S. Court of Appeals for the Ninth Circuit; Docket Numbers 81-4626, 81-4667, 81-4671 and 82-4162).

To many DG customers, Rdos was among the best — if not the best — operating system on the market. Customers testified that it was "comprehensive, compatible, field proven and rapid, running four times faster than any comparably priced system. It was, in fact, the only full-service operating system available for the Nova CPU."

Nova Rdos and CPUs were sold mainly to OEMs, who put them together with their own application software products for resale. DG licensed Rdos to customers, but only to those customers who also purchased the CPU. DG also required licensees of Rdos to buy not only the CPU, but other hardware, usually peripherals, or pay a license charge. DG protected production of Rdos by trade secret agreements.

Tying arrangement

The requirement that a purchaser can obtain one product only by purchasing another is known in legal terms as a tying arrangement. In this case, the CPU would be known as the tied product, and Rdos would be the tying product.

According to DG, "the tie was devised to ensure recovery of the development costs" associated with Rdos. Futhermore, DG said that "it would be unfair to permit emulator CPU manufacturers to reap the benefits of [DG's] software research and development when they sell their competing CPUs for use with [DG's] software."

DG's decision to tie was made after a competitive manufacturer of Nova emulator CPUs requested permission to use Rdos.

Digidyne produced emulator CPUs that were "designed to perform the Nova instruction set and thus to make use of Rdos." Digidyne, the plaintiff in this case, claimed that the bundle that was required to be purchased from DG unlawfully restrained trade and thereby violated the Sherman and Clayton Acts. Digidyne was correct in its analysis.

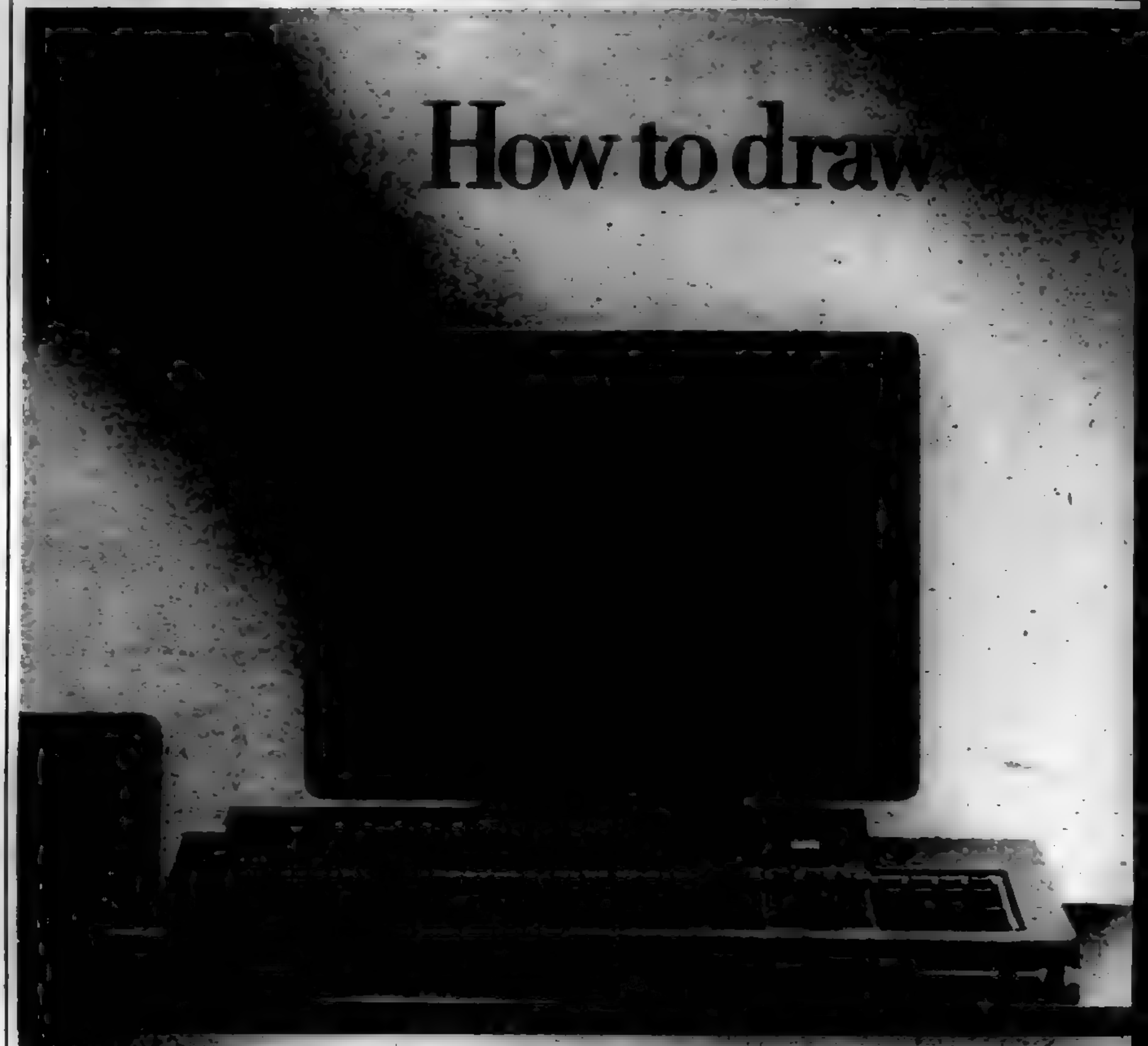
A tying arrangement is illegal in and of itself if three conditions are satisfied. First, the purchase of the tying product must be conditioned on the purchase of the tied product; second, there must be sufficient economic power regarding the tying product to restrain competition in the tied product; and third, there must be an effect upon a substantial amount of commerce with respect to the tied product.

With those conditions satisfied, a detailed market analysis of the relevant market is not required; all that is required is market dominance.

Market dominance is the "power to control price and to exclude competition . . . The crucial economic power may be inferred [however] from the tying products' desirability to any appreciable number of consumers or from the uniqueness in its attributes" (U.S. v. Loews; Fortner I).

In other words, as long as "there are some buyers who find a seller's product uniquely attractive and are therefore willing to pay a premium above the price of its nearest substitute, the seller has the opportunity to impose a tie" (Fortner II). When such forcing occurs, competition on the merits in

Saunders is a Boston-based attorney whose practice includes marketing issues.



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the market for the tied item is restrained (Jefferson Parish Hospital), and the antitrust violation occurs.

The requisite economic power also exists "when the tying product, here Rdos, is patented or copyrighted" because intellectual property protection "confers upon the defendant some advantages not shared by . . . competitors" (Fortner II).

The combination of copyright and the required use of trade secrets "established both the distinctiveness of Rdos and a legal bar to its reproduction by competitors."

DG admitted that it would be impossible for competitors to develop operating system software performing all the functions of Rdos without violating DG's copyright and utilizing its trade secrets, and DG was aggressive about chasing those who appeared to be violating those proprietary rights.

Those who wished to avoid being locked in by DG had to either abandon their own compatible applications software or convert their software to make it compatible with another disk operating system. The court found that conversion under these circumstances was not an economically realistic alternative. As a result, virtually no DG OEM customer had changed to a new supplier.

DG pressed the issue of product choice in the market. When OEMs select an operating system, DG said, they know about the tie. At the point of selection, the OEMs are free to purchase or not. The point, however, is that initial choice is not synonymous with free choice: In the year the suit was initiated, 93% of DG's CPU sales were made to locked-in customers, who were, after the initial sale, also forced to buy from DG for their subsequent needs.

With respect to competitors such as Digidyne, the cost of market entry was high as a result of DG's tie because Digidyne would have been forced to market both the CPU and a disk operating system that were competitive in price and quality.

Antitrust warning signs

The DG case outlines a few antitrust warning signs a company should be aware of in marketing its products. First, and most obvious, watch for tying. If products can be provided separately and selected separately by customers, a tie may be found if the products are not sold separately.

Second, a tying arrangement is assumed by the courts to be illegal if the tying product has a patent or is copyrighted.

Third, trade secrets have their place, but their use should be scrutinized where tying is involved. Fourth, if customers are complaining about the pains and penalties of the bundle, as DG's customers did, listen to them. Failure to do so may push them to get a hearing in court.

Fifth, with respect to pricing, do not attempt to recoup R&D costs by the tie. Software must be sold "separately, at a price that would reflect [R&D]." (U.S. v. Jerrold Electronics). Sixth, do not think for a moment that only monopoly power or a large or even significant share of the market is required to trigger a tying violation. The court in the DG case went to great lengths to dispel that notion. One customer may not hook vendors, but all that is required is the power to cause a customer to buy that which he might not otherwise have bought.

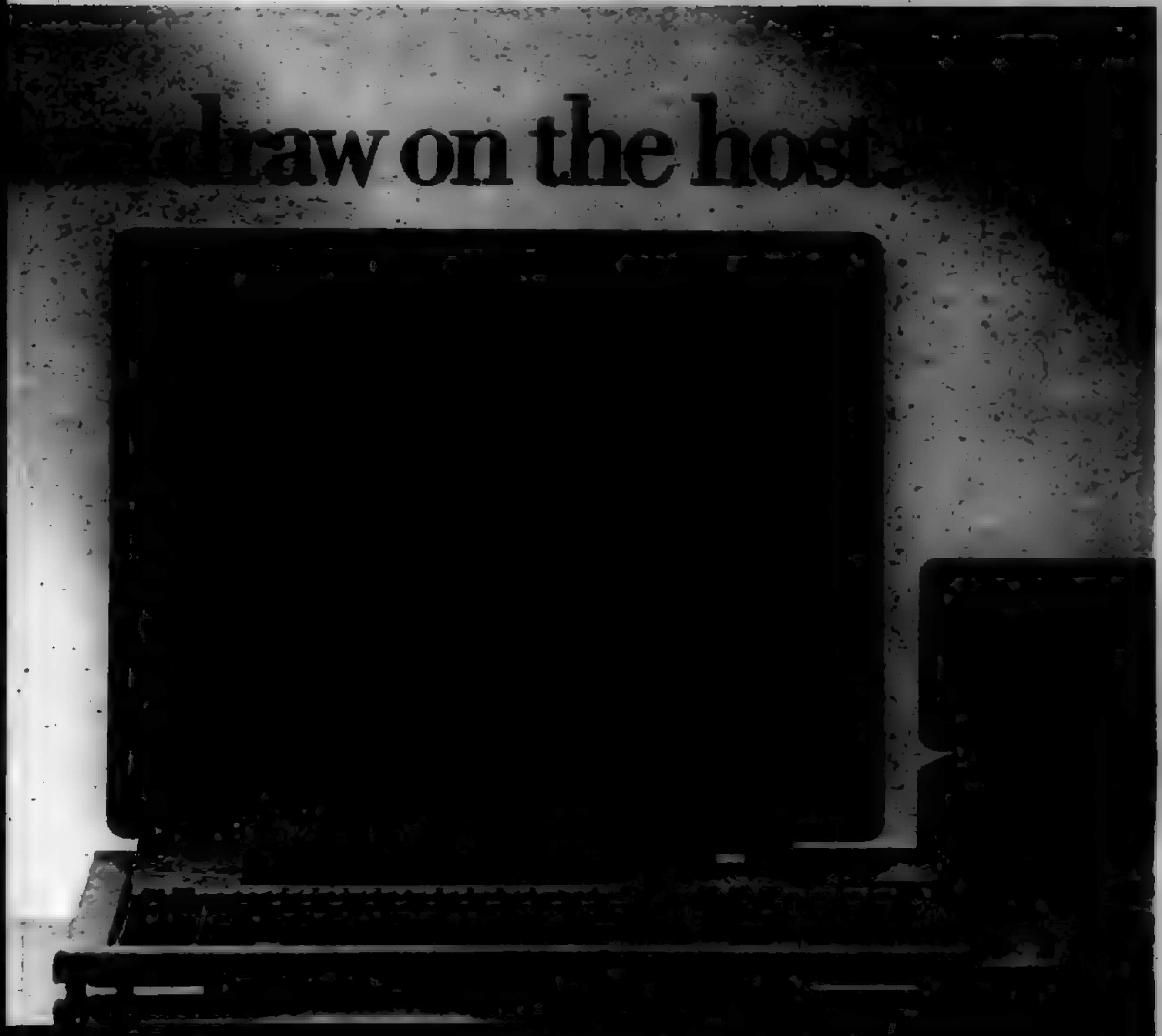
In sum, avoid a combination of factors that can lock in customers; tying arrangements, intellectual property protection, trade secrets and related agreements can create their own bundle of cost, liability and expense.

SUIT

from page 91

and Wang is Elk Industries, Inc., a Fort Lauderdale company established for the purpose of filing the suits. Elkins is the firm's major stockholder and Miami attorneys Feldman and Charles A. Levy are listed as officers.

Levy said the list of potential defendants includes both major telecommunications industry players and start-up companies using the allegedly patented technology in their products. "We're evaluating the companies one by one and will take action first against the ones most heavily involved in Florida," Levy said. "We're not looking to hurt anyone. We just want a reckoning by the courts of royalties due to Elkins."



IBM 3270 PC/GX

sessions, one PC session and two notepads concurrently. And each keyboard has a variety of ergonomic features, including special function keys and a numeric keypad for increased productivity.

Sit yourself behind a Smart Desk equipped with an IBM 3270 PC/G or GX, and draw your own conclusions. We think you'll agree it's a graphic example of the state of the art.

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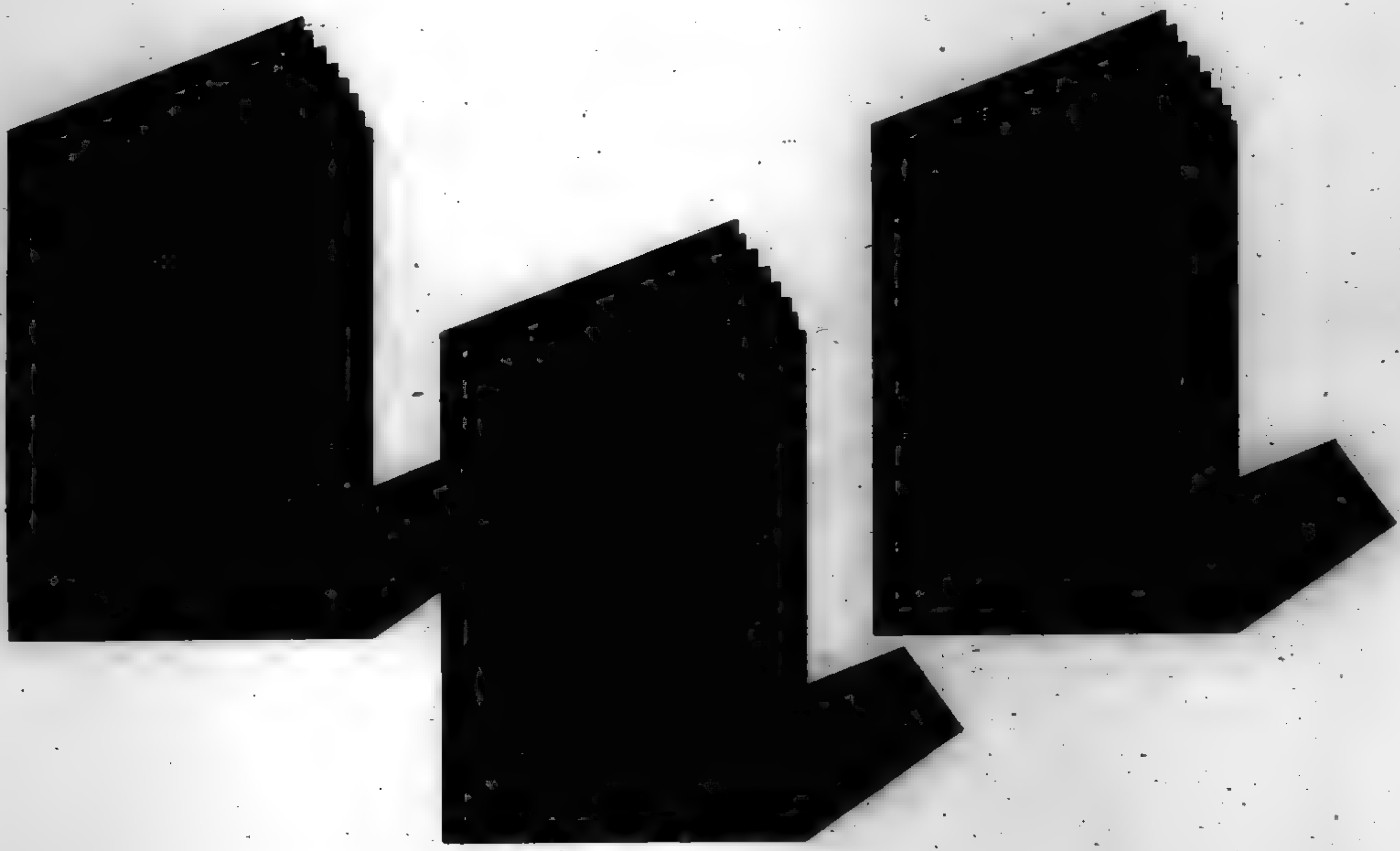

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AT&T Information Systems to eliminate 1,650 positions

MORRISTOWN, N.J. — Citing an "ongoing effort to drive down unnecessary costs," AT&T Information Systems recently announced plans to eliminate 1,650 jobs in two of its four divisions.

A spokesman said the company would make "all kinds of efforts" to accommodate the employees with local and out-of-state job transfers, retraining and early retirement options. Dismissal of employees that cannot be placed will be a last resort.

The announcement signified AT&T Information Systems' largest job cut of 1985. The division eliminated 6,000 positions last fall as part of AT&T Technologies's reduction of its work force by 11,000 [CW, Sept. 4], the first major cut since the January 1984 divestiture.

The decision announced recently will eliminate 1,000 positions in the eastern region of the General Business Systems Division, headquartered in Atlanta, which markets computers and telecommunications equipment to small businesses. Additional job cuts within the San Francisco-based western region of that division will be announced soon. The operation within the division that markets products to consumers will not be affected.

AT&T will cut 650 jobs in a nationwide consolidation of repair centers in its Services Division, which repairs and maintains both computer and telephone-related products. The current 17 repair facilities will be consolidated in plants in Miami, Kent, Wash., and Plymouth, Mich. The 14 division offices closing their repair operations will remain open for nonrepair functions.

The cuts will not affect positions within the Large Business and Computer Systems Divisions of AT&T Information Systems.

Spokesman Craig Lowder said the cuts affect employees across the board in management, administrative and production line positions. He said the decision was part of AT&T's continuing effort to remain competitive in the postdivestiture environment.

"AT&T Information Systems was a company born with 128,000 employees and not a dollar of revenue," Lowder said. "Two years ago, we identified the need to cut costs nationwide. It's the story of change, and it isn't over. In a competitive market, you are constantly looking at ways to shed unnecessary costs."

Bell Atlantic settles with MCI, reduces liability of subsidiaries

WASHINGTON, D.C. — MCI Communications Corp. recently announced a settlement with Bell Atlantic Corp. reducing overall liability of Bell Atlantic companies in the two antitrust suits filed by MCI against the various entities of the former Bell system.

MCI said the settlement includes cash payments to MCI and a series of business relationships between the two companies. Details of the cash settlement were not released.

The business relationships include arrangements for the seven Bell Atlantic local telephone companies to begin long-distance billing services for MCI and for those companies to purchase MCI's long-distance and other telecommunications services for internal use, MCI said.

The agreement was reportedly signed before a U.S. District Court jury award of $37.8 million was handed down against former Bell System entities in favor of MCI last month. A second antitrust suit is expected to go to trial next year.

STC claims first-quarter net loss due to revenue-recording change

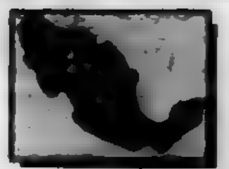
LOUISVILLE, Colo. — Storage Technology Corp. (STC) reported last week a first-quarter net loss of $29.7 million, or 86 cents per share, much of which was attributed to a change in its revenue-recognition policy.

STC said $16.2 million of the loss was due to the cumulative effect from prior periods of a change to record revenue later in the sales cycle; the new policy recognizes income after the products are installed, rather than when they are shipped.

The operating loss for the quarter was $13.5 million, or 39 cents per share. In the year-earlier quarter, the company posted a loss of $16.7 million, or 48 cents per share.

Revenue for the quarter ended March 29 was $81.6 million, down from $98.4 million a year earlier.

Despite the slump for STC, which is operating under protection from Chapter 11 of the Federal Bankruptcy Act, Chairman and Chief Executive Officer Ryal Poppa said orders have been improving, although at a lesser rate than expected.



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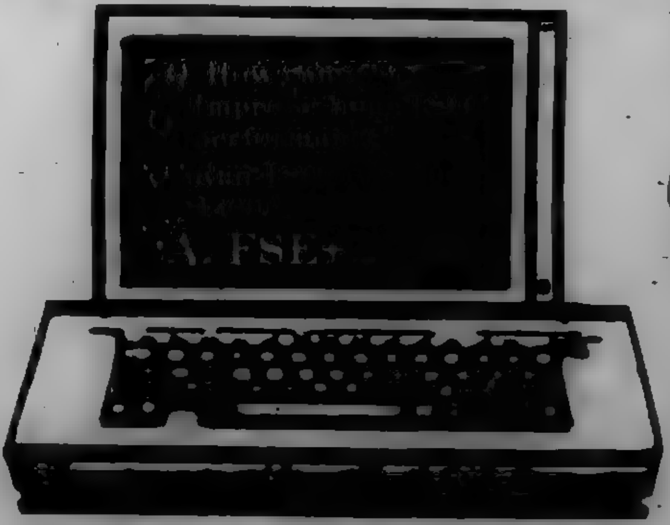

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SERIES

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sufficient value added to that data," Gartner said. "On Wall Street, you can only succeed if you have clout, if you have impact. We have the same criteria for success in our company."

The company philosophy extends to its seating plan. Helmut Alpers, the firm's executive vice-president of products, said the Gartner Group's market research analysts and Wall Street analysts who work for its subsidiary, GG Group, Inc., a brokerage and investment advisory firm, are now seated side by side.

Alpers, who was once Gartner's boss when both men worked at IBM, said, "We want that interchange." Asked if this presents a conflict — whereas on the one hand the Gartner Group issues opinions on the viability of firms and on the other recommends investments to institutions — Gartner said, "Of course there are conflicts. The issue is that they have to be managed. We do whatever we can to manage the conflict." He noted that consultants sit separated from analysts on a Chinese wall basis.

Staff experience is a company selling point. Gartner described the staff experience at market research firms as a spectrum. At one extreme, he said, is the Gartner Group, which tends to hire experienced analysts, many of whom have worked for other consultants or vendors. "The other companies at the other extreme tend to hire young, bright MBAs," he said, listing Dataquest, Inc., International Data Corp. (IDC) and the Yankee Group as following his firm in staff experience. "Our orientation is to hire more expensive people."

But the company has embarked on an MBA program to achieve a better balance of senior to junior staff, although Gartner claimed his firm will always be more weighted toward experience than is its competitors. "We may be a little too skewed toward senior people, and we will probably, over time, achieve a slightly different balance. But we will always be at the extreme end of the spectrum," he said.

On the viability of his competitors, Gartner said Yankee Group is under severe pressure in the market and Future Computing, Inc. has slowed down. "We grow because the market is increasing, but it is also obvious that we grow at the expense of our competition," he said.

Gartner said he has a good relationship with all his competitors, with one exception. Litigation surrounding the hiring of a Yankee Group consultant by the Gartner Group several years ago has recently been resolved in the Yankee Group's favor (see story below). But in the marketplace, Gartner said, especially in the telecommunications area, "We are beating Yankee Group. Yankee is losing in head-to-head situations with the Gartner Group the vast majority of the time."

Turnover has been low and morale high at the Gartner Group, its executives said. The company offers generous benefits such as a sabbatical after five years of service, a retirement plan that contributes 15% of salary and vests 20% annually and an employee stock option plan.

Morale was a problem for one former Gartner Group employee. "In the beginning, the Gartner Group emphasis was 'group.' Later, the emphasis became 'Gartner.' You could do anything you wanted, as long as it was exactly what [Gartner] wanted," said the former employee, who wished not to be identified.

Despite their differences, the former employee credited Gartner for "being up on where IBM was going," and he credited the company for its financially oriented analysis. "They're not just going out and counting boxes," the former employee said.

Memorable successes

In six years of forecasting and predicting, the Gartner Group claims memorable successes. According to Peter Wright, a corporate vice-president, the most memorable success was the late 1981 prediction of Storage Technology Corp.'s (STC) demise. "That was a year earlier than the stock market recognized it," he said. It was mid-1982 when the stock market lowered estimates of STC's 1982 earnings, he noted.

Another success was the company's prediction in the fall of 1983 of the demise of the peripherals industry (low-end, OEM market) companies, including Seagate Technology, Inc. and Tandon Corp. Competitors were optimistic about the OEMs until late 1984, Wright said, because they overemphasized the capacity of producers in their analyses. The Gartner Group considered demand and then capacity, concluding that reduced prices, lower margins and industry consolidation would result, according to Wright.

Accuracy is the analyst's responsibility first, but any projections or forecasts are discussed in research meetings attended by senior staff. At a typical one- to two-hour meeting, an analyst offers a perspective on some significant event of the past week. Other analysts advance different perspectives, often challenging the first. According to Alpers, "We get a distillation of ideas. And an analyst [improves] pretty quickly when everyone is sharpshooting at him."

Vendors are cooperative in providing market research firms with product strategies and demonstrations, he said. "It's just a matter of [which firm] can absorb the most information and evaluate it most effectively for [its] clients," Gartner said.

The most expensive way that the

See SERIES page 101

AT A GLANCE

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Fiscal 1984 Profits - Break even
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Strategies in Telecommunications Services	Wide-area, Intra-Local Access and Transport Areas distribution; networks, communications services	Both	
[illegible]			

Court rules against Gartner in Yankee noncompete suit

BOSTON — Judge James P. Lynch Jr. of Massachusetts Superior Court ruled here recently that a former employee of the Boston-based Yankee Group consulting firm violated a noncompete clause in his contract by going to work for the Stamford, Conn.-based Gartner Group, Inc. consultancy.

As a result of the ruling, the Gartner Group terminated the services of Richard Cohen, who had worked for the Gartner Group since August 1984. For two years prior to that date, Cohen had worked for the Yankee Group. The ruling prevents Cohen from working for a Yankee Group competitor until August.

The ruling also determined that Cohen had access to confidential Yankee Group information and that the Gartner Group and Cohen should be prevented from using the information until the August deadline expires.

The suit, which named Cohen and the Gartner Group as defendants, did not consider the issue of whether proprietary Yankee Group information was ever actually used by the Gartner Group.

Gideon Gartner, president of the Gartner Group, said the defense maintained that the noncompete clause was invalid because it was part of an overall agreement that was violated by the Yankee Group. Gartner also maintained that the Yankee Group's noncompete clause was not applied to all Yankee Group employees of Cohen's level at the firm.

Gartner said the ruling for the Yankee Group "is one of the worst miscarriages of justices ever seen. The judge totally misunderstood what was happening. It was a case that could not be lost." Gartner said he had no reason to appeal the decision because no damages have been assessed.

Gartner said the ruling could have an impact on future entrepreneurs who work for a company in a business related to their enterprise. "If I were [Digital Equipment Corp.], I would ask each of my young and immature employees to sign a noncompete" agreement, Gartner said. "If they went to start their own business, I'd enforce it."

See SUIT page 101

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Software firm appoints chief

SAN FRANCISCO — Former Informatics General Corp. President and Chief Operating Officer Bruce T. Coleman was recently named president and chief executive officer of Walker Interactive Products, Inc., a mainframe applications software firm based here.

Coleman succeeds company founder Jeffrey L. Walker, who will retain his position as chairman of the board.

Walker Interactive Products, founded 16 years ago, specializes in financial applications software and has five branch offices in the U.S. and one in London.

HP division targets OA mart

PALO ALTO, Calif. — Hewlett-Packard Co. recently expanded its objectives in the office automation market by establishing an Office Systems division.

The division will be responsible for directing the marketing of the HP 3000 microcomputer lines as OA products, the company said. Robert J. Frankenberg, operations manager of HP's Computer Systems division in Roseville, Calif., was named general manager of the division.

Frankenberg will be responsible for leading the push for OA products from the new division as well as the Sunnyvale, Calif.-based Personal Software division and the Office Productivity division in Pinewood, England. The company said it will continue to pursue the market for integrated office information systems with products such as HP Access software, a micro-mini link.

"HP intends to make a lasting contribution to the evolving [OA] market," said John L. Doyle, executive vice-president and general manager of HP's Information Systems and Networks group. "We have a strong and loyal customer base upon which to build a lasting position in this market."

In addition to the HP 3000 series, the company said it will more aggressively market to OA customers its Touchscreen II and Touchscreen MAX II micros.

Hathaway buys Global Software

DENVER — Hathaway Corp., which was unable to consummate a preliminary agreement to purchase Storage Technology Corp.'s (STC) 54% interest in Global-Ultimacc Systems, Inc., announced last week it had acquired the Global Software, Inc. division of Global-Ultimacc.

The Raleigh, N.C.-based software company was purchased by a newly formed Hathaway subsidiary for $6.9 million in cash and notes. Global Software, a developer of applications packages for IBM computers, had reported 1984 revenue of $8.4 million and was purchased in 1983 by STC for $14 million.

WANG

from page 91

to be at the top of the shipment list whenever the products made it out the door.

But when growth slows, and then appears to be headed for the red-ink zone, those minor problems become very costly.

Bureaucracies created during a company's heyday suddenly become overwhelming debits; product delays result in money flowing out the door instead of the product; and customers realize that not only do they have the luxury of waiting and watching but also that the high-flying suppliers of yesterday could be the court-bound cripples of tomorrow.

Wang now finds itself beset and is rushing to cut costs to a manageable level. Analysts said it may take years for the company to get back on track. Its shipment schedule history hangs like an anchor around its neck; its concessions to MIS decision makers are too little; too late at a point in time when the solidness of IBM is going to look ever more attractive to buyers.

But Wang is just an example hanging out to dry for everyone to see. Its problems are greater because its goals were so far reaching.

Other companies will follow with less noticeable cutbacks, but the effect will be the same. If even IBM, with its broad array of product sectors, is battening down the hatches, a lot of other computer industry players will have to run and hide out from the storm.

■

E. E. Ferrey, president of the American Electronics Association (AEA) recently advised the AEA board of directors that he will turn over the chief executive officer functions to a successor this fall, while continuing as an officer and director until Dec. 31, 1987.

Head of the organization for 25 years, Ferrey reportedly will be elected vice-chairman of the AEA upon selection of a president.

■

Bell South Advanced Systems, Inc., a subsidiary of Bell South Corp., became the latest valued-added reseller of IBM equipment with the recent announcement that it will deal in IBM System/36 and Personal Computer products. The regional phone companies, several of which have opened or acquired computer retail chains, seem intent on using their market presence to carve out a piece of the computer sales pie.

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QUOTA

from page 91

pricing of their [256K-byte chips] going from $50 to $20 to $12 is significantly faster than normal, even in a downturn," he said.

Sopkin expressed concern that a Japanese market share edge in current 256K-byte Eprom technology could dampen American competitiveness in new chip technologies expected to enter volume production in the next two years, such as 1M-byte random-access memory (RAM) chips. "If we back away from Eproms now, it's like taking the appeasement approach in World War II," he said. "Let them have one market and they want the others. They've already made it impossible for anyone to make money in [dynamic RAM chips]; now they want to do the same in static RAM and Eprom chips.

"I think the public and the [Reagan] administration have passed over the trade issue for too long, but the public is beginning to realize we are liable to lose the technology battle," Sopkin continued. "If semiconductors go, so go computers."

Japanese vendors held 67.9% of the $483.4 million U.S. 64K-byte Eprom market last year, according to Dataquest, Inc., a San Jose, Calif. market research firm. American manufacturers fear similar trends in the 256K-byte market, where Japanese vendors shipped 17.6% of the $93.4 million worth of chips ordered by U.S. customers in 1984.

The Semiconductor Industry Association (SIA), while stopping short of calling for import quotas, echoed Sopkin's comments about the significance of the Eprom market. "Our big reason for concern is that [failure in] this market will drive U.S. companies out and they won't be able to compete in later generations of semiconductors," said SIA Manager of Governmental Affairs Daryl Hatano. "We're continuing to look at the situation and will formulate our response sometime in the future."

An Intel Corp. spokeswoman said the company is not recommending any specific action limiting access to U.S. markets, but will support "action that would open [the Japanese] market to competition."

Some industry observers believe most other U.S. semiconductor vendors will shortly begin pressuring the Reagan administration to adopt import quotas on Japanese chips. "There really are no free traders left in this industry sector," said A. A. LaFountain III, president of LaFountain Research Corp. in Bay Head, N.J. "At low points in the cycle people feel the pain so much that they cry uncle."

McDonnell Douglas taps info systems execs

ST. LOUIS — Two McDonnell Douglas Corp. vice-presidents have been appointed to head the aerospace giant's reorganized McDonnell Douglas Information Systems Group.

Robert A. Fischer, president of the former McDonnell Douglas Automation Co., was named to the post of executive officer of the Information Systems Group.

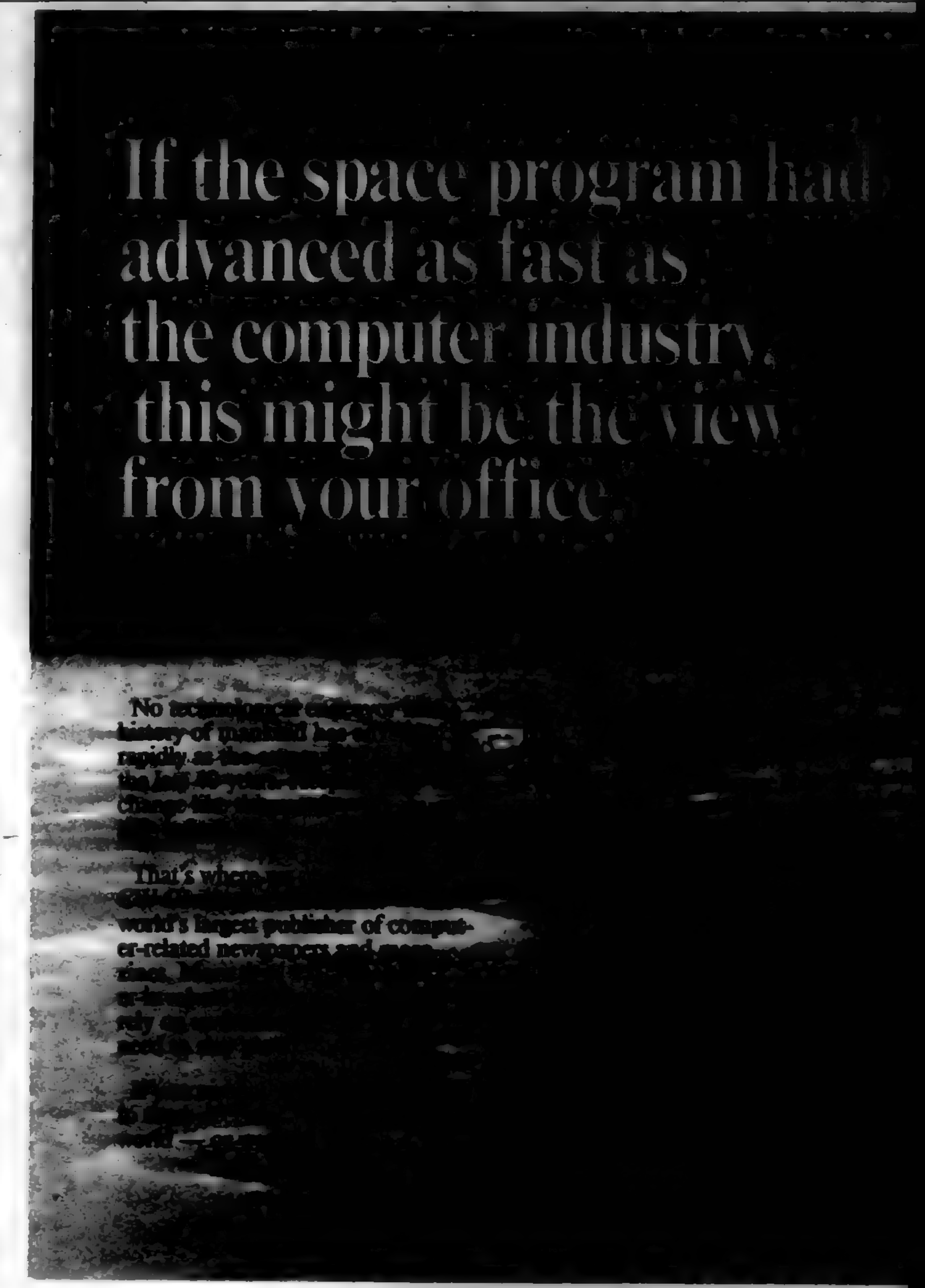
Gary E. Liebl, former president and chief executive officer of McDonnell Douglas Computer Systems Co., was named the group's operating officer.

The move frees McDonnell Douglas President John A. McDonnell from direct responsibility for the Information Systems Group.

The group, which reported total revenue of $1 billion last year, was formerly run by an executive board of all three men. McDonnell will return full time to his role as corporate president, the company said.

Fischer, whose office is based in St. Louis, will be responsible for strategic planning, policy formulation and coordination, acquisitions and divestitures, group organizational matters and supervision of staff.

Liebl, whose office is based in Newport Beach, Calif., will be responsible for the Information System Group's business units, operating plans, productivity programs and business unit organizational matters.


If the space program had advanced as fast as the computer industry, this might be the view from your office.

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That's where [illegible] world's largest publisher of computer-related newspapers and maga[illegible] zines. [illegible] rely [illegible] need [illegible] world — [illegible]

Fujitsu regroups U.S. division into subsidiary

SAN JOSE, Calif. — Seeking to market its microcomputer systems in the U.S. more aggressively, Japan's Fujitsu Ltd. recently announced that its Professional Microsystems Division will become a wholly owned subsidiary of Fujitsu America, Inc. (FAI).

The division has been renamed Fujitsu Microsystems of America, Inc. as of June 1. It was previously owned by Fujitsu's other U.S. subsidiary, semiconductor maker Fujitsu Microelectronics, Inc.

"Fujitsu's expansion worldwide has necessitated this move to increase the marketing strength of its acknowledged technological leadership in the computer industry," said Fujitsu Microsystems Vice-President Wayne Wahlenmeier. "Our realignment with FAI will have a positive effect on our U.S. marketing efforts and will provide increased support as our product line develops."

Fujitsu hopes to spur U.S. sales of such products as its Micro 16S series of business computers and its recently introduced Micro 16 System 2000, which is based on the Pick Systems Pick operating system.

The U.S. reorganization is the second realignment within Fujitsu this year. In April, the company consolidated its worldwide personal computer manufacturing, marketing and sales within its Computer Systems Group.

SERIES from page 96

Gartner Group obtains information is with the Comtec data base, compiled from a survey that cost $3 million in its first year and $2.7 million this year. Burke Marketing Services, Inc., a Gartner Group partner, compiles the data from 8,000 interviews, charting information technology use in 20 product categories.

Vendors are the target market for the Comtec data, which costs from $50,000 to $250,000 to buy, but Gartner Group analysts use Comtec to identify trends, Gartner said.

> *'The whole style of our company is a business style.'*
>
> — Gideon Gartner
> The Gartner Group, Inc.

Users are another key source of information. "We are today the largest provider of services to large users of DP, telecommunications and office equipment in the world," Gartner claimed. "We effectively came from nowhere and have become the dominant force in that part of our business." He challenged any of his competitors who dispute the claim to compare client lists.

IDC, which is famed for its data, provides processor-oriented data that is not as well defined as data the Gartner Group provides, Gartner said. "We collect many more data points that IDC does. The IDC data files are oriented toward collecting information on processors and what software is in the processor. The clients are totally different," he said.

Gartner also claimed that no one competes with Comtec, while IDC competes with Focus Research Systems, Inc. and Computer Intelligence Co.

Alpers added, "The whole thrust of what we do here is to try to net it out for our clients."

SUIT from page 96

Yankee Group President Howard Anderson said, "We are very happy the judge [ruled in our favor], and we are happy that our proprietary information has been judged to be sacrosanct."

Anderson agreed with Gartner that the decision may have an impact on employees who leave one firm to work for another or to start their own firms, but he said the impact will be good.

Cohen has filed a counterclaim asserting that the Yankee Group deprived him of commissions he earned while a Yankee Group employee.

— John Desmond

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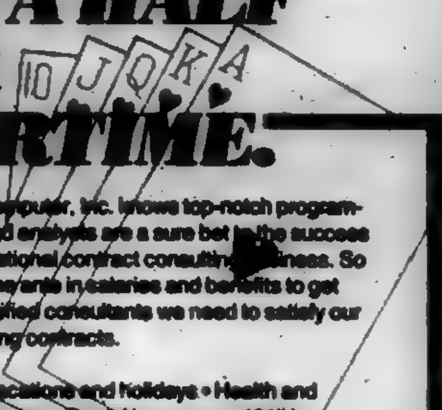

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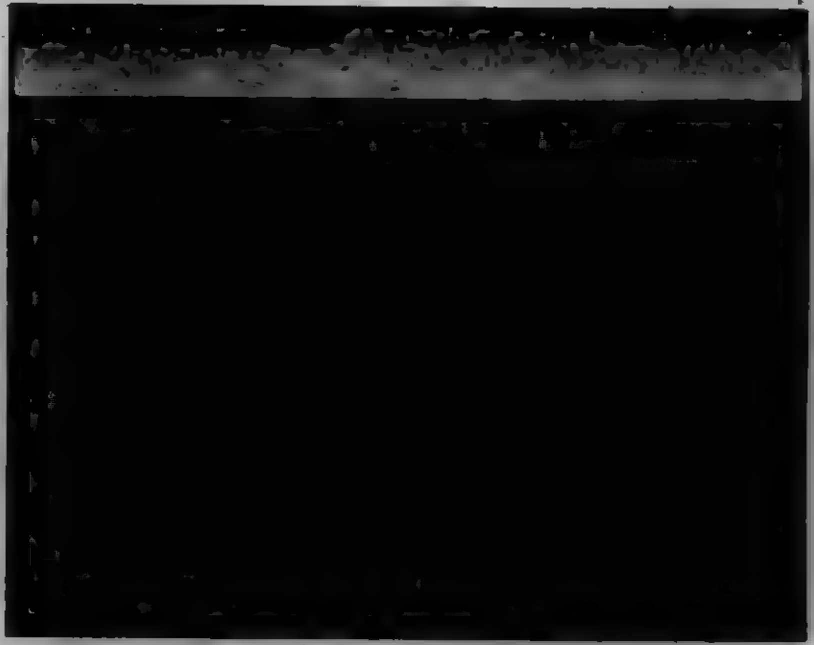

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Jan Ackerman

AUXCO

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There is an exciting career opportunity for motivated individuals with computer expertise. If you have experience with on-line interactive computing, you may qualify for one of the following positions in our state-of-the-art automated office environment.

Systems Programmers

Working from our corporate headquarters, this assignment will entail challenging duties on VM/SP system software products. You must have proficiency in IBM Assembler language and an understanding of compilers, editors, and operating systems. Preferred candidates will have a degree in Computer Science plus one year experience with VM/SP. Knowledge of SNA and IBM PC's is a plus.

Applications Programmers

You will assist users in developing business applications ranging from a comprehensive Budget System to spread sheets to word processing and graphics. Our preferred candidate will have a degree in Computer Science and one year experience in an interactive environment with knowledge of a fourth generation language such as FOCUS.

These positions feature an attractive compensation package. For immediate and confidential consideration, please send your resume to:

Reply to CW-[illegible]
Computerworld
Box 880
Framingham, MA 01701

Proof of U.S. Citizenship Required.

Equal Opportunity Employer.

ADABASE/NATURAL SUNBELT OPPORTUNITIES

[illegible], COBB & BRYANT, INC., the largest data processing consulting firm in the Mid-South, offers new opportunities for career minded professionals.

We are seeking individuals who enjoy varied work environments and the challenge of evolving hardware and software technology. Minimum travel. Experience with ADABAS and NATURAL required. MVS, COBOL, ASSEMBLER, FOCUS, CICS, and DB/DC considered a plus. Specify systems or application qualifications. Minimum 2 years experience required.

Benefits, ESOP and top scale salaries.

For consideration, send resume to:

[illegible], COBB & BRYANT, INC.
Attn: Technical Staffing
[illegible]
Memphis, TN [illegible]

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PROGRAMMER ANALYSTS

$30 - $50K + /Yr.

- ● C, UNIX
- ● IMS
- ● MAPPER
- ● Honeywell/Assembler

Positions available in Ohio, PA, NY, NJ, CT and Mass. Send resume in strictest confidence or call John Cerri at:

CompuData Services Corp.
[illegible] Worcester Rd.
Wellesley Hills, MA 02181
(617) [illegible]

DATA PROCESSING MANAGER

Headquarters of national company located in southwest Connecticut seeks experienced Manager to run a Data Processing Department. Qualifications enhanced by exposure to Prime hardware and Primos operating system, Personal computing software, data communications, network planning and analysis, and management experience. Background experience in business application development in FORTRAN and RPG rather than computer operations necessary.

We offer excellent working conditions and benefits and a competitive salary. Interested applicants should reply in confidence to the Human Resources Manager. Reply to Box [illegible], Computerworld, P.O. Box 880, Framingham, MA 01701

DIRECTOR OF DATA PROCESSING

Administrative position responsible for all operations and personnel of the Data Processing Department serving both instructional and administrative needs.

Requires a Bachelor's degree (Master's preferred) in Management Information Systems or closely allied field, extensive current knowledge of IBM and DEC systems, and at least 3 years' experience in data processing center management.

Minimum annual salary is $[illegible] with outstanding college paid benefits. Submit a letter of application and detailed resume by June [illegible], 1985 to the Personnel Director, Lakeland Community College, Mentor, Ohio [illegible].

PACIFIC SOUTHWEST AIRLINES - PSA

A major west coast airline, has immediate openings for Senior Analysts and Programmer Analysts with the following skills and experience:

SENIOR ANALYSTS (JOB 210)

5+ yrs. airline data processing project leader experience with airline reservation systems, flight planning, pricing, and flight following. IBM Assembly language programming experience. Position requires excellent oral and written communication skills.

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2+ yrs. programming experience in airline reservations systems with IBM Assembly language coding. Position requires knowledge of MVS, JCL and TSO.

PSA offers competitive compensation and an excellent benefit package which includes air travel privileges. No telephone inquiries. Send resume to:

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P.O. Box 85385
San Diego, CA 92138-5385
No phone inquiries, please.
EOE M/F

PSA
PACIFIC SOUTHWEST AIRLINES

Manager of Telecommunications

American Hospital Supply Corporation is a multi-divisional health care products and services company offering a career climate conducive to high visibility and fast track professional growth.

As the Information Services division of American, we offer a challenge to a technically astute management professional with a background in voice and data communications to re-engineer a [illegible] network to state-of-the-art IBM/SNA.

Requirements: 5-10 years experience in a large scale telecommunications facility, working knowledge of voice/data network design and implementation in an IBM SNA/SDLC environment; management background involving responsibility for a multi-million dollar budget. Degree in Computer Science or related technical discipline preferred.

We offer a competitive starting salary and complete benefits and relocation package, and invite qualified candidates to respond with resume and salary expectations to:

James Johnson
Information Services

American Hospital Supply Corporation

1450 Waukegan Road
McGaw Park, IL USA 60085

We are an equal opportunity employer M/F

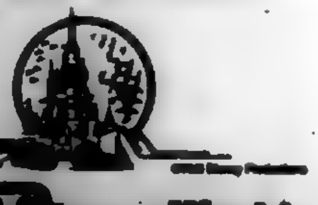
SENIOR EDP AUDITOR

Walt Disney World Co. has an immediate opening for a Senior EDP Auditor on its Management Audit Staff.

Qualified candidates must have a B.S. in Accounting or Computer Science and must have a minimum of four years' experience as an EDP Auditor, preferably in a public accounting setting. CPA, CISA status is preferred, with a familiarity with Sperry 90/80 or 1100 series machines desired. Some travel is required.

Qualified candidates interested in this excellent opportunity, please send resume, with salary history, in confidence to:

Walt Disney World Co.
Professional Staffing FN-10
P.O. Box 40
Lake Buena Vista, FL 32830



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TENNECO
WEST

APPLICATIONS PROGRAMMER SYSTEMS PROGRAMMER

THE OPPORTUNITIES

APPLICATIONS PROGRAMMER - Apply your experience and knowledge of structured programming to the development and support of a wide variety of business applications.

SYSTEMS PROGRAMMER - Assume responsibility for the installation, maintenance and tuning of MVS/SP and JES 2. Experience with SMP and Exit coding is essential.

THE ENVIRONMENT

● Computers	IBM 4381 and 4341
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● Communications	VTAM, NCP, IDMS/DC, CICS, [illegible]
● Languages	COBOL, ADS/O, RPGII, CULPRIT
● Databases	IDMS with IDD, ADS/A, OLM, OLQ
● Editors	TSO, SPF, ROSCOE, PANVALET

THE COMPANY

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EMPLOYMENT MANAGER
P.O. BOX 9380
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E.O.E. *M/F/H*

Morrison-Knudsen Engineers, Inc., an engineering, procurement and construction management organization, has an immediate opening in our Information Systems Division of our San Francisco corporate headquarters. We are in the process of implementing distributed processing capabilities for our headquarters and regional operations utilizing Wang VS equipment.

Lead Systems Analyst

Manage and participate in the design, development and implementation of information systems used in support of the engineering, procurement and construction management activities of the company. Project management experience in the implementation and support of integrated business applications is required.

Position requires Bachelor's degree in Information Science or related field, at least ten years of business systems experience with at least two years' programming experience. Prefer individuals with Wang VS and/or IBM MVS and engineering/construction experience.

Please send resume with salary history to **Sharon J. Reed, MORRISON-KNUDSEN ENGINEERS, INC., 180 Howard Street, San Francisco, CA 94105, Telephone: (415) 442-7300.**

EOE/M/F/H

MORRISON-KNUDSEN ENGINEERS
A MORRISON-KNUDSEN COMPANY

Senior Systems Analyst

Burger King Corporation has an immediate opening for a Senior Systems Analyst at our Miami headquarters.

Incumbent will participate in the design and development of a revolutionary IBM PC base computer system from its inception. You will be working with sophisticated Screen Developments, Graphics, Communications and DBMS software in a multi-tasking environment. Applications include sales analysis, cruise scheduling, inventory control, cash management, data collection from point-of-sale devices, transmission of data to other computers, etc. Minimum requirements are 2 years in the area of system analysis, 4 years in the area of computer systems design and programming, 2 years using the Lattice "C" language under the PC-DOS operating system, knowledge of PC-DOS Internal and PC Assembler, a 4 year degree in a technical or business field or equivalent.

We offer a competitive salary and excellent benefits including medical, dental, life insurance and deferred compensation plans. Please send resume and salary history to: **BURGER KING CORPORATION, 7360 N. Kendall Drive, Miami, FL 33156, Attn: Human Resources Manager.** Equal Opportunity Employer M/F/Handicapped.

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The University System of Georgia Computer Network is seeking applications for the position of Assistant Director for Network Services. [illegible]

[illegible]

Salary is commensurate with experience and qualifications.

To apply, submit a resume and the names, addresses and telephone numbers of three references to:

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Government Services
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Washington, DC 20006

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This position requires a solid background in systems analysis within a manufacturing environment, using RPGII on an IBM 34 or 36. This position is project oriented, involving analysis, programming and implementation, towards bringing various activities and operations on-line.

Send resume to:

ROTEX INC.
Attn: Mr. Jerry Sundahl
Data Processing Manager
1230 Knowlton St.
Cincinnati, OH 45223

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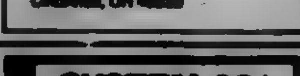

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LOGICAL OPTIONS
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A promotion has created an opportunity in our System Security group for a data processing professional with a working knowledge of the ACF2 Security System.

We are a progressive system security group responsible for all security components of a large multiple CPU centralized data processing facility. As a member of our system security group you will utilize the latest technological tools and techniques in this challenging environment.

Primary responsibilities will include:

- Administration of corporate data and physical security policies/procedures.
- Technical administration of corporate data security procedures and techniques in support of MVS, VM/CMS, CICS, and IDMS.
- Implementation, maintenance and testing of the corporate disaster recovery program.

Primary experience should include: OS/JCL and OS Utilities; CICS table maintenance, VM/CMS, TSO/SPF, and ROSCOE; ACF2 Data Security; Telecommunications Security; Use of IBM PCs and LANs; McCormack & Dodge Millenium Security, SDSF, and RUSCO Access System.

Mail resume and salary history to the Employee Relations Department. Principals only please.

Central and South West Services, Inc.
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Central and South West Corporation is one of the nation's leading electric utility systems, having annual revenues of more than $2 billion. With corporate headquarters in Dallas, CSW serves more than four million people through its operating companies in Texas, Oklahoma, Arkansas and Louisiana.

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We are currently searching for an IMS Specialist who will be based at our Corporate Headquarters in Winston-Salem, N.C. To qualify, candidates must be degreed professionals with experience in an IMS/DC-DB environment. Applicants must have a working knowledge of performance enhancement and tuning of IMS data bases, DBD and PSB gens, physical and logical data base design, and data dictionary usage.

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McLEAN TRUCKING COMPANY
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Winston-Salem, N.C. 27102

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☐ I understand there is no contract, fee or any kind of charge to me at any time for Quest's search and placement services. Please send details of current professional opportunities in cities checked: ( )Metro Baltimore area; ( )Northern and Southern New Jersey; ( )Delaware; ( )Philadelphia and Eastern Pennsylvania; ( )Washington D.C. and surrounding area; ( )Atlanta; ( )Other:____

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- *Surround yourself with state of the art technology which includes our real-time transaction processing system featuring 4 IBM 3033s, 3 IBM 3083s, and 2 IBM 3081s.*
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Being a member of the Eastern family also affords you an opportunity to live in the cosmopolitan cities of Fort Lauderdale or Miami. The diversified area offers unique opportunities to those who enjoy exciting night life, fine restaurants, and a casual outdoor lifestyle where sunny skies, white beaches, and warm temperatures prevail year round.

If an exciting change is what you're looking for in your career or lifestyle, please send your resume with salary history to: Eastern Airlines, Management Recruiting, Department VO, International Airport, Miami, FL 33148.

EASTERN
We earn our wings every day

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Arkansas is a natural

- **One of America's most desirable, natural settings.**
- **Top SYSTEMS PROGRAMMING opportunity.**
- **Progressive, state-of-the-art IBM facility.**
- **Significant career growth with dynamic, national company.**

Data processing arm of this Arkansas based, rapidly growing, NYSE, Fortune 500 company is seeking top individual for SYSTEMS PROGRAMMING. Work with hardware and operating systems to support the development of sophisticated on-line and batch systems. Large, modern IBM facility - 3033, 3083, VM/XA, MVS/XA, CICS, nationwide teleprocessing network, etc.

Outstanding salary and benefits package.

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Successful candidate must have at least BS Degree in Computer Science or related field with strong academic performance. Prefer MS Degree. Also, must have 1 to 2 years successful MVS systems programming experience. Leadership and communication skills are important.

Rare opportunity. Enjoy the best of both - life and work. Come to Arkansas. ARKANSAS IS A NATURAL.

Please send resume and salary requirements in strict confidence to:

Mr. [illegible]
ARKANSAS BEST CORPORATION
P. O. Box [illegible]
Fort Smith, Arkansas 72902

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HP-3000

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[illegible] Westpark Dr., Suite [illegible]
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Two Programmer positions with an internationally recognized health care and research institution are available immediately. Positions require structured Cobol experience, preferably in an interactive environment. General knowledge of systems design methodology necessary. Some experience with SAS or SPSS is preferred. Salary for position is negotiable based upon knowledge and experience. Send resume with salary history to:

The Personnel Department
PROJECT HOPE
Health Sciences Education Center
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EOE

SAIC

Systems Analyst

A challenging opportunity exists with Science Applications International Corporation (SAIC) for a senior systems analyst in a multi-project computing environment. Specific responsibilities include management of several analysts and programmers; planning and control of systems development and implementation; DBMS design on VAX systems for scientific/financial applications; and the preparation of system reports for clients, and project reports for management.

The successful candidate must demonstrate a professional background with 2-3 years experience as a Systems Analyst responsible for systems definition, design, production, testing, and installation in a VAX/VMS and/or HP3000/MPE computing environment, and 2-3 years experience in high-level language programming (FORTRAN, COBOL) covering program coding, testing, maintenance, and documentation. Candidates must also possess a B. S. in Computer Science, Engineering, Applied Science or Business. Knowledge of LISP and "C" languages, HP3000 IMAGE DBMS, and SAS are desired. The ideal candidate will also possess facilities in group presentations and oral/written communications.

SAIC is a high-technology, international consulting firm currently providing technical assistance to the Department of Energy at the Pittsburgh Energy Technology Center. We offer a salary commensurate with experience and education and an excellent benefits package. If you are interested in joining our rapidly expanding corporation as part of a professional team, send resume with salary requirements in confidence to:

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MUST HAVE EXPERIENCE

- Data Base Analysts (IDMS)
- Systems Programmers (strong VM)
- Systems Analysts
- Programmer Analysts

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The premier auto manufacturer in the San Francisco Bay Area is seeking solid professionals with excellent communication abilities and strong leadership qualities to serve as Project Leaders in the following areas:

- *Finance*
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Working with users, you will strategically plan, recommend and implement system solutions to the above disciplines. You will also develop functional specifications, prepare 'make or buy' proposals, and implement proprietary software.

These positions require at least 7 years' experience in systems analysis, applications programming, software evaluation, and specification definition. A Bachelor's degree in appropriate field or equivalent experience necessary. Must have working knowledge of COBOL or PL1. Prefer experience using IBM OS/JCL and utilities, TSO/ISPF and IMS/DB.

We offer an outstanding salary and comprehensive benefits package in a challenging environment emphasizing teamwork, respect and cooperation. Qualified candidates are invited to send a resume to Personnel Department:

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United Motor
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- 4+ years COBOL programming
- 2+ years analysis and design
- Honeywell DPS 6/IBM 4341 experience
- Prefer experience with data base management, on-line programming, medical applications and team leadership

MVS SYSTEMS PROGRAMMERS

- 5-10 years experience including MVS/XA, JES 2 internals, DASD configurations and IPO installations
- Working knowledge of CICS VTAM/NCP and ACF/VTAM
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If you qualify, we want to talk to you! CyCare Systems provides an excellent leveraged compensation plan that is more than competitive in the industry. Send your resume and salary requirements to: CyCare Systems, Inc., Dept. DP, 520 Dubuque Bldg., Dubuque, IA 52001.

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Major Florida Gulf Coast high-technology corporation needs Associate Editor for award-winning internal news magazine. Must have strong writing skills with a minimum of three years experience in corporate internal communications, magazine or newspaper environment. Data processing knowledge desired, Journalism degree preferred.

Reply with resume, recent writing clips and salary requirements to:

CW-B4082
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[illegible]

Bill Young, CPC (704) [illegible]

Corporate Personnel Consultants, Inc.
[illegible] Latrobe Drive, Suite [illegible]
Charlotte, NC 28211

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[illegible]

EXPERIENCED SYSTEMS PROGRAMMERS, ANALYSTS AND PROGRAMMER ANALYSTS FOR SUNBELT LOCATIONS

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Minneapolis, MN 55402

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- **Senior Systems Software Analyst—MVS**
  Will plan and implement MVS/XA conversion. Will also provide technical support for MVS/SP including installation, maintenance and problem determination. Could support VM and VSE.
- **System Software Analyst—MVS**
  Will assist in installation, maintenance and problem determination of MVS/SP. Will assist in conversion activity for MVS/XA
- **Senior System Software Analyst—CICS**
  Will provide primary support for planning and implementing CICS and evaluating system performance. Will direct and monitor the work of others.

Our environment includes Amdahl 470 V8's and 580 with MVS, VM, VSE, JES2, TSO/ISPF, ACF2, MSI, CICS, SMP, DPF and ROSCOE.

For immediate consideration, please send your resume and salary requirements to the Employee Relations Department. Principals only.

Central and South West Corporation
P.O. Box 225184 • Dallas, Texas 75222

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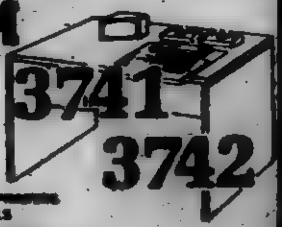

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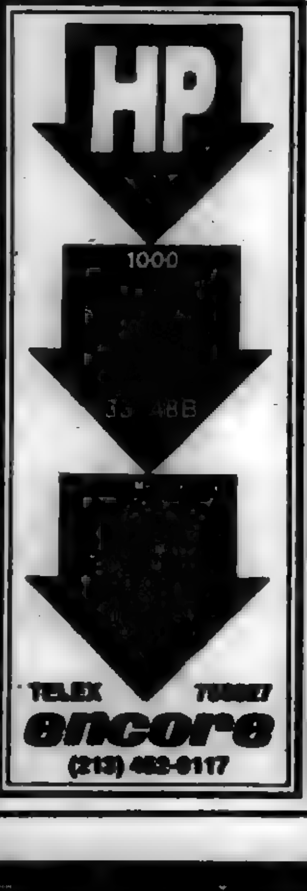

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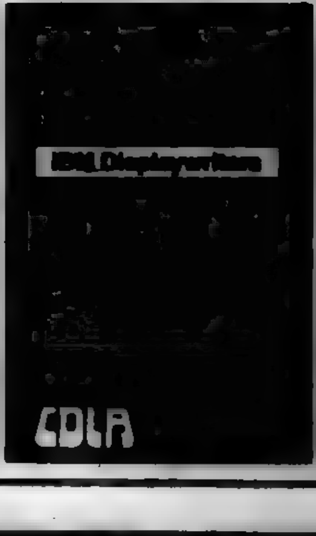

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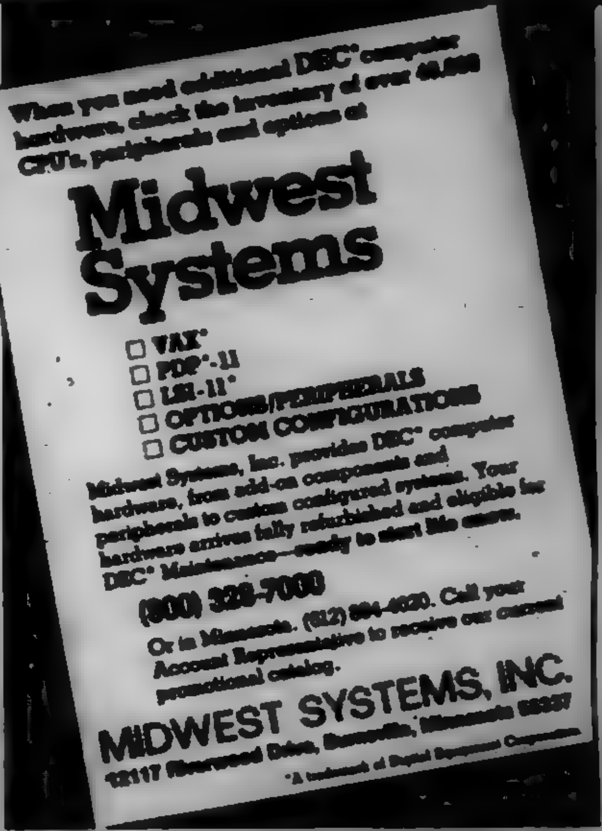
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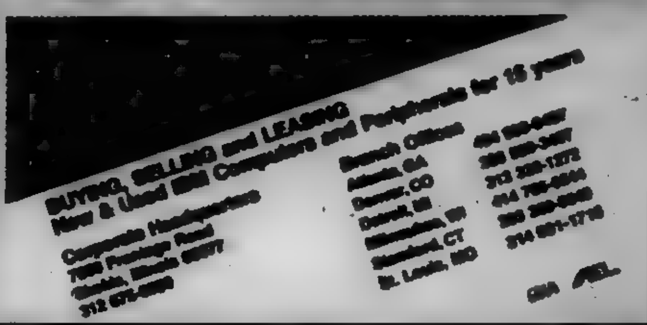
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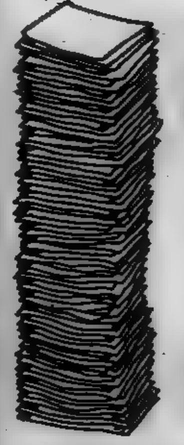

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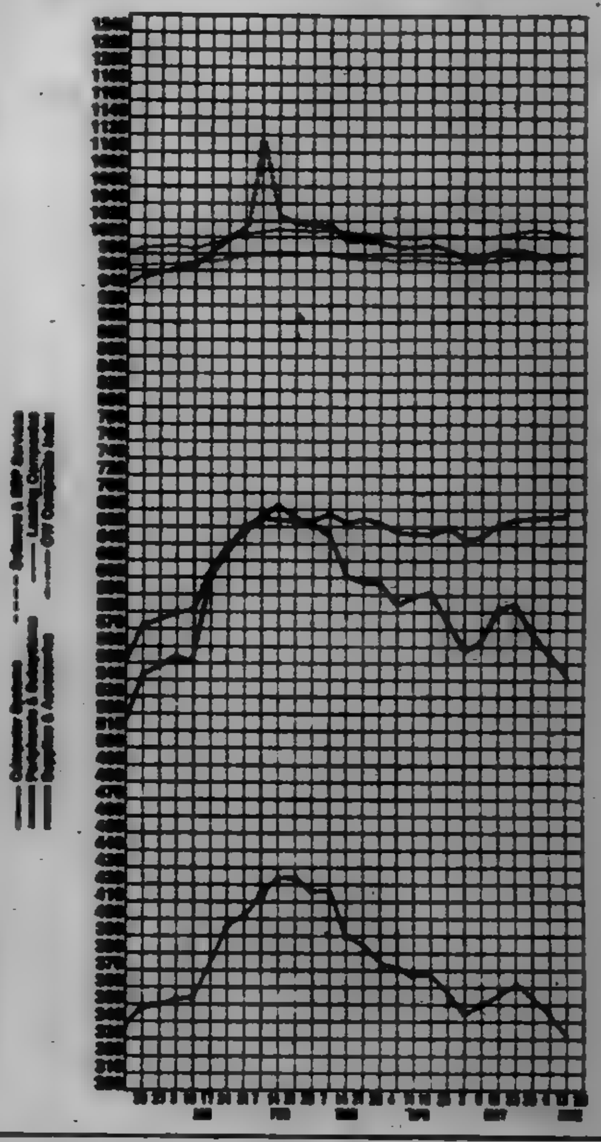

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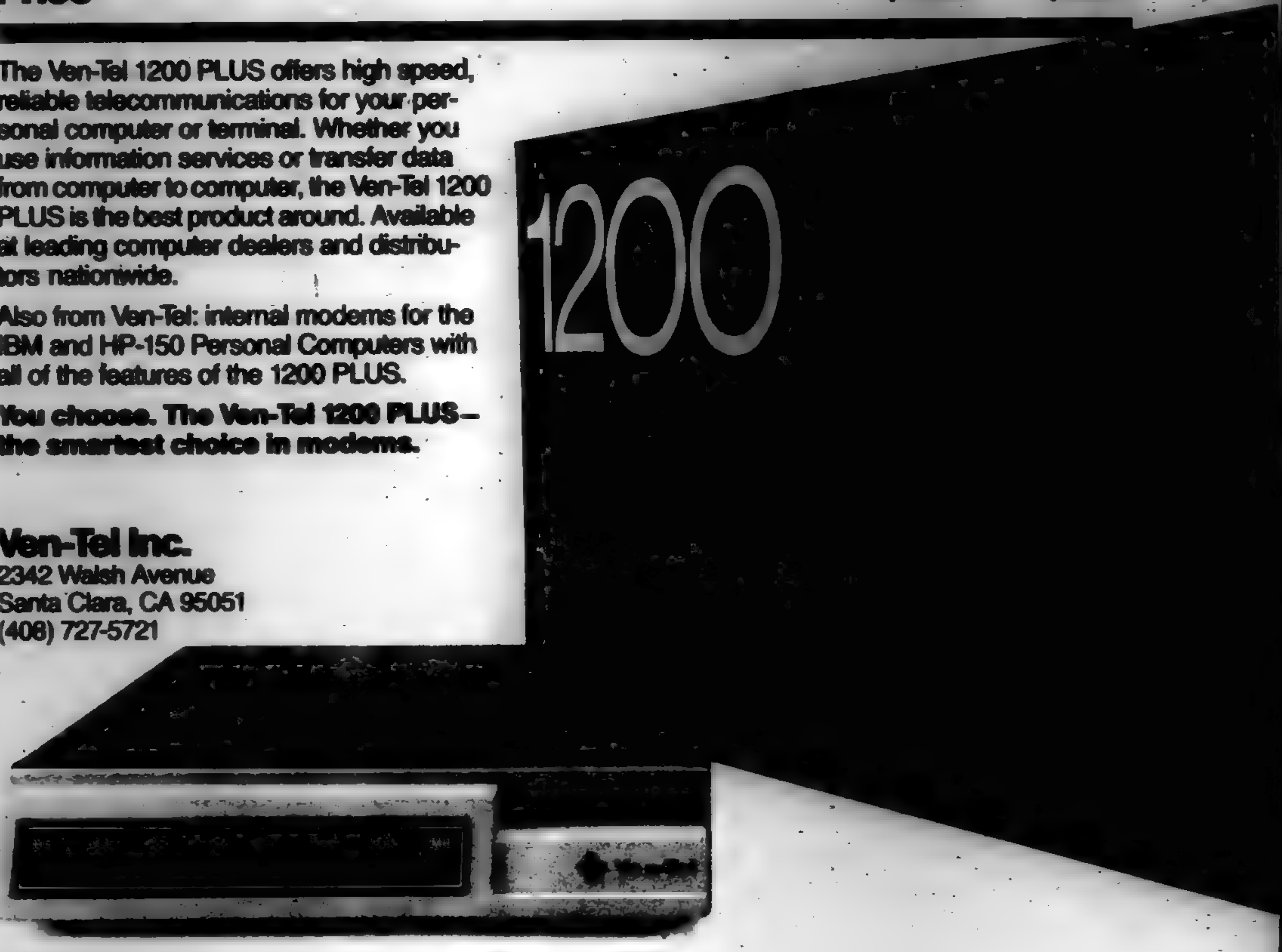

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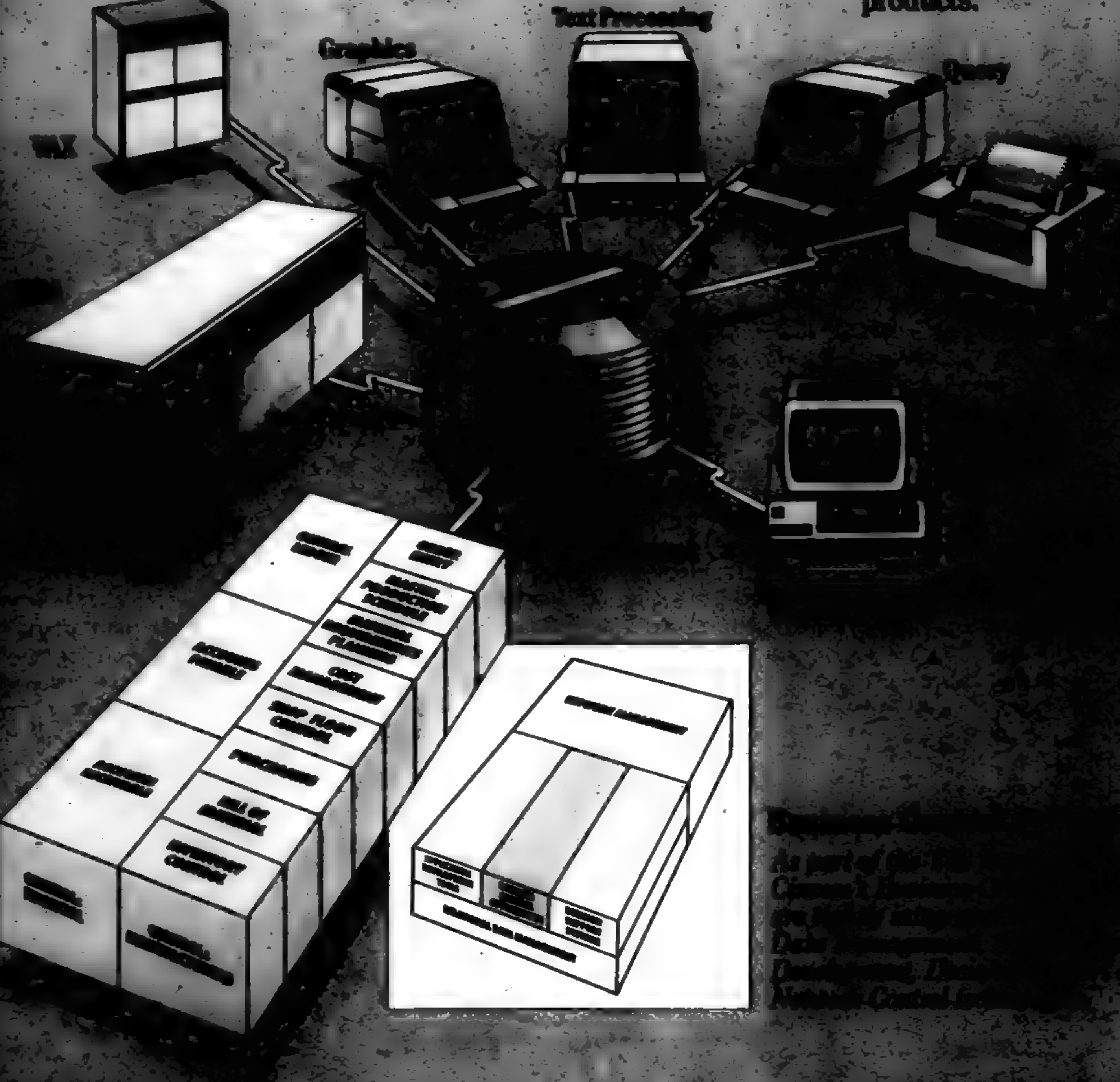

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Editorial

Blue Collar for Big Blue?

In the eyes of the computer industry, the factory floor represents an area of virtually untapped purchasing potential. Almost all parts of the manufacturing arena have withstood the onslaught of computers, particularly of integrated computer systems. Now that the assault on the desktop has slowed, the fight for the factory may be about to begin.

Ten years ago, computers as tools for white-collar workers was an unheard-of idea. Recent activity in that area, however, has been nothing short of legendary, both in the form of technology introduced by the vendors and in the thirst for computing capacity shown by the new user groups. Even as the office market is evolving (and at the moment softening), vendors are sniffing out new and unclaimed territory, which is almost certain to be the factory floor.

Although automation is certainly not a new idea in the manufacturing environment, most systems in use today are assembly line or stand-alone. The computer revolution/evolution that swept up the office worker yesterday is heading straight on for the factory worker today. Computer-aided design and manufacturing, manufacturing resource planning, robotics and the new buzz word, computer-integrated manufacturing, will not happen overnight, however. Factory automation and integration will be subject to the same waves of technological advancement and user demand that carried along office automation and the microcomputer phenomenon. In the meantime, vendors are working toward a long-range goal of automating the factory and then tying it into corporate systems linked to offices and the data center.

Notwithstanding that this will be a long-term conversion and persuasion effort, computer makers are beginning to gear up for this new market. And even as the stampede is set to begin, the industry is wondering (and worrying about) how powerful a factor IBM will become.

In a recent speech marking Honeywell, Inc.'s centennial, James Renier, Honeywell vice-chairman, summed up the hopes of many other computer vendors when he predicted that IBM will not be able to hold sway over the industrial segment of the marketplace to the same extent it has over the other computer markets. In the meantime, vendors are waking up to this new market, reassessing resources for the factory, beginning product development and market strategy and trying to jump in before IBM — their seemingly eternal nemesis — gets there first.

None of this will happen overnight, but the seeds have been planted. Now we can wait and watch the rush for positioning and users can hope to take advantage of the product harvest.

Insider

A Better Cost Cutter

By Adam S. Zais

Manufacturing enterprises are beginning to realize that information automation is a better cost cutter than production automation. This will remain the primary driving force behind this fast-expanding market.

Computer-based manufacturing planning and control systems have finally shed the image of being a technology that is better in theory than in practice. Manufacturing resource planning (MRP II) is not only a hot topic, it is fast becoming a vital topic if manufacturing enterprises are to survive. The question many companies now face is when — not if — a system will be implemented.

Market shipments are growing at a compound annual rate of 37.4% through the end of this decade. Nearly 51% of the domestic manufacturing plants will have installed some form of manufacturing information system by 1990, according to a recent research report by International Data Corp.'s Computer Integrated Manufacturing Service. This figure represents a conservatively estimated investment of more than $16 billion in the next five years.

The long sought-after integration of manufacturing and design within manufacturing operations — sometimes called computer-integrated manufacturing (CIM) — is taken a step closer to reality with the development of interfaces designed to link design and manufacturing systems. These links are typically being established between either MRP II or data collection systems and the product design data base.

The introduction of increasingly powerful microcomputers has created a market for smaller, less expensive and more easily implemented and managed systems. In fact, the microcomputer segment of this marketplace is showing the most rapid growth as a heretofore unserved end-user — the small manufacturer — is jumping on the manufacturing information system bandwagon.

There has been a tremendous move away from in-house development — "made" systems — toward packaged software.

The value of the software content of the total system sale is rising. In 1982, the software percentage in the average system sale was 13.5%; in 1984, that percentage had reached 27%. As the average percent value of software content rises, the average value of the total system is dropping at a rate of approximately 6% to 7% compounded on an annual basis. By factoring this out, a total system (hardware and software) that costs $400,000 in 1984 will cost $250,000 in 1990.

Many available systems offer vastly improved software capabilities and a greater degree of module integration. This is transparent to the user who sees only a whole system. These systems more accurately reflect the manufacturing organization's real day-to-day needs by offering developments such as the following:

- On-line — Users have access to the system through transaction terminals or linked micros.
- Real-time — The system supports the user in his time frame, not in a batch mode.
- Net-change — The system continuously updates itself following every transaction; also not a batch mode of operation.

Developments such as these enable users to distribute specific application and information requirements to areas of the plant or office on an as-needed basis, while simultaneously effecting a data base integration strategy (for example, linking the shop floor to the front office to the engineering/design staff).

Manufacturing is increasingly an information-driven activity. Manufacturing information systems are, essentially, information-gathering, decision-making and business-planning automation systems that utilize the abilities of the computer to optimize the use of information in an automated organization.

The philosophy of present-day MRP II systems offers a blueprint for companies to begin designing a single information system that integrates financial, manufacturing, engineering and administrative applications under data base technology. The corporate information management solution will mirror this structure on a much larger distributed scale. This enterprise-level data base system will be a logical but physically linked group of data bases, not one gigantic machine. A heterogenous distributed data base system implementation topology will be the lasting CIM design in the factory of the future.

■

Zais is program manager, Computer Integrated Manufacturing Service, for International Data Corp. in Framingham, Mass.

dB
BY RICH TENNANT
WHAT'S THE PROBLEM, RAY?
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Q&A

Jim Stifler is director of Industrial Automation Marketing at IBM. Computerworld Focus *talked with him about IBM's expanding role in computer-integrated manufacturing (CIM).*

IBM has been criticized in some quarters for not actively aiming a more aggressive marketing strategy at the factory floor but instead concentrating almost exclusively on management information systems [MIS]. Do you think that's valid?

No. A lot of information is coming from IBM systems that people in manufacturing use today — applications attuned to production scheduling, inventory, bills of material, graphics and so forth. The fact that we've taken our Personal Computer technology and ruggedized it to use in the harsh environment of manufacturing represents an interest on our part to expand the use of IBM systems in the manufacturing area.

Manufacturing seems to have grown in pockets of automation distinct from each other — the factory floor, manufacturing resource planning [MRP], computer-aided design [CAD] and MIS. Do you see IBM tying these isolated areas together?

Customers are certainly asking for more integration of these manufacturing components. Companies spending money on factories are asking to have the planning system, which has traditionally been in the data processing arena, tied very closely to what's going on in the plant on a minute-to-minute basis. In the past, people may have been satisfied with overnight reports.

Today, however,, with new manufacturing technologies, with flexible assembly or flexible machining operations, you really need access to things like scheduling, bills of material and parts data. This means MIS will be playing a larger role because MIS has traditionally been the controlling factor in planning systems. Planning has a major impact on purchasing, shipping and receiving, accounting, cost accounting and order entry — all of those things that drive manufacturing.

At the engineering level, we're seeing that if customers are handling numerical control [NC], for example, they want to have a terminal doing functions similar to those of an IBM Industrial or Personal Computer — they want to be able to look at a drawing on a screen and also use that same system to inquire into a bill of material, specification files and tooling and then be able to download the actual NC instructions into that device and drive the NC tool. When you tie all those requirements together, the result is a device like an industrial computer that, for less than $10,000, has the ability to get at the planning data as well as the graphics and NC data — basically a universal workstation.

Where should the focus of CIM be placed in a user's organization?

IBM's view right now is that CIM is something customers build. No single vendor, to my knowledge, can now provide CIM in total.

Customers really need to have a plan for product strategy, and they need to understand what will drive that product strategy to make them more competitive in their particular markets. Depending on the industry, customer competitiveness hinges on factors such as better planning, improved order entry, the way customers participate in their specific markets, their market share and customer service. It can also come from something more directly product-related — something like CAD, for instance, that can allow customers to be more competitive because they can get their designs out faster than other manufacturers. Customers want to sit down with us and start planning CIM from any one of these areas. What they want from us is the integration of communications, data and cross offerings of products in all CIM areas.

What do you see as the major obstacle in implementing CIM?

Getting a commitment from high-level management to agree to the changes in a business that CIM warrants in order to become more productive.

Too many of us in organizations tend to delegate problems to lower levels and order them to be fixed. CIM has to involve top-level executives directly because it involves so many areas within the corporate structure. Many of those business procedures still used today to justify corporate investments — decisions based on short-term; payback considerations — just can't be applied to something involving the resources and long-range planning of CIM. Resistance by top management to making commitments to these long-term goals will be one of the key inhibitors to CIM for the next five years.

IBM recently entered into OEM agreements with Calma Co., Computervision Corp., McDonnell Douglas Automation Co. and other CAD systems vendors. Do you see that increasing?

Yes. In the industrial environment, we've opened relationships with a number of what we call industrial distributors, organizations that have traditionally sold devices such as programmable controllers and instrument packages to manufacturing and process people. These people now carry our computer line.

We've also opened a number of OEM agreements with manufacturers of programmable controllers, machine tools and other industrial instrumentation, and we're expanding our traditional value-added remarketer channels. Because the technology is moving so fast, many companies that once built their own hardware now find their sales volumes can't justify the necessary research and development to bring state-of-the-art technology to the market. Such turnkey systems vendors are finding it easier to buy hardware and add to it.

What area within IBM would guide a customer toward CIM?

We have an organization called the Industrial Sector, which is part of our marketing group. Within the Industrial Sector we have a number of specialists who work with our branch-office people. A customer can have one of his marketing representatives or industry specialists bring in someone from our Industrial Sector group to discuss IBM's industrial products and planning. We also have demonstration centers to show our products and analyze what the customer ought to do first. Beyond that, we also provide application transfer teams, also part of the Industrial Sector, which conduct joint studies between IBM and a customer concerning the customer's needs in CAD/CAM, industrial automation and business planning.

Letters

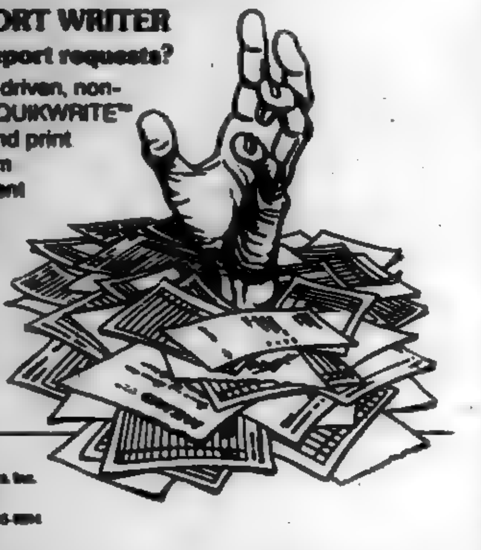
Who Really Pays Hacker's Phone Bills?

The Q&A clip from the March 20, 1985 issue of *Computerworld Focus* recently appeared in my in-basket, and I felt that in order to assert the innocence of the Tandy Corp. Model 100 portable computer, I should respond to the column.

The interview with the computer hacker who uses his knowledge to break through computer security to do such harmless things as "getting secret codes so I can make free long-distance calls" reflects an attitude adopted by other dishonest people to minimise their crimes. Most of us are astute enough to realise the costs of his "free" calls are passed on to the rest of us consumers.

I can't help but flinch when I see an excellent product like the Model 100, which has proved to be an outstanding performer in so many applications, used for dishonest purposes.

Linda Miller
Marketing Information Department
Radio Shack
Tandy Corp.
Fort Worth, Texas 76102



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In the News

Costly Gear, Bad Training

Companies that invest large dollar amounts in hardware and software to solve their problems are going to be disappointed; "only people run businesses," according to Al Lanick, a consultant with Advanced Systems, Inc., a Chicago-based management consulting firm specializing in manufacturing training.

Lanick stressed the importance of training to support the implementation of elaborate and costly manufacturing systems. Reaction has ranged from total acceptance to total rejection. With the latter, an attitude of "Why should I invest more money when I'm buying all these expensive systems?" predominates. But Lanick contends that the only way to make the systems successful is to provide formalized training. Good training also allays worries about job security and helps build the confidence workers need to ensure good implementation.

Lanick cited the differences in training methodologies for management information systems (MIS) personnel and for manufacturing staff. "Unlike MIS, which has had a steady growth of professionals and a growing discipline in terms of how to use systems, manufacturing to some extent has lagged in adopting some of the new technologies," he explained.

Most effective training is done on an inhouse basis using a facilitator in a small group setting, according to Lanick. The facilitator, usually a person from the plant or facility, understands the business and speaks the jargon of the industry.

Two training audiences exist, Lanick said. The first, top management, is responsible for making sure the system does what it is billed to do; the second consists of those who have direct line responsibility for actual implementation.

Although the cost of comprehensive training varies, company size is not as important as the length of time the training might take. "I have seen $10 million companies that have spent $50,000 to $70,000 on manufacturing education, and much larger companies that have spent less," Lanick added.

No Prime Cuts Here

Each day seems to bring more bad news about layoffs, cutbacks, hiring moratoriums and "common vacations" from computer and peripherals manufacturers. The slowdown is affecting companies from the Pacific's Silicon Valley to the Atlantic's Route 128.

It was refreshing to hear that Joe M. Henson, president of Prime Computer Corp. in Natick, Mass., expects Prime to hire 1,000 additional people this year. In his address at the annual stockholders' meeting in Boston on May 15, Henson said most of the jobs will be in sales, research and development and computer-aided design and computer-aided manufacturing (CAD/CAM).

A company spokesman pointed out that the CAD/CAM market itself is growing at about 30% to 40% a year and said Prime will certainly meet or exceed those figures. Last year [CAD/CAM] accounted for about 16% to17% of Prime's total business at a growth rate of about 35%.

Although representatives from Prime would not divulge exact numbers, Bob Sanches, manager of human resources, CAD/CAM and Workstations/Terminals Group at Prime, said the increases in numbers of jobs could approach 20%. All of the CAD/CAM positions will be in the Natick/Framingham, Mass., locations.

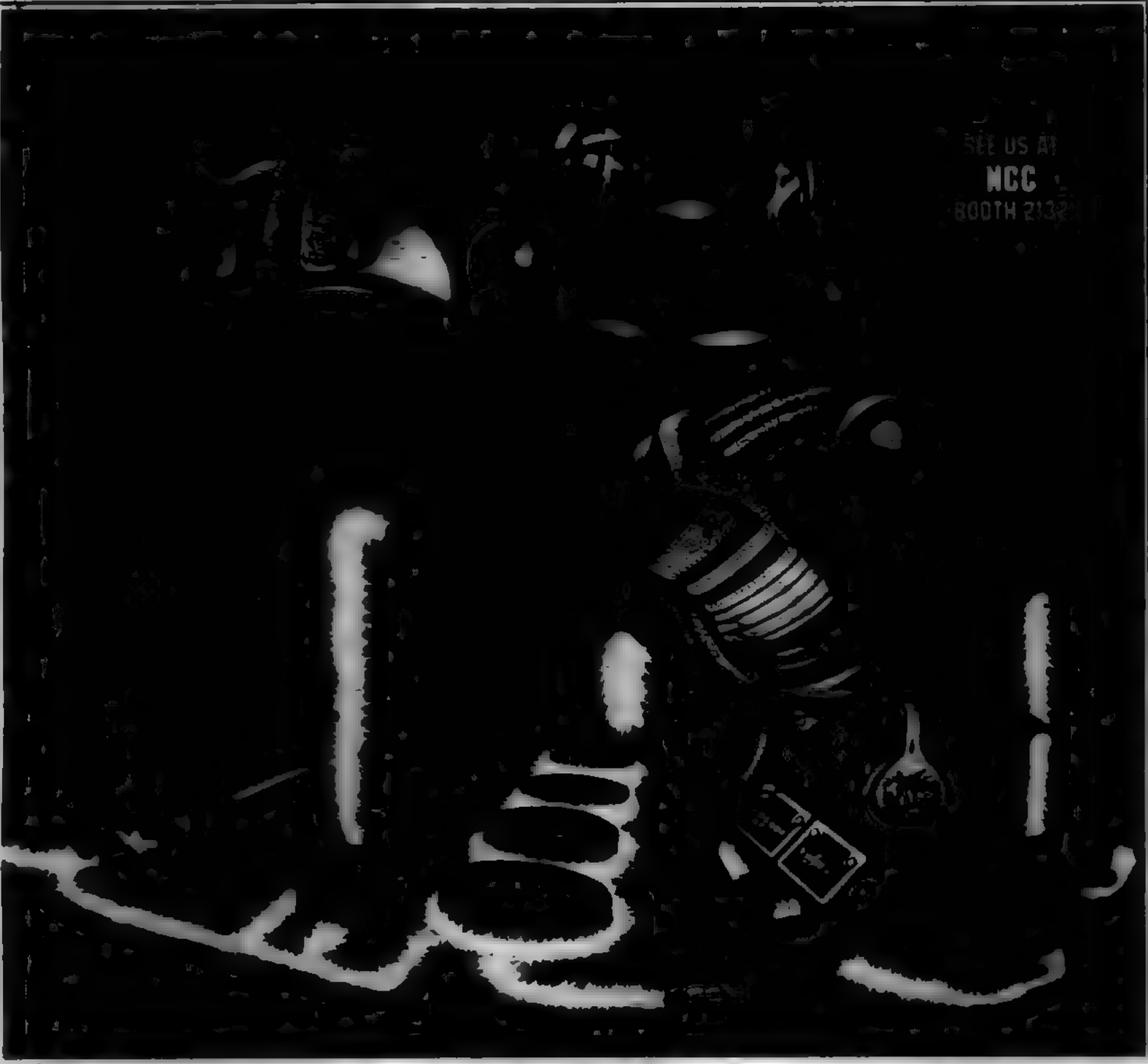
OSI Demo in November

Boeing Computer Services Co. of Vienna, Va., recently announced it will join with General Motors Corp. in cosponsoring a multivendor demonstration of the International Standards Organization's (ISO) Open System Interconnect (OSI) protocols.

The Boeing/GM demonstration will take place at the Autofact Factory Automation trade show in Detroit in November. The joint demonstration will feature interconnected OSI 802.3 and 802.4 networks via the Internet protocol, layer 3 of the OSI reference model. According to Laurie Bride, manager of network technology at Boeing's corporate headquarters in Seattle, Wash., participants include Intel Corp., AT&T Information Systems, Inc. and Honeywell, Inc. on both 802.3 and 802.4; Kodak Corp., Motorola, Inc. and Sun Microsystems, Inc. on 802.3; and IBM, Hewlett-Packard Co., Digital Equipment Corp. and Allen Bradley Co. on 802.4. In addition, the demonstration will operate with the OSI Transport, Session and File Transfer protocols, levels 4, 5 and 7 of the reference model.

Prior to the November event, Boeing has invited several major computer manufacturers to participate in the creation of an OSI testing center at its headquarters in Bellevue, Wash. Robert L. Dryden, president of Boeing Computer Services, said the testing center will be an open facility and encourages users to visit.

Doane Perry, editor of "Communications and Distributed Resources Report" for International Data Corp. in Framingham, Mass., said Boeing Computer Services is expected to grow but the aircraft industry may not. If that happens, the computer arm of Boeing could be a force in the industry, much like H. Ross Perot's Texas-based Electronic Data Services recently bought by General Motors. "Boeing Computer Services has always been quite innovative and resourceful," Perry concluded.



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In Brief

DALLAS — Intel Corp. of Santa Clara, Calif., and Westinghouse Electric Corp. of Pittsburgh, Pa., announced they had signed a letter of intent to jointly develop software products to conform with General Motors Corp.'s Manufacturing Automation Protocol (MAP) specifications.

Under the agreement, announced at a recent MAP users group conference, MAP software developed by the two companies will become the exclusive property of Intel, and Westinghouse will retain a royalty-free license to use and distribute MAP software with the sale of Westinghouse hardware products.

NORWALK, Conn. — During the next 10 years, U.S. industry will purchase a total of about 250,000 industrial robots, according to a report issued by International Resource Development, Inc. (IRD). IRD also predicted that nearly 60,000 of these robots will be equipped with vision capabilities enabling them to operate with more flexibility and safety than blind robots.

The IRD report said that although prices for vision-capable robots, currently averaging about $150,000 each, will fall rapidly, buyer resistance will likely remain for several years because of reliability problems and design bugs plaguing today's robot vision systems. IRD added, however, that recent advances in signal processing semiconductor chip sets have helped boost the performance of vision-capable robots, and even greater performance improvements are expected over the next few years.

The report also mentioned that, contrary to some industry experts, U.S. robot vendors do not seem likely to be displaced by Japanese vendors. Further information is available from IRD, 6 Prowitt St., Norwalk, Conn. 06855.

FALLS CHURCH, Va. — The American Production and Inventory Control Society (Apics) has announced publication of its 1985 Spring Seminar Proceedings, "Computer Integrated Manufacturing and Flexible Manufacturing Systems." Included in the proceedings are articles dealing with effective planning for technological change, management of implementation of advanced systems and price and performance evaluations of flexible manufacturing systems.

The 346-page book, order number 40666, costs $20 from Apics Publications Order Department B, 500 W. Annandale Road, Falls Church, Va. 22046.

MADISON, Ga. — SEAI Technical Publications has announced two new publications on computer technology and manufacturing.

Artificial Intelligence Applications for Manufacturing is a review of the fundamentals of artificial intelligence with a description of more than 120 commercial products applicable to manufacturing. The 194-page book is available for $110.

The 1985 Handbook of Manufacturing Software is divided into two parts: Part I reviews the fundamentals of computer technology and presents a description of major application areas; Part II includes cost, computer compatibility and availability for more than 500 software programs applicable to manufacturing and industrial processes. The listing includes programs for mainframes, minicomputers and microcomputers. Computer applications for robotics are also covered. The handbook sells for $197.

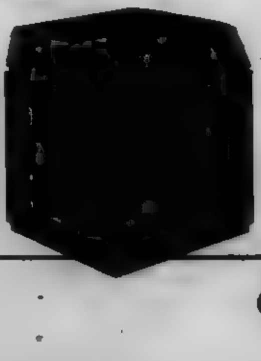
Both books can be ordered from SEAI Technical Publications, P.O. Box 590, Madison, Ga. 30650.

CHELMSFORD, Mass. — Apollo Computer, Inc. has signed with Siemens AG of West Germany an OEM contract projected to be worth $100 million over the next three years. Under the agreement, the Power Engineering and Automation Division of Siemens will purchase Apollo's Domain workstations for computer-aided design use in computer-integrated manufacturing networks, computer-aided software engineering and expert systems.

NEW YORK — The Dun & Bradstreet Corp., parent to McCormack & Dodge Corp. in Natick, Mass., recently announced the acquisition of the manufacturing software business of Rath & Strong Systems Products, Inc. (RSSP), the Dallas-based developer of manufacturing information software systems. RSSP will become a unit of McCormack & Dodge.

RSSP's software product, Production and Inventory Optimization System (Pios), is an on-line, real-time manufacturing control system made up of eight modules that can be purchased and implemented separately. McCormack & Dodge will incorporate Pios into its Millennium Series of business application software products, thus expanding McCormack & Dodge's software offerings into the manufacturing environment.

"The Rath & Strong product is a pretty well respected product, but it's a big manufacturing system in terms of its capabilities. It may be difficult for McCormack & Dodge to move [Pios] through the mid-size manufacturers that it does a lot of its business with," Damian Rinaldi, director of the Software and Services Information Program at International Data Corp. in Framingham, Mass., explained. Rinaldi also said the integration task will be fairly extensive, but "McCormack & Dodge has shown remarkable patience in terms of its long-term strategizing. The choice [of Pios] makes real good sense for the long term; in the short term, I don't know how many successes they're going to have with the product," he concluded.



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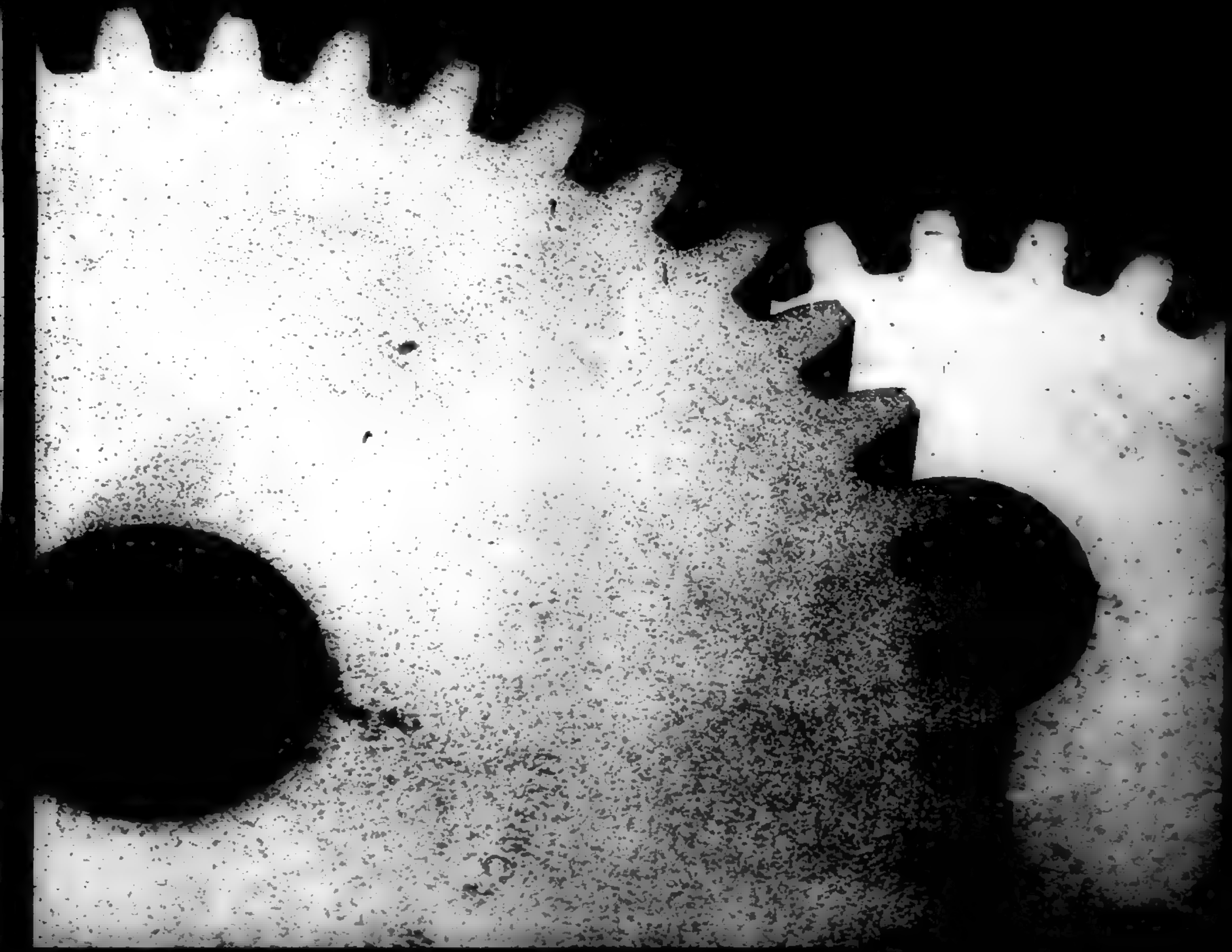
CIM Implementation— A Top-Level Priority

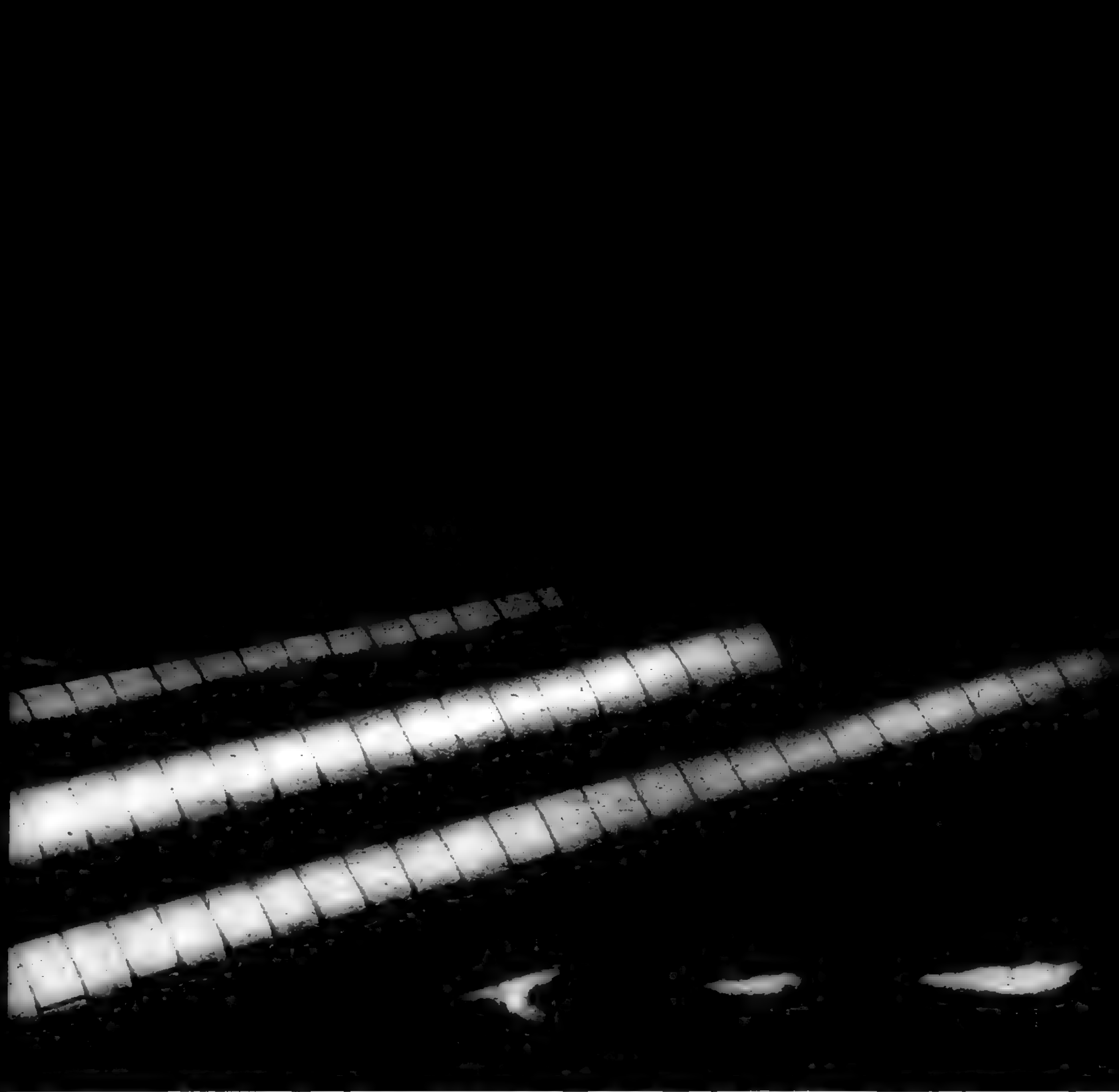
By Ray L. Dicasali

It is old news now, but no less troubling to hear. For the past 10 years, U.S. manufacturers have been frustrated. It is as if the world was stuck on its axis and nothing we could do would stop the drain on our productivity, our market and our profits. John Naisbitt elevated this trend to the status of megatrend and predicted that the U.S. manufacturing base will continue to erode as production moves offshore. Some now operate as though this process is a foregone conclusion. [illegible] question [illegible] phoning through the night?

We've discovered one part of the answer: We're not even sure we're in the right game. We know it's hardball, but the rules have changed. We've entered a new era in world manufacturing: the competition is stiffer, the life cycle of products shorter and the margins narrower. In addition, the continuing strength of the U.S. dollar has aggravated the problem by making it [illegible] foreign goods to compete in the U.S. and harder for U.S. goods to be price competitive in the world market. It's no longer enough to work harder; we must also work smarter.

Some manufacturers have taken significant strides in the past five years to gain greater control of their operations through deliberate strategic planning. The result is improved performance in all areas, from manufacturing operations to distribution





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These manufacturers have focused as much attention on planning for obsolescence as on introducing new products to the market, and they have a host of new tools to aid them.

Important advances such as robotics, computer-aided design (CAD), computer-aided manufacturing (CAM) and computer-aided engineering (CAE) have taken place in technology. Much attention is being focused on Just-in-Time manufacturing, zero inventory and optimization; flexible manufacturing and group technology are not far behind. All of this is supposed to combine to comprise the focused factory or the factory of the future.

This proliferation of technology and terminology seems at times to resemble confusing clutter. Does it make sense? What does it mean for data processing personnel?

The new term for this technology is computer-integrated manufacturing (CIM). CIM is the umbrella under which the independent pieces — CAD, CAM, group technology, robotics and so on — are organized to work together. The definition is not yet complete, but it has reached a point where several major components of CIM can be described.

CIM is computer-based, and it is hardware. It is also software. At its core, CIM is a view of the layout of the manufacturing plant from an information processing perspective. It is as much a way of managing information as it is machinery and manpower. CIM is also firmware — dedicated pieces of automation, whether robotics, CAD/CAM or automated storage and retrieval systems for materials handling.

These three components, as well as some pieces not yet envisioned, are combining to comprise a powerful new tool for manufacturing. Information drives the tool, and DP will play an increasingly larger strategic role. In 1990, U.S. manufacturers will spend $33 billion on this technology, according to International Data Corp., a research firm in Framingham, Mass. Nearly one third of that amount — a fourfold increase over the amount spent in 1984 — will go for management information systems (MIS) and materials resource planning (MRP). In spite of all the excitement surrounding CIM and what it will mean for U.S. manufacturing, however, CIM is not the goal of all this activity. The goal is competitive survival — shortened development time, reduced costs and improved quality. We must be more responsive to the market and more profitable.

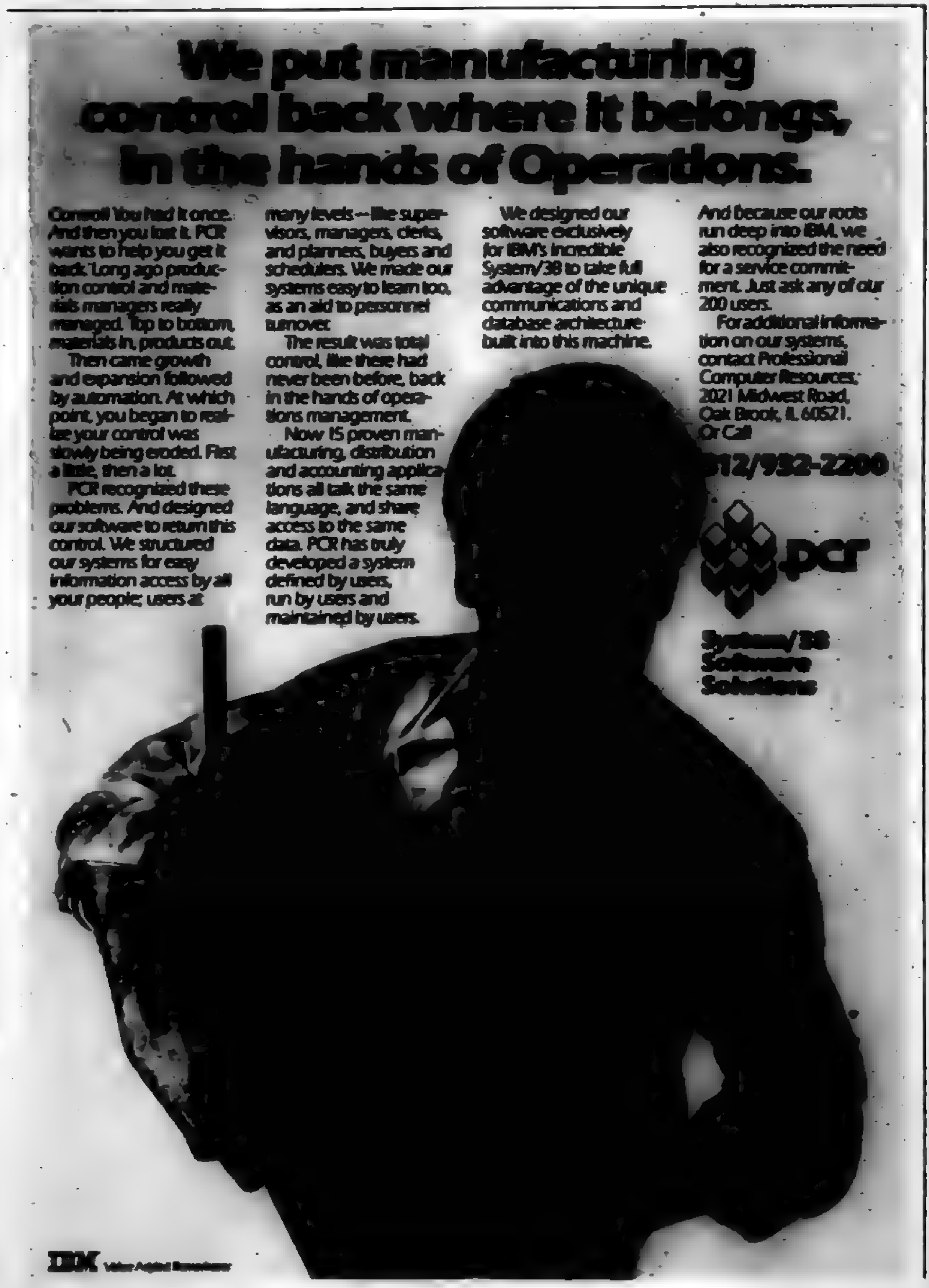
This task will not be accomplished merely by throwing around corporate assets such as money and manpower, although these will, of course, be required. Capital resources alone won't get the job done. The real issue will be how well the technology is managed. The challenge of CIM is an executive challenge, and the question will be how well top management does its job.

What is called for on the front end is a clear, precise, corporate strategy for implementing CIM. Each manufacturer will have to determine what its strategy will be. Although the strategies will be different for each industry and for every manufacturer, success will hinge upon careful planning of several logical steps:

- *Prime the corporate culture for change.* In order for the implementation of a CIM strategy to be a top corporate priority, preliminary education will be required. Management must have a basic understanding of how the new technology will fit in the overall operating plan, whether the strategy calls for a completely new facility or incremental implementation of new technology. Sustained commitment to the project will be difficult without a realistic understanding of the technology and of the required time for implementation. Without top management's strong commitment, the project will face impossible barriers.
- *Clearly define expectations.* Be sure you know what problems you are trying to solve. By defining your expectations, you will establish a blueprint for making wise investment decisions. This preparation will serve you in two ways: First, you will eliminate technology that doesn't yield targeted results. Second, you will have a benchmark to guide you in a process that could take several years to complete.
- *Appoint a CIM champion.* The role of CIM project team leader is as much an advocacy role as it is a leadership role. CIM is not only a new tool, it is a new way of doing business. A CIM project needs someone to champion its cause and that person should be someone with no vested interest in old departmental divisions of authority.

The role of project team leader is a full-time job. The leader should be experienced — someone who understands the problems to be solved and who either is at board level or has board-level backing and commitment.

- *Establish a project team.* Because the project team is charged with changing the manufacturing corporate culture, it is important that the group should be a representative body and include people from all areas of the company which will be affected. It is particularly important to include people from DP, marketing, engineering, purchasing, production and finance because those people will be expected to increase efficiency and productivity with the new technology.
- *Perform a detailed environmental analysis.* This step is one of the most crucial, yet it is the step most frequently overlooked in the process of implementing new manufacturing technologies.



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- 60 Government—State/Federal/Local
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- 70 Mining/Construction/Petroleum/Refining
- 75 Other User__________

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2. **OCCUPATION/FUNCTION (Circle One)**
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- 12 VP/Assistant VP
- 13 Treasurer/Controller/Financial Officer
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- 22 Director/Manager of Operations/Planning/Administrative Services
- 23 Systems Manager/Systems Analyst
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- E. Office Automation Systems

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Only when you have a detailed analysis of current operations in hand will you have a clear picture of where to focus your efforts. Technology can help you solve problems, but it is not a miracle cure for bad communications, bad production flows and bad management.

One of the chief benefits of implementing new technology is gaining a fresh perspective on how you do business. In the process of performing an environmental analysis, you may discover that new technology is not necessary, at least not in the form you had initially envisioned. There may be simpler answers: For example, you might find that shortening a production line (thereby decreasing the time needed to move a product between workstations) is a better answer than installing automated handling systems.

A detailed environmental analysis is time-consuming. Nevertheless, it is not only well worth the effort, it is the foundation upon which to build your future.

Know what you want to accomplish, then look for the means to achieve it and keep it as simple as possible.

• *Identify the technology your strategy requires.* After you have a clear picture of how you currently operate and of the problems you need to address, you're ready to clearly document the specific details of your CIM strategy.

You might decide you need an integrated manufacturing control system that ties production more closely to distribution. You might find that a CAD system would greatly increase productivity, but a CAM system would have little impact. The need will be different with each manufacturer; therefore the strategy will be different.

The point is this: Know what you want to accomplish, then look for the means to achieve it and keep it as simple as possible.

• *Formalize your operating policies.* Moving from an informal manufacturing system to a formal one requires time. It's possible that 70% of the life of the project will be spent performing this task and the prior one. It's also possible that 50% of the benefit of the project will occur here as well. If the new system is to work effectively, however, you must have the proper disciplines in place to reinforce a formal approach. This is a good time to call on the expertise of experienced outsiders — people who know not only the details of the new technology but also the nature of your business.

• *Establish working partnerships with suppliers and vender.* A good businessman takes control of factors that are controllable and anticipates those that are not. All too often, manufacturers believe they are at the mercy of their suppliers — suppliers of materials, machinery or computer hardware and software. One of the chief goals of a CIM strategy should be to gain greater control in this area and to build working partnerships with people you must depend on.

Quality and service are becoming as important as price (and in many instances, more important) to maintain a competitive edge in the market. For the partnership to work, suppliers need to know you are as concerned about quality and service as you are about price. You need to select your partners carefully.

Can material suppliers, for example, deliver what and when they say they can? Can you monitor and track their performance? Can you furnish them with long-range visibility of your material needs? If technology is being supplied, is it applicable and proven, or is it still just promises? How does it integrate with the technology you already have? Before you invite anyone to be a partner in the success of your business, you want to know the answers to these basic questions.

• *Follow a sound, proven implementation methodology.* Can the partners supplying you with new technology offer you a proven implementation methodology? If not, you should seriously question their ability to play an active, beneficial role in your business.

• *Track and report your progress.* Whether you plan to build an entirely new manufacturing plant or a factory of the future from the ground up or plan to implement the new technology in incremental steps, you will probably need to rethink your cost-benefit analysis model.

Moving toward CIM is not a quick fix. It is a long-term project, and it requires a long-term investment strategy. Return on investment is not justified under a two- to five-year model, judging from the experience of leading-edge manufacturers already implementing CIM strategies.

One major industrial manufacturer is planning to spend $50 million over 10 years to develop a state-of-art factory of the future. Whatever your strategy calls for, be realistic about the payback cycle. If you underestimate the time it will take to see return on investment, you may undermine commitment to the project.

■

Dicewell is vice-president of the Manufacturing Systems Division of Management Science America, Inc., Atlanta, Ga.

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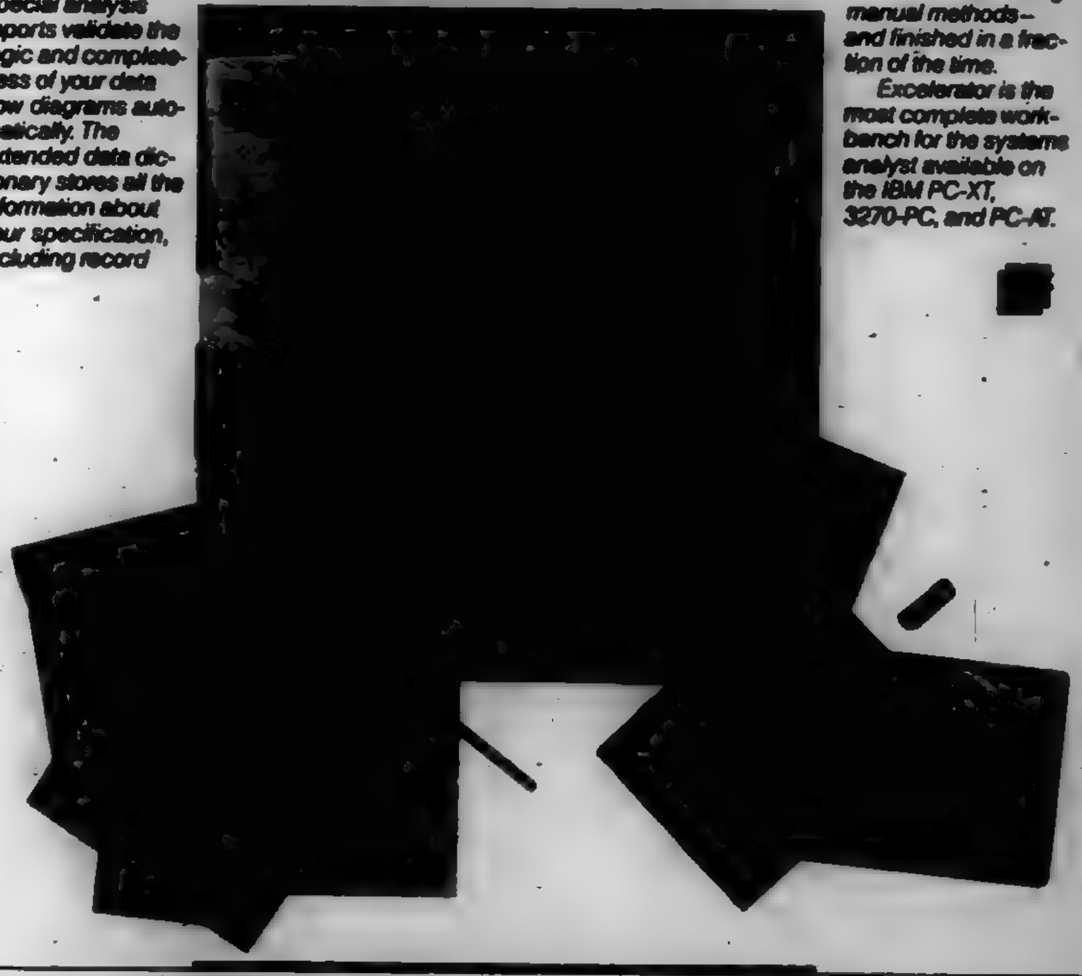

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Manufacturing Networks Can Be Tricky Areas

MAP: GM's Attempt To Set Standards

By Ron B. Keil

Worldwide competition is exerting increasing pressure on the automotive industry in its own basic business — providing transportation products. To meet these challenges, General Motors Corp. has stepped up the pace of a number of programs aimed at continuous improvement in the cost and quality of manufactured products. In this process, large numbers of robots, programmable controllers and other programmable devices have been introduced into the manufacturing process, and statistical process control tools are being used to monitor "as built" quality. Accompanying this growth in the number of programmable devices has been a growth in GM's requirements in other areas. In addition to an increased need for computer support for programming, documentation and backup, the need for sophisticated communication has been outstanding. A review of some components involved will point out why GM's Manufacturing Automation Protocol (MAP) is so important. Among the areas affected are the following:

- Work force involvement has proven to be a valuable tool for GM's quality and cost-improvement effort. In an attempt to provide facts about the state of the business, employees are told GM's competitive position in relation to quality and costs. This information is

(Continued on Page 20)

One User Gives MAP a Try

By David C. Scott

Amid all the hoopla about computer-integrated manufacturing (CIM), most organizations have reached only a couple of concrete conclusions. First, achieving true CIM will be an evolutionary process. The last of the turnkey CIM believers has faded away, and the word evolution is appearing in nearly all articles and discussions on the subject. Second, the computing environment on the CIM shop floor will include a multitude of vendors selling computers of varying types, computer numerical control (CNC) machinery, process controllers, reliability and quality inspection and computing equipment, robots and automated material handling and storage systems.

Those who agree with these conclusions must also acknowledge the need for a flexible yet powerful communications infrastructure for the factory floor. Indeed, putting such a system in place should occur relatively early in the move to CIM because it will provide a technological foundation for factory automation.

General Motors Corp. dealt with this situation by initiating its Manufacturing Automation Protocol (MAP) effort. MAP is an attempt to develop a specification for a set of standards to allow a multiple vendor computing environment on the shop floor. Testament to the wide acceptance of the above conclusions is the fact

(Continued on Page 22)

(Continued from Page 18)

communicated by video setups at numerous locations in the plant complex.

- An indirect effect on manufacturing costs has been the escalating cost of utilities. To try to control this area GM measures usage of water, gas, pressurized air, steam, electricity and other resources — often by means of computers and programmable controllers.
- GM is investigating and, in some cases, implementing asynchronous machining and assembly systems that are much more flexible than the traditional systems of the past. To facilitate flexibility, the communication requirements increase in order of magnitude.
- To protect its large investment in facilities, GM uses closed circuit TV surveillance and computerized monitoring systems to warn of fires or other dangers.
- Accounting systems, personnel systems, material and inventory control systems, warranty systems and others use large mainframe computers with remote terminals located throughout the manufacturing facility.

As the above mentioned items indicate, the need for communications in GM plants is considerable. That communications system must be able to accommodate voice, video and high-speed data. The communications network therefore becomes an integrating force for factory operations. And, of course, because the automotive industry is a highly competitive business, any communications system GM installs must be cost-effective.

GM realized in the middle 1970s that, because of its requirements for an integrated communications system and the diversity in programmable device vendors, communications standards were needed for the factory floor. Some ad hoc task forces were formed to focus on broadband coaxial cable.

In early 1980, with corporate support, the Manufacturing Automation Protocol (MAP) task force was formed and included former broadband task force members. The original MAP task force objectives were to define a MAP message standard that supports application-to-application communication, to identify application functions to be supported by the message formatting standards and to recommend low-level protocols that meet functional requirements. The task force is comprised of representatives from about 15 GM divisions and from the corporate manufacturing staff (see Figure 1).

Soon after its formation, the task force identified the International Standards Organization's (ISO) seven-layer model for open systems interconnection (OSI) as a basis for standardized networks. Because the model specifies function rather than protocols, however, compliance with it does not ensure multivendor communication. The strength and current support of the MAP specification is its selection of existing or emerging standard protocols. All seven layers of the MAP specification will be international standard protocols. The current version of the MAP specification is 2.1. GM has committed to upward compatibility for all future versions since 2.0.

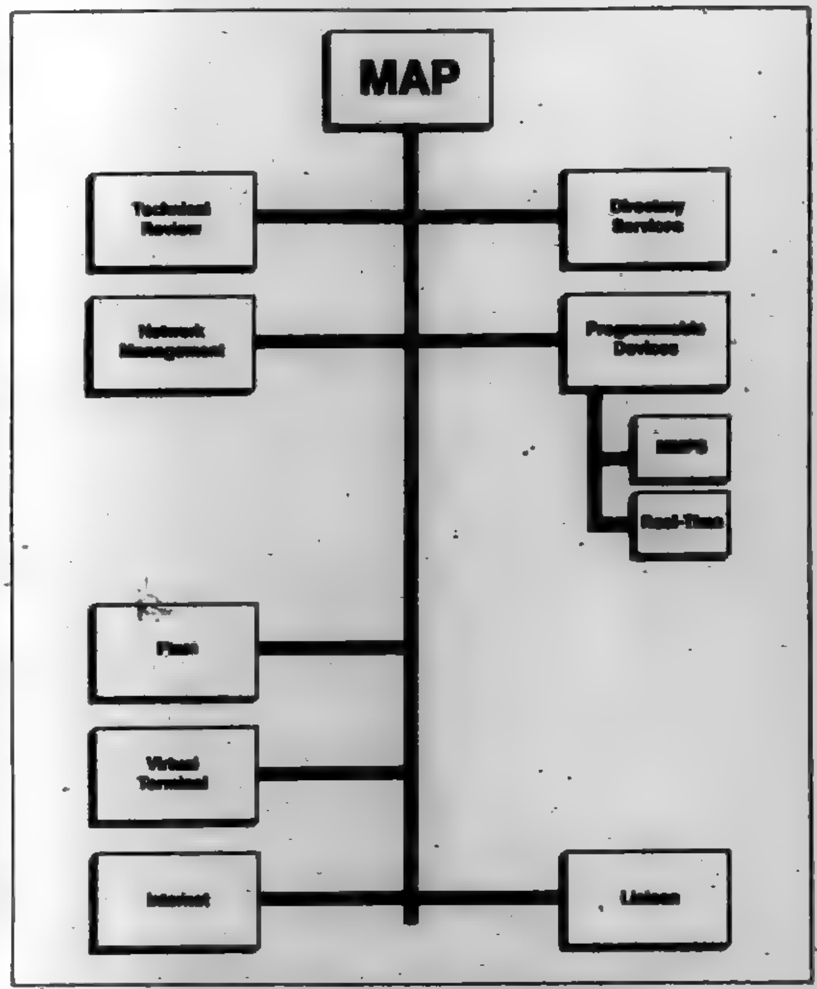

Figure 1. General Motors Corp. MAP Task Force

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GM's goal for MAP is that it become an open national standard with widespread use. The 1984 National Computer Conference demonstration took MAP a step nearer this goal.

- Layer 7, application (has responsibility of providing communication services to user programs): currently specified as a GM manufacturing messaging format standard (MMFS), the ISO common access service elements (Case), ISO file transfer and some preliminary network management and directory services.
- Layer 6, presentation: currently null.
- Layer 5, session: currently specified as the ISO session kernel.
- Layer 4, transport: the ISO transport protocol.
- Layer 3, network: the ISO connectionless network services (CLNS).
- Layer 2, data link: specified as the IEEE 802.2 LLC procedures.
- Layer 1, physical: specified as IEEE 802.4 token bus broadband.

MAP currently specifies broadband coaxial cable for the physical media in factory floor local-area networks. For several reasons, GM believes broadband is the best choice among current available media.

First, broadband coax accommodates multiple networks on the same media. Second, it will simultaneously support high-speed data as well as voice and video. A final point in support of broadband coax is that it is flexible enough to accommodate GM's rapidly changing plant requirements.

GM chose a token bus access method for factory floor local-area networks. In a token access procedure, a predetermined device generates a token and passes it around the network. A device can transmit only while it has the token. All devices listen and respond to data addressed to them. A token passing procedure is deterministic because the maximum response time can be explicity calculated. The token bus access method (IEEE 802.4) is supported by the programmable controller industry.

The layers above transport are value-added to the local-area network. MAP specifies session kernel to provide the connection establishment and management of the users. Session's dialogue management provides the application with standard mechanisms for synchronization and full-duplex and half-duplex communication. The application layer protocols provide the communications to the user program. Applications (user programs) talk about the application layer as their universe; the official term is universe of discourse.

The application layer elements specified in Version 2.1 of MAP include Case, MMFS and file transfer and access management (Ftam). Case provides connection, context switching and other services common to any user. MMFS, which was developed by GM and its vendors to provide necessary services and messaging to programmable devices, is currently undergoing a thorough review in the Electronics Industries of America's Committee 31 as Draft 1393A. A national standard should be available in 1986. Ftam provides services for file users. An application uses the services necessary for its particular function.

GM's goal for MAP is that it become an open national standard with widespread use. The 1984 National Computer Conference demonstration took MAP a step nearer this goal when it proved that a multivendor networking project can work. GM and Boeing Computer Services Co. are sponsoring another networking demonstration at the Autofact Conference in Detroit in November. At that time, Boeing's 802.3 local-area network will be connected to MAP's 802.4 local-area network. MAP Version 2.1 will be implemented. GM believes Version 2.1 finally offers a minimum set of services for an operating local-area network — a significant step.

The ultimate goal is that through standardization and proliferation, very large-scale integration chips will be developed and will drive the connection cost for each programmable device below existing point-to-point connections. GM is committed to the development and worldwide use of MAP and will seek a competitive advantage on the use of the network, not on the standards.

■

Keil is manager of communications and control systems engineering for the Chevrolet-Pontiac-Canada Group of General Motors Corp. in Warren, Mich.

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(Continued from Page 19)

that over the past two years, the MAP Users' Group has grown phenomenally and now includes representatives of virtually all of the largest U.S. manufacturers.

One of MAP's early supporters outside of General Motors was Deere & Co., the large manufacturer of agricultural, industrial, forestry and consumer equipment. Deere has often been recognised as a leader in the areas of factory automation and CIM. In 1981 the Computer and Automated Systems Association (Casa) awarded Deere's Tractor Works in Waterloo, Iowa, its first Lead Award, presented annually to a company in recognition of a leading edge implementation of CIM. Other examples of advanced automation and integration of computer-based systems can be found throughout the company.

Deere has, however, paid a high price for that integration. Up to 50% of the final costs of introducing automated processes and systems have gone to installation and integration of computerised equipment with existing systems. The bill for ongoing support of such systems from a communications and integration viewpoint has limited the advantages gained. The current direction of the CIM movement has the potential to amplify these problems because it emphasises the use of many new shop floor computing devices: powerful microcomputers and engineering workstations in an hierarchical, distributed computing environment for functions such as cell controllers, distributed numerical control (DNC), adaptive control of processes and real-time scheduling to accommodate concepts such as Just-in-Time manufacturing. These devices will be required to communicate not only among themselves but also with the various computers arriving on virtually every piece of new manufacturing equipment. Thus the rationale behind MAP is very appealing to Deere because it strives for plug-in automation and shop floor communications, basics for the realization of true CIM.

To emphasize its commitment to MAP, the company incorporated what turned out to be the first manufacturing production MAP-compliant network in a CIM pilot project in 1984. The intent of the project, as depicted in Figure 1, was to demonstrate CIM by developing techniques to transform computerised designs into completed manufacturing instructions that could be transmitted directly to and from the shop floor using a DNC system. The system was to support sheet metal parts to be manufactured in a cell including a turret punch press with laser and a straight shear.

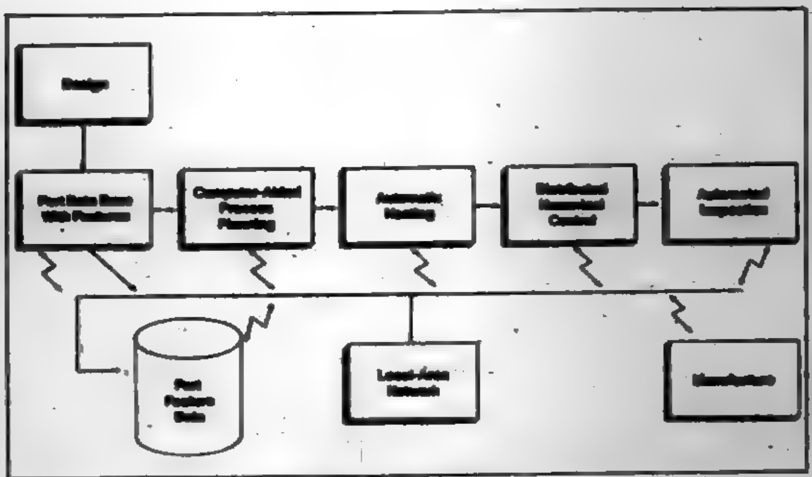
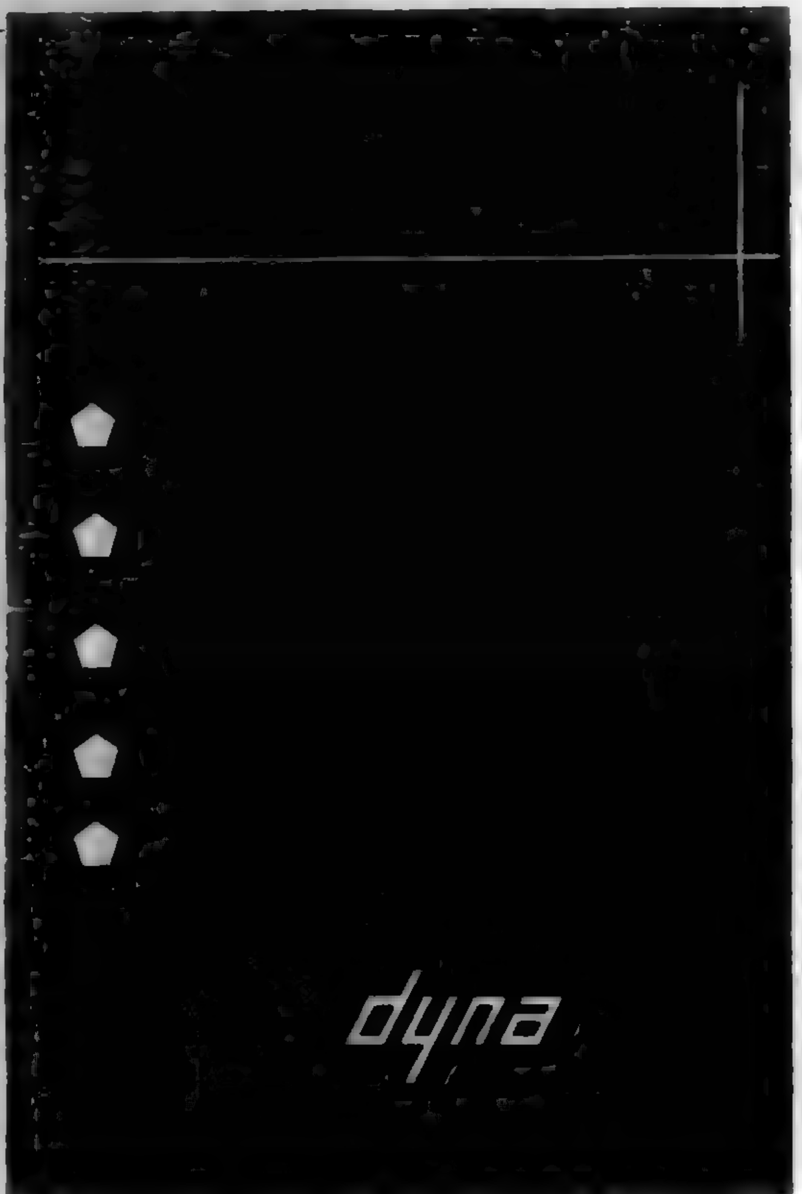

Design
Computer-Aided Process Planning
Distributed Numerical Control
Automated Inspection
Local-Area Network

Figure 1. A CIM Pilot

Starting with computer-based design geometry augmented by feature-type data, computer-aided process planning would develop a manufacturing plan and instructions, including a numerical control (N/C) program for each part. A nesting package on a Computervision Corp. system would then nest many of the same or different parts on the same raw material sheet and finalise a program to drive the N/C punch press with laser. Finished plans would be transmitted to a DNC host computer where they would be archived and managed. From the DNC host they could be downloaded directly to the machine controller. The need for a communications backbone, which would also need to accommodate all other emerging automation and CNC equipment in the factory, was discovered as the project planning proceeded. Local-area net technology was seen as a logical solution, and a work package to pursue a local-area net was formulated. The initial application would be the DNC system.

In May 1984, requests for proposals for a local-area network were sent to several vendors. Deere's involvement with MAP had progressed during the planning phases of the local-area network package, and the company decided to include MAP compliance as a bid requirement. Although installation of a broadband backbone and associated one-time start-up costs is more expensive than traditional point-to-point coaxial wiring schemes, the expenditure was approved because it would both save cabling dollars in future rearrangements and accommodate CIM.

The local-area net was designed and implemented by an in-house team. The broadband utility was designed by an electrical engineer from plant engineering with training from an equipment vendor. Other team members included representatives from computer systems to handle interfacing and protocol problems and from manufacturing engineering systems to address DNC and process application questions.



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Diana La Muraglia
General Manager
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The plant engineer developed a computer program that allows graphical design of cabling schemes and automatically computes signal levels and other parameters and then inserts required components (amplifiers, couplers and so on). This allows quick evaluation of feasibility and cost of several alternatives for cabling. The 3,300 feet of broadband was installed by a cable television contractor. MAP-compliant network interface units (NIU) were purchased from Concord Data Systems, Inc. and a DNC host computer was purchased from Numeritronix. The network was operational by Nov. 1, 1984.

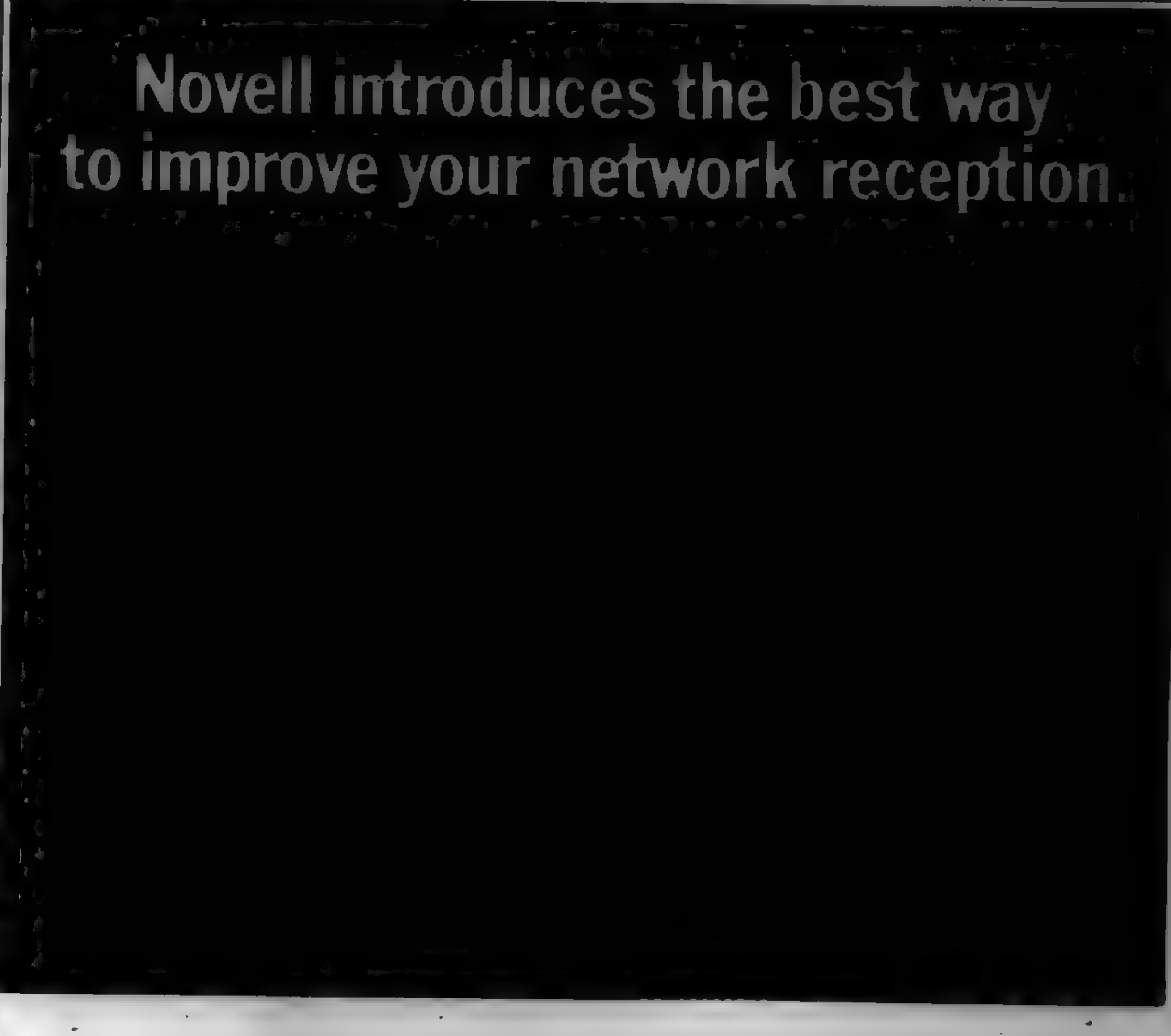
Pilot members were excited when they compared future possibilities of using the network with their former experiences.

Attempts were then made to link the Numeritronix computer and the punch/laser machine tool's General Electric Co. 1050 controller. The problems encountered read like a Why MAP? listing. The implementation team still had to resolve incompatible protocols and speeds; only the first two layers of the MAP specification, which provide media access control (getting you on and off the network), were being implemented in the NIUs. Connections to nodes from the NIUs were RS-232 links, making the initial DNC application appear like a point-to-point connection via the broadband. The RS-232 standard provided several challenges; the various devices were using different pin configurations. Perhaps the biggest stumbling block was the lack of complete communication specifications; as a result, data scopes were needed to figure out exactly what speeds, protocols and other communication parameters were being used.

After nearly a month of uncovering and solving such problems through both software and hardware, a successful link between the DNC host and the first machine was completed. Having learned from the first machine, the team successfully connected the second machine, the shear, much more quickly even though it encountered many of the same problems. NIUs were connected to Computervision and Digital Equipment Corp. VAX systems and, using the routing capability of the NIU, connections were made to an Okidata Corp. printer, a Sun Microsystems, Inc. engineering workstation and several types of terminals. The cell was released to production Feb. 1, 1985.

The consensus among pilot participants was that it was a very worthwhile learning experience. The critical need identified was that more complete and detailed specifications regarding communication requirements should be provided to vendors and received from vendors so that debugging could be more direct. Pilot members were excited when they compared future possibilities of using the network and the ease of adding additional devices with their former experiences stringing additional cables for each new or relocated device. Even though device connection was usually straightforward, protocol and messaging problems reinforced the desire for completion and commercial offerings of the upper layers of MAP, which will address these areas. Additional applications that would take advantage of the video and audio capabilities of the broadband, (for example, plant security video, interactive training of operators and video teleconferencing) are already being discussed. Plans are being finalized to extend the network to accommodate an additional application — a DNC-like system to download computer-optimized control parameters to a series of resistance welder controllers.

Perhaps the largest remaining challenge is planning for and managing the shop floor communications, computing and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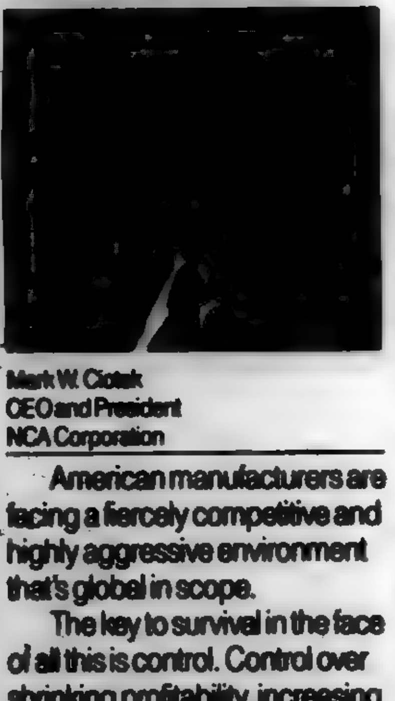

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Mark is CEO and president of NCA Corporation, a leading software developer and marketing company that's helping manufacturers stay competitive with a manufacturing resource planning (MRP II) system called MAXCIM.™

With 20 integrated modules, MAXCIM is designed to handle everything from financial planning in the executive office to job tracking on the factory floor.

"Our comprehensive approach requires a flexible computer system with a wide range of solutions," Mark points out. "That's why we chose Digital's VAX™ computers for MAXCIM. And that's why manufacturers are choosing us."

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Included within the VAX computing environment is the VAX Information Architecture, a comprehensive system of integrated information management software products. From this vast array of products, NCA's customers can select those best suited for their needs.

Three of these VAX Information Management products – FMS™ forms management system, DATATRIEVE™ query language and report writer, and Common Data Dictionary – are used in conjunction with MAXCIM. By incorporating these products, MAXCIM optimizes the user-interface, and provides easy access and universal definitions for all of your data.

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whether it's stored across the plant or at a plant across the country.

"Digital's approach to software is ideal for MAXCIM because the performance of an MRP II package is enhanced by the degree of integration between modules," Mark says. "And the superior integration within both MAXCIM and the VAX Information Architecture gives manufacturers the most flexible solution possible."

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"Because of this compatibility, you can use MAXCIM across the entire line of VAX systems," Mark says. "So when our customers upgrade, they can bring their existing applications right along with them."

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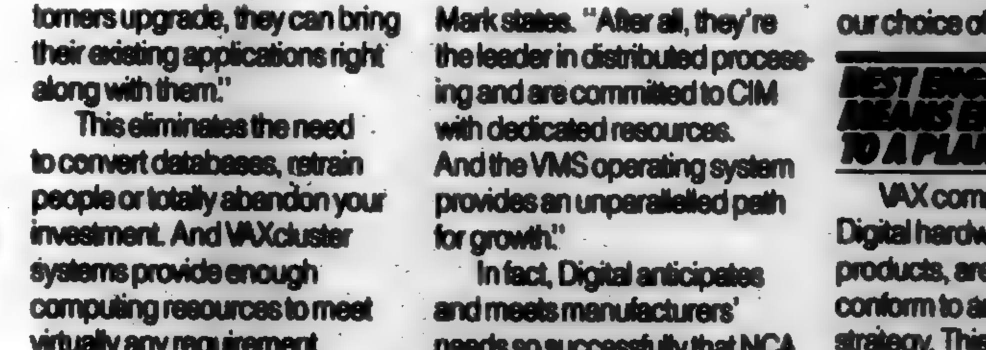

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"Digital has a solid reputation among manufacturers," Mark states. "After all, they're the leader in distributed processing and are committed to CIM with dedicated resources. And the VMS operating system provides an unparallelled path for growth."

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automation directions to accommodate CIM in a large decentralized company such as John Deere. If experiences such as those in the pilot are to be worthwhile, they need to be shared and incorporated in future efforts. Deere has taken several steps to address this challenge:

At the corporate office, a CIM systems organization was formed with computer-aided design and manufacturing (CAD/CAM) systems departments within it. CAM systems responsibilities include factory automation planning, factory local-area networks and MAP activities. A Shop Floor Computer Communications and Control (SFCCC) Users' Group has been formed under this group's leadership. A steering committee formed to coordinate and provide input to the overall group has members from corporate manufacturing engineering, computer systems, quality and reliability engineering and CIM systems. This general group is composed of factory representatives from the same disciplines as the steering committee. As in the pilot, each unit is encouraged to form a core shop floor communications team with members from plant engineering, computer systems and manufacturing engineering systems. Similar to the GM MAP Users Group experience, response to the SFCCC has been very enthusiastic; all units have experienced the above problems as individual machines and cells have been installed.

The role of the SFCCC is threefold: education, coordination and direction. At the overall meetings, educational segments on topics such as MAP are included with unit updates on experiences and current problems and issues being faced. Members are asked to share lists of vendors, contacts, informational sources and any data that may be useful to others. As issues are brought to the surface by the group, plans are formulated for their resolution in an effort to provide future direction.

At the first general meeting, users decided to form three interim working groups to develop guidelines for the three primary issues identified during the meeting. The first group will develop boilerplate specifications for inclusion in shop floor equipment specifications that will deal with the desired capabilities of the computer control. It will cover physical and electrical characteristics, protocols and general capabilities required to integrate the equipment into an overall CIM system. Basic examples are upload and download commands and terminal mode. The application layer of MAP using the EIA-1393 specification will be the ultimate answer when complete. The second group will work on guidelines for the communication utility and physical cabling schemes, including plans on how to evolve from current systems (for example, PBX) to the ultimate broadband for MAP in a cost-effective way. The final group is addressing flow and placement of data in the evolving distributed hierarchy on the shop floor.

The largest remaining identified need is training at all levels. To address this, outside training vendors are being contacted to provide courses ranging from overviews of local-area networks to MAP to detailed broadband engineering instruction. Extensive contacts are being maintained with vendors of local-area networks, computer equipment and controllers to obtain education on their directions and products and to encourage their participation on future pilot projects stressing MAP.

CIM will become a reality on a broad scale within the next few years. If companies are to be ready, however, foundations must be laid now. The communications schemes for the shop floor are essential, and the MAP approach offers a very attractive alternative with an expanding support base from users and vendors. Rather than just waiting for MAP to happen, companies that hope to realize the CIM potential must now begin planning and learning through activities such as pilots and users groups. The benefits are tremendous.

Scott is division manager, Computer-Aided Manufacturing Systems for Deere & Co. in Moline, Ill.

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But How Do You Cost-Justify It?

By [illegible]

In that article, Hayes and Abernathy concluded that "the key to long-term success, even survival, in business is what it has always been — to invest, to innovate, to lead, to create value where none existed before. Such determination, such striving to excel requires leaders — not just controllers, market analysts and portfolio. In our preoccupation with the braking systems and exterior trim (for example, return on investment), we have neglected the drive trains of our corporations."

Although enlightened leadership is surely required to create value, reduced dependence on analyzing investment returns is not the answer either. Measurement methodologies are not the problem; the way many companies use them needs to be reexamined.

Consider the way many companies justify CIM (and other DP) investments. The corporate controller prepares and distributes instructions and forms for evaluating capital expenditures as part of the capital budgeting and authorization system. For expenditures that involve business expansions or cost reductions, the instructions and forms typically call for the following:

- Forecasting differential cash outflows — for example, for a 10-year period or the life of the investment. Outflows include the initial investment, training and start-up expenses; operating costs; changes in working capital; and income taxes paid.
- Forecasting differential cash inflows for the same period. Inflows include revenues, recovery of working capital and a residual value in the last year of the forecast.
- Subtracting the cash outflows from the inflows to calculate a net cash flow by year.
- Discounting the net cash flows by a cost of capital to determine a net present value or calculating an internal rate of return (the discount rate where net value of inflows exactly equals outflows). Figure 1 (above) shows a format used for this purpose.

	Year 0	1	2	n
Outflows (investment)				
Capital expenditure				
Expense items net of income taxes				
Working capital required	___	___	___	
Total outflows	___	___	___	
Inflows				
Revenues				
Costs and expenses excluding depreciation		___	___	___
Cash flow before taxes and depreciation				
Income taxes paid — net		___	___	___
Cash flow after taxes paid				
Residual value				
Recovery of working capital		___	___	___
Total inflows		___	___	___
Net cash flow	___	___	___	___
Effect on profitability computation				
Cash flow before taxes and depreciation				
Book depreciation	___	___	___	___
Profit before income taxes				
Income tax provision	___	___	___	___
Profit after income taxes	___	___	___	___
Taxable profit computation				
Funds before taxes and depreciation				
Tax depreciation		___	___	___
Taxable profit				
Measurements				
Internal rate of return	___ %			
Net present value	___ @ ___ % Discount rate			

Figure 1. Capital Expenditure Budgeting Process

Although this methodology is conceptually correct, in practice it is commonly misapplied in several ways. It is unfortunate that this misapplication provides an uneconomical bias in favor of short-term projects at the expense of investments, such as CIM, that offer long-term strategic benefits. Five common pitfalls are:

- Evaluating CIM investments as stand-alone, cost reduction-oriented, capital expenditure proposals rather than as business-building strategic investments.
- Overlooking indirect cost reductions.
- Using excessive discount rates.
- Underestimating the residual values of CIM equipment.
- Relying on a single conclusion when a range of likely outcomes would be more appropriate.

The CIM investment decision is usually a strategic investment that a company makes to gain a competitive advantage, and it should therefore be evaluated in its entirety. The company should forecast and discount all the differential cash outflows and inflows associated with the strategy, not just the cash flows associated with the cost-saving component of the investment.

Differential cash flows are elements of cash inflow or outflow that are expected to differ if one course of action is adopted rather than another. Such cash flows may be estimated by adding up cost savings and marginal profit contributions before noncash charges (such as depreciation) or subtracting base case forecasts from forecasts that reflect an investment in CIM. The base case forecasts should reflect various competitive scenarios (for example, "the competition does not install CIM" or "the competition installs CIM"). The CIM installation forecasts should also reflect alternate investment and operating scenarios.

The base case is not zero. There is no such thing as a no-change alternative. If a company does not invest in CIM but its competitors do, the firm will lose competitive position. No change often translates into a decline and an eventual abandonment of a business. Decline and abandonment, therefore, may be the scenario that should be forecast as the base case for purposes of estimating the differential cash outflows and inflows for the CIM investment alternative.

Although direct cost savings are often relatively easy to identify, some companies overlook the impact CIM installations have on indirect costs. For example, CIM may require less supervision because fewer people are required. Fewer people reduce payroll and human resources department costs. Direct and indirect payroll cost reductions also translate into reduced payroll tax, pension fund obligations and other employee benefit costs. Reduced space requirements mean lower heat, light, janitorial, maintenance and other building occupancy costs. Improved quality results in reduced inspection, material handling, rework, scrap, yield and sales adjustment costs. Lower inventories result in lower inventory carrying costs. Such indirect cost reductions often exceed the direct cost savings associated with the installation of CIM systems.

Forecasts of net cash flows are usually discounted by a rate that reflects the perceived time cost of the capital (money) invested in a project. This discount rate is intended to reflect a company's capital cost based on the financial characteristics of the business. The National Association of Accountants defined the cost of capital in their publication, "Statement on Management Accounting: Cost of Capital" [Nov. 1, 1984]. According to that definition, the cost of capital is "a composite of the cost of various sources of funds comprising a firm's capital structure. It is the minimum rate of return that must be earned on new investments that will not dilute the interests of the shareholder." In practice, the cost of capital is supposed to be the weighted cost of debt and equity to be employed over the time horison of the prospective investment (see Figure 2 below).

The cost of capital is not the same as a hurdle rate, which is simply a benchmark that some companies use to screen prospective capital expenditures. If the likely internal rate of return of a project exceeds the hurdle rate, the project presumably merits further consideration.

		After Tax Rate (Percentage)	Mix Debt/Equity (Factor)	Weighted Cost (Percentage)
Debt (54% x 12.8%)		6.9	.27	1.9
Equity (using Capital Asset Pricing Model)				
Equity Risk Premium (Assume)	6.0%			
Company Risk Adjustment (Beta Value Line)	.80			
Company Risk Premium	4.8%			
Treasury Bond Rate	11.0%			
		15.8	.73	11.5
			1.00	13.4%

Figure 2. Example of Cost of Capital Calculation

For at least three reasons, many companies discount their net cash flow by rates that exceed their actual cost of capital. Those reasons are the following:

- Because of the federal budget deficit, the current cost of debt and equity capital may be abnormally high and may not reflect future capital costs. Future costs of capital over the time horison of the investment are the numbers that are most relevent for the investment decision.
- In a quest for financial conservatism, many companies underutilize long-term debt. A high proportion of equity tends to increase a company's cost of capital and the discount rate that is applied; a high proportion of debt tends to lower this rate.
- Also in a quest for conservatism, controllers tend to round up their calculations of their company's cost of capital. Thus, a calculation of 13.4% (shown in Figure 2) becomes 15% rather than 13%.

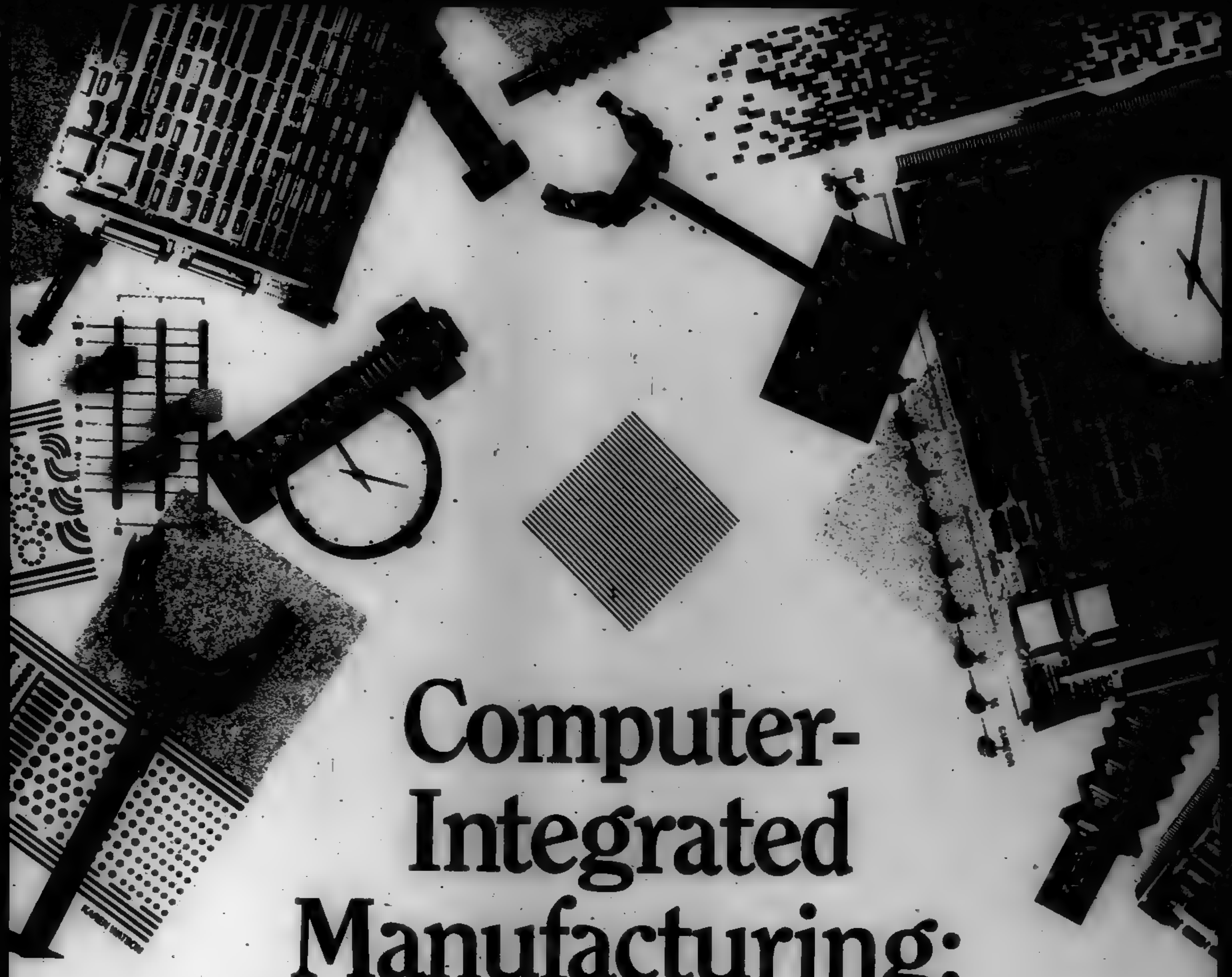
High discount rates favor projects that pay off in the short term rather than projects that, like CIM, offer long-term strategic benefits because of the effect of compounding.

Management may underestimate the residual values of prospective CIM investments, for example, by assuming that machinery and equipment will have a useful life of, say, 10 years and will be worth a scrap value at the end of that period. This is hardly the case. Not only may CIM investments (like commercial airplanes) have economic lives that will substantially exceed their book lives, but their residual value at the end of the tenth year will reflect the impact of inflation during those 10 years. Even assuming 4% per year inflation, today's residual value of $1 is equal to $1.57 in 10 years. This figure increases to $1.80 if a 6% annual inflation assumption is used. The problem is that while companies usually impound inflation in the discount rate they use, they often ignore it when they estimate residual values.

Financial managers often seek a single number forecast rather than an estimate of a high, low and most-likely outcome of alternative competitive and economic scenarios and discount rates. The forms are designed for one set of numbers so that each proposal can be compared with others. In reality, economic justifications are based on estimations subject to error in both directions. Thus, forecasts for CIM investments should reflect various scenarios and assumptions. Alternative assumptions, for example, should include a reasonable range of forecasts of the timing and amount of cash flows, residual values and discount rates. The array of computer-generated answers should be assessed using good, old-fashioned business judgment. Analysis should be used as a tool to assist economically sound decision making rather than relegated to the realm of braking systems.

If data is estimated objectively and biases favoring short-term payouts are eliminated, internal rate of return and net cash flow techniques can well serve corporate executives in justifying investments in computer-aided manufacturing systems.

Saad is senior consultant with Arthur D. Little, Inc., in Cambridge, Mass.



Computer-Integrated Manufacturing: The Key Word Is *Integrated*

By Stan Kolodziej

The computer industry has always found manufacturing a tough nut to crack. The separate pockets of operations in manufacturing companies have resisted integration by computers. On the factory floor, for example, automated test equipment, programmable logic controllers and numerical control equipment, isolated from corporate management, have worked within their own closed-loop environment of specialized data and instructions. Beyond the shop floor, supervisory material scheduling and control also worked within its own requirements and cluster of work cells.

In the early 1970s, however, the first steps toward integration of the various components occurred. The advent of minicomputers allowed data processing to be dispersed at a lower cost among various corporate departments. Operating systems were more powerful, and programming was becoming easier for in-house personnel. On-line, real-time report writers provided quick distribution of materials handling, inventory and other data without the traditional time lag and channeling through MIS.

Also in development was the concept of materials requirements planning (MRP), an attempt by manufacturers to utilize the newly available corporate processing power to integrate applications such as billing, work in process, inventory, cost accounting, purchasing and other direct manufacturing procedures.

The emphasis was on integration. This emphasis on data integration, however, has occurred more often in theory than in practice. One major obstacle has been built-in resistance by various departments within manufacturing, which were driven by fear of change and reluctance to relinquish control.

Faced with the daunting complexity of the manufacturing market, turnkey systems houses had little choice but to produce specialized vertical market products that worked in relative isolation from systems in other departments. Aggravating the situation were the number of proprietary operating systems and software produced; interfacing with other vendor systems became impossible without extensive and expensive reprogramming.

Only In Hollywood

The word robot conjures up images of science fiction anthropomorphic androids wreaking vengeful havoc on its human creators or dutifully carrying out mankind's salvation. Of the estimated 19,000 robots now toiling in U.S. industry, however, most look more like one-armed cuisinarts than humans. The intelligence of most robots consists of taking a few simple orders and performing tasks that would tax the patience of a child.

Today's robots are used on the assemblyline to spot weld, arc weld, spray paint, move material and perform minor assembly jobs. Robots can work in areas that are toxic and dangerous to humans; they do not take breaks, do not belong to unions, do not demand sick pay, rarely countermand an order and really don't care how the Celtics are doing. Management likes robots.

Robots are incredibly structured workers. They have to be. The average robot is not a jack-of-all-trades. In fact, the average robot performs only a single function — but does it very well. Robots represent specialized labor to the nth degree. The curious fact that robots work in clusters, or cells, has nothing to do with their being gregarious. They are merely being cost effective. While one robot is doing a spot weld on one side of an automobile chassis, another can do the same on the other side. When they are finished, the chassis will continue down the conveyor belt and meet other welding robots whose areas of expertise might be doors. After these come the painting robots, and then the finishing robots. True division of labor, but hardly renaissance machines.

Times are changing. The buzzword in manufacturing is *system*. Customers want robot systems, with system applications, not just single machines. They want robots to be integrated, not segregated. They want robots to be holistic, not individualistic, to work in kind with other processing machinery, with support systems, with inventory control — to become part of the new team flexible manufacturing.

Robot makers have heeded the word. Systems they want, systems they'll get. Sometime in the future. Right now the robot industry is busy reaping what it has sown. Multiple vendors with multiple protocols, control systems and programming languages. No SNA-like standard exists in the robot industry. The closest is General Motors Corp. Manufacturing Automation Protocol (MAP), but it will be several years before MAP is strong enough to force robot vendors to conform to its standard. Until then, integrating robots into flexible manufacturing systems will cost dearly.

All is not gloomy. Robots are beginning to see the light — literally. Vision-capable robots are better, smarter and more reliable, thanks to major advances in signal processing semiconductor technology. These robots promise to be the leading edge in manufacturing systems of the future.

As for those Hollywood robots shown balancing the company books, don't hold your breath.

Rapid growth occurred in yet another relatively independent and very important area of manufacturing: computer-aided design and computer-aided manufacturing (CAD/CAM). CAD/CAM has also attracted its own set of systems vendors which, until recently, provided application-specific products that remained all but isolated from other DP operations within manufacturing. With the recent economic downturn and increased competition from foreign manufacturers, however, U.S. industry has again been taking a long hard look at how computers and the linking of manufacturing operations can help increase profit and efficiency. A primary impetus has come from within the manufacturing industry itself.

Manufacturing resource planning (MRP II) goes a few steps beyond its predecessor, material requirements planning. MRP II is a planning and operating system that includes all manufacturing functions — material, capacity, finance, engineering, sales, distribution and marketing. MRP II is meant to be a generic set of operational rules applied to all manufacturing companies, regardless of size and product. Its basic premise is integration; its modus operandi is computers.

A working MRP II system is in place at the Pratt & Whitney Aircraft Co. in East Hartford, Conn. Ted Brindamour, Pratt & Whitney's manager of office automation, described the company's MIS data base as "very elaborate," and said the entire shop floor control systems of several regional plants provide data to it.

"Numerical control machines and logical controllers on the shop floors are online to the IBM mainframes in MIS at the East Hartford head office," Brindamour explained. "Data from the shop floors is used to produce work schedules, parts forecasting, machine time scheduling and identifying manufacturing bottlenecks for engine parts.

"Every two weeks we produce a new schedule, listing what kinds of engines we're going to ship, what kinds of spare parts, and then the system creates a new schedule for the shop floor to build to. What we're working on now is using the raw and finished material tracking to interface more with the financial group to do 'what if' scenarios and strategic planning."

Though this installation uses a relatively advanced MRP II system, it is only the first step in what the manufacturing industry has designated as computer-integrated manufacturing (CIM), deemed the ultimate evolution of computerized manufacturing. CIM has come to mean the implementation of a fully integrated data base that flows through the entire manufacturing process from process control to finance, with all intermediate steps — such as production control, scheduling, inventory, cost accounting and engineering — driven from the same data base.

Implementing CIM is a huge undertaking, one fraught as much with organizational considerations as with the actual availability of CIM technology. Digital Equipment Corp., for instance, advises its clients that the implementation of its Baseway integrated manufacturing system should be overseen by a controlling group within an organization and not on a departmental basis.

"MIS is a service organization which has a heavy influence and responsibility in supporting the computer systems that are supporting the manufacturing environment," Denney LaBarge, DEC's marketing manager of manufacturing, architecture and networks, explained. "However, though the actual implementation of CIM systems might not come from MIS but from the various departments themselves, the strategic implications of a truly integrated environment require a focus by something like an MIS group to make sure the integration can be handled in a flexible and expandable manner. The market is moving toward a high degree of compatibility in the multivendor environment, but you still need either MIS or some other technical resource to oversee and advise."

ASK Computer Systems, Inc., a Los Altos, Calif., turnkey systems house and producer of the manufacturing management (Manman) integrated manufacturing system, sees nothing wrong in individual departments taking control of CIM integration.

According to David Sohn, ASK's vice-president of marketing, "The impetus to install a system like Manman can come from one of three places. The manufacturing department is often a key mover because they know they need a better tool for scheduling and planning. The financial side is also interested because by integrating manufacturing with the financial area, you can get better control over the financial end. The third area is MIS, which may be responding to questions from both the manufacturing and the financial groups, then coming to us for answers. Departments can implement almost in a vacuum, unconcerned about what the next department is doing, since we've already taken care of that problem through built-in controls."

Of those few computer vendors now beginning to offer several pieces of the CIM puzzle, DEC is in an unusually good position, in large part because of the early dominance of its PDP-11 computer on U.S. factory floors. PDP-11s control individual work cells through programmable logic controllers; the PDP-11s, in turn, are further clustered into groups of work cells usually controlled by DEC VAX minicomputers.

DEC has used this base to further penetrate into the MRP and MIS functions of large manufacturing concerns. Recently, DEC has seen the time ripe for the introduction of Baseway, its series of software products that will serve as the core of a manufacturing environment and the means to link both DEC and other vendors' equipment. Baseway is a sophisticated communications highway leading from the factory floor to MRP and beyond. The product consists of three software components: the Shopfloor Gateway, a hardware and software communications device running on a PDP-11 system and acting as a translator between specific shop floor devices and a host computer; the Baseway Application Software Bus, which runs on the VAX/VMS operating system, communicates with control devices on the shop floor and provides a common means of sharing data throughout a factory; and the Programmable Device Support, a menu-driven application capable of downloading and uploading, reading and writing, comparing, documenting and maintaining a library of ladder logic programs.

"While MIS can use the shop floor data made available through Baseway," LaBarge explained, "most of the companies using Baseway are employing it in a decision support mode for the management functions essential to keeping the manufacturing plant operating. This includes material management, quality control, maintenance, supervision and superintending and keeping track of production statistics to reconcile against the production schedule. Reports can be created showing the current production status of an entire plant, by departments, workstations or individual machines."

DEC also seems committed to the needs of users in a multivendor manufacturing environment. Gateways from Decnet networks to IBM Systems Network Architecture (SNA) environments provide a good avenue for DEC and its large manufacturing customer base to further extend into the IBM-controlled MIS departments, a logical step if DEC is intent on influencing future manufacturing MIS purchasing decisions.

LaBarge added that DEC is also intent on producing products that will be compatible with both the International Standards Organization's Open Systems Interconnect and the General Motors Corp. Manufacturing Automation Protocol (MAP) architectures, both gaining more popularity and support in manufacturing.

Baseway represents the flagship CIM product from DEC, and more will be forthcoming from Cimlab, the company's newly opened CIM laboratory located in Shrewsbury, Mass. Cimlab will be DEC's primary facility for developing and testing its CIM products.

Computervision of Bedford, Mass., one of the pioneers in CAD/CAM application systems, has attempted to integrate MRP II and CAD/CAM through Factoryvision, a microcomputer-based factory floor management system. The heart of the system is a 32-bit Computervision CDS 3901 CPU supporting up to 16 view-only terminals. The Factoryvision data base consists of text and graphics such as engineering and detailed drawings, process plans, assembly instructions and numerical control data. Product information created and stored on Computervision CAD/CAM systems is distributed by Factoryvision throughout the various levels of factory management and operations, enabling designers, engineers and administration to maintain drawings and project data. It will also provide floor managers and production workers on the factory floor with up-to-date graphics and instructions.

Factoryvision draws on Computervision's extensive CAD expertise to tie together the CAM, or manufacturing element, with graphics, a union that until recently has been more one of words than of substance. "The general decline in computing costs has made it economical to distribute CAD/CAM data directly, instead of relying on hard copy carried by hand," John Langley, Computervision's product manager, said.

Factoryvision is aimed to achieve graphics data distribution through three modules. Planning and Administrative is used by engineers and designers for the viewing and maintenance of drawings and plans. Production System carries production data such as process plans, tool lists and work load and distribution data directly to the factory floor. Machine Tool Management enables numerical control data to be sent through the Factoryvision network to a shop floor machine tool, coordinate measuring machine or robot — without the use of tape.

"We're not creating graphics or generating requirements or detailed scheduling," Langley explained. "Factoryvision acts as a conduit to channel process information down from MRP and CAD/CAM to the factory floor. A typical application would consist of a demand created in MRP, followed by a suppply order sent to the shop in the form of a schedule. Once the order is completed, a feedback in the form of a transaction goes back to an MRP mailbox so that files can be updated to relieve demand. We're really the middleman between the business systems and the factory."

ASK Computer Systems has specialised in providing turnkey systems for MRP for almost a decade. Starting with an inventory control package, ASK has gradually extended its offerings to try to keep pace with the expanding role of MRP. "From the inventory core," Sohm explained, "we added a master scheduling module, a capacity planning module and materials requirements planning. That set was basically what people in the past called materials requirements planning. When you add order entry, accounts receivable and payable and general ledger, you have MRP II."

ASK's Manman MRP II system is structured around 16 modules, Sohm said, and runs on either Hewlett-Packard Co. 3000 series or DEC VAX series computers. Data flows in two directions. From the factory floor, process data can be keyed into terminals and fed into the central computer, which can reside in MIS or elsewhere (Sohm stressed the location was relatively unimportant). Factory floor information tracking material movement and processing is fed immediately by the central computer into general ledger files, booking those material usage costs to appropriate general ledger accounts. As this data is processed, production schedules are updated, enabling management to recalculate production schedules on a regular basis.

ASK and other CIM systems suppliers are learning that being profitable in CIM means coming to terms with a manufacturing world dominated by DEC and IBM. As MRP II becomes more of an MIS-influenced and MIS-driven function, systems vendors are providing gateway facilities to tie into IBM mainframes and DEC minis.

High-profile CAD/CAM vendor Apollo Computer Corp. of Chelmsford, Mass., for example, has made sure its new Domain networking software can tie users into IBM computers through 2780 and 3780 terminal emulation and DEC computers through an Ethernet gateway. A gateway to IBM's SNA network is scheduled soon. Bill Kaiser, Apollo's manager of CAD/CAE/CIM market development, said, "IBM will not be able to cover all the bases in CIM for some time. However, as CIM becomes more of a corporate concern, with MIS a major player, any vendor that can't relate its products to IBM MIS data bases is going to be isolated."

Analysts generally agree that if any company has the resources to market a complete CIM system in the near future, it is IBM. Though cool and reticent about its intentions in the CIM market, the computer giant has been quietly putting the pieces together for what seems to be a planned assault on a CIM market that should reach $73 billion in the U.S. by 1989, according to International Resource Development, Inc., a Norwalk, Conn., research outfit.

In the CAD/CAM area, IBM's extensive offering of software packages includes Cadam, for drafting; Catia, for three-dimensional mechanical design; Caeds, for linear analysis; and CBDS, for circuit board design. Late in 1984, IBM also lowered prices on its models 4331 and 4361, the same superminis that drive IBM's CAD/CAM systems and are used extensively throughout manufacturing MIS departments. At the low end, IBM will be introducing a Cadam version for its Personal Computer and will also announce a ruggedised version of its Personal Computer for shop floor use. At the high end of the CAD/CAM market, IBM is aggressively pursuing penetration through value-added resellers to regain an engineering segment they had all but lost over the past two decades. It is conceivable that by the end of this decade, IBM will be a major force on the shop floor, in the design and engineering departments and in corporate industrial DP, three areas that comprise the main building blocks of CIM.

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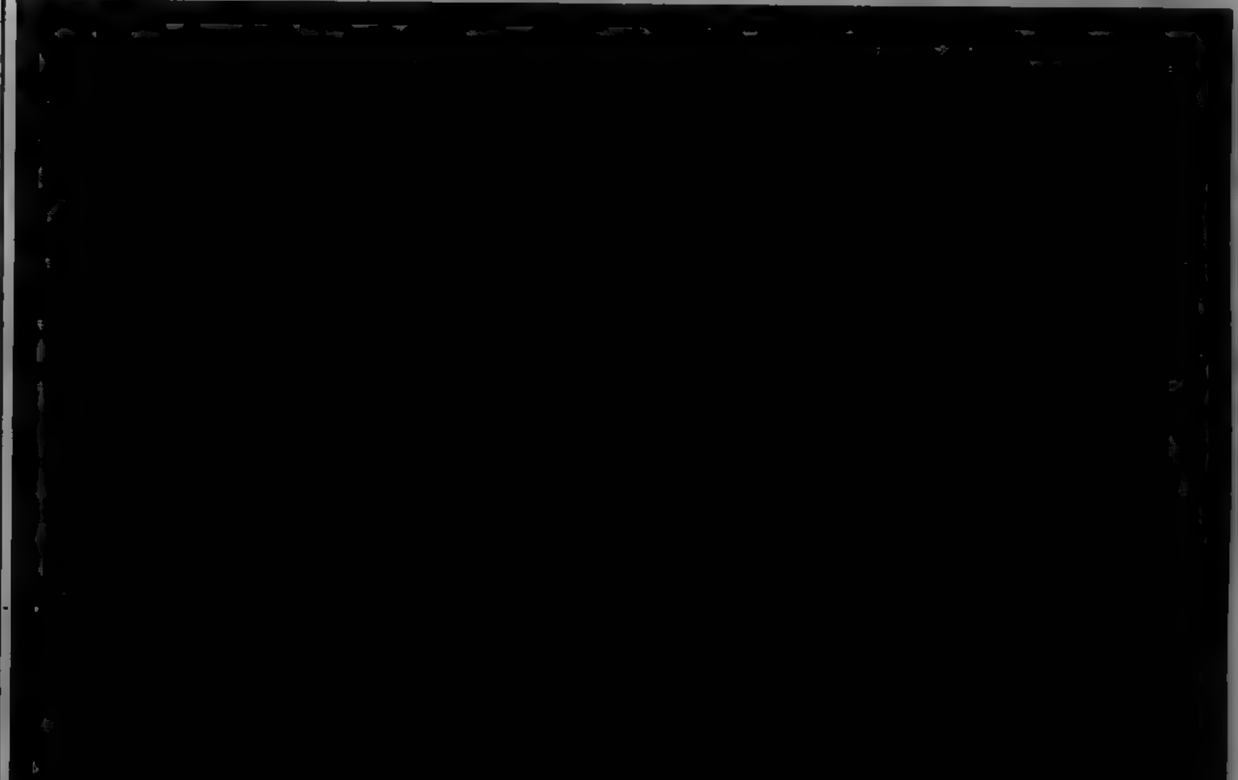
Kolodziej is a senior writer at Computerworld Focus.



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Automation Heats Up At Lukens Steel

By Lee White

Lukens Steel Co. in Coatesville, Pa., has a history of making history. Brandywine Iron Works and Nail Factory became the first U.S. iron company headed by a woman when, in 1825, Rebecca Lukens took over the mill her father founded. In spite of lawsuits instituted by her family, she ran the company until 1840 and lived to see it renamed in her honor.

More than a century later, Lukens Steel made history once more. In 1960, IBM and Lukens joined forces to computerize the guiding of electric furnaces by means of an IBM 1800. Twenty-five years of computerization and 175 years of steelmaking later, Lukens hit the Fortune 500 — at the 500th place. Those 175 years were not all good years, however. Lukens' success story could be compressed into the last five of those years and can be attributed to state-of-the-art computerization and state-of-the-mind people. That success came in spite of the fact that steel production at Lukens fell from 734,000 tons to 483,000 tons between 1980 and 1984, profits declined, the number of salaried personnel was halved and the ranks of steel workers decreased by 35%. In 1983 Lukens lost $14 million.

Lukens wasn't the only organization in trouble: The steel industry was suffering across the board, partially because the economy was soft and partially because an influx of less expensive foreign steel was under way. It was during this period that management decided some drastic changes had to take place in the way business was conducted.

On the decision-making body guiding these changes was Al Eastburn, vice-president of manufacturing services and planning. Eastburn reports directly to W.R. Wilson, president and chief executive officer of Lukens, Inc. (Lukens Steel Co. is a unit of Lukens, Inc.) and reporting to Eastburn is Lukens Steel's entire DP department, which is divided into management information systems and process control. Eastburn knew that the key to competitive steel making was automation of the process and timely dissemination of information and product to Lukens' customers. For about three years, these two projects have been evolving. They are expensive, in terms both of hardware/software and of staffing requirements, but Eastburn convinced top management the money had to be spent.

Providing for efficiency in a steel mill was no easy task. After an order has been taken, mill instructions are generated by computer and can be 30 pages in length. These instructions are written by the IBM 3083 and are based on metallurgical, customer or processing requirements. If there is no plate in inventory, the order and others of the same chemistry or size are accumulated until the total approaches 160 tons. At this point, the department prepares a furnace, a process also known as "setting a heat." From this point on, the progress of the heat is tracked by local process control computers until shipment occurs.

Two systems resulted from the years of work: Materials Tracking and Expediting (Matrex) and Status On Line (Statline). Prior to Matrex and Statline, according to Mark Kamon, manager of production control and rolling, 200 people worked in production control. These people tracked 650 to 700 orders per month and coordinated 22,000 pieces of steel (in various stages of completion) through 900 acres and 50 different buildings and operation locations. The primary task of these workers was to communicate order status to salespeople and customers. A customer who called to inquire about an order got his information two days later, at which point it was two or three days old and often incorrect.

"We had this mass of people all over the plant who kept those records. They were late, transposition errors were incredible, you had handwriting off sometimes illegibly handwritten documents [that might be] the fifth copy. It was very inefficient, very unprofessional and error-prone from beginning to end. Ergo, Matrex and Statline," Kamon said.

Matrex is the system into which plant personnel key information as the raw material wends its way through processing. When enough raw material has been accumulated, it is melted, poured, cooled, heated again, rolled, laid out, cut, inspected, loaded and shipped. At each point in the process, the status is plugged into the computer. Statline is fed by the Matrex system in an on-line, real-time environment. When a customer or salesperson calls, the sales support person keys in the mill order and item number and can immediately tell the caller the status of the order.

One of the more difficult processes that culminated in Matrex and Statline began in July 1984. Martha Dixon, project manager, and Tom McFadden, lead information services analyst, were charged with automating the tracking system. "We were concerned because we were designing a system for 300 people — union people — working in a manufacturing environment. These people had no concept of computers or keyboards," McFadden said. Their motivation level was also suspect: They were asked to take time from their work to input information into a computer, but they were paid no more for the extra task. Dixon knew the solution would have to be creative.

The answer came in the form of 17 laid-off and retired Lukens plant workers who were rehired to train factory personnel. In an almost circus-like atmosphere "simultaneous activities were going on, major activities. Tom was designing [the system], the programmers were programming, the user was defining the needs. We were also reconfiguring an IBM 4381 and installing an IBM 3083. There were 55 CRTs and printers [to be installed] for this project alone," Dixon explained.

And it wasn't just the systems staff that contributed to the endeavor. Telecommunications was involved with cabling, and the cubicles that housed the computer terminals had to be built and installed. "It was a very dynamic, fluid process. The training aspect had to go on because there were about five or six major transactions that occurred; all the processes we go through with plate [steel] — all had to be designed," Dixon said. The due date for completion of all hardware and software installation, designing, testing and training for the first two buildings and personnel was Sept. 17, 1984. The staff made that deadline, and by the end of October the entire project was completed.

According to Dixon, McFadden and Kamon, the key factors in the successful completion of the implementation were the resourcefulness and motivation of the trainers and the receptive attitudes of the hourly and salaried factory workers. Dixon had high praise for the trainers. "Everybody had a great deal of respect for them. They were brought in for a very temporary assignment, and they put their hearts and souls into it. They trained the people, they learned, they tested for us and they worked odd hours. The retirees — some of them had been with the company for 20 and 30 years — knew the operations out in the mill, they knew the people and there was acceptance [of them] by the union workers."

Mill workers got equally high marks. "The hourly union people have no constraints on them. [Data entry isn't] tied to their payroll. It's strictly an honor system, and we're getting in the neighborhood of 98% of the data input into the system. I still to this day cannot believe we're getting 98%," McFadden enthused. Kamon echoed McFadden's sentiments. "They're inputting 20 characters at a pop. We want it timely, and we want it right. We audit [input] and it's 99%-plus accurate the first time."

These efforts resulted in an extremely favorable bottom line. The customer satisfaction rate, determined by quality of final product and on-time shipping, was approximately 30% in the second half of 1984. After implementation of Matrex and Statline, the customer satisfaction rate increased to 90% in the first quarter of 1985. Ron Jones, manager of customer service, sent surveys to Lukens' customers recently to see what effect Matrex and Statline have had. All surveys were returned with favorable reports.

Jones cited one example of the turnaround Lukens experienced. "There is a bridge fabricator in the South. This time last year he refused to give us another order. We went to him after we got the system in place and were able to sell him on the fact that we had changed. He gave us another chance, and we have an almost perfect record with him."

But the computerization of the tracking and expediting portions of Lukens Steel is only half the story. In the early '80s, process control (which had been phased out in the '60s) was reactivated when Eastburn hired Sharon Muscedere as supervisor of process control. Muscedere, an electrical engineer, had never worked in the steel industry, but the challenges sold her on the job. "There were a hundred different projects I could see right off the bat. The other steel companies were really ahead of us when I first got here, but we're catching up fast. Right now we've got a project priority list that can go on for the next 10 years."

> **Key factors in the successful implementation were the resourcefulness and motivation of the trainers and the receptive attitudes of hourly and salaried factory workers.**

The first step for Muscedere's process control group was a migration from the centralized 1800 to three levels of distributed control through Digital Equipment Corp. computers. Traditionally an IBM shop, Lukens made a conscious decision to go with DEC, according to Russ Melton, Eastburn's assistant. "[IBM] abandoned the process control side and all the engineers came through college learning about DEC, so that was the machine of choice. IBM would really like to get back into this business, but they've got a long, hard pull ahead of them," he commented.

After the hardware decision was made, Muscedere had to find a way to collect sensor information. Lukens chose Gould, Inc. Modicon programmable controllers for their heavy-duty construction and ability to function in a dirty, non-temperature-controlled environment. Another important reason was that the controllers require no programming language. "They use ladder logic very similar to the schematics electricians are familiar with," Muscedere said. "After we install them, the maintenance department is able to support them for us."

Another problem was data communication. Because heavy drives and machinery cause electrical interference in the plant, data communication over twisted pairs was not good enough. Muscedere and her staff decided to install fiber-optic communication lines and statistical multiplexers to put intelligence at both ends of the line.

But the biggest job was converting from the 1800 to DEC PDP-11/44s and finally to a DEC VAX cluster. "We found that the scope grew with the project. We wanted to have growth built in," Muscedere explained. At present there are three VAX-11/750s: one for the live system, one as a backup/test system and one for development. The company expects to add another live system in the near future.

The process control group had given much thought to the problem of growth. "One thing certain in process control is that sooner or later you're going to upgrade to larger computers, so there is a definite need for transportability of software," Muscedere said.

To ease the growing pains, the company custom designed a virtual operating system (VOS) for all the software. Lukens has already realised tremendous benefit from the effort; in the migration from PDP-11s to VAX-11/750s, 95% of the software did not have to be rewritten.

The general environment of the steel mill couldn't seem less well suited to computerization; the mills are dirty, noisy, old and hot. Yet an astonishing amount of automation is taking place. Describing the inside of a steel mill is difficult, but the phrase "sensory overload" is appropriate. The furnace itself has a 22-foot inside diameter. The buckets carrying the scrap steel that is dumped into the furnace weigh 70,000 pounds each when empty; the scrap charge adds another 130,000 pounds to the weight. Each heat uses at least three buckets of scrap. The roof of the furnace lifts and rotates 61 degrees to allow the bucket of scrap to be poured into the furnace, and the roof itself weighs approximately 150,000 pounds. The furnace's total weight with three buckets of scrap is 1,300,000 pounds.

The electricity consumed for a furnace's heat is so high that Lukens pays the highest electric rates in Pennsylvania. To minimise that expense, most heats take place in off-peak usage hours. The heat attained in each furnace approaches 3,000 degrees Fahrenheit. One furnace uses 800 kilowatt hours of electricity per minute; the average house uses 500 kilowatt hours per month. Strolling through the melt shop when it's 90 degrees Fahrenheit outdoors and fire is belching from the furnaces is enough to convince those who believe in hell to try and lead a better life. When one then realizes that a computer is sensing, moving, monitoring, recording and reporting all activities from the selection of the scrap to the melting of the steel, the enormity of the task is underscored.

Much of the operator's job is done from the pulpit, a glass-enclosed area a few yards away suspended about one story over the furnaces. The operator uses CRTs and buttons to monitor the scrap, the weight of the buckets and the heat chemistry. When all the numbers are correct, the furnace is turned on. Dave Kramer, lead systems engineer, explained that the entire system, called Operator Guidance and Control, exists primarily to supply just the amount of energy necessary. A secondary purpose is to collect data for an historical file, which includes targeted chemistries and unusual events of the heat. This information, combined with data from computers in the chemistry laboratory, is put into a data base that is transmitted to Mathematica Products Group, Inc.'s Ramis on the IBM 3083.

Kramer is heading up another automation project at the West Side building. At present, two furnaces heat treat high-carbon plate steel. Prior to the project's first phase, temperature was monitored by 35-year-old controls. Kramer and his group brought in a Leeds and Northrup Co. Max 1 distributed control non-language-based system, added various other digital displays and improved temperature control from plus or minus 30 degrees to plus or minus 5 degrees.

The second phase, which is in progress now, is to add a DEC PDP-11/73, a microcomputer and a Gould Modicon 584. These additions will control temperature and aid in tracking the product. Kramer's group is presently designing a touch-sensitive screen to allow operators to select information. This will produce a chronological report that can be used by the metallurgical groups to evaluate and improve the process. The third phase, which Kramer hesitated to call the last, will "beef up" the supervisory computer and automatically link the monitored information. In addition, "there will be functions to improve combustion control for energy conservation. This will be communicated to the [IBM 3083] so we can get historical production information into Ramis-like files to statistically evaluate necessary improvements."

That Lukens is on its way to state-of-the-art from a computer standpoint is obvious. But Wheeling-Pittsburgh Steel Corp. spent $700 million to modernise its steel-making operations, only to be forced into filing Chapter 11 bankruptcy in April 1984.

What sets Lukens apart is the respect its managers show for the workers and the resulting willingness of the workers to do their part to make the company function better. Kramer, who works quite closely with many of the factory personnel, said the operators have received the systems very well. McFadden added that the workers were very aware that their futures hung in the balance. "We had gone through two years of losing money. They all recognised that this was an effort that was going to make the company more profitable," McFadden said. Muscedere, whose background had included clean-tech E.I. DuPont de Nemours & Co., expressed surprise at the workers' easy acceptance of process control automation. "The operators, the union people, desperately want computer assistance. I find that attitude refreshing — really different from other places I've worked."

Rebecca Lukens might have a hard time understanding the concept of automation, but she'd no doubt be very proud of the company that bears her name.

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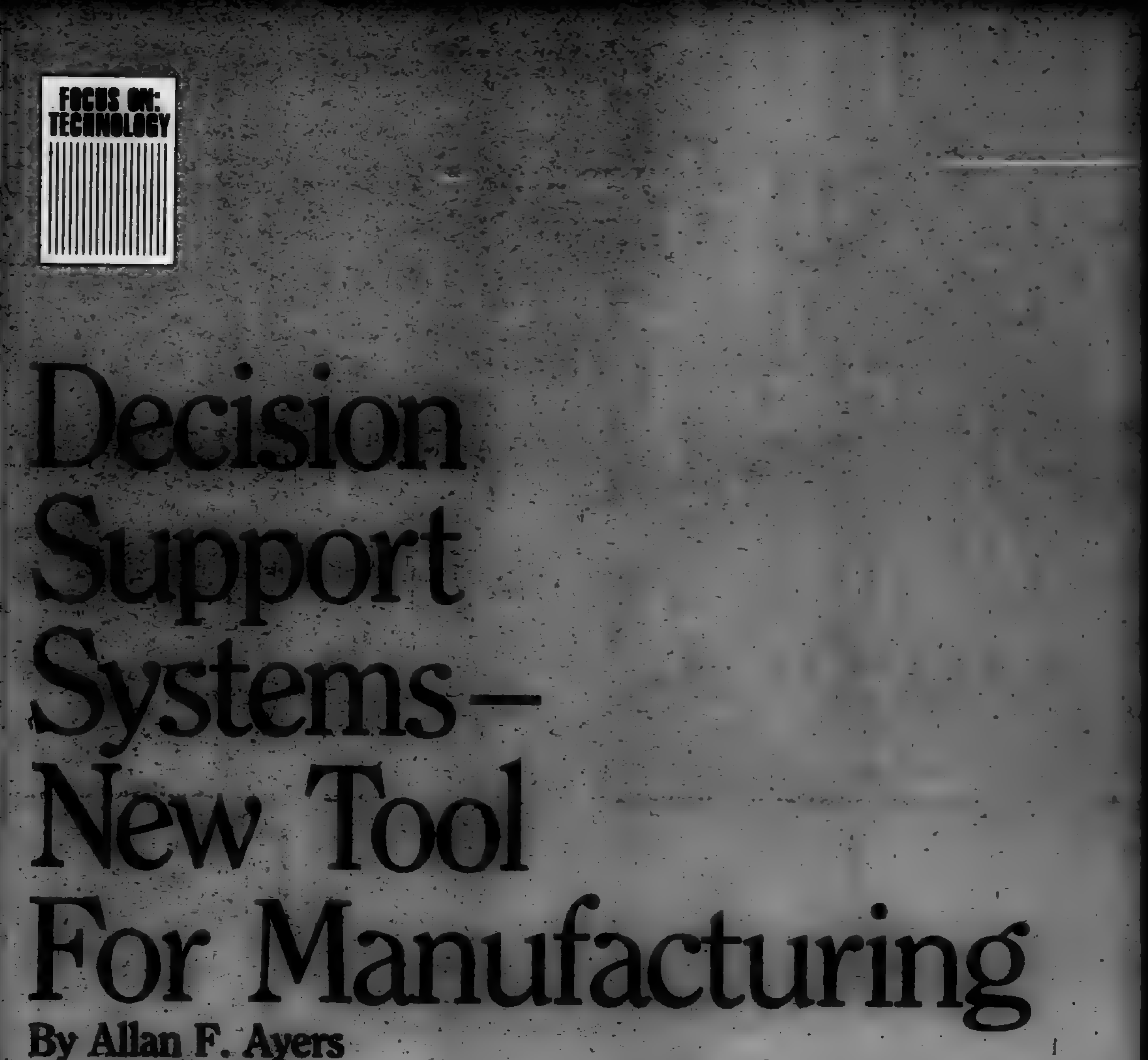
White is senior writer at Computerworld Focus.



FOCUS ON:
TECHNOLOGY

Decision Support Systems— New Tool For Manufacturing

By Allan F. Ayers

The number of manufacturing control systems (MCS) has grown enormously in the past decade. These systems, commonly known as MRP systems, evolved from the materials requirements planning process. More than 140 of these systems are currently on the market. Some are truly full MCS; others provide only parts of the MCS. Many operate on more than one type of hardware. Some are strong in planning; others in shop floor control.

All of these systems, however, have one thing in common: They are principally operational systems — designed to process the following operational activities:

- Receiving daily or weekly input transactions such as orders, shipments, receipts and detail forecasts.
- Generating detail-level outputs such as shipping documents, production orders and requirements lists.
- Providing detail inquiries such as bills of material structures, open orders and available inventory.
- Day-by-day systems control.

What most management control systems lack is the summary-level management information managers need to plan and manage the overall performance of the business. There is a valid reason for this omission: The realm of management information cannot readily be packaged. Management styles differ; therefore presentation and analysis will vary. The actual measurement and reporting requirements are different and depend on the nature of the business and the analysis required at the moment. Management information is also less structured and cannot be routinely scheduled. This is where decision support systems (DSS) become useful.

DSS Environment: DSS are used to solve information problems in a particular environment. That environment is created through the following conditions:

- The problem is too complex to be solved by hand. Complexity may be caused by the volume of numbers, the difficulty of the analysis or both.
- The problem continues to change with the high degree of uncertainty and is probably event driven. There are frequent changes in variables that may be updated either on a time schedule or in response to some level of control feedback. (For example, decisions about inventory stocking levels may change as interest rates drop.)
- The inputs to the problem cause frequent rerunning of the process to evaluate the new results.
- The answers are needed in a short time relative to the nature of the analysis.
- Intermediate results may be used to specify the direction of the rest of the processing; therefore the problem calls for an interactive person/computer relationship.

Data Acquisition: A DSS must have the flexibility to draw data from several sources. The principal source would normally be existing computerized data bases. These bases may be in any of several forms ranging from simple sequential data files to elaborate data base structures. Because a DSS would presumably operate on a copy of the data rather than on the data base itself (to protect data integrity), this variability in structure need not be a complex problem. It may require interface programs that draw data from the data base and load it into file structures suitable for the DSS. A major problem in dealing with corporate data is the size of the data base. With very large hierarchical data bases, a thorough analysis of the data to be provided for the DSS and the frequency of revision are essential.

A second source of data would be manual inputs from the user of the system. A DSS should therefore have input loading and data file management capabilities. Many available DSS software products have complete CRT screen development and data entry editing capabilities. A company doing an analysis of requirements for selecting a particular product should pay close attention to its needs in this area.

Personal Computers

Symphony
Dbase III
Rbase
Dataflex
Oracle
PC/Focus
Nomad2

Minicomputers

Oracle
Info
Ingres
Natural
Relate/3000
Datatrieve
Quso-IV

Mainframes

Oracle
Focus
Nomad2
Natural
Ramis II
IDMS/R
Express
Manage

Figure 1. Software Tools

A last source — public data bases — is becoming increasingly more significant and is now available via computerised communications. Public data bases are usually retrievable through personal computers or data terminals. To be used in conjunction with data from company resources, this data clearly has to remain in computer-readable format and be communicated to the hardware system running the DSS software. Other methods of obtaining this data include periodic computer tapes and, for larger client companies, direct computer communication.

Data Processing: A DSS should be able to perform several types of processing on the data in the system. First, the data may have to be aggregated, merged or otherwise manipulated to put it into an appropriate level of detail and configuration for analysis. This would be considered a processing step. Second, the preprocessed data will be analysed. This may include statistical analysis (such as linear regression), groupings or percentages of totals or matrix manipulation using an electronic worksheet approach. Third, all these manipulations might call for "what if" capabilities or other simulations to test results and the sensitivity of those results to changes in the data.

Data Presentation: A DSS must be able to present the results of analyses. This presentation may take the shape of either a line by line display on a video display terminal or a formal report with graphics incorporated.

Computer resources that the DSS will use has still not been addressed because the DSS can be implemented either on personal computers (linked to the corporate computer) or through computer software tools directly on the corporate computer. The technical aspects will differ, but the concepts will remain the same. Some examples of software available to support a DSS are shown in Figure 1. This list is not complete, and the breadth of capabilities varies significantly from one tool to the next. (Special-purpose tools that would add to a DSS have not been included.)

DSS in Manufacturing: The number of ways a DSS could be applied in manufacturing are limited only by the manufacturing manager's imagination. A standard MCS consists of 10 or 11 modules covering the systems shown in Figure 2, Page 38.

These systems are all oriented around transaction input and day-by-day control. Depending on the specific MCS, individual modules may have some additional features; some may have capabilities for aggregate management-level information. The latter, if available, is most likely of a limited nature.

Four DSS processes relate directly to senior-level manufacturing needs. These four, which can have a major impact on the

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quality of decisions made and on the bottom line of the income statement are production/sales/inventory (PSI) planning, management performance, quality management and manufacturing/distribution coordination.

Production/sales/inventory planning: The PSI process provides management with a methodology by which sales, finance, production and inventory relationships can be optimized. This relationship can be improved only through the realization that the planning process is implemented from the top down and that each successive level of achievement depends on the achievement of the preceding level. Business planning leads to production planning and performance, which in turn leads to sales (customer shipments), aggregate inventory levels and, ultimately, to master scheduling (that important document that drives our total manufacturing operation).

The objective of the PSI plan is to develop a course of action that maximizes market penetration under the constraints of production capacity and inventory investment. The PSI process is an integration of sales, manufacturing, logistics and financial data to produce a continuous 12-month master production plan at a product family level. The process begins with a sales forecast by month of the number of units required in each family for the next 12 months. Production plans are then calculated to meet sales requirements and desired finished goods inventory targets. The production plans are reviewed to assess the plant's ability to respond. Finance also reviews the dollar results of the forecast, inventory and production plans.

The PSI plan is at a family level suitable for senior management attention. This implies a maximum of about 10 to 15 families.

The PSI process is iterative. Each month, sales submits necessary changes to the existing forecast and projections for the 12-month planning horizon. Manufacturing reviews required changes in light of current assembly and procurement lead time constraints, capacity limitations, inventory position and the master schedule impact. Top management has the final right of review on the PSI plan. After top management has revised and approved the plan, changes and inputs to the master schedule are made.

The implementation of the PSI planning process requires several inputs:

- Sales forecast data is usually by product family and month for 12 months. The data should be expressed in terms of units where possible. This may be obtained through a computerized or manual forecasting system.
- Production planning data (which expresses current plans for the plants) is by product family and month. These units may or may not be in the same unit of measure as a sales forecast; if not, one or the other must be converted.
- Inventory target levels are expressed in turns, weeks of inventory or units on hand.
- Financial data converts all plans to dollars to determine the financial impact.

The processing concept is relatively simple: Beginning Inventory + Production — Sales = Ending Inventory.

In the real world, sales may be projected to exceed production capacity or to be far below capacity. In both cases, decisions that will call for compromises must be made. Inventory targets may be ideal, but the actual balance of inventory between various stocking points may prohibit reaching the targets. The system would process the equation, reflect the results and provide the ability to balance the system by revising the plans to the relative satisfaction of all key managers.

To process this type of an analysis, a spreadsheet system can be used if it has appropriate links to corporate data. The corporate data would provide, among other things, current actual results as well as current master production schedules (that aggregate into the total production plan) and possibly sales forecasts.

The operating environment for the PSI planning process should include the following steps:

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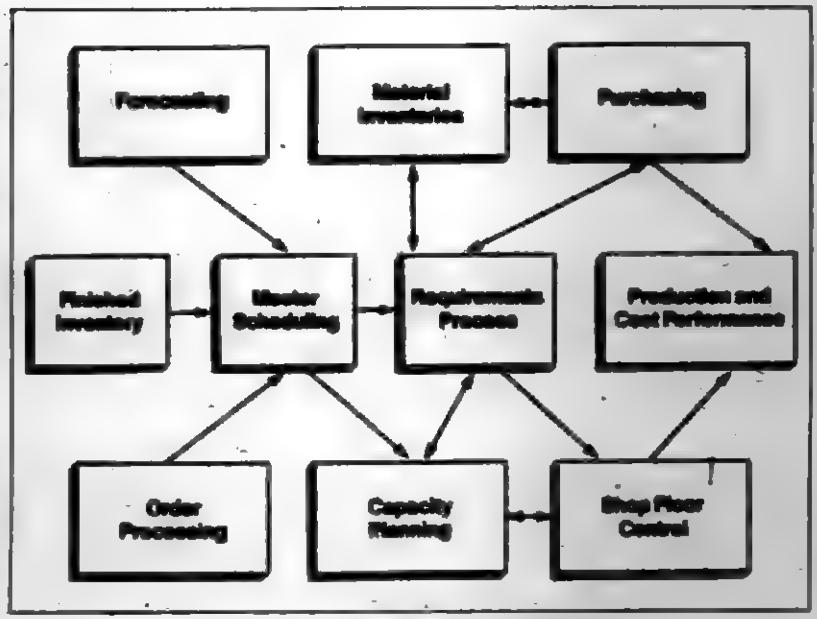

Figure 2. Manufacturing Control System

- The sales forecast would be provided either through aggregating individual item sales forecasts up to an appropriate product family level or by using product family group forecasts. The use of item forecasts would assume that the individual item forecast had already been reconciled with higher level group forecasts created independently to provide a satisfactory sales plan.
- Actual sales data as provided by customer order processing and sales history systems would be accumulated to the appropriate level.
- Inventory results would be generated based on the sales forecasts and desired targets to meet customer service objectives.
- Production needs would usually be projected based on meeting inventory targets at the product family level. Aggregate production needs may be developed by summarizing individual production requirements if item projections are used.
- Summary results would be reported comparing sales and inventories and production.
- Where problems occur, detail information must be available to be analysed to revise the aggregate results. Subsequent adjustments must be made to detail-level data (forecasts, inventories or production plans) to reflect the revised plan. This adjustment is usually an update to the master production schedule.

Production management performance analysis: The management performance process should be looking at appropriate summary-level objectives for performance and reporting actual results against those targets.

Quality management recently gained a lot of attention as a means of improving a company's competitive position. Unfortunately, quality management is a little bit of mom and apple pie. In the real world, the range of success with measuring and managing quality has been wide. Beyond the ability of tracking inspection results and measuring statistics for acceptance and rejection in materials, quality management frequently gets limited systems attention. There is a real relationship among quality, profitability and market share. In a study by the Strategic Planning Institute, the bottom line return on sales doubled with an improvement in quality, which justified a 9% increase in selling price.

Quantifying quality, especially perceived quality, is difficult. However, an index of product quality can be developed by measuring and evaluating key factors that make up quality. This index then becomes a relative measure that can be tracked and compared to predefined targets. Factors that make up quality might include level of rejects in key materials, level of intermediate assembly inspection rejects, level of final product inspection of rejects, warranty repairs, production problems and mean time between failures.

Perceived quality is more difficult to assess and will be determined through market analysis. If a measure of perceived quality can be obtained, comparing it with the quality index (based on objective data) can provide a measure of a product's present position. (See Figure 3.)

A DSS provides the tools with which current quality factors can be measured and potential improvements analysed. In addition, more detailed information could be captured for analysis. The most important additional need is to understand causes for rejects at each inspection point; failures cannot be resolved unless causes are identified.

Another process in which DSS provides useful support is yield analysis of production output. Through statistical sampling, a process can be evaluated to determine average yield (or tolerance level) of a production process. In addition, statistical boundaries can be established to provide a specificed probability that subsequent production runs are within acceptable levels. Production runs that exceed limits are then examined to analyse reasons for their being out of the acceptable range.

The DSS would be used for both statistical analysis (using suitable statistical tools) and tracking (gathering and retaining actual production data). The DSS would also be able to simulate the implications of changing the process parameters either in the statistical analysis or for tracking the process.

Rework costs and controlling rework product might also be a part of the quality management DSS if this process is not included effectively through the MCS.

Although there is a substantial overlap in the functions performed by physical distribution and materials management entities in a company, the coordination of planning and action between manufacturing and distribution is often a large black hole. Because cost economies are available through developing a well coordinated distribution and manufacturing interface, this is a fourth key role for DSS. Developing the concepts of the distribution and manufacturing coordination system begins with identifing the points of interface and working backwards to identify the source systems affected. For example:

- Customer delivery dates may have to take into consideration the next replenishment of a distribution center, which may in turn be dependent on a production run. The replenishment may be on a routine cycle that coordinates outbound shipments with pickup of material from vendors. The order due date may also have a much more direct connection with manufacturing in some process industries or job shops where production is planned on a first-come, first-served basis or on a consistent production cycle.
- Production plans may be dependent on rebalancing inventories in a distribution center or on the inability to rebalance those inventories. More and more is being heard about distribution requirements planning (DRP) as a means of developing requirements for a plant. DRP, however, is only as good as the distribution center and plant information, particularly relating to forecasts and product availability. Production planners may need to be able to review distribution center needs in light of a plant service area.
- Customer service performance is a major factor in distribution performance. But service factors also affect inventory levels and quality management. Rarely are the most appropriate service measurement factors provided in an off-the-shelf order processing system because the parameters that are effective in the real world are closely related to the company and industry in which it functions. The DSS can be used to capture basic data from the order processing system. This information might include order date, original due date, actual ship dates, lines shipped complete on each shipment and partial shipment information. Added to that data might be other measures of service. The DSS would provide flexibility to analyze this data and improve the quality of customer service.
- Transportation planning calls for the ability to combine outbound shipments with inbound receipts. If those can be balanced, there may be justification for a contract or private fleet. If that fleet is already in existence, its cost-effective use requires knowledge of both planned receipts and planned shipments.

A quality index will enable a company to track the impact of their quality practices on the market perceptions of their products. As a correlation is developed, details behind the quality measurements can be analysed to improve the production process in the future.

Steps to develop a quality index might include:

- Obtain from the manufacturing control system (or a statistically-based quality measurement system) the rejects for finished goods, assemblies and parts — either purchased or manufactured.
- For each type of rejects, develop frequency of occurrences, cost per occurrence and weighting factor that would put the various types of rejects into a reasonable balance. For example:

Type of Rejects	Number	Cost	Weight	Value
Finished Goods				
Assemblies				
Purchased Parts				
Manufactured Parts				
Raw Materials				
Internal Quality Index				xxxx

- Obtain and track field service repair information and add this information into the quality index, weighted as suitable.
- Conduct periodic customer surveys through a telemarketing organisation to appraise perceived quality of the product in the marketplace. These surveys, conducted quarterly, could rank performance on a scale of 1 to 10 for repetitive types of products or on a better/same/worse than a year ago basis for products of a more durable nature.
- Plot internal quality index, field service index and customer survey for correlation over time.

Figure 3. How to Establish a Quality Index

The DSS is the bridge that provides the capabilities to pull the source data from the various operating systems and to generate these analyses.

A decision support tool provides a mechanism for developing application systems that have a direct impact on the bottom line — reduced costs for inventory, production, freight and distribution — and improved sales through quality management and more responsive production planning.

The most effective use of a DSS in manufacturing occurs in conjunction with the already existing manufacturing and distribution control processes. A DSS should not replace routine system data collection and reporting that can be performed more efficiently through data processing production systems. A DSS will, however, contribute to the success of any system by providing a flexible set of tools for management analysis of the results.

The reason MCS took so long to evolve is that the computer power and resources were not available. Now they are — on-line processing, powerful systems to handle the complex MRP and capacity requirements processing, shop floor data collection equipment and, now, DSS to custom design management's needs.

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FOCUS ON:
TECHNOLOGY

Micro-Based CAD Systems–From Plain Vanilla To Thirty Flavors

By Stan Kolodziej

Until micro technology opened up the computer-aided design market to new groups of users, the only game in town was run by companies like Computervision Corp., IBM, McDonnell Douglas Automation Co. (McAuto) and Applicon, Inc. These vendors offered powerful, multiuser systems that allowed from two to four engineering and design workstations to be attached to a central minicomputer or mainframe. Although the systems were expensive — up to half a million dollars — the design features were excellent, offering 1,024 by 1,024 pixel screen resolution and dedicated CAD software with capabilities such as three-dimensional and multiple viewing, solids modeling, windowing and sharing graphics data bases with other designers.

High price tags, however, were not the only complaint users had about these large systems. A major problem was that several workstations competing for memory placed a drain on the central computer, and response times could become sluggish. CAD was meant to be transparent to designers and to augment their creativity by letting them work at the speed at which they thought rather than the much slower speed of traditional manual drafting. Sluggish response times therefore contradicted the intent of the system.

Another problem was finding time for designers on individual workstations in the multiuser systems. Per-seat prices of host-based systems remained high, availability of workstations limited and only the largest corporate users — traditionally those with revenues over $50 million — could cost-justify installing multiple CAD systems.

A new breed of CAD vendors arose to capture a share of the burgeoning CAD market and fill the demands of companies that could not afford the larger multiuser systems. These vendors began marketing relatively low-cost, single-user technical workstations that could offer many of the design capabilities of the large systems at a fraction of the cost. The new systems also satisfied a craving of large corporate users to further distribute CAD in-house while keeping costs down. As a result, these vendors began opening a market roughly 10 times larger than the traditional CAD market.

Instead of running data through a central processor, technical workstations took advantage of newly introduced 32-bit processors such as the popular Motorola Corp. 68000. The 32-bit processors could handle the rigorous floating point computation and number crunching involved in producing high-resolution CAD drawings and still provide necessary fast throughput. Another advantage was the networking options that enabled these workstations to be linked for the exchange of data. CAD users found they could now have extensive CAD capability for less than $100,000.

A good example of such a system comes from one of the pioneers in technical workstations, Apollo Computer, Inc. of Chelmsford, Mass. Apollo's Domain system consists of individual 32-bit workstations linked by a local-area network. Workstations provide from 1M bytes to 4M bytes of main memory, 1,024 by 1,024 pixel resolution and extensive hard-disk storage. Domain bit-mapped, raster-scan displays use independent 1M bytes of random-access memory for color display. Applications for which Apollo has slated Domain include three-dimensional wireframe, solids modeling and finite element analysis for mechanical engineers; schematic capture and integrated circuit design for electrical engineers; and architectural and structural drawings for the architecture, engineering and construction (AEC) market. Domain packs the punch of a large CAD system into a series of microcomputers.

Many technical workstation vendors are gradually incorporating AT&T's Unix as the operating system for their products. In a market originally known for its array of proprietary operating systems, more vendors are porting Unix versions such as AT&T's System V standard and the Berkeley 4.2 version onto their machines. By doing so, they allow users and turnkey systems vendors to produce a growing base of applications software that can be migrated among various systems without extensive modifications.

Bill Kaiser, Apollo's manager of CAD/CAE/CIM market development, commented, "More CAD vendors are realizing that in a market growing more competitive, users are not going to go with vendors that tie them into proprietary operating systems and networks. Manufacturing companies are starting to build impressive software bases in-house and are looking to try and link their own CAD applications into other areas of manufacturing such as manufacturing resource planning (MRP) and the factory floor. Vendors will have to provide for such future links."

Like IBM, Apollo realizes that value-added resellers are playing a larger role in providing CAD vendors with deeper distribution and market penetration into user markets, especially through vertical applications. One vendor especially successful in this area is Sun Microsystems, which was early to adopt Unix for its CAD products and encouraged users and OEMs to customize its systems. As a result, Sun has managed to capture 15% of the U.S. CAD technical workstation market after only two years in the business.

IBM's new aggressive CAD marketing strategy is also playing a major role in reshaping the CAD market. At the large systems end, IBM has started to intensify and broaden its CAD software offerings, using its installed base of 4300 series superminicomputers as the driving engines of its Cadam, Catia, Caeds and CBDS software programs. As the movement for the integration of CAD and MIS gains momentum, CAD vendors are feeling pressure from users to provide gateways for the interchange of graphics and design data between IBM CAD programs and their own CAD systems.

A good example is the CDS 5000 system from Computervision, a Bedford, Mass., CAD pioneer. The CDS 5000, based on an IBM 4300 computer, uses group technology software from the Organization for Industrial Research (OIR), a Waltham, Mass., subsidiary of Computervision. The system works with software that codes and classifies manufacturing components to create an elaborate parts design data base. From terminals, users can specify certain attributes of a part and receive data on what's in stock. They can also take a generic design of a part and specify characteristics such as length and diameter; they will then receive information from the data base on whether the design has already been done or whether a design can be standardised to use a part already in stock.

"Such a system, where group technology meets with inventory and work in progress, is the beginning of the interaction of MIS, CAD and CAM technologies," explained Bruce Jenkins, senior editor at Daratech, Inc., a Cambridge, Mass. research firm. "For IBM, it represents an opportunity for engineers and designers to see that IBM's data base management systems are truly premier; it also shows MIS departments that computer integration can start in their area. Companies like Computervision are also in a position to say, 'Look, we can use existing IBM computers to create a top-notch CAD system.' That means the user can get started on computer-integrated manufacturing at a fraction of the cost of dedicated high-end CAD systems."

The revolution IBM unwittingly started in the low-end, micro-based CAD market is already having a profound effect on the higher priced technical workstation segment. Two years ago, the low-end CAD market consisted mainly of dedicated technical workstations in the $25,000 to $50,000 range. That period was followed by one dominated by vendors that intended to use the IBM Personal Computer as a proficient, serious design tool with price tags below $10,000.

After initial resistance from CAD users, these predominantly IBM PC-based plain vanilla systems began to gain acceptance. Their first conquests were in the educational environment as CAD learning tools. Next, small AEC firms that could not afford multiple technical workstations saw these new PC-based CAD systems as an opportunity to gain a foothold in automated design. Shortly thereafter, large AEC companies also saw the benefits of some of these PC-based systems. Users were surprised to find that not only was PC CAD software inexpensive — generally between $500 and $1,500 — but many programs actually lived up to the performance claims of their vendors, especially those from the more successful California PC-based software vendors such as Autodesk, Inc., Personal CAD Systems, Inc. and Futurenet Corp. Larger AEC companies that had purchased large numbers of IBM PCs and were now at a loss as to how to utilise them found they could divert some machines to engineering and design departments to offload some of the front-end design burden from the larger CAD systems. Another advantage of PC-based systems was their ability to handle word processing and spreadsheet applications, which the larger, dedicated systems generally could not provide.

Based on sales, the most successful PC-based CAD software vendor is Autodesk. The company's Autocad software recently surpassed IBM's Cadam drafting package as the most-installed CAD software in the world, with installations expected to approach 23,000 by July. Since its introduction two years ago, Autocad has captured roughly 75% of the U.S. PC-based CAD market.

Software packages like Autodesk's Autocad, Personal-CAD Systems' Cadplan and Caddraft and Futurenet's Dash-1 Schematic Designer offer the ability to create; cut and paste; edit and revise; and store and retrieve professional drawings just like their more expensive CAD counterparts.

A cross section of Autocad's users is also indicative of the broadening customer base and use for such PC-based CAD systems. Boulton said Autocad users are about evenly divided among the mechanical engineering, electrical engineering and architecture fields. Uses range from developing contact lenses to designing Olympic bobsleds. One system is even working on the design for the next U.S. entry in the America's Cup Races. The size of companies represented by users also ranges widely, from freelance designers to organisations like Ford Motor Co., General Motors Corp. and other Fortune 50 companies. These large companies are using Autocad to download and upload drawings between IBM PCs and large CAD systems from vendors such as IBM and Huntsville, Ala.-based Intergraph, Inc.

Given the low cost of such PC-based systems, however, users cannot expect performance on the same standard as more expensive CAD systems. PC-based systems are still tied to the much slower processing and response times of 16-bit microcomputers. They are also standalone devices with nonexistent or very weak networking, multiuser and multitasking capabilities. Screen graphics resolution is generally around the medium 600 by 400 pixel range, and windowing, three-dimensional viewing and solids modeling — three major components of larger CAD systems — are still beyond the capability of most PC-based systems.

Vendors of PC-based systems, however, are working to rectify these limitations. Autodesk, for example, will soon introduce additions to Autocad called Advanced Drafting (AD) extensions. Although the basic Autocad package still sells for $1,000, the AD II extension adds mirroring and drag-in capabilities as well as isometric viewing for an extra $1,000. The AD III extension will also provide three-dimensional capability for an additional $500.

Some vendors are increasing the IBM PC's CAD power by adding an Intel 8087 coprocessor to handle floating point computation and increase design throughput. Others, such as Personal CAD Systems, Futurenet and Daisy Corp. of Mountain View, Calif., are further increasing the power of their programs by having them run on the IBM Personal Computer XT and Personal Computer AT, taking advantage of the XT's hard disk and the AT's faster Intel 80286 processor. Turnkey system vendor Hi-Tech Marketing Corp. of Wakefield, Mass., for example, has introduced integrated CAD systems based on the IBM PC AT, the IBM PC XT and the Nippon Electric Corp. APC3 microcomputer. Ranging in price from $2,000 to $30,000, the Hi-Tech systems can run both off-the-shelf and custom software. One Hi-Tech product can even produce numerical control code directly from design specifications, a feat that, according to the company, is usually handled only by systems that cost much more. Users are also purchasing add-on graphics boards from companies like Tecmar, Inc. and Hercules, Inc. to improve IBM PC graphics and resolution.

The IBM PC remains the primary engine driving the extreme low end of the CAD systems market, but other vendors are attempting to place similar CAD software on several IBM PC compatibles from companies such as Zenith Data Systems Corp., Texas Instruments, Inc., NCR Corp. and Compaq Computer Corp. as well as on the new flock of IBM PC AT compatibles. Other CAD programs — for example, the popular Cadapple from Versacad of Huntington Beach, Calif. — are appearing on Apple Computer, Inc. microcomputers and even machines running the CP/M and CP/M-86 operating systems.

This increased activity in the low-end CAD market has attracted larger CAD companies. Applicon, Inc., the Shlumberger subsidiary in Burlington, Mass., has introduced the Aria workstation, based on a 32-bit processor compatible with the Digital Equipment Corp. VAX/VMS operating system. An entry-level Aria system with 3M bytes of main memory and 160M bytes of off-line storage costs $80,000. Control Data Corp. of Minneapolis, Minn., has introduced a low-cost version of its high-priced Icem system. The new Icem Intelligent Workstation has a 32-bit processor with 2M bytes of memory expandable to 8M bytes, and 240M bytes of disk storage. A single workstation configuration with dual display costs from $86,000. Intergraph recently announced Micro II, a DEC Microvax-based four-workstation system priced between $40,000 and $60,000.

Still more competitively priced is Intergraph's $20,000 32-bit workstation, the Interpro 32. The workstation can operate either as a general-purpose computer running software under the Unix 4.2bsd operating system or as an IBM PC-compatible computer running programs under MS-DOS. Computervision seems to have been the first large CAD vendor to test the waters of the PC-based CAD market with the release last year of its Personal Designer package. Other large CAD system vendors will probably follow suit, especially in light of DEC's recent introduction of its $20,000 Microvax II desktop computer and rumors that IBM will soon introduce its own CAD workstation.

Statistics certainly bear witness to why vendors are becoming more interested in the microcomputer-based CAD market. International Resource Development, Inc., a research firm in Norwalk, Conn., is projecting the worldwide CAD market to climb from $2.1 billion in 1984 to $29 billion in 1994. Within this field, low-cost CAD systems — those generally below $80,000 — are expected to capture about 20% of total CAD revenues by 1986, translating roughly into a $800 million share of a $4 billion market. In contrast, low-cost CAD systems captured only 3% of the total CAD market in 1980.

Though PC-based CAD systems still accounted for only $60 million in 1984 U.S. revenues, Los Altos, Calif.-based Creative Strategies International, Inc. has predicted that by 1988 these systems will account for the lion's share of micro-based AEC installations, an area with an annual growth rate of 60% and no signs of flagging.

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Kolodziej is a senior writer at Computerworld Focus.

FOCUS ON:
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JIT: What Is It? And How Does It Affect DP?

By Lee White

Winning the guessing game of supply versus demand in a manufacturing plant can all too often mean the difference between a large corporate profit or a large corporate loss. Tradition says that the safe bet is to have enough product in inventory to satisfy potential demand. Now, however, tradition is being challenged.

Manufacturing resource planning (MRP II) is complex systems software that can include materials requirements planning (MRP), production scheduling, inventory transactions, bill of material, purchasing, shop floor control, routing and work center identification.

At the other end of the process, no module exists to detail or control the manufacturing process itself. Enter Just In Time (JIT), a philosophy that has as its goal maintaining just enough material in just the right place at just the right time to make just the right amount of product. Guided by this philosophy (or mind-set), companies set a course to achieve the goal.

At the core of either MRP II or JIT is inventory. In the case of MRP II, the computer stores data that relates to inventory — inventory of raw material and inventory of finished product. Enough of both must be on hand to satisfy that elusive entity, demand. But there is another reason for the large amount of inventory and the accompanying need to use high-powered computers to store all data relating to it: poor quality. If some of the stored raw material is of poor quality, extra material must be on hand to serve as a substitute when the quality problem is detected. Similarly, at the other end of raw material is finished product. Excess finished product must be kept in inventory just in case questions arise about the quality of the finished product. Unfortunately, problems with raw material or finished product are usually not detected until the product comes off the last assembly line.

What made it difficult to detect these problems was that manufacturing facilities needed long production runs on machines to justify the time necessary to change over machines to make different products. The machine that turns out 26-inch bicycles may be the very same machine that manufactures 20-inch bicycles. That machine must be set up differently to run the smaller bicycles, however, and changeover may take two people four hours to accomplish the task. If that changeover time could be shortened — from four hours to 10 minutes, for example — significant saving could result. Instead of using the machine to make 10 26-inch bicycles each hour (a total of 80 26-inch bicycles daily), management could elect to make 20 each of 20-inch, 22-inch, 24-inch and 26-inch cycles daily (still a total of 80 bicycles). And if it were found that the bolts necessary to make the 22-inch bicycle were defective, a 10-minute changeover time would allow workers to make a different size bicycle while quality bolts were located for the 20-inch cycle.

Quick changeover or setup time is one of the most important components in a JIT environment. The technique began in Japan in 1957 in the setup operation at the Mitsubishi Heavy Industries shipyard in Hiroshima and resulted in marked improvement in the setup operation for a diesel engine bed planer. In 1969, management at the Toyota Motor Co. asked Shigeo Shingo, a noted Japanese consultant, to help them reduce the setup time of a 1,000-ton press. The setup time had already been cut from four hours to an hour and a half, and Shingo was able to further reduce the time to three minutes. The techniques employed to accomplish the feat resulted in a book entitled *The Toyota Production System*; this book became the bible of the JIT movement.

The U.S. company that has made the biggest splash with JIT is Omark Industries, Inc., in Portland, Ore., the world's largest manufacturer of saw chain. Larry White, plant manager, likened the shortened setup time to a pit stop at the Indianapolis 500 road race. "You know what? It'll work with anything," White enthused. "They don't have a huge investment to change those tires in five seconds, but they've got all the right equipment in all the right places. Everything's organized. Everybody knows what his job is and away they go."

It all began for Omark in 1980, when Jack Warne, Omark's president, observed JIT manufacturing in a Mitsubishi plant in Australia. Shortly thereafter, he and a group of executives from other companies went on a guided tour of Japanese factories with Norman Bodek, president of Productivity, Inc., in Stamford, Conn. On his return to Oregon, Warne organized a task force, and the company purchased 600 copies of Shingo's book.

In 1982, small study groups of managers, engineers, supervisors, secretaries, production planners, machine designers and inspectors reviewed the book. "What we were trying to do was to gain some understanding of the philosophy," White explained. Omark renamed the JIT system Zips (zero-inventory production system) and developed a three-pronged approach to implementation: Zips, total quality commitment and employee involvement.

Actual implementation of Zips was very basic. The plant manager was given a key to the room where inventory was housed. If a problem arose and more inventory was needed, workers had to justify their needs to the plant manager. If the plant manager agreed that a problem existed, he assigned "one more cupful of work-in-process," White said, "or just enough to tide you over until you have a little more time to fix the problem."

One of the teachings of JIT is that inventory must be viewed as evil. White compared excess inventory to water covering the rocks beneath the surface of a pond. "You can never see the rocks — or problems — until you lower the water — or inventory. You fix the problems and then lower the inventory some more, and then you fix that. It's a continual process of improvement."

In the first five months of Zips implementation, Omark reduced inventories by 50%. According to White, this 50% reduction translated into "double-digit millions [of dollars]" at the Portland location. A secondary result was savings in floor space. "We've now freed up well over 30% of our floor space at the same production level." This savings has let Omark use existing facilities to produce additional new products or additional volume in the same product lines.

Another critical tenet of JIT is establishing close relationships — personally and logistically — with vendors to reduce chances of defective inventory. In a large manufacturing company that does not practice JIT, the multivendor environment is the norm. When the time comes for a contract to be let, vendors' bids are requested and a group of vendors is selected. Relationships between manufacturer and vendor and between vendor and vendor become adversarial and quality may suffer. In a true JIT environment, awarding of bids is based primarily on quality and physical location of the supplier; the result is often a single-vendor situation.

The Nissan plant in Smyrna, Tenn., is a prime example of how well the single-vendor relationship can work in a true JIT environment. Although most of the manufacturing processes are heavily robotized, the trim and chassis plant is using JIT for seat procurement. The vendor is Hoover Universal, Inc., North American Seat Division, headquartered in Saline, Mich. When the Nissan plant was being built, bids were requested from seat manufacturers, with the understanding that the successful bidder would build a plant close to Nissan's location and provide seats for the trucks on an as-needed basis. According to Prince Reed, production control manager for Hoover in Murfreesboro, Tenn., orders for seats are sent from Nissan's computer to a printer in Hoover's shipping department. At the same time, the order information is sent to a robot, which goes to the rack and picks out the requested seats. Hoover's trucks leave its plant every hour and make the 18-mile trip to Nissan.

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Hoover is no stranger to JIT manufacturing. Reed said that his company is cooperating with auto makers all over the nation to fulfill their JIT requirements; he cited as examples General Motors Corp., Ford Motor Co., American Motors Corp. and Volkswagen of America, Inc.

Reed said that to his knowledge none of the contracts Hoover has with the various automobile manufacturers has been canceled. There is always the possibility that a low bid from another company could close the plant, he added, but continued good quality is Nissan's primary concern.

Another piece of JIT manufacturing is the linking or overlapping of subassembly operations. In a JIT shop, all the machines required to produce finished product are placed in close proximity, obviating the need for long-distance moves of work-in-process. Moving machinery is expensive and time-consuming, especially when it becomes a trial and error situation. "We're still moving machinery around. We're going to be spending on the order of half a million dollars this year moving machinery around one [Omark] plant," White said. Management at Omark has seen the dollar savings that result when a true JIT implementation is up and running and, as a result, is probably more understanding about expenditures of this sort.

Short setup times, overlapping subassembly operations and a small number of nearby suppliers may be the tangible hallmarks of successful JIT implementation, but consistent, thorough and sensitive employee training is the key to its success. Gerry Dorman is chairman and chief financial officer of Rath and Strong, a Lexington, Mass.-based management consulting group that specializes in MRP and JIT. He has seen problems develop when there is little flexibility in job definition. Another problem is individual incentives. "It's more difficult to put things into overlapping operations if people are used to an individual incentive," Dorman said. To overcome this problem, management often opts for group incentives. Dorman admitted that, because changes of this kind would fall into the category of change in working conditions, a manufacturing plant with union workers would have to negotiate the incentive system at contract time.

Before JIT ever hit the shop floor at Omark, most salaried workers had studied the concepts. The training has continued and White expects it to go on for about three years. "We're talking on the order of 40 hours of class time for every employee, every year — from president to janitor. It's a huge training investment," White said. The company is doing most of the training internally and has hired a professor from a Michigan university to teach statistical process control. "We didn't have anybody who had the teaching skill plus the technical knowledge to transmit that real dull boring statistics garbage. We found this guy who has the technical skill and he's a super teacher." Omark has contracted to employ the professor for 25 weeks each year, while the rest of the year he travels to IBM and other companies.

Set against each other, MRP and JIT seem outwardly antithetical. Al Lanick, consultant with Advanced Systems, Inc., a manufacturing training firm in Chicago, Ill., admitted that a controversy is raging over MRP and JIT. "There are people in the [manufacturing management consulting] industry who are racking up a lot of billable hours taking a position one way or the other, but I think you would find that most of them today say [MRP and JIT] can coexist," Lanick said. He added that changes need to be made and not every MRP application is going to be valid in a JIT environment, but corporations that have invested millions of dollars in manufacturing systems are certainly not moving away from computerization. Instead, they and their vendors are adopting a new philosophy on how to produce product. "This will require some tremendous changes in thinking and attitudes on the part of employees in those companies," Lanick concluded.

Dorman of Rath and Strong agreed that JIT does not obviate the need for MRP, referring to JIT as a philosophy and MRP as the systems and software. Dorman said the two are related; to consider the MRP/JIT question as a contest is "a false argument, or straw men at best."

As an example of the close relationship, Dorman mentioned the MRP module of shop floor control. In the pure MRP environment, the module might address three separate subassembly operations. In a manufacturing facility employing JIT, the three operations might be overlapping or linked and occur so rapidly that the result is one operation instead of three. In this case, data within the MRP software would be modified to reflect only one operation.

Standing witness to the peaceful coexistence of MRP and JIT is Omark Industries. Management at Omark has removed shop floor scheduling from the MRP system because Zips has solved that problem. Instead, MRP is being used for capacity planning, human resource planning and raw materials purchasing. What this reallocation has done is to free the mainframe for other on-line systems. "The problem with MRP is that it always runs in batch mode. If you run batch daily in a large operation, you're probably going to burn up two to four hours a day," White explained. All that has changed with the successful JIT implementation, Omark is now able to schedule daily, and process in batch weekly.

Although JIT has little if anything to do with computerization, Dorman stated there is a great need for management information systems professionals to understand the just-in-time environment. This is especially true for the analyst charged with the task of designing workable systems for the company, he added.

Whether a company uses MRP, JIT, a combination of both or neither, the days when American companies didn't have to worry about competition are gone for good, White said. "If you haven't improved, some other competitor is working on an improvement of the process, the design, the function of the part or a change to better suit the customer. The old saying, 'if it ain't broke, don't fix it,' just doesn't pertain anymore."

In spite of many recent articles in trade newspapers and magazines stating that the U.S. is fast becoming a service-oriented country and manufacturing is a dying industry, White disagreed in theory, and said he hoped such a shift would never occur. "If we aren't manufacturing anything, who in the hell is going to have any money to buy the services?" he asked. "One of my staff guys put it like this: If there isn't any manufacturing business left in the U.S. and there're only two jobs left, and one is shucking corn and the other one is selling insurance . . . ." White laughed.

White is a senior writer at Computerworld Focus.

ALAN WITSCHONKE

Cadd/CAM Acquisition: Who's In Control?

By Joel N. Orr

The engineering manager, told that data processing is to head the computer-aided design and drafting system acquisition effort, does a slow burn. Or, in another company, the DP manager considers passive resistance when he learns that DP will be required to interface to whatever engineering buys but will have no say in the selection. Who should be in control?

Computer-aided design and drafting and computer-aided manufacturing (Cadd/CAM) systems are, of course, computer systems; their selection and management can therefore best be addressed by computer professionals. But engineering and manufacturing are often reluctant to involve DP in these activities because they see DP as an adversary.

Before deciding who should own the Cadd/CAM turf, it is important to understand what Cadd/CAM encompasses.

Computer-aided design and drafting: Cadd is a phrase that glues together two terms of very different scope. Drafting is the producing of drawings; design is the ordering of intentions. Drafting is the most common way of giving form to designs, much as typing is the most common way of giving form to writing.

All Cadd systems have certain components in common: A computer, a workstation with a graphics display and an input device, a graphics output device and Cadd software. Cadd systems range in size from desktop personal computers to the largest of mainframes, supporting hundreds of workstations. They can be centralized, like the IBM Cadam system; decentralized, like Apollo Computer's Auto-Trol systems; or a bit of both, like the Intergraph Co. system. Prices cover a wide range: on the low end, $7,200 for a tiny Apple Computer, Inc. Apple-based Robographics turnkey, complete with plotter; on the high end, millions of dollars for a large Control Data Corp. Icem system with dozens of workstations.

Most Cadd systems are not used for other functions; such use would have a negative effect on workstation response time, one of the most important ergonomic characteristics of a Cadd system.

Cadd and productivity: Computer-aided drafting is easy to cost-justify because drafting has a well-defined and measurable product; the benefits of computer-aided design, however, must be taken largely on faith. Small wonder that most of the 15,000 Cadd systems in use are made to function as drafting machines and that designers seldom use them. Drafting systems for most engineering disciplines are similar; they must all permit the rapid production of drawings. Electronic, mechanical and architectural drafting demand lines and curves, text and symbols, panning and zooming and so on — but to varying degrees. Design systems are application-oriented: Schematic capture systems must preserve topological continuity, but have little use to the creator of integrated circuits. It is also helpful for design systems to interface to application-specific analysis programs, which are seldom marketed by the Cadd system vendor.

Drafting systems are usually operated by dedicated operators expert in their use. Design systems — and relatively few Cadd systems are used this way — are available to designers on an as-needed or casual basis. These arrangements make it easy to measure the productivity of a drafting system and almost impossible to do the same for a design system.

Computer-aided manufacturing: CAM is a term that can legitimately be applied to a wide variety of applications: numerical control, robotics, manufacturing resources planning, computer-aided process planning and many others. CAM predates Cadd.

CAM and productivity: Automating the factory is generally more fruitful than automating the engineering office; each gain in efficiency is multiplied by the volume of production. Furthermore, manufacturing personnel are much more accustomed than design personnel to dealing in measurables. Identification and achievement of productivity gains are therefore much easier in the factory than in the design office.

Cadd/CAM: The greatly heralded

productivity gains of industrial automation can be realized only through integration of design and production automation. The key to this process is the geometric description of the product design, which must originate with engineering. Electronic transfer of the completed design to manufacturing and electronic feedback from the manufacturing process to engineering can eliminate communication delays and opportunities for the introduction of errors.

Computer-integrated manufacturing: CIM departs from the traditional view of manufacturing in the U.S. It involves using computers to automate the entire manufacturing process in an integrated form, rather than mirroring the historical separation of engineering and manufacturing. In general, the U.S. lacks a map for moving from Cadd/CAM to CIM, although the idea is popular.

Whose turf?: The problem of ownership has several layers. Cadd is largely the province of engineering; CAM involves manufacturing. Engineering and manufacturing often find themselves at odds with each other because they work toward conflicting objectives: Engineering wants to perfect the design; manufacturing wants to get it (the product) out the door. DP, on the other hand, has often lost the trust of both engineering and manufacturing by mismanaging their expectations. Computer professionals, viewed as empire-builders who care nothing for the real needs of users, are therefore excluded from Cadd/CAM system acquisition and implementation decisions.

It's also true, however, that DP personnel commonly feel frustrated by engineering and manufacturing management's apparent lack of willingness to recognize the need to invest in training and automation, although they may be expending large sums on factory and office equipment and buildings that offer far less productivity leverage.

Objective obstacles also exist. Most DP installations in manufacturing companies are highly centralized IBM affairs. Cadd applications, because they require large message and buffer sizes and extremely fast system response, place enormous demands on computers. Installing Cadd in the central computer system causes system responsiveness to drop at a rate out of proportion to the number of users added. The drop leads in turn to the acquisition of additional CPUs and a very high cost per "seat" for Cadd.

Cadd systems require exotic peripherals — graphics workstations, plotters and digitizers — with exotic interfacing demands. Few DP departments are equipped to assist end users in the selection and installation of this type of equipment. In addition, most of these strange peripherals were designed for the minicomputer environment, not the centralized DP milieu. They typically speak Ascii, not Ebcdic; they look like teletypes, not Systems Network Architecture (SNA); and they usually require operator expertise for smooth operation.

Another trend keeping Cadd out of the computer room is the growth of microcomputer Cadd systems. Dozens of computer-aided drafting products are now available for desktop microcomputers — products functionally equivalent or superior to many of the older mini- and mainframe-based drafting packages. Although larger computers are still required for such computer-intensive functions as solids modeling and finite element analysis, most of the 20,000 mini- and mainframe-based Cadd systems in use are functioning purely as electronic drafting boards — at an average per-seat cost of more than $100,000. A complete micro drafting system — including hard disk, graphics input device, medium-resolution (480- by 640-pixel) color graphics display and small pen plotter — can be had for $10,000. And these small units can be networked.

Engineers who buy computers without the assistance of DP professionals often do so at the cost of recreating in miniature all of DP management's hard-learned lessons — the importance of backups by losing data, the frustration of device incompatibilities by not setting and imposing standards and the need for security and formal record management procedures by having valuable designs leave the premises with a fired employee.

It takes time for engineers to learn why private data bases are not good for the company and why the device that costs least in the short term often winds up costing most in the long term. By the time they learn these and other lessons, they have gone too far simply to admit their mistake and invite DP to help. The result is new mini-DP departments doomed to repeat all the errors DP itself committed in the '50s and '60s.

Cadd/CAM may not belong in the computer room, but the Cadd/CAM implementation process does need the participation of DP professionals. DP should take the initiative in bridging the existing communication gap with engineering and manufacturing by:

- Assigning personnel to learn both Cadd/CAM technology and the needs of engineering and manufacturing.
- Offering education, information and cooperation to the engineers.
- Working toward changing the situation from one that pits DP against the engineers to one that pits "our" company against the flood tide of technology.

■

Orr is chairman of Orr Associates, Inc., a consulting firm in Danbury, Conn., serving Cadd/CAM and graphics equipment and services users and vendors. He is Cadd/CAM editor for Computer Graphics Today, Computer Graphics World *and* Hardcopy *and is a founding member and elected director of the National Computer Graphics Association.*

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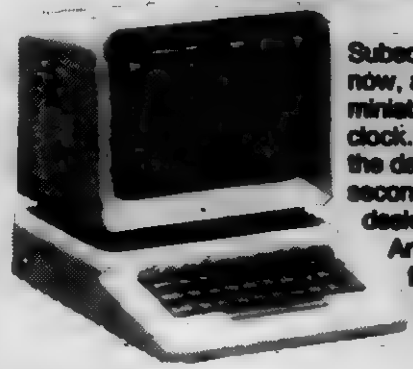

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Products

CDS II

BEDFORD, Mass. — **Computervision Corp.** has announced Phase II of its Computervision Distributed System (CDS), a network of central host-based systems and remote engineering workstations for the manufacturing industry.

CDS II uses an industry-standard Ethernet-TCP/IP network architecture and Computervision's Fastlink communications link, a 10K-byte/sec file transfer bridge between a Computervision CDS 4000 computer and Digital Equipment Corp. VAX computers.

According to the vendor, its Communications Concentrator can simultaneously connect up to six remote intelligent workstations to a host server CDS 4000 through the TCP/IP architecture.

Systems that Computervision said could be integrated with CDS II include Computervision's Personal Designer software running on an IBM Personal Computer XT or Personal Computer AT; and Digital Equipment Corp. VAX-based systems running Medusa, as well as others.

Prices for the CDS II system can run from $30,000 to $2 million, depending on the configuration. For further information, contact Computervision Corp., 15 Crosby Drive, Bedford, Mass. 01730.

BURLINGTON, Mass. — **Matra Datavision, Inc.** has announced its Series 50 computer-aided design (CAD) workstations, which, according to the vendor, allow users to tailor the workstations to their specific CAD requirements. The Series 50 workstations use Motorola, Inc. 68000 processors with 1M byte of main memory and offer direct memory access of 2M bytes to increase throughput speed.

Matra Datavision also introduced Euclid Turbo 3D/2D, a software package aimed at providing a smooth transition from three-dimensional solids modeling to two-dimensional drafting applications.

Prices of the Series 50 workstations start at $40,000. The Euclid Turbo 3D/2D package is priced at $60,000. For further information, contact Matra Datavision, Inc., Corporate Place 1, 99 S. Bedford St., Burlington, Mass. 01803.

MINNEAPOLIS — **Honeywell, Inc.** has introduced its Plant Management System, designed to improve production management, energy consumption, product quality and product yield. According to the vendor, the system permits on-site production scheduling, maintenance management and material management and storage.

The system also enables customers to link their off-site Honeywell or non-Honeywell corporate computer systems, giving on-line plant data to company planning and administration areas.

Honeywell also introduced the Work Center Controller 1250 from Honeywell's **Digital Datacom, Inc.** subsidiary located in Long Beach, Calif. The controller automates the collection and processing of data on work in progress, inventory, maintenance scheduling and quality assurance and testing.

A full-scale Plant Management System ranges in price from $750,000 to $1 million, excluding license fees for selected applications. The desktop Work Center Controller 1250 is priced at $10,000. The floor or rack-mounted versions range in price from $30,000 to $100,000.

For further information, contact Honeywell, Inc., Honeywell Plaza, Minneapolis, Minn. 55408.

LOWELL, Mass. — **Wang Laboratories, Inc.** has introduced its Engineering Support System, a system combining the Wang PIC workstation and Autocad, a computer-aided design (CAD) package from Autodesk, Inc. of Sausalito, Calif.

The PIC workstation is priced at $15,935; Autocad is priced at $2,000. For further information, contact Wang Laboratories, Inc., One Industrial Ave., Lowell, Mass. 01851.

SCHAUMBURG, Ill. — **Cad Design Systems, Inc.** (CDSI) has introduced a turnkey computer-aided design (CAD) system that retails for under $10,000. Cadstation includes an IBM Personal Computer with high-resolution graphics monitor, 640K-byte random-access memory, 10M-byte Winchester disk drive, 360K-byte disk drive, 8087 math coprocessor, two RS-232 serial ports, one parallel port, MS-DOS 2.1, six-pen plotter, digitizing tablet and Autodesk, Inc.'s Autocad software enhanced by CDSI's Acadplus.

More information is available from CDSI, Suite D, 1305 Remington Road, Schaumburg, Ill. 60195.

SUNNYVALE, Calif. — **Adept Technology, Inc.** recently introduced Adeptvision, a vision system to accompany its direct drive robot system, Adept One.

Adeptvision

Adeptvision is completely integrated with the Adept One robot and operates from the same controller, thus eliminating interface problems, according to the vendor. The vision enhancement can recognize either stationary parts or those on moving conveyors. Adeptvision can also reportedly identify touching or overlapping parts.

The price of the robot averages $40,000, depending upon options; Adeptvision adds $17,000 to the price. For more information, contact Adept Technology, Inc., 1212 Bordeaux Drive, Sunnyvale, Calif. 94089.

MAYNARD, Mass. — **Digital Equipment Corp.** has introduced the Microvax II system based on DEC's "VAX-on-a-chip" processor, the Microvax 78032. Also introduced was the Vaxstation II graphics workstation based on the new very-large scale integration processor.

The Microvax II will reportedly run all VAX software and give VAX 11/780-level performance at a fraction of the cost, DEC said. Four Microvax II systems will be offered, ranging from an $18,840 single-user model with 2M bytes of main memory and a 31M-byte hard disk drive to a $43,780 16-user system with 5M bytes of main memory, 213M bytes of disk storage and a 95M-byte streaming cartridge tape drive.

The Vaxstation II workstation based on the Microvax CPU offers 2M bytes of memory, bit-mapped video graphics, a 19-in. monochrome monitor, dual floppy disk drives, a 31M-byte Winchester disk drive and MicroVMS software. It is priced at $26,500. The two machines will replace, for the most part, the Microvax I and Microvax I-based workstations, DEC said. The new products are targeted for the engineering, commercial, education and computer graphics market.

For additional information, contact Digital Equipment Corp. in Maynard, Mass.

SAUSALITO, Calif. — **Autodesk, Inc.** recently announced that Autocad, its microcomputer-based computer-aided design (CAD) software, has been linked with IBM's mainframe-based Cadam via a translator developed, sold and supported by Cadcor of Mountain View, Calif.

According to the vendor, Cadam/Autocad Translator will allow engineers to work at personal computer-based engineering workstations that run not only Autocad but also programs such as Lotus Development Corp.'s 1-2-3 and Symphony, Ashton-Tate's Dbase III, Microsoft Corp.'s Word and Micropro International Corp.'s Wordstar. Autocad drawings can reportedly be transferred to and from the centralized Cadam data base on the host.

Translation is accomplished through a Fortran program on IBM 4300 or 3080 mainframes operating under VM or MVS. Communication between Autocad and Cadam is accomplished via an IBM 3270 coaxial connection or serial asynchronous Ascii transmission.

Cadam/Autocad Translator costs $10,000 per Cadam site and $200 per Autocad workstation.

For more information, write to Cadcor, 175 E. Dana St., Mountain View, Calif. 94041.

IRVINE, Calif. — **McDonnell Douglas Computer Systems Co.** has announced a manufacturing control software package designed to run on its own Microdata M4700, M6320, M6525, M9100 or M9208 minicomputer systems.

Called the Manufacturing Management and Control System (MMC), the system consists of the following modules: Engineering, Sales Order Processing, Master Production Scheduling, Work in Process Costing, Shop Floor Control, Standard Costing, Inventory Planning, Purchasing, Work Order Launching, Accounts Receivable, Accounts Payable, Payroll and General Ledger. The modules may be purchased separately or as a total package.

MMC is reportedly a fully-integrated, on-line system designed to accommodate companies with 50 to 800 production workers. The one-time license fee ranges from $2,500 to $37,500, depending upon the combinations of modules chosen and the Microdata computer on which the system runs.

For more information, contact McDonnell Douglas Computer Systems Co., 17481 Red Hill Ave., Irvine, Calif. 92714.

SCHENECTADY, N.Y. — **General Electric Co.** has demonstrated Modelmaster, its factory simulation software that runs on IBM Personal Computers, IBM Personal Computer compatibles and General Electric's Workmaster Programmable Control Information Center, an industrialized version of the IBM PC.

Modelmaster

According to the vendor, Modelmaster creates realistic representations of factories or parts of factories complete with icons that resemble robots, forklift trucks and so on.

To model a factory with Modelmaster, the user interacts with the computer using a typewriter-like terminal and a graphics tablet with a mouse input device. The vendor claimed the typical manufacturing engineer can learn to use the system in half a day. Shipments of Modelmaster are expected to begin in the third quarter of 1985.

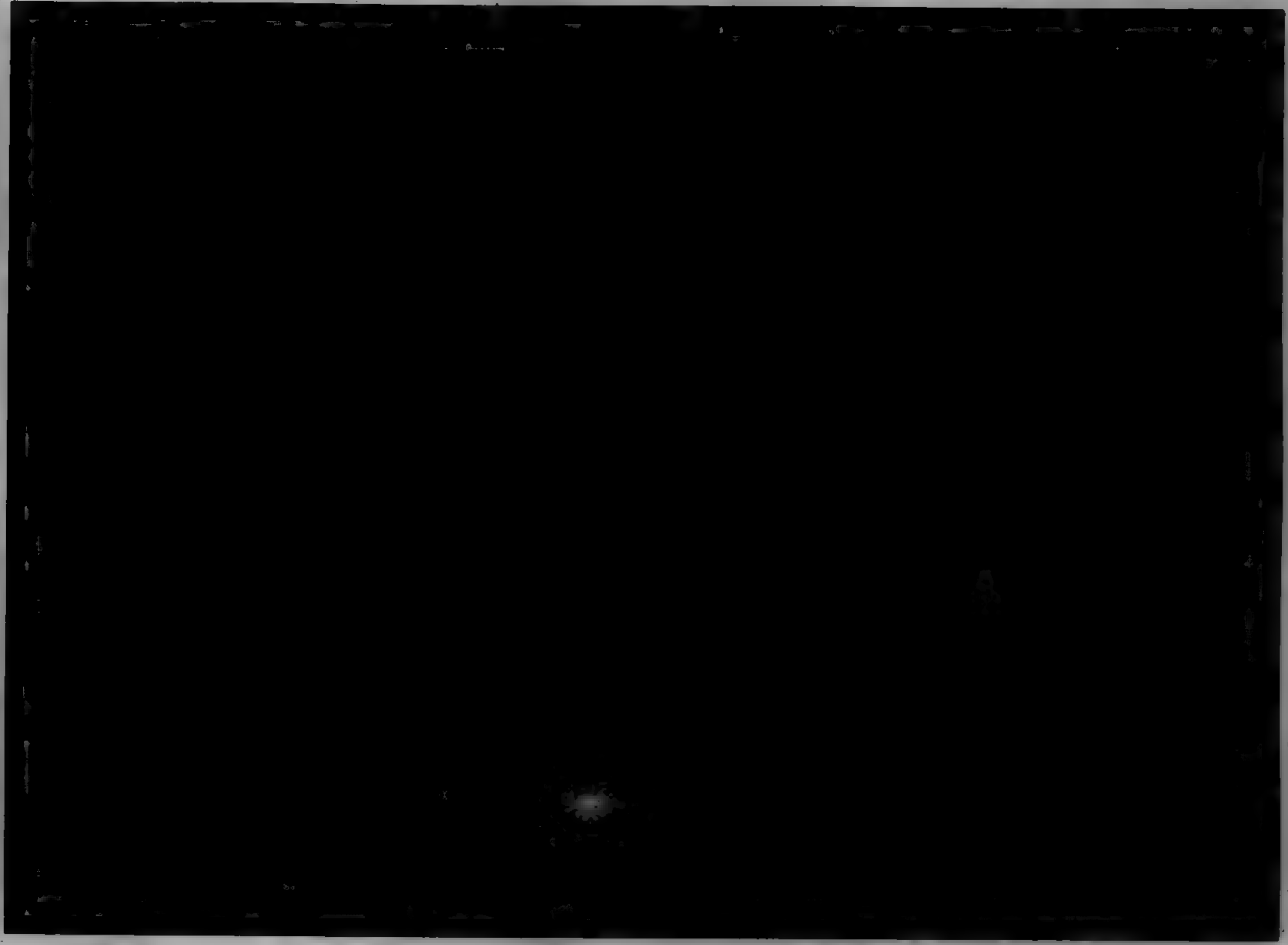
For further information contact the General Electric Research and Development Center, P.O. Box 8, Schenectady, N.Y. 12301.

BURLINGTON, Mass. — **Applicon, Inc.** has introduced Aria II, a family of advanced 32-bit engineering workstations designed for the technical professional.

The Aria II uses the newly announced Microvax II processor boards manufactured by Digital Equipment Corp. The workstations include 3M bytes of memory and a 160M-byte disk drive for mass storage, as well as Applicon's Bravo data base management and user interface capabilities.

Aria II workstations also have a 22 in. by 27 in. by 36 in. processor module with a hardware floating point accelerator and MicroVMS operating system. The workstations are available with a choice of 13-in. or 19-in. displays.

Aria II will be available in July 1985, the vendor said, at prices ranging from $99,000 to $125,000. For more information, contact Applicon, Inc., 32 Second Ave., Burlington, Mass. 01803.



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Calendar

June 20-21, Santa Clara, Calif. — **Dataquest Focus Conference.** Contact: Dataquest, Inc., 1290 Ridder Park Drive, San Jose, Calif. 95131.

June 24-26, San Francisco — **IBM Teleprocessing Software: Structure, Systems and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 24-26, Dallas — **Introduction to Data Communications.** Also, July 1-3, Boston; July 10-12, Washington, D.C.; July 24-26, New York; and July 24-26, San Francisco. Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

June 25-27, Phoenix — **Dataquest's Annual Computer Storage Industry Conference.** Contact: Dataquest, Inc., 1290 Ridder Park Drive, San Jose, Calif. 95131.

June 26-28, Dallas — **The Integrated Voice/Data PBX: Architectures and Products.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

June 27-28, New York — **Networking, Protocols and Compatibility.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 27-28, San Francisco — **IBM's SNA: A Master Plan for Teleprocessing and Data Communications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 27-28, New York — **Telecommunications I: An Introduction to Voice Communications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 10-12, Hyannis, Mass. — **Toward Knowledge-Based Systems: Information for Decisions.** Contact: Information Industry Association, Suite 400, 316 Pennsylvania Ave., Washington, D.C. 20003.

July 15-17, Los Angeles — **Local-Area Networks.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

July 15-18, Chicago — **1985 National Computer Conference.** Contact: Afips, 1899 Preston White Drive, Reston, Va. 22091.

July 22, Seattle — **Strategic Management Planning.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

July 23-25, Seattle — **Logical and Physical Design.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

July 29-August 2, Norfolk, Va. — **1985 World Conference on Computers in Education.** Contact: Afips, 1899 Preston White Drive, Reston, Va. 22091.

August 13-15, Boston — **Computer Graphics '85.** Contact: National Computer Graphics Association, P.O. Box 3412, McLean, Va. 22103.

August 26-29, San Francisco — **Intech '85.** Contact: Network Users Association/Intech '85, Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

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IBM launches multiproduct blitz

Announcements reveal moves to integration

By Peter Bartolik
CW Staff

ANALYSIS

If an overload of products is a contributing factor to the current computer industry slump, IBM's announcements did nothing to ease the problem.

With the release of a desktop version of the System/36, three Personal Computer AT versions of the 3270 Personal Computer and realignment of both the System/36 and 38 product families, users have yet another mass of product specifications to swallow. And if that isn't enough to chew on, AT&T is expected to unleash today its own volley of announcements.

Through the 237 pages of technical specifications that IBM issued describing its announcements, some strategies and directions are becoming more evident.

■ Mainframes may still be the mainstay of IBM's business strategy, but last week's announcements underscore the fact that the No. 1 computer vendor recognizes that its future growth hangs on moving — or communicating — the back room processing power to desktops.

In just a few tumultuous years, the once-maligned IBM Personal Computer has traveled, philosophically, from a fringe position as an entry system to a crucial role on IBM's product chessboard.

See ANALYSIS page 5

Adds desktop version to System/36 family

By Eric Bender
CW Staff

RYE BROOK, N.Y. — IBM last week let loose a barrage of product announcements, price cuts and improved product delivery dates affecting virtually every major product line the company offers.

In all, IBM made 60 separate announcements. Industry analysts said they believe many of the products had been planned for introduction later in 1985 and early in 1986 but were accelerated after it became clear that the sluggish sales IBM reported in the first half of 1985 will persist.

Headlining the product debuts was the System/36 PC, which combines a slimmed-down System/36 with a directly attached Personal Computer and supports up to four workstations. Big Blue also announced memory upgrades for other System/36 models.

Designed for small business and departmental applications, the System/36 PC is based on the new 5364 processor, a desktop or floor-standing unit said to run existing System/36 application programs without recompilation. For the three additional workstations, users can choose among Personal Computers equipped with terminal emulation; 3180, 5250 or 5290 family terminals; and several workstation and Personal Computer printers.

See BARRAGE page 10

Other announcement highlights

[illegible]

DG posts first loss, lays off 1,300

Joins ranks of vendors ailing from sales slump

By Clinton Wilder
CW Staff

Data General Corp. led the parade of continuing bad news in the computer industry last week with its announcement of 1,300 layoffs, the first companywide dismissal in its 16-year history.

The Westboro, Mass.-based minicomputer maker said it will post its first operating loss ever in the current quarter ending June 29 and may lose money in the next quarter. DG also said its previously announced U.S. plant shutdown, planned for July 1-3, would be extended to include the week of July 8-12, and it left open the possibility of further temporary shutdowns during the remainder of 1985.

"We were geared up for much more demand this year," DG President Edson D. de Castro said of the layoffs, which cut the company's worldwide work force by 7%. "This represents an attempt to get costs in line with demand. It was a very tough decision and clearly something we did not want to do."

DG's dramatic action marked the industry's third straight week with a four-figure layoff announcement by a major computer vendor. Previously, Wang Laboratories, Inc. slashed its staff by 1,600 employees, and Apple Computer, Inc. issued pink slips to 1,200 workers (see chart page 11).

In a separate announcement last week, Honeywell, Inc. said its second-quarter earnings will decline sharply from $80 million, or $1.70 per share, in the same quarter a year ago. A spokeswoman said the Minneapolis-based mainframe vendor's Information Systems Division sales had fallen substantially below second-quarter 1984 results because of weakness in industrial and computer markets.

Honeywell also said that growth for the year will be flat or slightly above that of 1984, "based on forecasts of an improved economy in the second half of the year." Honeywell earned $230 million on $6 billion in revenue last year.

See SLUMP page 11

TOP OF THE NEWS

Separated on grounds of incompatibility. Burroughs and Sperry broke off merger talks after determining that a marriage of the two might create more problems than it would solve. Page 2.

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Sheepskin of marginal value? That's the way many DP hiring managers regard certification, despite what the certifying authorities claim. Page 8.

■

DEC will modify its net architecture to comply with international standards protocols in an effort to ease communications between machines of different brands. Page 10.

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An insurer reduced its telephone bills as much as 15% with the installation of a virtual private network. Page 12.

■

Not put to the test. A survey found most firms hold poor track records regarding in-house software testing procedures. Page 41.

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NEWSPAPER

Burroughs-Sperry merger off

Users voice mixed reaction to demise of negotiations

By Peter Bartolik
CW Staff

NEW YORK — Burroughs Corp. abruptly terminated merger talks with Sperry Corp. early last week, scrapping a plan to maintain two mainframe product lines in a merged company.

Sperry, stressing that Burroughs had made an unsolicited bid, reiterated many of the doubts that had been expressed by users and analysts following the initial joint announcement that negotiations were under way [CW, June 17].

In a prepared statement, Sperry said that "there were serious concerns expressed by many customers who questioned the benefits to them of such an arrangement. Further, there was doubt that these customers could accept the credibility of maintaining separate Burroughs and Sperry product lines over the long term. Sperry management shares these concerns."

Burroughs withdrew its offer Monday morning before the stock markets opened, according to Jeanette P. Lerman, vice-president of corporate communications with Burroughs.

Lerman said terms of a proposed merger had been prepared by financial advisors and were presented to management of both companies. "It was time to decide whether or not to do it; [Burroughs] had to have a decision," she said. Sperry, according to Lerman, "decided [it] couldn't do it." Lerman said negotiations had been ongoing for a two-month period and sped up in the days prior to termination of the talks.

Sperry, however, had a different version of how the talks ended. Spokesman J. Peter Hynes said Sperry management had several concerns and sought more information from Burroughs, only to be informed that the offer had been withdrawn.

Although Burroughs said its stock exchange offer would have provided $65 worth of Burroughs stock for each share of Sperry stock, Hynes said the offer was for not less than one share of Burroughs stock and not more than 1.18 shares for each share of Sperry stock, depending on the price of Burroughs stock.

Lerman said Burroughs had planned on maintaining both companies' mainframe product lines. Despite broad skepticism about that plan, Lerman said the merged company would have enjoyed more than $1 billion in resources for R&D and engineering, could have reduced expenses by purchasing peripherals common to both and realized savings by eliminating duplicated research efforts. Additionally, Burroughs contemplated unifying the product lines of smaller computers. However, Sperry said the move "would have produced more redundant product lines than complementary ones." Sperry also said the offer did not meet its own directions, focusing more on telecommunications, software and applications, microprocessing and communications connectivity.

The negative reaction in the stock markets to the merger, Lerman asserted, had as much to do with IBM's revised financial situation [CW, June 17] as the actual terms of the merger. "It would have been interesting to see what happened if IBM didn't make that announcement," she said.

Burroughs has no current plans for similar negotiations with other companies but would consider any alliance that makes sense, Lerman said.

Despite the fact the Burroughs offer was the second this year — in March, negotiations with ITT were also terminated — Sperry said its Information Systems Group "will continue its successful program for growth through internal expansion and partnering in areas of strategic interest."

Although Sperry's statements seemed designed to assure its customer base that the company is well positioned for the future, two users contacted by *Computerworld* said they were disappointed the deal fell through.

"I was hoping they would merge," said Dan Snyder, vice-president of information systems at Tyson Foods in Springdale, Ark., which a month ago replaced an 1100/80 with an 1100/91. He said Burroughs has outstanding operating systems, while Sperry's operating system is outdated.

The merger would have provided greater competition to IBM, according to Lt. Col. Robert Shinpaugh, director of systems control at Gunter Air Force Base in Alabama, where a diversified hardware base includes four Sperry 1100/82 machines, two Sperry 1050-11s, a Burroughs B4800 and two B4700s. In addition to the competitive aspects, he said, the merger would have ensured greater job opportunities for MIS employees lacking a background in IBM systems.

One Sperry user was not unhappy, however. "I didn't see what the benefit of a merger would be, so it didn't disappoint me," said James Patterson, manager of systems and programming at Northwest Airlines in St. Paul, Minn., where 11 Sperry machines are in operation.

Burroughs users were generally skeptical about the two companies merging. "I would tend to think that an executive in a merged company would be tempted to effect a savings by combining the two service organizations," said Patrick L. Schiavo, vice-president of systems and data processing with Seamen's Bank for Savings in New York. "That's something you can't do overnight."

John J. Monaghan, executive vice-president and chief of administrative services with the Dime Savings Bank, Valley Stream, N.Y., said the merger talks had sparked concern. "I could not see it giving the customer base any additional capabilities."

CW staff members Donna Raimondi and Charles Babcock contributed to this report.

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WHODUNIT

Sortland Yard warns against "Rafflles-type sort programs."

Call (201) 568-9700.

Ask for Inspector SyncSort!

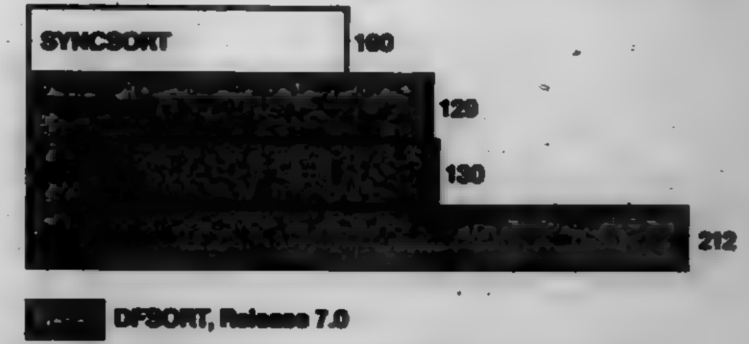
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied. "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

syncsort INC.

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IBM software primes System/38 for Office Systems net

By John Gallant
CW Staff

RYE BROOK, N.Y. — Amid a deluge of product introductions and enhancements, IBM last week announced software that transforms the System/38 into a key component of its Office Systems network.

The products, which appear to fulfill Big Blue's earlier strategic commitments to the System/38, include a link between the mini and IBM Personal Computers; operating system enhancements that provide support for mainframe terminals and important IBM communications architectures; and software enabling System/38 workstations to communicate with other IBM office products.

As a result, the System/38 gains the ability to share information with Personal Computers running Displaywrite and to exchange documents with other System/38s, System/36s, mainframes running the Distributed Office Support System (Disoss) and other office systems via IBM's Systems Network Architecture (SNA) protocol LU6.2, dubbed Advanced Program-to-Program Communication [CW, May 27].

William Petrone, founder of Northeast System/38 Users, Inc., said the announcements marked "a coming of age for the System/38.

"The System/38 is no longer just an intermediate processor," said Petrone, who is also director of technical services for Computer Software and Services, Inc. in Sterling, Mass. "The System/38 can now act as a host in an SNA environment. IBM has made a commitment to the integration of its office products, and the System/38 is the answer. This adds a lot of life to the processor."

The following were among the announcements:

- Office/38 Personal Services/38 (PS/38). This, along with enhancements to the System/38 CPF, allows System/38 workstation users to participate in document exchange within IBM office networks. PS/38 offers capabilities for electronic mail through IBM's Document Content Architecture (DCA), document file, search and retrieval, messaging across one system or a network, text processing and other office functions.
- CPF Release 7.0 Office Host Services Support. This consists of enhancements to the System/38 CPF operating system. The added CPF components provide for SNA Distribution Services (Snads) document exchange with the System/36, System/38, Disoss/370 and 5520 administration system via LU6.2.

The enhancements also support IBM Document Interchange Architecture (DIA) document distribution and library services with the IBM Displaywriter via LU6.2.

Offer interfaces

IBM said the DIA and Snads components of CPF and PS/38 offer function and user interfaces similar to those provided by other IBM office systems that support DIA, Snads and Personal Services. Another communications enhancement to CPF Release 7.0 — dubbed the Distributed Host Command Facility — allows a System/38 to appear as a host for terminals attached to a 370 architecture mainframe with IBM's Host Command Facility. The terminals will appear to the System/38 as remotely attached 3277, 3278 and 3279 displays. Attachment between mainframes and the System/38 is via SNA/Synchronous Data Link Control.

- IBM Personal Computer Support/38. This provides for information exchange and resource sharing between the IBM Personal Computer and the System/38. The product consists of both a System/38 and a Personal Computer component.

In conjunction with the System/38 software announcements, IBM also unveiled an enhanced version of its 8100 Information System operating system that also provides workstation support of Snads. Release 3 of the Distributed Processing Programming Executive/System Product (DPPX/SP) allows for the distribution of documents, microcomputer files and DPPX data sets through Snads.

PS/38 and Personal Computer Support/38 are scheduled for November availability, CPF Release 7.0 for September and DPPX/SP Release 3 for January. PS/38 has a monthly charge of $400 or a one-time charge of $8,000; CPF Release 7.0 has a monthly charge of $869 or a one-time charge of $22,000; Personal Computer Support/38 has a one-time charge of $995; DPPX/SP Release 3 has a monthly charge of $869 or a one-time charge of $19,600.

IBM Information Systems Group is located at 900 King Street, Rye Brook, N.Y. 10573.

Addition to System/38 family boasts multichip logic

By Tom Henkel
CW Staff

RYE BROOK, N.Y. — IBM last week replaced its System/38 Model 8 CPU with a newer technology Model 18, said to incorporate more bipolar chips than the Model 8 and to feature a higher density multichip logic module.

The company also slashed prices of other models in the line and of some related peripherals (see story page 6), while taking steps to make the line more compatible with both larger and smaller IBM processors (see story above).

The Model 18 reportedly offers about 1.1 times the internal performance of the Model 8, and users of smaller System/38 CPUs can field-upgrade to the newly announced unit, presumably through a board swapping process that IBM said takes roughly nine hours.

Available in July, the Model 18 comes in 4M-, 6M- and 8M-byte main memory configurations. The CPU features a minimum instruction cycle time of 133 nsec. An entry-level Model 18 with 4M bytes of main memory and one disk drive costs $120,000. A similar configuration with 6M bytes of main memory costs $135,000, and an 8M-byte configuration costs $150,000.

Announcement highlights

Other highlights of the System/38 announcement include the following:

- Expansion of the maximum main memory capacity on the System/38 Model 6 from 4M bytes to 6M bytes.
- The ability to attach twice as many (up to eight) workstation controllers to System/38 models with a workstation Controller-Extended feature. The availability of additional controllers means that up to 256 terminals can be locally attached to a System/38. The Workstation Controller-Extended feature code costs $6,200. It can be leased for $251 per month, and there is a $29 monthly maintenance charge.
- A System/38 X.25 Communications Attachment, an expansion of the previously available X.25 support that provides an interface for attachment to X.25 packet-switched networks through an X.21 interface at up to 19.2K bit/sec. The feature enables communication through an X.25 network to Systems Network Architecture devices attached to a System/38. It costs $5,000 or can be leased for $197 per month. There is a monthly maintenance charge of $50.

More information is available from local IBM sales offices. IBM's Information Systems Group is located at 900 King St., Rye Brook, N.Y. 10573.

CORRECTIONS

IBM's 3081 Model KX is composed of two tightly coupled processors and is not a single processor, as stated in "User: Quick installation for NAS 8083" [CW, June 17].

In the article "Enhanced Focus release out from Information Builders" [CW, May 13], Intel Corp. was incorrectly listed as the vendor of the System 2000 data base management system. System 2000 is owned by SAS Institute, Inc., which purchased the data management system from Intel in December.

In the June 10 edition, the name of Dataserv, Inc., a Hopkins, Minn.-based leasing and marketer firm, was misspelled.

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ANALYSIS from page 1

Certainly IBM is not the first or the fastest to bring departmental computing systems to desktop-size configurations — Digital Equipment Corp. had a much more sophisticated product, the 32-bit Microvax II, out a few weeks earlier — but IBM clearly is the most successful at selling small machines.

The Personal Computer AT brought multiuser microcomputing capabilities to the corporate world, and the desktop System/36 is IBM's first step to adapt the convenience of microcomputers to department minicomputers.

The prodigious list of Personal Computer products that are available today indicates that IBM is committed to ensuring it has a microcomputer targeted at just about every potential customer and that it is just as committed to the microcomputer sale providing an entree to larger systems.

■ As much as it desires a complete array of machines, IBM is also faced with the need to integrate a vast product lineup, ranging from the ubiquitous Personal Computer to the 3090 mainframe.

Software products announced

Buried in the avalanche of announcements made by IBM was a series of software products designed to link IBM processors, including the System/36 and 38 and even the mysterious 8100, to networks.

Document interchange under the Distributed Office Support System will tie the minicomputers together, and Systems Network Architecture will tap the horsepower of the mainframes to run the whole show, according to IBM.

But with each product, or rather, with each wave of products, IBM's effort to tie all its hardware offerings into one cohesive system must surely become just that much more complex.

■ IBM in recent years has shown a willingness to purchase components from other vendors, but that does not mean the company will willingly ignore any opportunities for profit.

Disk drive vendors wooed, snubbed

Microcomputer disk drive vendors have been alternately wooed and snubbed by IBM in recent years as the company doled out contracts to provide storage for its Personal Computer products. With the System/36 desktop version, IBM is offering its own 5¼-in., 40M-byte hard disk drive.

IBM showed another face with the introduction of two Ascii terminals with built-in capabilities allowing them to emulate the terminals of five other vendors, including DEC; historically, other vendors have emulated IBM.

A spokesman for DEC said that his company was flattered by the new products and that the emulation capabilities available mark a recognition by IBM of the need to coexist in multivendor environments. More likely, IBM saw a need that would be filled by other vendors if it did not act.

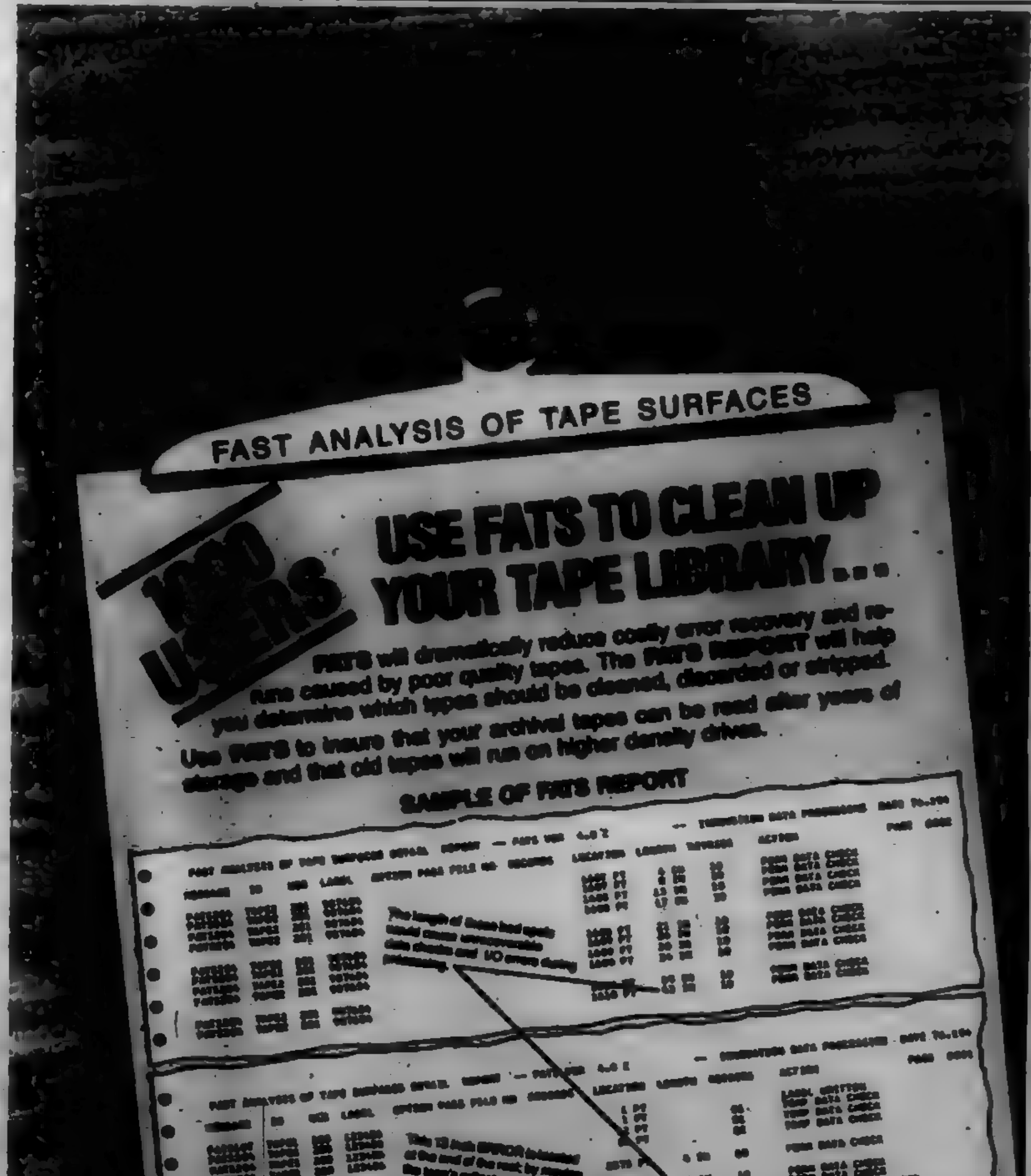
■ IBM seems convinced it can weather the current industry slump by putting products on the market as quickly as possible. Not only is some of the new hardware available almost immediately, but the company also moved up delivery dates on a broad range of previously announced software for medium- to large-scale systems.

Price cuts

Accompanying the product announcements was another round of price cuts starting with the System/36 and progressing up through the 3090 series mainframes. These cuts also seem designed to prompt decision makers to make their decisions now.

■ IBM is showing little sympathy for the MIS executives who are charged with evaluating, ordering and installing corporate information systems. While the product saturation strategy may make sense to IBM executives, it may be confusing the rest of the world.

While MIS departments are being exhorted by IBM to add 3090 mainframes and enticed to add 3080 models, they are under increasing demand to integrate corporate processing strategies. And with traditional minicomputers facing off against a new generation of miniaturized superminicomputers, integrating departmental processing with corporate processing is no mean feat.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IBM pares purchase, upgrade [illegible]

RYE BROOK, N.Y. — In an apparent effort to make its larger systems more attractive [illegible] IBM last week pared 5% off the purchase price of its 3080-series and 4361 series processors while knocking [illegible] to 8% off the 4381's price.

More hefty price cuts were made on IBM's midrange System/38, with reductions on for some of those processors and related peripherals of up to [illegible].

In what was believed to be an early glimpse of a price cut IBM had been holding for the fourth quarter, IBM dropped the purchase and model-to-model upgrade charges for machines purchased after June 18. On-order machines and model conversions installed after June 18 will automatically receive the lower price.

Memory enhancements within the mainframe product lines were not affected by the price cuts. For example, users can get a discount by upgrading from a 3083 CPU complex to a [illegible]

[illegible] on 3080 series

Both the base and X models of the 3080 series received 5% across-the-board purchase price cuts. For example, a 3081 Model KX2 CPU with 32M bytes of main memory was [illegible] to $3,310,000. The price to upgrade the Model KX2 to a 3084 Model QX2 configuration was cut from $3,585,000 to $[illegible].

The prices of the 4361 Model Group 4 and 5 processors were also reduced. A [illegible]-byte 4361 Model Group 4 was reduced from $1[illegible] to $126,900. A 12M-byte 4361 Model Group 5 was reduced from $255,000 to $24[illegible]. All 4381 Model Group upgrades were cut by up to 12%. For example, the price to upgrade a [illegible]

[illegible]

IBM 3270 AT touts twice its predecessor's performance

NEW YORK — Last week's wave of IBM product introductions also included the 3270 Personal Computer AT, said to offer more than twice the average performance of the 3270 Personal Computer.

Available in August, the 3270 Personal Computer AT provides concurrent operation of up to four host interactive sessions, two notepad sessions and multiple PC-DOS 3.1 sessions, IBM said.

Price of the basic system unit, with 512K bytes of random-access memory (RAM) and a 1.2M-byte diskette drive, is $6,090. A high-end system unit with 640K bytes of RAM, a 20M-byte hard disk drive and an Extended Graphics Adapter (providing all-points-addressable graphics capability) costs $8,145. The 3270 Personal Computer Control Program Version 2.1 costs $300.

Two graphics models also debuted; the 3270 Personal Computer AT/G and 3270 Personal Computer AT/GX, both designed to access data from IBM 370-based host computers to create and display charts, diagrams, drawings and text. The memory addressing capabilities of the AT/G and AT/GX can be extended to 2.5M bytes, IBM said. Both will be available in August.

The AT/G reportedly features a 14-in., eight-color display with 720 by 512 user-addressable points. A basic configuration will cost $11,670.

The AT/GX is offered with either a 16-color or monochrome display, each providing 960 by 1,000 user-addressable points, IBM said. Price for a starting configuration with 19-in. color display is $18,920.

The systems will run under the 3270 Personal Computer Graphics Control Program Versions 2 and 3, with Version 3 supporting extended memory capabilities. Version 2, available in August, costs $450. Version 3, out in September, costs $550.

More information is available from IBM Information Systems Group, 900 King Street, Rye Brook, N.Y. 10573.

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IBM graphics unit debuts

RYE BROOK, N.Y. — A color graphics terminal for IBM mainframes and two Ascii terminals that can emulate other vendors' products were among the peripheral products unveiled by IBM last week.

The 3179 Color Graphics Display Station is available in two models, the G1 and G2. The Model G1 has a 122-key typewriter keyboard, and the Model G2 has a combination 122-key typewriter and APL2 keyboard.

The units both feature an eight-color, 1,920-char. or 2,560-char. alphanumeric display on a 14-in., all-points-addressable screen.

At the same time, IBM unveiled a 3979 Expansion Unit that provides auxiliary device ports to attach an IBM 5277 mouse and an IBM 7371 or 7372 color plotter. The 3179 Model G1 and G2 cost $2,995. The Expansion Feature costs $295. All three are available immediately.

IBM also introduced the 3161 and 3163 Ascii display stations Models 11 and 12 to replace the older 3101 Model 881 terminal, which IBM said it will stop marketing in September.

The newly announced units were designed to be attached to IBM or non-IBM systems. The entry-level 3161 offers basic features such as menu setup, definable function keys and split screen. It also has an auxiliary port and a cartridge capability for the addition of emulation modules. The unit also includes an Ascii keyboard with numeric pad.

The 3163 includes the same features as the 3161 but adds smooth scrolling, windowing, double-height and double-width characters and a redefinable keyboard, IBM said.

Both terminals can emulate the 3101 Model 881, as well as terminals manufactured by other vendors. The 3161 can emulate Applied Digital Systems, Inc. Viewpoint terminals, Hazeltine Corp. 1500 terminals, Lear Siegler, Inc. ADM-3A and ADM-5 terminals and Televideo Systems, Inc. 910 series terminals. The 3163 can emulate Digital Equipment Corp.'s VT52 and VT100 terminals via a plug-in cartridge emulation package.

Available immediately, the 3161 Model 11 costs $695, and the Model 12 costs $774. The 3163 Model 11 costs $1,095, and the Model 12 costs $1,174. The plug-in cartridge, which allows the 3163 to emulate DEC's VT52 and VT100, costs $50.

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Hiring execs don't see ICCP certification as critical asset

Experience, education more important for choice

By Donna Raimondi
and Clinton Wilder
CW Staff

Do DP managers consider the certification of data processing professionals a significant factor in making hiring decisions? Not according to most hiring managers in several companies contacted by *Computerworld*.

The 12-year-old Institute for Certification of Computer Professionals (ICCP) claims that voluntary certification is a valid and useful way for employers to recognize expertise and professional attitude among computer professionals. However, the majority of managers said that certification does not even show up on the list of winning attributes.

Member organizations represented on the ICCP's board include the Data Processing Management Association, the Association for Computing Machinery, the Computer Society of the Institute of Electrical and Electronics Engineers, Inc. and the Association for Systems Management.

"We are more interested in a person's reputation than in his credentials," said Jerry Downer, director of systems development at Best Western International, Inc.'s corporate headquarters in Phoenix. Best Western, an IBM shop, has one staff member with an ICCP Certificate in Data Processing (CDP), but the certificate held no weight in the decision to hire that person, he said.

That opinion was echoed by Mike Accurso, director of systems at National Car Rental Systems, Inc. in Minneapolis. Experience and education are the factors he considers when hiring for his application systems programmer slots, which range from entry- to management-level, he said.

Accurso noted that some certification programs allow people who have been in a field for five years to obtain credentials, but "when you look at the field, length [of employment] does not indicate competence," he said.

"I'm always impressed when I see an [ICCP] certificate because I see so few of them," said Charles Connoy, manager of systems at GTE Data Service Co. in Marina Del Rey, Calif. Connoy's shop has an IBM 3084 and a National Advanced Systems Corp. 9070. There is no way to seek out certificate holders because they are so rare, Connoy said. When he does see one listed on a resume, he automatically selects that person to be interviewed, he said.

> *'We are more interested in a person's reputation than in his credentials.'*
>
> — Jerry Downer
> Best Western International, Inc.

However, education comes first, experience second and a certificate third on his priority list for hiring, he noted.

A company-developed test of specific skills at Consolidated Cigar Corp. in Secaucus, N.J., makes ICCP certification unnecessary, said George Rey, director of systems and data processing. The test, which includes basic Cobol questions, a logic test for approaches to programming and some testing of math and verbal abilities, effectively screens out unqualified applicants, he said.

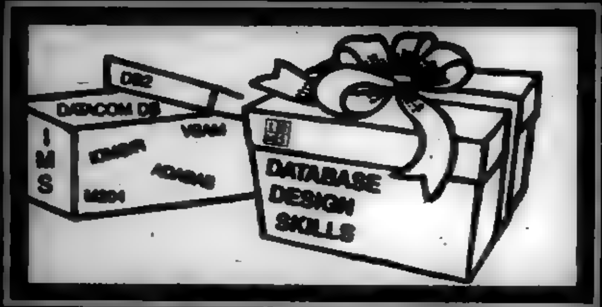
If nothing else, certification shows the applicant's career initiative, said Bobby Webb, director of MIS administration, planning and research at Hardee's Food Systems in Rocky Mount, N.C. "If I had two exactly equal candidates, and one had a CDP, I'd lean toward that candidate . . . but the situation has never come up," he said. Less than 10% of the resumes Webb sees include ICCP certification.

"I think it measures motivation more than talent," said Robert J. Woodrow, director of MIS at Agway, Inc. in Syracuse, N.Y. "I don't think we are in a position yet where testing reveals performance. . . . You can test for technical skills [but] not [for] performance."

For Rich Mathy, assistant manager of data processing at Manitowoc Co., in Manitowoc, Wis., education is the most important criterion when hiring entry-level people. Experience is the chief factor for higher level jobs, and certification does not hit the list at all, he said.

A certificate would demonstrate that a prospective employee's quest is to be more professional in his area, and it would earmark a resume for special attention, according to the manager of a 50-member DP applications department staff in a large research and development contracting firm in New Mexico. The company hires only master's degree-level analyst/programmers, the manager said, and as far as he knows, nobody on his staff has a certificate. He did not foresee a time when certification would be a necessary qualification in his organization.

"For this company, they should save their money [spent for certification]," said Bob Kist, vice-president and manager of systems and programming at Pittsburgh National Bank. The most important qualification is specific experience with banking applications or IBM systems, he said.



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DEC moves to support international standard protocols

By John Gix
CW Staff

MAYNARD, Mass. — Digital Equipment Corp. said last week that it will modify its network architecture during the next three years to comply with international standard protocols, a commitment that the company said is aimed at facilitating communications between different makes of computers.

In a sweeping announcement, DEC said it will do the following:

- Adopt the approved levels of the International Standards Organization's Open Systems Interconnect (OSI) network reference model.
- Build a software product implementing the OSI's transport level.
- Support the CCITT X.400 messaging recommendations.
- Modify its current X.25 support to conform to the revised CCITT standard.
- Provide hardware and software support of General Motors Corp.'s Manufacturing Automation Protocol (MAP).

Users contacted for comment on the DEC announcement said they were interested and pleased with the commitment but that the real importance of OSI support will only be realized if other vendors follow DEC's lead.

Of perhaps the most significance is DEC's intention to use the four lower layers of the seven-layer OSI network reference model in its Digital Network Architecture, industry analysts said. Computer systems of various makes that comply with OSI-specified protocols will be able to communicate, or so is the intent.

"OSI is going to provide users with a great deal of vendor flexibility by enabling information systems from various manufacturers to communicate. Users won't be tied into one manufacturer's implementation," said Harold Folts, executive director of Omnicom, Inc., a consulting services company in Vienna, Va., that works with computer vendors to help apply these standards. "This is a key milestone in the evolution of OSI."

> *'OSI is going to provide a great deal of vendor flexibility by enabling information systems from various manufacturers to communicate.'*
>
> — Harold Folts
> Omnicom, Inc.

DEC will, during the next three years, adopt OSI layers one through four, the only OSI layers that have been ratified as international standards, the highest level of specification, according to John Adams, manager of strategic planning and marketing for DEC's Distributed Systems group.

Level 4 of the model, the so-called transport layer, provides for virtual circuits between computers and ensures that data arrives correctly and in the order sent, Adams explained. "It is the foundation for other network capabilities."

Even though OSI layers one through four are now international standards, OSI is still a reference model and, as such, offers a menu of class options. Vendors that implement different OSI classes will not be able to communicate, Adams said.

For this reason, DEC will try to build a superset transport that incorporates components specified by user-driven standards, specifically GM's MAP and Boeing Computer Services Co.'s Technical and Office Protocol (TOP). MAP and TOP are modeled after OSI and use a similar transport layer but differ in their specification of layers above and below the fourth layer.

Adams said that for upper levels of the OSI, DEC will replace its protocols where practical and coexist with the standard where needed. "For DEC-to-DEC communications at the applications level, we will probably maintain our own proprietary protocols because it will allow us to support more functions and achieve higher performance than we would if we supported the industry-standard protocol," Adams said.

"DEC's announcement shows the maturity of OSI," noted John Heafner, chief of systems network architecture with the National Bureau of Standards in Gaithersburg, Md. "Large organizations have a need to buy from multiple vendors, and in order to put multivendor products together, they have to have some kind of industry-supported standard."

Some analysts, however, fault OSI because of its options. "While OSI appears to be a standard, it is implemented slightly differently by almost everybody," said John King of James Martin Associates, a consultancy in Carmel, Calif. "OSI really isn't a standard; it is, as they call it, a reference model."

The first product that DEC will build to OSI will be the VMS OSI Transport Service. This product will reportedly facilitate task-to-task communications between a program running under VAX/VMS and a program running on another vendor's system that implements the OSI model. The product is scheduled to be released in early 1986.

Other standards DEC has committed to include the latest release of the CCITT's X.25 and X.400 recommendations. DEC will modify its current X.25 network support to comply with the newly revised 1984 X.25 standard, the company reported. The latest revision specifies use of a symmetrical protocol that enables data terminal devices to communicate without going through a public data network, Adams explained.

DEC said that, in 1986, it would begin to incorporate the X.400 mail and messaging recommendations into its products. This standard reportedly specifies how OSI-compliant networks exchange electronic messages.

Finally, DEC also committed to developing and delivering hardware and software systems that comply to Version 2.1 of GM's MAP. In 1986 DEC will deliver software for VAX/VMS and Microvax/MicroVMS, the company said. Controllers and modems that implement MAP protocols will also be made available at that time.

DEC is headquartered in Maynard, Mass. 01754.

BARRAGE

from page 1

Available in July, a starting configuration with 256K bytes of internal memory; a 5¼-in., 1.2M-byte floppy disk drive; a 40M-byte hard disk drive; and a link to the directly attached Personal Computer costs $5,995. The 5364 System Support Program sells for an additional $995.

The machine received mildly favorable reviews from industry analysts. Several noted the popularity of the two-year-old System/36 family and the thousands of software programs available for the latest arrival but questioned the system's performance characteristics.

"The direction [in which IBM is] heading with the System/36 PC is a very good one," said Gwen Peterson, director of business computer services at Dataquest, Inc. in San Jose, Calif., but she also listed some important system limitations.

Constraints

"There are only three local workstations, and that will be a major constraint," she said. "And there are so many restrictions on how you can use the required [Personal Computer]; in many respects, it ends up just being a very expensive systems console." Additionally, some form of disk backup is desirable, she suggested.

"I have some real concerns with the performance," said George Colony, president of Forrester Research, Inc. in Cambridge, Mass. Compared with new supermicrocomputers such as Digital Equipment Corp.'s Microvax II, the System/36 line "looks like junior varsity, at this time," he maintained.

Among limitations in running microcomputer software on the attached Personal Computer, IBM said its Topview and Business Management series software, Microsoft Corp.'s Multiplan, Borland International's Sidekick and Microstuf, Inc.'s Crosstalk XVI "should not be loaded while the IBM System/36 PC is active." Various problems also arise with other applications, including Lotus Development Corp.'s Symphony, and some PC-DOS 3.1 functions may not be used, IBM said. Additionally, IBM's PC Network is not supported.

The System/36 PC can handle external communications through a single communications line interface for Binary Synchronous Communications (BSC) or Synchronous Data Link Control (SDLC) on the directly attached Personal Computer. A prerequisite is BSC or SDLC hardware and software on the Personal Computer. The communications line reportedly can handle up to 64 remote displays or printers.

The IBM System/36 PC

Using the previously announced PC Support/36 program, Personal Computer users can share PC-DOS data stored on 5364 disk drives and can hotkey between Personal Computer and System/36 sessions, IBM said.

A $325 diskette exchange facility, used with a Personal Computer AT attached to a System/36 Series 5360 or 5362, permits converting between the 8-in. format used by the larger machines and the System/36 PC's 5¼-in. format.

IBM announced a host of software packaged for the new machine, including RM/Cobol Runtime ($250); RM/Cobol Compiler and Runtime ($1,250); Professional Visual Aid Composer ($1,500); Composition Utility Version 2 ($4,500); Business Management Accounting System ($995 per module); and Business Report/Application Development System ($1,250). Personal Services/36 will be available for the new machine in first-quarter 1986.

A second 40M-byte hard disk drive costs $2,095. A $495 add-on card that expands internal memory to 512K bytes is scheduled for first-quarter 1986 delivery.

Minimum system requirements include a System/36-supported printer, the directly attached Personal Computer (with between 256K and 512K bytes of random-access memory) and PC-DOS 3.1.

The System/36 PC will be sold through IBM's National Accounts, National Marketing and National Distribution divisions. Sales channels will include value-added dealers, selected authorized dealers and selected product centers.

The internal memory enhancements for existing System/36s will be offered in first-quarter 1986. Up to three 512K-byte cards (priced at $2,500 each) can be added to 5360 Model B processors for a total of 1.75M bytes. Up to four 256K-byte cards (costing $1,250 each) can be installed in the 5362 for a total of 1M byte.

More information is available from IBM Information Systems Group, 900 King St., Rye Brook, N.Y. 10573.

SLUMP

from page 1

Also last week, Hewlett-Packard Co. said it would shut down all of its domestic operations July 1-3 as a cost-cutting measure. HP had announced last month it would restrict hiring, travel, overtime and contract labor expenditures. Apple, Wang and DG had all announced domestic plant shutdowns similar to HP's before instituting massive layoffs.

Across-the-board layoffs

A spokesman said the DG layoffs, announced June 17, will affect employees at all levels of the company, including 150 in sales and marketing support positions. Dismissals include 450 workers at three Massachusetts facilities; a total of 200 in Westbrook, Maine, and Portsmouth, N.H.; and 250 among production workers at three plants in North Carolina, two in California, one in Austin, Texas, and one in Mississauga, Ontario. Layoffs will affect 250 overseas employees.

DG's announcement reflected the suddenness of the industrywide downturn, which began early this year and caught computer executives, analysts and market researchers by surprise. Booming sales of minis and superminis to the scientific and technical user market through direct and OEM channels had produced DG's best quarter ever at the end of 1984, with the company earning $23 million on a record $333 million in sales.

"The minicomputer business was going great guns six months ago. Data General hired people to position the company for continued growth and got caught with bloated expenses," said Craig Symons, an analyst with the Gartner Group, Inc. in Stamford, Conn. "I think all the major layoffs represent companies streamlining, paring away the fat. I really don't think they're cutting the meat yet."

DG's orders took an anticipated start-of-year dip in 1985 and continued to decline thereafter. Profits for the quarter ended March 30 dropped 36% to $9.1 million from $14.2 million in the same quarter of 1984. DG's deCastro said he held little hope for improvement in the minicomputer market before 1986.

Symons said major cost-cutting announcements are a good indicator of vendor pessimism for the near term. "If they were optimistic that things would get better, they would batten down the hatches and ride through the down cycle," he said. "If they're not optimistic, they take steps like this to downsize their companies."

Bob Randolph, a market research analyst for International Data Corp. in Framingham, Mass. and a former DG consultant, said that recently announced products from Digital Equipment Corp. have cut into DG's sales. "The [DEC] VAX 8600 is a watershed product that is getting high-end supermini people back in the DEC camp," he said. "DG is taking some heat there, and the Microvax II may hurt them in the workstation area, too."

1985

June

National Semiconductor Corp.
Plans to lay off 1,300 workers.

Wang Laboratories, Inc.
Lays off 1,600 workers.

Data General Corp.
Lays off 1,300 workers.

Storage Technology Corp. (STC)
Lays off 500 workers, resumes five-day workweek.

Advanced Micro Devices, Inc.
Plans four-day workweek, executive pay cuts.

General Electric Information Systems Co.
Lays off 300 workers.

Apple Computer, Inc.
Consolidates manufacturing, lays off 1,200 workers, closes three plants.

AT&T Information Systems
Plans to cut 1,600 positions.

Burroughs Corp.
Plans to transfer or dismiss 750 workers.

Sperry Corp.
Lays off 285 workers.

May

Columbia Data Corp.
Files Chapter 11 reorganization petition.

Zial Corp.
Files Chapter 11 recapitalization petition.

Hewlett-Packard Co.
Plans extended summer holiday shutdown.

Apple
Lays off 50 workers, closes one plant.

Convergent Technologies, Inc.
Plans one-week summer shutdown at one division.

April

STC
Adopts four-day workweek.

DG
Announces extended summer holiday shutdown.

Texas Instruments, Inc.
Lays off 1,000 workers.

Computervision Corp.
Lays off 950 workers.

Honeywell, Inc.
Small Computer and Office Systems Group lays off 130, plans four one-week shutdowns.

March

Signetics Corp.
Lays off 650 workers.

Control Data Corp.
Announces plans to cut unspecified number of workers.

Intecom, Inc.
Lays off 200 workers.

Apple
Plans staggered one-week shutdowns.

Wang
Plans two-week summer shutdown.

February

Intel Corp.
Lays off 900 workers, closes or reduces operations at several plants.

National Semiconductor
Plans two-week shutdown; later revises plan and adopts four-day workweeks for 10-week period.

January

Apple
Plans to terminate 1,000 temporary workers.

Exxon Office Systems
Lays off 300 workers, seeks buyer.

Xerox Corp.
Plans to sell or close Shugart Associates, Inc.

1984

December

Honeywell
Lays off 1,000 workers at Synertech division; seeks buyer for division.

TI
Lays off 2,000 workers.

Walker Interactive Products, Inc.
Lays off 100 workers.

November

STC
Lays off 1,200 workers.

October

STC
Files Chapter 11 reorganization petition.

September

Gavilan Computer Corp.
Files Chapter 11 reorganization petition.

August

Amdahl Corp.
Cuts 300 positions.

AT&T Technologies
Plans to cut 11,000 positions.

IBM micros get Plus hard disk drive

By Kathleen Sullivan
CW West Coast Bureau

MILPITAS, Calif. — Plus Development Corp. today is expected to introduce its first product, Hardcard, a 10M-byte hard disk drive mounted on an IBM Personal Computer plug-in card.

Hardcard contains a hard disk drive system in a card measuring 4 by 13 by 1 in., according to company President Stephen M. Berkley. Designed to fit into an IBM Personal Computer expansion slot, the Hardcard includes a 3½-in. hard disk drive, a controller, drive electronics and file management and installation software.

The Hardcard can be installed in any IBM Personal Computer or Personal Computer XT as well as compatible computers, he said. Its retail price will be $1,095.

According to Berkley, the 2-lb Hardcard has an average access time of 65 msec. When in operation, it uses 10.9W of power. Its specified mean time between failures (MTBF) is said to be 25,000 hours, a figure that puts the Hardcard's MTBF at twice the industry norm for IBM Personal Computer XT-type devices, Berkely said.

The Hardcard comes with the Hardcard Directory, a file management program that allows users to load and locate applications programs and data files on the hard disk. It was developed by Software Publishing Corp., a Mountain View, Calif.-based software firm known for its PFS series of applications programs.

The Hardcard will be produced in Japan at Matsushita Kotobuki Electronics, Berkley said, and will be ready for shipment in October.

At present, the Hardcard is being tested at several companies in the San Francisco Bay area, Berkley said. At the San Francisco-based Bank of America, the Hardcard was installed in an IBM Personal Computer that handles calls to an internal electronic telephone directory.

"We put the Hardcard in about a month and a half ago and it has worked without missing a step," said George Miller, a vice-president in the bank's advanced research and development division.

However, Miller did have problems when he tried to install the device in one of the original IBM Personal Computers residing in his shop, because the read-only memory (ROM) in these early systems was not designed to recognize the existence of a hard disk. As a short-term solution, Miller installed a software program that tells the machine to talk to the Hardcard; in the long run he plans to install an updated Bios ROM, he said.

Hank Chesbrough, Plus Development's product manager for Hardcard, confirmed that users would have to update their systems with the Bios ROM if they own the early versions of the IBM Personal Computer.

More information is available from Plus Development, 1778 McCarthy Blvd., Milpitas, Calif. 95035.

Ten banks form lockbox-based cross-country network

By Charles Babcock
CW New York Bureau

NEW YORK — Manufacturers Hanover Trust Corp. in New York and Wells Fargo Bank N.A. in San Francisco, along with eight other banks, have found that a little technology can stretch a long way.

Using little more than a micro-based program and standard asynchronous communications, they have formed a cross-country network out of their individual lockbox fund collection services.

Lockbox is the practice of a bank collecting receivables for a corporate customer, saving the time the corporation formerly spent transferring payments from itself to its bank. The collection service has been around since the 1940s and can be viewed "as a mature product," said Georgette Cipolla, a vice-president at Manufacturers Hanover and president of the new network, U.S. Dollar Net (U.S.$Net).

One day of 'float' eliminated

Accounting firms estimate that lockbox service saves a company at least a day of "float," the period it must wait for customers' checks to clear and funds to be released into its account.

By forming a network, the 10 banks have added several new features to an old service:

■ A corporation can have its customers send payments to the network bank nearest them, saving part of the time that a check spends in the mail. A company in New York, for example, could have a customer in San Francisco send its payment to a Wells Fargo lockbox there. Wells Fargo would then effect an electronic transfer to Manufacturers Hanover in New York during the same day, eliminating two or more days delay before the money would be booked to the company's account, according to Cipolla.

■ A corporation that previously set up its own lockboxes in several cities with several banks may be able to achieve the same goal dealing with one bank in the network. "It totally eliminates the geographic nature of your receivables," Cipolla said.

■ Although a company may have lockboxes at 10 banks on the network, its fees are not increased by the same factor. Cipolla said she could not reveal Manufacturers Hanover's fees without violating antitrust regulations, but there would be a price break over opening separate lockboxes at each bank, she noted.

Features provide added reach

These features give the lockbox service added reach, and in a competitive banking climate, that could be an advantage, according to banking observers. But the banks achieved the service enhancements with only a modest addition of technology.

"I wish I could tell you we use a [Cray Research, Inc.] mainframe, but we don't," said John J. Cipriano, vice-president in charge of product management at Wells Fargo; one of the banks that originated the regional network that served as the model for U.S.$Net.

When funds are deposited in a lockbox, they are entered into the general accounting system, much as any other deposit, on the bank's mainframes. From that point, the data is accessed, tabulated and moved about by a program written for the IBM Personal Computer, Cipriano said.

Exchanges net dollar for dollar

The banks do not do a dollar-for-dollar exchange in each lockbox transaction. Rather, they net out the difference between what they would send to another bank vs. what they would receive, one of the key functions of the software, Cipriano said.

"We had developed our own treasury workstation and used bits and pieces of it" for the U.S.$Net program, he said.

The treasury workstation is a proprietary program for a personal computer that helps a corporate treasurer interface with several banks, retrieve financial data soon after it appears in an account and put data into a standard Lotus Development Corp. 1-2-3 format, he said.

Standard transmissions used

The U.S.$Net software uses standard asynchronous data transmissions to effect transfers. "It is a rather simple application, but it has enormous leverage," Cipriano said.

Charles L. Biggs, a partner in charge of banking service at the New York office of Touche Ross & Co., a Big Eight accounting firm, said the lockbox network will probably cut "two, three or four days off the float of a corporate payment, and that's really dynamic. They're taking a little bit of technology and adding value to their product."

The network was incorporated March 5 in California. Cipolla said 24 of Manufacturers Hanover's 400 corporate lockbox customers have requested the service so far.

In addition to Manufacturers Hanover and Wells Fargo, the following banks are involved in the network: Bank of Hawaii, Bank of New England N.A. in Boston, Centerre Bancorp in Missouri, First National Bank of Maryland, National City Bank of Cleveland, Rainier Bank of Washington State, United Bank of Denver and Valley National Bank of Arizona.

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Virtual private net cuts firm's phone costs by up to 15%

FIRST USER

By Paul Korzeniowski
CW Staff

NEW YORK — Home Insurance Co. here, the first user of Isacomm, Inc.'s Virtual Private Network, reported that the network has cut monthly telephone costs by from 5% to 15% and paid for needed network equipment in three months.

"We chose U.S. Telecom's [Isacomm is a U.S. Telecom company] Virtual Private Network because it would provide us with reliable transmission and cut costs," noted Seth Lewis, telecommunications manager at Home Insurance.

Home Insurance's relationship with U.S. Telecom started before the installation of Virtual Private Network. "We have U.S. Telecom's long-distance service at our home office, so we were interested in its virtual private network when it was first announced," Lewis said.

When Virtual Private Network was announced, the insurance company decided to install it at 15 field offices. While the home office had used U.S. Telecom's long-distance network, the field offices had worked with a number of carriers such as AT&T and MCI Corp. for their long-distance requirements. Home Insurance's Virtual Private Network replaced the various dial-up long-distance services.

Many features provided

A virtual private network provides a number of features. Companies can, for example, create seven-digit corporate dialing plans without having to install a private line to every location supported. The system automatically converts seven-digit numbers to 10-digit numbers when a trunk is full. Speed numbers can reduce dialing to three or four digits. Authorization codes prevent nonemployees from accessing the system, and account codes supply billing information.

Fifteen Home Insurance offices located throughout the U.S. have been connected to the U.S. Telecom network since it was first cut over three months ago. A Northern Telecom, Inc. SL-1 private branch exchange in each office is connected through dedicated lines, leased by U.S. Telecom from a local operating company, to U.S. Telecom's point of presence in each locale. Major locations include New York; Chicago; Columbus, Ohio; Los Angeles; Denver; St. Louis; Kansas City, Mo.; Phoenix; and Boston. Lewis plans to add three offices to the network during the summer and a number of branches in the fall. The network has resulted in reduced long-distance costs, Lewis said.

He estimated that installing Virtual Private Network cost $30,000. "We had to purchase some PBX line cards and other small items," he said. The cost included some needed changes to Home Insurance's telephone network. "Some offices needed additional trunks, so we decided to install them with the new network," Lewis said. Savings from reduced long-distance costs have paid for the equipment, he said.

Normal installation problems

The telecommunications manager reported that Home Insurance experienced normal first-time installation problems. "There were some problems with branch transmissions," he said. "Sometimes, the problem was with the local telephone company, and other times it was with the office line. At one location, U.S. Telecom was unable to transmit a microwave shot. But there weren't any major glitches." The service is primarily used for voice transmission. "There is some dial-up data transmission, but it is minimal," the telecommunications manager noted.

The network has the potential to transmit the company's data as well as voice transmissions. Currently, the company transmits branch data on IBM System/34 or 36 minicomputers over AT&T private lines to Home Insurance's IBM 3084 mainframe.

Lewis listed a number of reasons why the company is not using Virtual Private Network for data transmission. A major factor is that U.S. Telecom does not plan to complete its fiber-optic network until 1988. "I am not sure that some of the present facilities would be able to meet our data transmission speed requirements," he said. "Once the fiber-optic network is in place we may take a closer look at transmitting data on the network. Until that time, we will keep our present network."

Lewis added, "Our data network is dispersed through the U.S. and Canada. [Virtual Private Network] is not available in all these locations at this time."

National Semi posts loss

SANTA CLARA, Calif. — National Semiconductor Corp. said last week it lost $2.7 million, or 3 cents per share, in the fourth quarter ended May 31. The loss reflected a 9% drop in revenue from $470.8 million a year ago to $428.6 million, evidence of the current downturn in the semiconductor market.

National Semiconductor's loss was cushioned by a $3.8 million extraordinary credit from an accounting use of foreign operating loss carry-forward charges. In the year-earlier quarter, the company earned $24.4 million, or 28 cents per share, including an extraordinary credit of $7.8 million.

The company posted record sales of $1.79 billion in the fiscal year ended May 31, compared with $1.65 billion in fiscal year 1984. But profits plummeted 32.5% from $64 million in the previous year to $43.2 million in fiscal 1985.

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Novell unwraps IBM AT-based fault-tolerant local net

CW AT PC EXPO

By Eric Bender
CW Staff

NEW YORK — Novell, Inc. unveiled personal computer local-area networks built around off-the-shelf hardware and offering three levels of fault-tolerant operation at PC Expo here last week.

Supported under Novell's Advanced Netware/286 network software, "basic fault-tolerant systems can be put together for under $30,000," President Ray Noorda claimed. He pointed to potential use in financial, manufacturing and other applications in which avoiding system downtime is essential.

The Novell offerings are not the first to provide fault tolerance on microcomputer local-area networks, but they are the first to be configured around industry-standard hardware, according to Novell Marketing Vice-President Craig Burton. Nestar Systems, Inc. of Palo Alto, Calif. began shipping fault-tolerant products a year ago.

The Advanced Netware/286 fault-tolerant file server is a dedicated system based on an IBM Personal Computer AT and supporting up to 15M bytes of internal memory, 2G bytes of disk storage, 128 users and five shared printers, Burton said.

To off-load some of the disk I/O processing, the server can accept up to two Netware Disk Coprocessors, which are based on an Intel Corp. 80188 microprocessor and feature 16K bytes of random-access memory and the SCSI interface.

The system design addresses potential failures in the server's disk storage, the server itself and in the network's communications hardware, Burton said.

First-level features

Available in the third quarter, the first level of fault tolerance includes duplicate directory and file allocation maintenance, read-after-write verification and media-defect detection and correction. The software costs $2,495 per server, and the Disk Coprocessor will sell for $895.

Level two, scheduled for fourth-quarter delivery, adds disk mirroring, with storage automatically duplicated on a second disk. Using dual Netware Disk Coprocessors, the network also will provide disk and controller duplexing. Additionally, the dual coprocessors will speed performance during network reads of the disk, Burton said. Second-level software is priced at $3,495 per server.

Most Netware customers "that look at data integrity as critical" will migrate to the second level of fault tolerance, Burton said.

Advanced Netware/286's third level of fault tolerance adds server mirroring and server duplexing, Burton said. The third level will be available in first-quarter 1986 for $4,995 per server.

While Novell does not plan to offer an uninterruptible power supply (UPS) itself, Burton noted that adding a UPS is a requirement for fault-tolerant operation.

Applications written for other versions of the Netware family of network operating software will run under Advanced Netware/286, Burton said.

Novell is located at 1170 N. Industrial Park Drive, Orem, Utah 84057.

Ore. House OKs VDT bill

By Maura McEnaney
CW Staff

SALEM, Ore. — VDT legislation came one step closer to law here recently, after the Oregon House of Representatives gave a 31-28 vote approval to a bill requiring statewide education programs for VDT workers. The bill now faces final approval by Oregon Governor Victor Atiyeh.

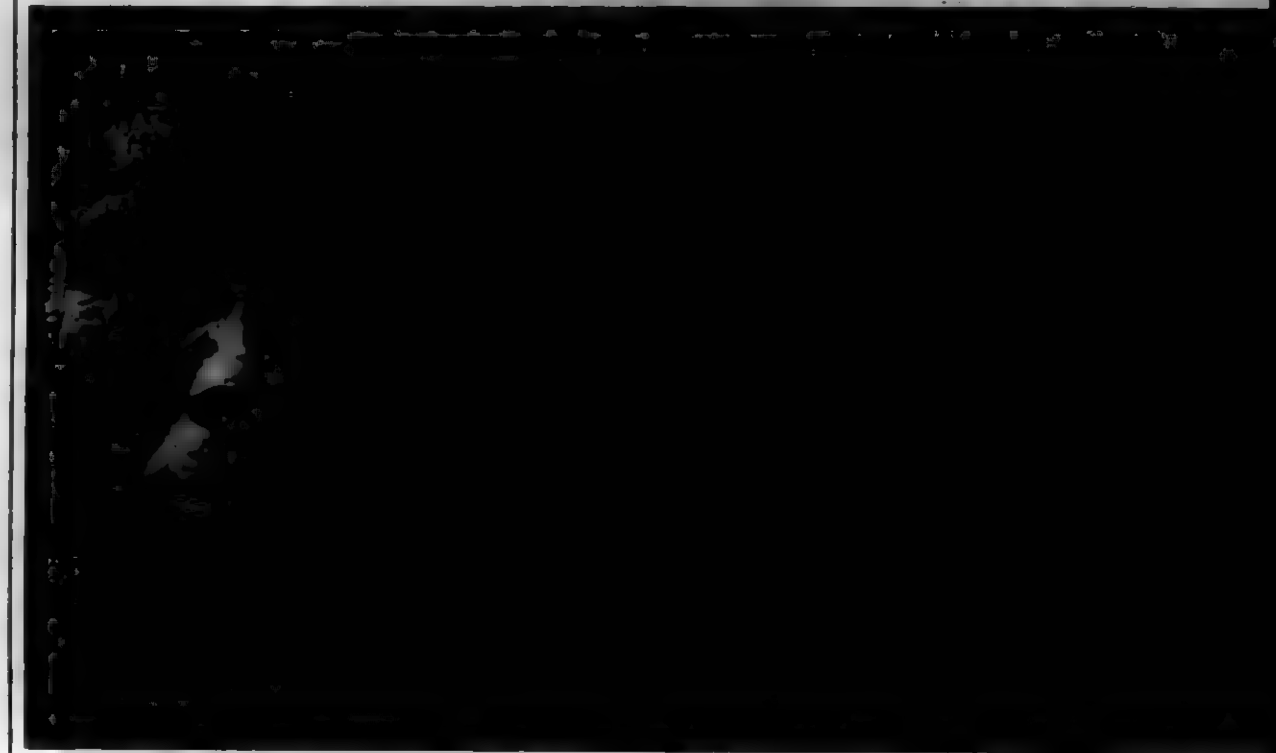
A spokesman for the governor's office, however, indicated that the governor had voiced objections to an earlier version of the VDT bill, which, the spokesman said, does not appear to be significantly different from the one passed by the House.

The spokesman also said the governor believes potential hazards that could be associated with VDT use are best addressed by existing statutes and do not merit statutory regulations. The bill could reach the governor's desk later this week.

Approved by a 27-1 margin in the state Senate earlier this year, the bill requires the director of the state's Worker's Compensation Department to set up education and consulting programs for workers using VDTs. It also requires the director to develop guidelines for the purchase, installation and use of VDTs for state workers using terminals for four or more hours per day.

The guidelines will be optional for private-sector businesses, according to a spokesman from 9 to 5, the National Association of Working Women, which is lobbying for the VDT legislation.

The Missing Link: Even if you find it, you'll find it obsolete.



Which should come as no surprise to anyone in MIS who's tried to tie managers' PCs to the company's mainframe.

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All this with complete data integrity—since everything, from wire to wire, is back under MIS control.

PC/Focus gets single-user upgrade, network version

By Eric Bender
CW Staff

NEW YORK — Information Builders, Inc. has expanded its PC/Focus fourth-generation language/data base management system product with a single-user release, the addition of a network version and a host-language interface.

PC/Focus Release 1.5, now being shipped, provides major improvements in ease of use, data base efficiency and communications, the company claimed.

Among ease-of-use enhancements are a multiwindow text editor and a Hot Screen Report Output facility with full screen report scrolling and the ability to select and save report data in a file for later use, according to the vendor.

Upgraded DBMS features include an improved screen manager that can use color, reverse video, underscore and other display attributes; compiled Modify procedures; and a Combine feature permitting a set of up to 16 data base files to be relationally joined, the company said.

Added communications features

Added communications features include an enhanced asynchronous protocol that provides continuous error checking and retransmission facilities, support for CXI, Inc.'s Pcox board and support of the Hewlett-Packard Co. 7475 flatbed plotter, the vendor said.

Release 1.5 upgrade kits are free for customers now under the company's extended maintenance and service contract. For other current users, the product costs $550. The price for new users is $1,595. In addition to IBM Personal Computers, the package is available for the Wang Laboratories, Inc. Professional Computer, Texas Instruments, Inc. Professional Computer, HP Touchscreen, NCR Corp. Workstation 300 and Convergent Technologies, Inc. Ngen computers, according to the vendor.

Multiuser PC/Focus, which contains all the features of the single-user Release 1.5, will be offered on the Nestar Systems, Inc. Plan series networks in August and the IBM PC Network in the fourth quarter.

The software consists of two components — PC/Focus software, which can be loaded onto a network file server or onto a local hard disk drive workstation, and Sync software, which can be stored on the file server or on a Sync machine.

Acts as traffic coordinator

This last device, based on a 512K-byte IBM Personal Computer AT or compatible, is a network resource that acts as traffic coordinator for access to Multiuser PC/Focus data bases, a spokesman for Information Builders said.

Multiuser PC/Focus will cost $4,800 for an eight-user version and $6,800 for a 16-user version, with one year of maintenance and enhancements included.

The Host Language Interface enables programs written in traditional programming languages to create, build and maintain PC/Focus data bases. The data bases can be designed as simple relational tables or as more sophisticated hierarchical and networked structures, according to Information Builders.

Available in August, Version 1.0 of the Host Language Interface can be used with IBM's PC Assembler, Microsoft Corp.'s Fortran 77 and Pascal and Computer Innovation's C86 languages. A license for use on up to 20 personal computers costs $2,500 and includes a year of support, maintenance and enhancements.

Information Builders is located at 1250 Broadway, New York, N.Y. 10001.

How it works:

DataBridge™: Brings data from widely varying systems together into one executive database. It integrates commercial databases, on-line public databases and, of course, your own in-house systems (including DSS models or 4GL DBMS).

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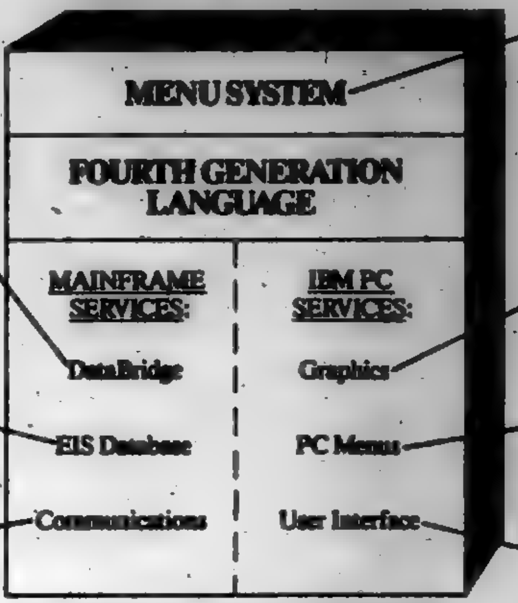

Command Center is designed for use with IBM®(VM/CMS), DEC® VAX™, or PRIME®, and any number of IBM PCs.

Menu System: Gives you mouse or touch-screen driven operation, controlled from the host. Provides the user with the ease of use of a PC with the database power of your mainframe.

Graphics: The PC graphics module creates bar, line, scatter, cross-sectional charts, and mixed text and graphics from data and commands sent from the mainframe.

Local Menu Storage: Menu screens can be stored on the PC so they don't have to be re-transmitted from the host.

User Interface: Non-keyboard pointing devices such as a mouse or touch are used for menu selection. Keyboard access is an option.

THE SYSTEM AT WORK:

Because Command Center is a single, 100% integrated micro-mainframe system, it gives MIS a way to serve a wide variety of purposes throughout the managerial structure of a company. For example:

One of the country's largest consumer products companies is using Command Center to build an executive system for presidents of its ten operating companies. Key items tracked include weekly sales, financial data, competitive information and industry news stories.

A major manufacturing company uses Command Center as an interface to the corporate data center to give non-technical senior managers financial information such as monthly closings, corporate consolidations and forecast updates.

A leading fast-food franchiser has developed an information system to give managers immediate access to historical operating results for 1200 franchise outlets, and to display growth rates, productivity, profitability and return on assets.

In short, Command Center is a tool that can dramatically disperse computer usage, while putting the management of information systems back in the hands of MIS.

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Sept. 19	Detroit, MI	Nov. 14	Dallas, TX
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SAS statistical package expands firm's micro offerings

CW AT PC EXPO

By [illegible]
CW Staff

NEW YORK — SAS Institute, Inc. expanded its line of personal-computer-based products with its recent announcement of SAS/Stat, a statistical package designed to be used with SAS base data management and analysis software running under the IBM PC-DOS operating system.

The company also announced a terminal emulation product that allows users to produce hard-copy graphics with an IBM Personal Computer. The announcements were made last week at PC Expo here.

SAS/Stat, scheduled for release in the fourth quarter, reportedly offers interactive statistical procedures for simple and complex analyses and includes an interactive windowing facility for editing and managing I/O and messages.

The SAS/Stat software can be integrated with the SAS System on mainframes and minis, the vendor said. SAS under PC-DOS, scheduled for release in the third quarter, includes an Irma Decision Support Interface that allows SAS data sets to be uploaded or downloaded from the host computer to the micro.

The annual license fee for SAS/Stat software, which is delivered on IBM Personal Computer XT-formatted master diskettes, varies according to the number of workstations supported — 50 workstations would cost $2,000.

Also announced was SAS/Rterm, a remote communications product that can emulate Digital Equipment Corp.'s VT100 terminal as well as the graphics commands of Tektronix, Inc.'s 4696 ink-jet printer, the IBM Personal Computer Graphics Printer and Hewlett-Packard Co.'s 7470, 7475 and 7550 plotters. The SAS/Rterm capabilities can be accessed via the device driver in SAS/Graph Version 5 graphics software.

When a user wants to print a particular graph, the image reportedly is transmitted to the printer, allowing the user to move on to another task while the graph is being printed.

SAS/Rterm connects to the host through Ascii asynchronous support and requires 256K bytes of memory. A color monitor and color/graphics adapter are required for graphics previewing.

A first-year license for the SAS/Rterm software is $1,500 for 50 workstations.

SAS Institute can be reached through Box 8000, SAS Circle, Cary, N.C. 27511.

[illegible]

CW AT SYNTOPICAN XIII

Ramblings from the floor of Syntopican XIII last week:

■ It would have been easy for Syntopican attendees to take a wrong turn and sit down for a session titled "Ideas on Increasing Production in Conveyor Car Washes." That's because the annual convention of the International Car Wash Association/National Car Wash Council was sharing the Washington Convention Center with Syntopican last week.

■ Are your micro users frustrated by the bureaucratic procedures developed to enhance security and protect data integrity? Kenneth G. Rau, a partner in the Winchester Consulting Group, a consulting firm in Woburn, Mass., recommended the use of an automated data distributor hardware and software program to control data access.

"Standing between the [micro] user and the corporate data base, the automated data distributor, or ADD, acts as interpreter, sentry and translator for the users' data needs," Rau said in a Syntopican paper. ADD provides tailored data files to micro users based on previously submitted user data requirements, he said.

■ The Association of Information Systems Professionals (AISP), the sponsor of Syntopican, will be making some changes for Syntopican XIV, to be held in San Francisco next year. At a recent summit meeting with leading vendors about the decline in vendor participation in trade shows, the AISP staff got at least 20 practical suggestions for changes.

In addition, the AISP has formed Information Systems Exhibits, Inc. to manage future Syntopican shows. AISP allowed its contract with Prestige Expositions, Inc. to expire.

Syntopican XIII had only 50 exhibitors, but vendors said they had good traffic at hours when there were no educational sessions.

■ One exhibitor, Lanier Business Products, Inc. of Atlanta, drew a crowd by staging a trivia game show, sprinkled with trivia questions about Lanier products and markets.

■ Telecommunications managers can advance their careers if they demonstrate ways that the telecommunications system can enhance the company's products and services, according to Robert A. Derounian, telecommunications specialist at Eastman Kodak Co. in Rochester, N.Y. "Demonstrate your business acumen before selling technology" to corporate executives, he recommended.

Gun scare at DEC plant all wet

LITTLETON, Mass. — High-tech high jinks brought the local police to a Digital Equipment Corp. small systems engineering plant here one morning last week. Officers from Littleton and nearby Boxboro responded to a report that someone had walked into the plant carrying a concealed weapon; specifically, the report said, a powerful Israeli-made Uzi machine gun wrapped in a towel.

Between 200 and 300 employees were evacuated by fire alarm — a method chosen by police so as not to provoke the would-be gunsel.

But police found no Middle Eastern terrorist inside blasting DEC Rainbow computers.

Instead, investigation revealed the weapon was actually a sophisticated, state-of-the-art water pistol — unloaded. Apparently, several DEC employees at the plant were similarly armed for battle in an ongoing game — a fact unknown to the DEC employee from another facility who spotted the alleged gunman while waiting in the lobby.

The incident, however, did not damage DEC's reputation for pride in expert engineering. "It turned out to be a $20, battery-powered water pistol that can shoot 25 feet," a Littleton police officer said. "It's amazing — it looks very real. I've never seen one like it in my life."

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DEC adds financial application to All-In-One system

MAYNARD, Mass. — Digital Equipment Corp. last week continued the expansion of its All-In-One Office and Information System with the introduction of a financial and operations planning package. The Business Operations and Strategy System (Bossystem) is the second in a series of departmental applications based on All-In-One that also includes the All-In-One System for Sales and Marketing introduced in February [CW, Feb. 11].

According to a DEC spokesman, the All-In-One Bossystem consists of five major components designed to provide corporate and financial data to departmental managers. The components include menus that provide an interface to overall systems functions, a spreadsheet with communications capabilities for the distribution of data, a data management facility, a report generator for ad hoc and periodic reports and an applications template library. All components can be customized by individual data centers.

The spokesman said the Bossystem gives departmental managers and staff access to data through the product's data base.

Integration options

The product can be integrated with the System for Sales and Marketing package and third-party software packages. It is accessible from the All-In-One Version 2.0 menu and provides what the spokesman labeled "high-level report access techniques" that allow users to view key departmental data.

The applications templates can be used for developing forecasts, budgets and reports, and the product includes additional facilities for developing project and manufacturing control and investment and long-range planning applications.

Also included with the Bossystem is the capability to send live spreadsheet and graphics documents among users and a data link that allows users to transfer information to and from spreadsheets and to reports from the departmental data base.

Scheduled for October availability, the All-In-One Bossystem costs $10,000 for the VAX-11/730, 11/750 and 11/785 systems and $15,000 for the VAX 8600. Prices range from $6,000 to $9,900 per CPU for VAX cluster systems.

DEC is located in Maynard, Mass. 01754.

Another Smart Solution From AVATAR

The idea is simple. Make your PC spreadsheet even more powerful by giving it mainframe data. But getting that data out of your mainframe, into your PC and onto your spreadsheet isn't that simple.

Until now, you've had three choices. Transfer entire files from the host and risk choking your PC with data. Not very efficient. Or find the information in printed reports, then reenter and reformat it. Very tedious. And the alternative of asking your DP department to write special host software...well, they're overburdened already. Three choices, no real solution.

Now there's TURBO, the newest micro-to-mainframe link from AVATAR.

TURBO's Data Capture lets you select just the information you need from the mainframe. And use it immediately in any of your PC applications – Lotus, dBASE, you name it. Without re-keying, reformatting, re-anything.

And you can use TURBO's host-assisted File Transfer the way file transfer was meant to be used – for sharing data with other PC users on the 3270 network.

If that isn't enough, TURBO's exclusive Macro Language adds a whole new dimension to your micro-to-mainframe link. Use Macros to automate file transfer and data capture. Better yet, massage host data even before feeding it to your spreadsheet.

So give your PC a TURBO from AVATAR. And delight your Lotus with mainframe data.

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OA productivity requires more emphasis on training

CW AT SYNTOPICAN XIII

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Corporations spend a "paltry" 6% of their office automation budget on staff training, according to Sidney E. Harris, OA expert at Georgia State University. That figure will have to be raised significantly for OA to fulfill its potential for improving office productivity, he told attendees at last week's Syntopican XIII here.

Without adequate training, expensive hardware and software will go unused, Harris said at the Syntopican session titled "Alternatives for End-User Support Strategies." He recommended development of an information center and a user group to provide training and support for end users.

Laura Scharer, manager of information systems planning and management services at O. M. Scott & Sons, Inc., the Marysville, Ohio-based lawn care firm, strongly agreed with Harris' assessment.

"Training can be what wakes up the technology," Scharer said. Teaching end users how to use their OA tools, she explained, helps the organization to obtain the return on investment projected when the OA equipment was first purchased.

To get started on a training program, Scharer suggested that the information center manager conduct a survey of the organization to understand better its state of computer literacy and find out who needs training. She provided several other tips for training programs:

- Demonstrate that the information system can solve practical business problems encountered by the users.
- Offer demonstrations, which keep the attention of users better than lectures and homework.
- Develop a "buddy system" among users so that expert users help novices.
- Provide "cheat sheets" of routine commands as part of the training materials, since users will spontaneously develop them anyway.
- Be sure to provide training for the trainers.

Harris said his 1984 study of Atlanta businesses showed that end-user support typically goes through seven stages. In the first stage, when there are few microcomputers in the organization, users must learn by doing. In the second and third stages, training classes are begun as more micros come aboard. In the fourth and fifth stages, a micro manager is appointed, an information center is formed and a user group starts. In the sixth and seventh stages, the micro department becomes so advanced that it may even sell its services to other subsidiaries and outsiders.

Harris stressed that effectiveness of the OA implementation must be continuously monitored so the organization can learn from its mistakes.

In another presentation, Theodore Stout, president of the Blake Corp., an Atlanta-based consulting firm, said OA should become an integral part of the company's facilities management program, so that OA managers have a say in the design of the office and purchase of furniture.

Major gains in office productivity are possible, he said, with improvements in furniture, acoustics and office design. In one case history Stout cited, placing acoustic boxes over noisy line printers increased office performance by 8.8% and had an investment payback of three days.

Chip meet to focus on transition

TUCSON, Ariz. — Representatives of the semiconductor industry will speak at the Semiconductor Industry Conference Oct. 14-16 at the Sheraton El Conquistador Hotel here.

The theme of the conference, sponsored by Dataquest, Inc., will be "An Industry in Transition." Topics to be discussed include high-level silicon applications and the challenge of automotive electronics.

Registration is $750 for Dataquest clients and $1,000 for others.

Information is available from Dataquest, 1290 Ridder Park Drive, San Jose, Calif. 95131.

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NEWS

Software suit alleges violation of shrink-wrap law

By Edward Warner
CW Staff

TORONTO — Quaid Software, Ltd., the publisher of a program that defeats the copy protection of some personal computer software products, is facing a $100 million civil suit brought against it earlier this month by Vault Corp., makers of the Prolok copy protection system.

The suit, filed in Federal District Court in Louisiana under that state's 1984 shrink-wrap software protection law, claims that Quaid Software, based here, illegally decompiled and copied Prolok. Quaid decompiled Prolok, the suit alleges, to produce its Copywrite program, which reportedly can defeat Prolok protection.

However, Robert McQuaid, Quaid Software's president, claimed Copywrite is used only for making legal backup copies of a protected program. While acknowledging that his firm has "occasionally looked at software with a decompiler," McQuaid maintained that "in the case of Prolok, it was not necessary to do something that sophisticated."

McQuaid added that his firm has done nothing wrong but is, nonetheless, eager to settle the two-week-old suit, saying, "I'm not an advocate of spending a large amount of money on lawyers." McQuaid, however, said his firm will not pay Vault the entire sum demanded in the suit.

Vault Chairman W. Krag Brotby, meanwhile, said the suit will determine whether Quaid Software can produce software that allows users to make unlimited copies of a copy-protected program "as long as [users] call them backups." Louisiana's shrink-wrap software protection law requires users to abide strictly by the license agreement of a personal computer software package when the agreement is printed on the package's exterior and the package is covered in see-through plastic wrapping. To break open the shrink wrap is to agree to abide by the license, the law states. Vault said Prolok's packaging meets that law's requirements.

The suit also alleges that "Quaid has willfully and maliciously misappropriated Vault's trade secret, the Prolok software program, and thereby violated the Louisiana Uniform Trade Secrets Act." McQuaid said that he found the claim "incredible" in light of what he said was Vault's having "distributed several million copies of its software."

Approximately half of all personal computer software in use by U.S. businesses is pirated, amounting to a loss of $600 million to $800 million annually for software publishers, according to a survey by Dallas-based Future Computing, Inc.

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The deadline for the submission of abstracts is August 1. They should be sent to G. Stanley Doore, Office of the Federal Coordinator, Suite 300, 11426 Rockville Pike, Rockville, Md. 20852. Papers are due by Nov. 1.

MANAGERS ON THE MOVE

RALPH L. BRADLEY II has been promoted to vice-president in charge of management information systems for ITT Commercial Finance in St. Louis.

In his new position, Bradley assumes full responsibility for all of ITT Commercial Finance's systems departments.

Previously he served for two years as international project manager for Heublein Corp. in Farmington, Conn.

He joined ITT just over a year ago, after serving more than two years as a manager with Peat, Marwick, Mitchell & Co., a national public accounting firm in St. Louis.

Bradley holds a bachelor's degree from Syracuse University in New York and an MBA from the University of Connecticut at Hartford.

■

RUSSELL SCHROEDER has been appointed vice-president of management information systems and data processing for Shopwell, Inc. in New York.

Schroeder has more than 16 years of experience in the MIS area of the supermarket industry. He has been with Shopwell since November 1984.

Prior to that, he was employed with Grand Union Co. for seven years, National Tea Co. for two years and Allied Supermarkets for seven years.

He graduated from the Detroit Institute of Technology with a degree in marketing management and holds a graduate degree in commercial banking from the American Institute of Banking.

Shopwell serves the metropolitan New York and southern Connecticut areas operating a chain of supermarkets under the Shopwell, Food Emporium and Value Center names.

USPS to ditch its electronic mail delivery service

WASHINGTON, D.C. — The U.S. Postal Service (USPS) recently said it will pull the plug on its electronic mail delivery service — Electronic Computer-Originated Mail — Sept. 2, ending the product's troubled three-year history.

USPS officials testifying before the House Subcommittee on Investigations said efforts to sell the electronic mail equipment had been unsuccessful because no financially attractive offers were submitted.

Approximately 900 customers use the service, which allows computerized tapes to be submitted to the USPS where the information on them is transmitted electronically to a receiving station and a hard-copy message is then printed out and placed in the mail.

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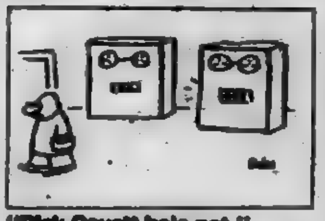
FIG users group meet scheduled

SAN JOSE, Calif. — The Seventh Annual Convention for users of the Forth programming language will be held Sept. 21-22 at the Hyatt Rickeys Hotel in Palo Alto. The convention is sponsored by the Forth Interest Group (FIG).

Registration for the convention costs $10.

More information is available from FIG, P.O. Box 8231, San Jose, Calif. 95155.



"Dick Cavett he's not."

WASHINGTON UPDATE
CW Washington Bureau

U.S. senators sponsor computer education bill

WASHINGTON, D.C. — Leading Democrats in the U.S. Senate recently introduced legislation to provide federal grants for the purchase of computer hardware and software in elementary and secondary schools, with special emphasis on schools with poverty-level children.

The Computer Education Assistance Act of 1985 (S. 1276) was sponsored by Sen. Frank R. Lautenberg (D-N.J.) and cosponsored by Sens. Christopher J. Dodd (D-Conn.), Edward M. Kennedy (D-Mass.), Robert C. Byrd (D-W.Va.), Daniel P. Moynihan (D-N.Y.), Paul S. Sarbanes (D-Md.), Quentin N. Burdick (D-N.D.) and Bill Bradley (D-N.J.).

School districts will have to make extensive plans on how they will use the computers for instructional purposes to get the federal matching grants, Lautenberg said.

The bill proposed an annual budget of $150 million for buying hardware and software and for training teachers.

If passed, the bill would also provide $20 million annually to establish teacher training institutes and would authorize the government to evaluate educational hardware and software and then disseminate the results.

High-tech panel to study effect of export controls

WASHINGTON, D.C. — The effect of national security controls on international technology transfer and the competitiveness of U.S. high-technology industries will be studied by a blue-ribbon panel.

The 21-member panel was convened recently by the Committee on Science, Engineering and Public Policy, a unit formed by the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine.

The chairman of the panel will be Lew Allen, director of the Jet Propulsion Laboratory of the California Institute of Technology, former director of the National Security Agency and chief of staff of the U.S. Air Force. The announcement said the panel expects to release its report by the fall of 1986.

Other panel members include Thomas A. Cristiansen, manager of international trade relations for Hewlett-Packard Co. in Palo Alto, Calif.; John M. Deutch, dean of science at MIT; and retired Adm. Bobby Inman, president of Microelectronics and Computer Technology Corp. in Austin, Texas.

SEC's Edgar to include public utility firm filings

WASHINGTON, D.C. — The Securities and Exchange Commission (SEC) recently announced it will expand its electronic filing and retrieval system, called Edgar, to include electronic filings from public utility holding companies.

The SEC approved temporary rules that revise its filing requirements to accommodate computer-generated filings delivered via direct digital transmission, diskette or magnetic tape. "Currently, the commission accepts filings prepared on [more than] 85 different word processors or personal computers," the commission statement said.

The rules require filings made on diskettes or tapes to be accompanied by a sheet of paper with an authorized signature attesting to the accuracy of the filing. Filings made by direct digital transmission will use personal identification numbers as signature symbols.

Afips offering NCC telephone registration

CHICAGO — National Computer Conference (NCC) registration is just a phone call away in 1985.

The American Federation of Information Processing Societies, Inc. (Afips) is offering conference registration by telephone, payable with a major credit card.

Prior to July 11, the toll-free number to call is 1-800-NCC-1985, an Afips spokesman said. Attendees can register July 9-13 by calling 312-567-8000 between 9 a.m. and 8 p.m. "This is to cut down on the lines and to provide an extra service for people registering," the spokesman said.

At the conference, early registration is offered Sunday, July 14, from 10 a.m. to 8 p.m. Registration hours July 15-17 are 7:30 a.m. to 6 p.m.; on July 18, registration is 7:30 a.m. to 3 p.m.

Afips is predicting a strong turnout of 80,000 at this year's conference, and early registration has been heavy.

"That will help ease the lines," the spokesman said. Early registrants are sent through separate lines to pick up their conference materials and preprepared badges, the spokesman said.

The advance registration fee is $125, and on-site registration costs $150.

For further information, Afips is located at 1899 Preston White Drive, Reston, Va. 22091.

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The beauties above are two of the most user-friendly pieces in all of techdom. And both are backed by yet another dynamic duo: the sterling quality of Digital and the stalwart service of Leasametric.

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Copyright Office inquiry targets electronic data bases

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Copyright Office is struggling with the question of how to give copyright protection to commercial data bases that are constantly changing.

Under long-standing copyright rules, the author must deposit a copy of the work with the Copyright Office to register the copyright in order to retain full legal protection and remedies. Data bases can be copyrighted because they are compilations of information.

But the Copyright Office recently acknowledged the difficulty of registering an electronic data base that changes very frequently and that may not appear in hard copy.

In a June 10 public notice, Dorothy Schrader, general counsel of the Copyright Office, launched a regulatory inquiry on the subject and sought public comments on how to deposit and register electronic data bases.

"Data bases provide special problems for copyright deposit because they are constantly changing, and there remains some question about the copyrightability of additional small increments of information," the notice said.

Oliver Smoot, executive vice-president of the Computer and Business Equipment Manufacturers Association, said, "The real practical issue is how you comply with the registration requirements of the Copyright Act for a work that changes — you obviously can't deposit continuously."

Smoot noted that the matter would not be a problem if the U.S. adhered to the policies of the international Berne Copyright Convention, which does not require registration.

The Copyright Office's inquiry was prompted by recommendations from the Information Industry Association (IIA), a trade group for electronic data base vendors, and the Association of American Publishers.

Ultimately, IIA President Paul G. Zurkowski suggested, the Copyright Office should be able to accept data base deposits electronically, with an on-line filing system like those developed at the Securities and Exchange Commission and the U.S. Patent and Trademark Office.

In the meantime, the IIA said, data base vendors should have the option of submitting paper copies of only the first and last 25 pages of the data base, or other representative portions of the data records, for both the original data base and subsequent revisions.

The Copyright Office said it is seeking public comments on the IIA proposal. Comments are due July 15.

In a broader sense, the whole topic of copyright in the computer age is being explored by the U.S. Congress' Office of Technology Assessment (OTA), according to OTA researcher Earl Dowdy. Dowdy said it is debatable whether data bases should be granted copyright protection at all and whether such a copyright can be enforced.

"It's clear that copyright protection was intended not for information per se; it was intended for the form that information comes in," Dowdy said. "A data base is ambiguous, [because] it falls in the gray area between information and form."

OTA's report, tentatively titled "Intellectual Property Rights in an Age of Electronics and Information," will be published in late October or early November, Dowdy said.

Wohl will be honored at AWC meet

CHICAGO — Amy D. Wohl, president and founder of Wohl Associates, will receive the 1985 Augusta Ada Lovelace Award at the Allerton Hotel here July 14 during the fourth annual conference of the Association for Women in Computing (AWC).

The award will be given to honor Wohl for her "vision and pathfinding experience in the field of office automation systems and end-user computing," the AWC said. Wohl is editor and publisher of "The Wohl Report on End-User Computing" newsletter, a columnist for *Computerworld* and a frequent contributor to the trade and general business press on office automation, personal computing, computer literacy and office technology.

More information can be obtained from the AWC, 407 Hillmoor Drive, Silver Spring, Md. 20901.

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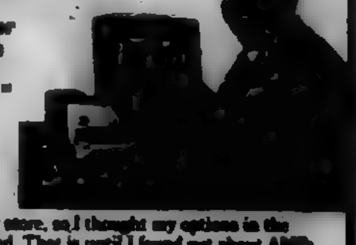

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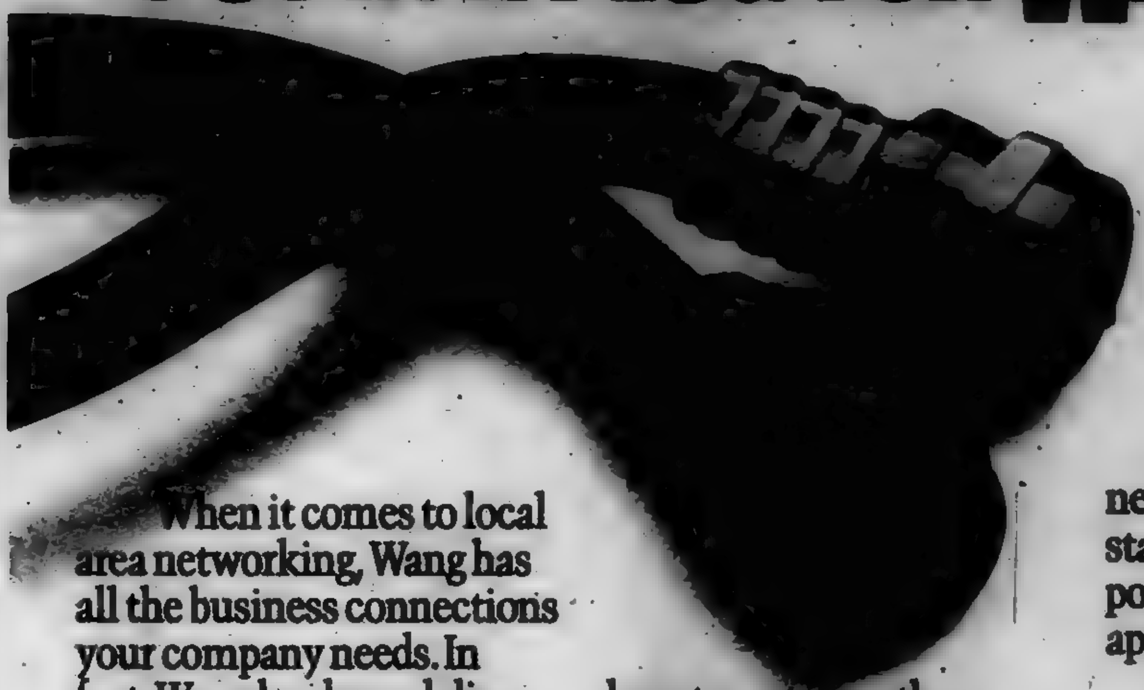

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Hacker sentenced for accessing U.S. agency computers

By Mitch Betts
CW Washington Bureau

DENVER — A Los Angeles computer operator who pleaded guilty in May to trespassing in the U.S. Department of Agriculture's Forest Service computers in Colorado was recently sentenced to three years of probation, a $3,000 fine and 200 hours of community service.

The defendant, 26-year-old Philip Gonzales Fadriquela, also was required to forfeit his computer equipment and provide a statement to the Forest Service explaining how he gained access to the agency's computers [CW, May 27].

Cathy Goodwin, assistant U.S. attorney, called the sentence moderate, adding that it makes an important statement that computer crimes will be prosecuted and convictions can be obtained under the 1984 Computer Fraud and Abuse Act.

Sentence handed down

On June 14, U.S. District Judge Jim Kerrigan sentenced Fadriquela to three years of probation and fined him $1,000 for each of the three misdemeanor charges.

Under the Computer Fraud and Abuse Act, the maximum penalty for each misdemeanor charge is one year in prison and a $5,000 fine. The law covers unauthorized trespass in U.S. government computers.

Goodwin said the defendant asserted at the sentencing hearing that the hacking activity was innocuous and innocent and the result of curiosity. Fadriquela's attorney could not be reached for comment.

The defendant apparently dialed into the Telenet, Inc. telecommunications network and made unauthorized use of an access code to enter the GTE Telenet Communications Corp. network; he apparently then dialed numbers at random until entering a Data General Corp. mainframe at the Forest Service office in Fort Collins, Colo., sources said.

Goodwin said Fadriquela admitted that he got the Telenet access codes from hacker bulletin boards.

Goodwin said Fadriquela's statement to the Forest Service indicated that "there is a way to get in [the service's] system that they didn't even know existed — and they have since taken corrective measures.

"Once he got in [at Fort Collins]," she explained, "he was familiar with the [DG mainframe] . . . and knew ways to move around in it with ease. But it was the luck of the draw. It could have been almost anybody's system that he randomly accessed."

The prosecutor quoted Fadriquela as telling the court: "I didn't think I was trespassing because I was still in my own house. It's not like I went to Colorado and walked through their office." He complained that the computer programs did not have notices warning against trespassing, Goodwin said.

Robert Booms, Fadriquela's attorney here, criticized the broad scope of the hacker law. He said his client never went beyond using a password and identification code and never made use of the information stored in the computer. "Like most computer hobbyists, he was more interested in the computer than the contents of the computer," Booms said.

Fadriquela bought a modem around Christmastime last year, Booms said, "and basically went bananas with it," using it for periods of 12 hours or more to enter computer systems.

The trespass was made easier by the fact that the government agency used passwords such as "guest" and used the same word for the user code, the attorney said. "[Anyone] can figure that out," he said.

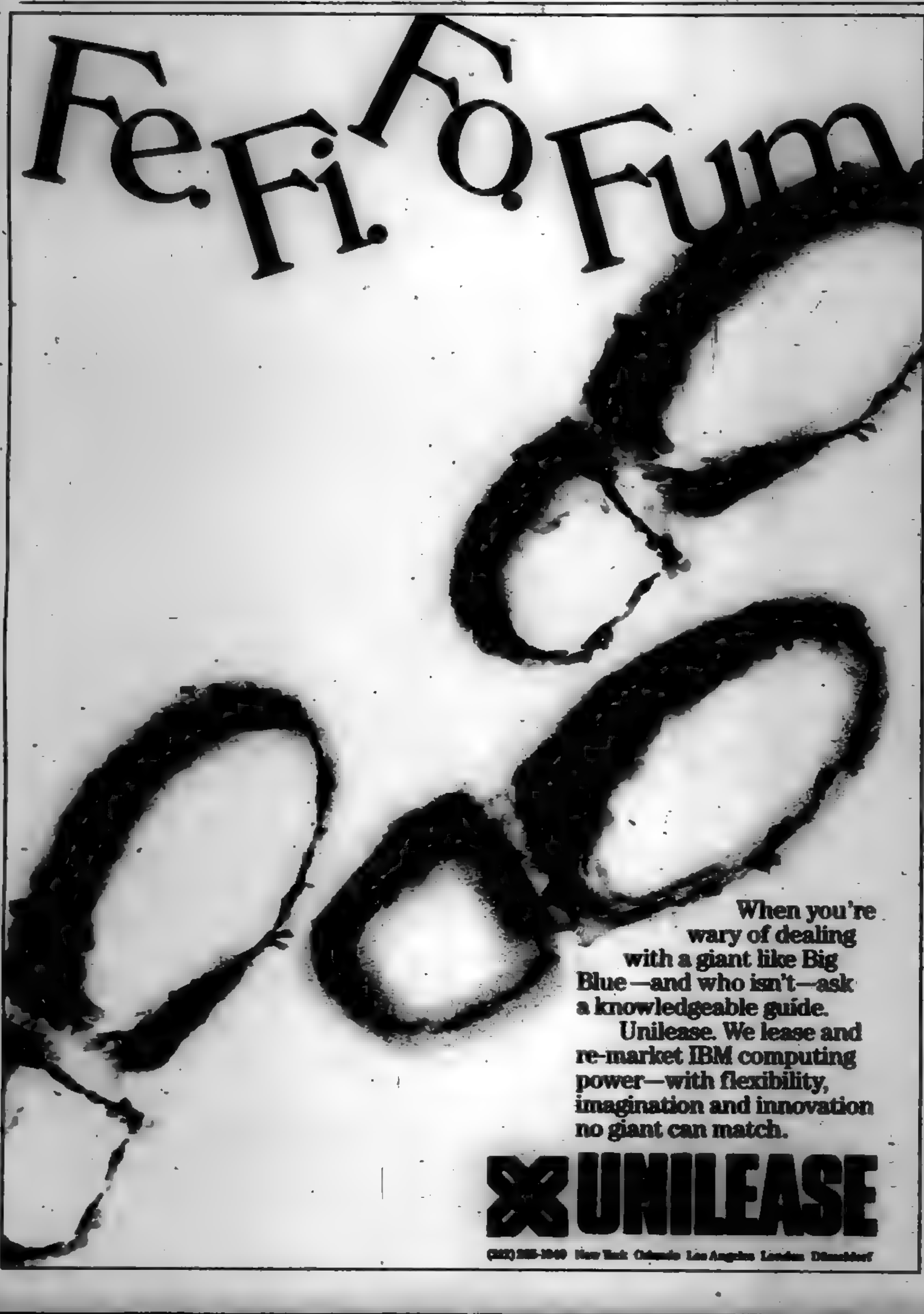
Discovery of the trespass

The trespass was first discovered by Kevin Abt, director of quality assurance at GTE Telenet in Vienna, Va. [CW, Feb. 11]. Goodwin said Abt "happened to be monitoring the [network] at home on his home computer, and he noticed some activity at unusual hours by the Forest Service — like 3 a.m. — when they normally wouldn't be on-line."

After monitoring the trespasses for about a week and keeping a log, authorities traced the intrusions to the telephone of a Los Angeles optometrist, a GTE Telenet subscriber who was getting unexplained charges on his telephone bills, Goodwin said.

"That was our clue, of course, that there was a tap into his line. So we had to physically trace it back to the defendant's house," she said. Fadriquela was arrested Feb. 6.

"I had an argument with the computer and it fired me!"



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Upgrade gives drug firm measure of DP flexibility

LEE'S SUMMIT, Mo. — When Pfizer, Inc. opted to replace its batch order processing system back in 1983, the pharmaceutical company's Agricultural Division here had to decide whether to upgrade its own operations simultaneously.

The Pfizer Agricultural Division is a supplier of animal health products. Manufacturing, distribution and sales offices are located here; corporate headquarters are located in New York.

Faced with an obsolete corporate product distribution system and an underpowered local IBM System/3 small-business system, the company considered first replacing the IBM computer here just to handle the nondistribution applications, and then upgrading the in-house-developed corporate distribution system, said Robin Sitver, manager of financial analysis and systems development. Sitver headed a task force that evaluated product alternatives.

"The old system couldn't handle inventory control. It did order processing, but that was in a batch environment. There was no on-line edit checking or other state-of-the-art features. It couldn't handle our marketing programs, so most of our pricing was done manually. It did check inventory availability and back orders, but it really didn't offer automated lot control. Tracking orders was difficult, and although there was some credit checking, it wasn't as sophisticated as what we're doing now," Sitver said.

System upgrade an option

Upgrading the system here to handle distribution and giving the division an independent distribution system was Pfizer's other option, Sitver said. Because of the division's size and its business methods, Sitver and the task force chose to look for a customized inventory control and distribution system for an IBM System/38 at the facility here.

Because the Agricultural Division is seasonal and tends to ship larger but fewer orders than sister divisions in more conventional pharmaceutical markets, its order processing and pricing requirements did not mesh with those of the corporate system. Sitver explained, "We have several different product groups and many different channels of trade in which we conduct business. So at any one point in time, we have many specials. As a result, our pricing is often somewhat complicated.

To help with the software selection, Sitver and others on the task force interviewed major users in five departments. "We took everyone's wish lists and used [them] as requirements for our vendor," she said. The ability to implement different pricing and order requirements was another consideration, Sitver noted.

Of the three systems examined, including a proposal for an IBM customized program, the Agricultural Division selected Friedman & Associates' Customized Real-Time Installed Software Products (Crisp) program.

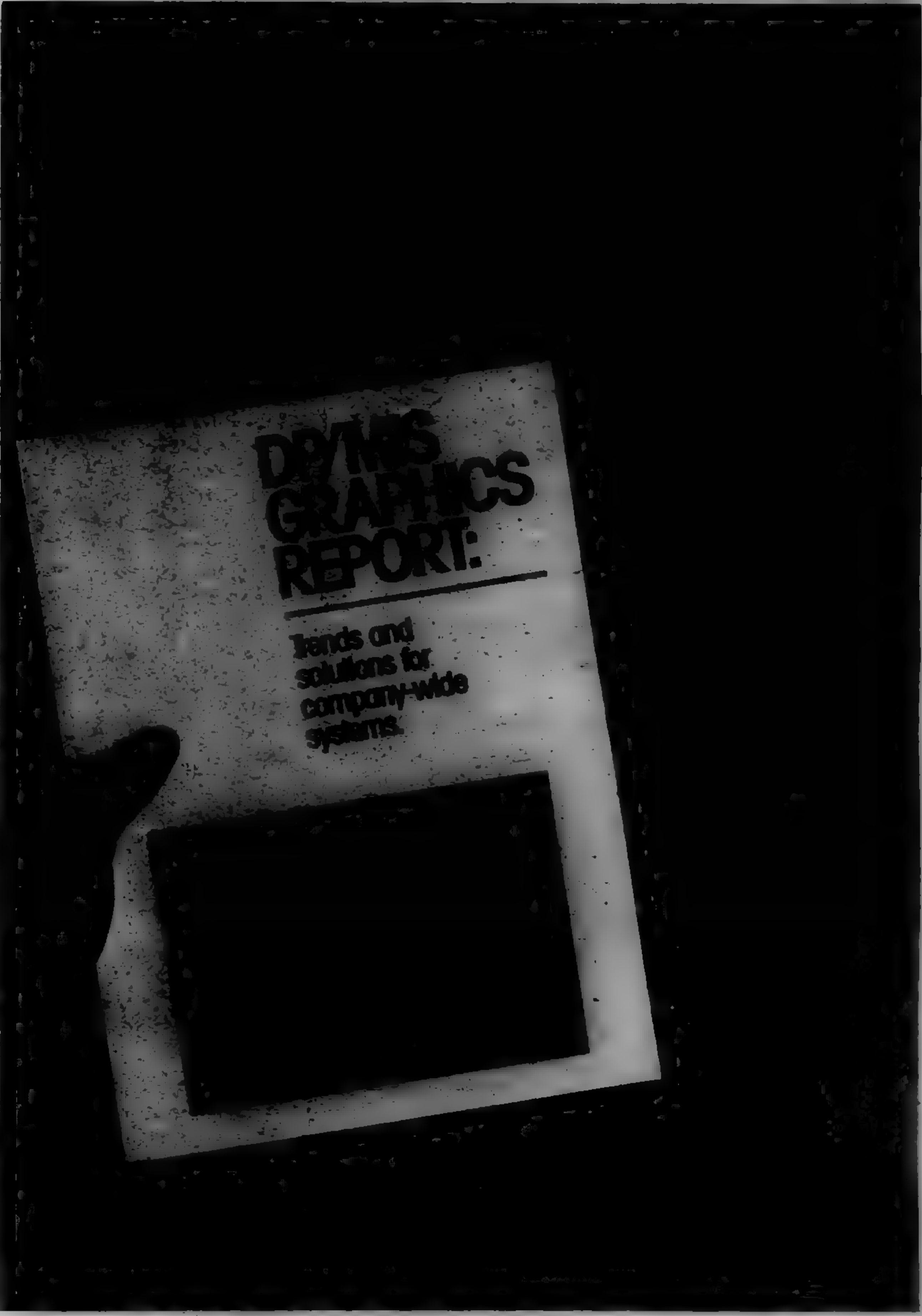
Flexible pricing structure

According to Sitver, the Crisp pricing routines allowed the company to set up a flexible pricing structure. "We certainly know we have fewer errors. In the past, 85% of all our pricing was done manually. Now it is all done by computer."

Editing at order entry for such variables as correct price, invalid product numbers, incorrect multiples, customer eligibility and the presence of promotional codes saves time, Stiver said. "Previously, such errors would not have been caught; the order would have been sent to our batch system. Then it would be rejected, then resubmitted. At that point, you would have lost half a day," she said.

Crisp provided inventory control and tracking and includes automatic lotting of orders on a first-in/first-out basis. The system is

See [illegible] page 30



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Until now, laser printers fell into the category of pure science fiction for most applications. Those that could handle even a modest work load cost more than the moon and stars. And those that were affordable just couldn't keep up with a busy office.

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For pure speed, nothing in the price range can beat the LN03. At 8 pages per minute – or 333 cps – it can handle the volume of a busy office with ease.

It also prints true compound documents, with business graphics and text on the same page, in a single pass. And it prints on virtually any cut sheet paper, including overhead transparencies. All of which makes it ideal for almost any multi-user environment.

IT WON'T WASTE YOUR TIME.

The LN03's real edge in speed and productivity comes from its paper handling capacity. With 250 page input and output trays, the LN03 can print thick documents – pre-collated – without reloading. Try that with any other laser printer in the class and someone will end up changing the paper 10 times or more, reverse collating every page by hand, and babysitting the entire process. Which is counterproductive to the whole idea of office automation.

BETTER QUALITY THAN LETTER QUALITY.

The LN03 also gives you advantages over daisywheel and dot matrix printers, too. Because one LN03 can do the job of the two conventional printers you're probably using now.

In fact it can do *more* than *both*. For a lot less money.

For starters, it forms characters precisely with 300 x 300 dot resolution. Characters that are not only far cleaner than your dot matrix printer, but even better than your letter quality printer. You may actually have trouble telling the difference between text that's been printed on the LN03 and text that's been professionally typeset. In fact the LN03 characters are so well formed, they're recognized by Optical Character Readers with no problem at all.

To give your documents a professional appearance, the LN03 lets you pick and choose from a virtually unlimited variety of typefaces, sizes and styles. And they've all been developed especially for the LN03 by Compugraphic Corporation, the world's recognized authority on computer-generated typefaces.

Two resident typefaces give you no fewer than 16 different sizes, styles and pitches, while optional ROM cartridges let you add just about any face or font you might consider. Including your own custom designed faces. You can even down-line load your own character set or custom designed graphics fonts to print your logo, letterhead or forms. If you like, the LN03 can print sideways, down the length of the paper as well as across, to accommodate spreadsheets, compiler listings, graph captions or other special effects.

In short, the LN03 gives you a remarkable combination of print quality and versatility. So every piece you print makes a great impression.

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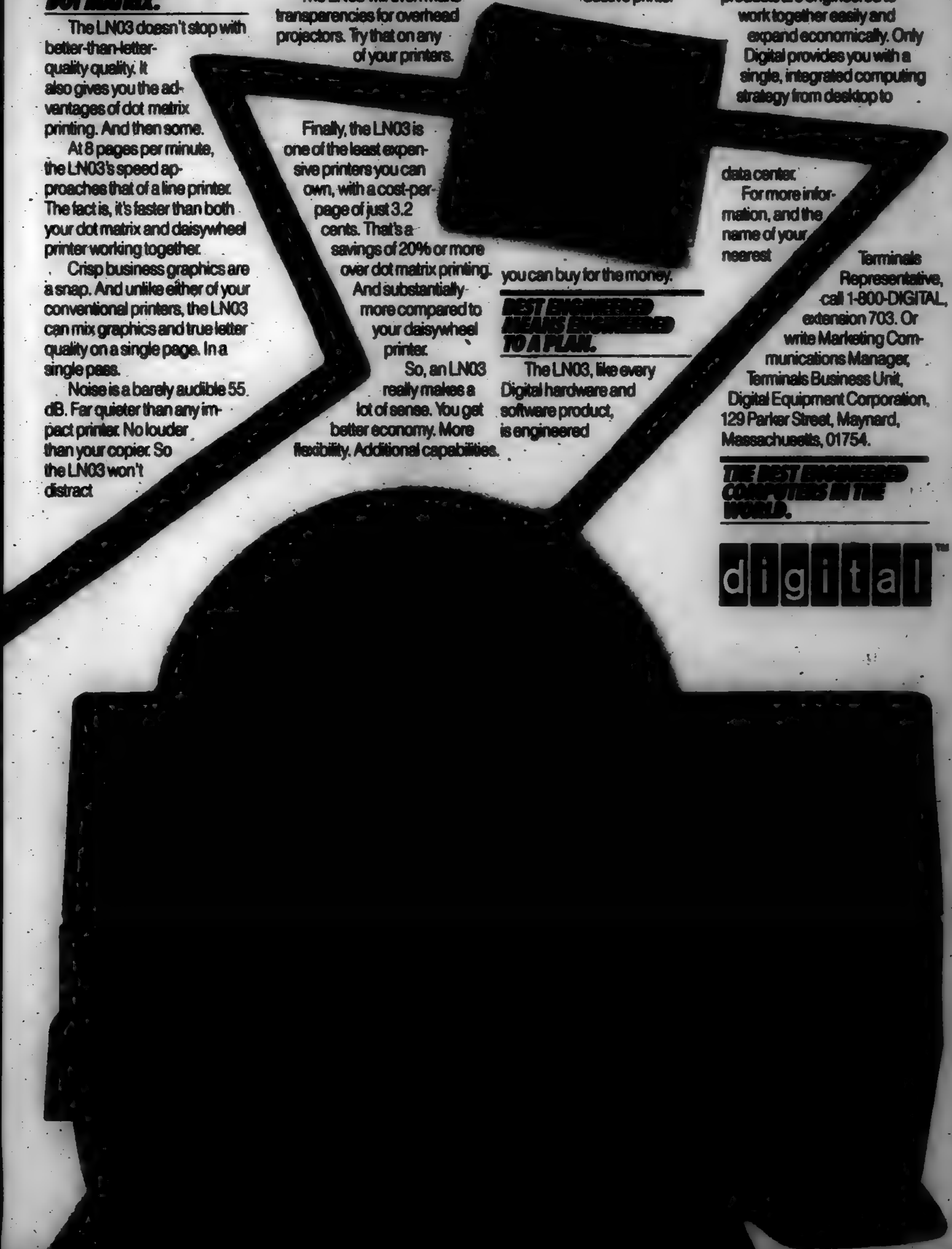

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Crisp business graphics are a snap. And unlike either of your conventional printers, the LN03 can mix graphics and true letter quality on a single page. In a single pass.

Noise is a barely audible 55 dB. Far quieter than any impact printer. No louder than your copier. So the LN03 won't distract and annoy workers even in an open office.

The LN03 will even make transparencies for overhead projectors. Try that on any of your printers.

Finally, the LN03 is one of the least expensive printers you can own, with a cost-per-page of just 3.2 cents. That's a savings of 20% or more over dot matrix printing. And substantially more compared to your daisywheel printer.

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TURNAROUND TIME

Larry Long

Q *The weakest of three candidates for a programming manager's job graduated from the same college as my boss, a vice-president. They hit it off very well, and my boss made it clear whom he wanted hired. However, the choice is mine, and I feel that either of the top two candidates are far superior to my boss's choice. What would you do?*

Don't let your boss's personal bias get in the way of your own good judgment. Hire the person whom you want.

Q *My present position is computer programmer/operator and has been since June of 1978. I'm the remaining programmer out of two who maintained all systems. Because of a recent merger, the present systems are being eliminated and replaced by software, which requires no programming, from an outside vendor.*

My experience is in Singer System Ten assembler language. Singer dropped out of the computer market in the early '70s, and there is little, if any, need for a Singer programmer.

For the past year, I have mailed more than 50 resumes to various programming advertisements. I have also sent resumes with descriptive letters explaining my background to three different employment agencies. To date, I have not received one interview. I thought that with a strong background in an assembler language I would be able to acquire a new programming position by now. Instead, I can't even get an interview.

If you have any ideas, I would be glad to try them.

In a resume, you want to put your best foot forward. In a small shop, you have gained experience as a systems analyst, programmer and operator. The fact that you have Singer experience is irrelevant in most instances and, perhaps, is perceived as a negative attribute by some. Emphasize hardware experience when it benefits you to do so, deemphasize it when it does not. In this case, the Singer experience will not be perceived as an asset.

To strengthen your resume, I would recommend learning at least one more language and gaining some data base proficiency. A good programmer, when making a conscientious effort, can achieve a solid base in a language within a couple of weeks. You may need to attend a seminar or enroll in a college course to gain data base expertise.

You may have the basic skills, but your experience is inconsistent with market demands, so you may have to become a bit of a salesman to get your foot in the door. Once that happens, you can demonstrate your broad range of experiences as well as your willingness and ability to learn.

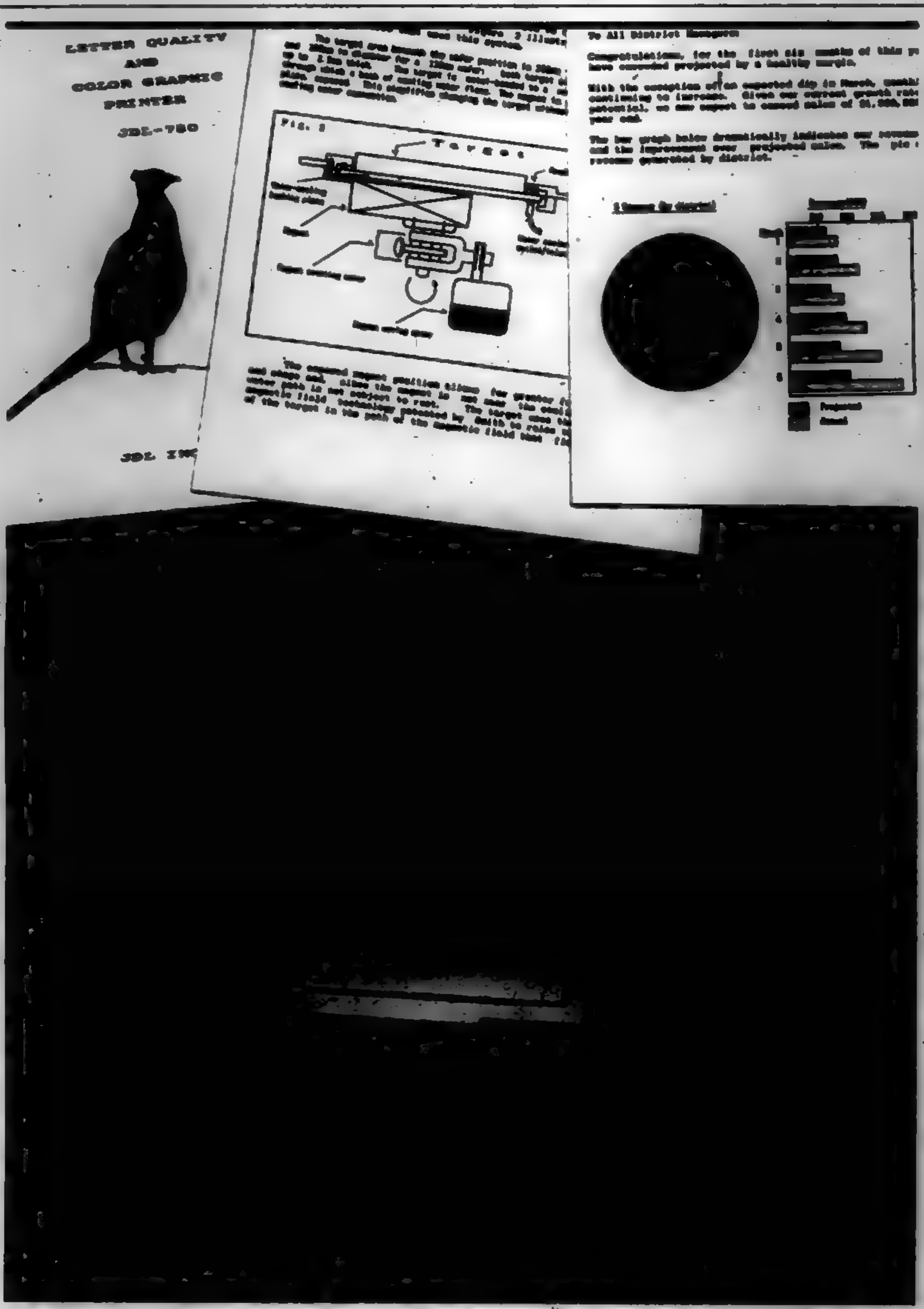
Q *I've worked with a commercial software company for almost 10 years. Two years ago, I changed jobs from creating software to marketing it. Yesterday, I received my first call from a headhunter, presumably because one of my products has been very successful this year.*

She told me that a well-known software company was seeking someone with marketing experience. She said she felt that with my track record I would probably get the job if I interviewed for it. The position pays 50% to 70% more than my current salary. Although I am happy here, my wife and I are very enthusiastic about the possibility of a large jump in income.

I have no experience in dealing with headhunters and don't wish to discuss this with my friends at work. Does a headhunter really know if I will get the job? Is this position too good to be true?

Search firms present candidates for consideration. One method of finding candidates is the blind call. She doesn't know whether you will be invited for an interview, much less get the job. I would guess that there really is an opening and that the salary range was portrayed accurately. For the more traditional technical positions, this is not always the case.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*



BATCH

from page 27

equipped with a traffic check function that allows the division to consolidate orders for favorable freight rates. According to Sitver, "The bottleneck has gone from the shipping office to the floor. The system lots the orders faster than the people on the floor can pick them."

The software program handles the division's distribution. According to Sitver, orders are shipped and recorded into the system. "The invoice is generated, notification is sent to New York, and all corporate systems are updated."

According to Sitver, "We can handle situations with this system that we couldn't with the batch system. Now there's a lot of inquiry capability. And if you have to change customer information — name, address, special instructions — all that is done on-line."

INTERNATIONAL REPORT

CANADA

TORONTO — A $500,000 agreement has been signed between publisher Jack McClelland & Stewart Ltd. and Apple Canada, Inc. The publisher will introduce 35 Apple Macintosh 512K-byte microcomputers, Apple Laserwriter printers and the Appletalk personal network into its operations over a nine-month period. By April 1987, the publishing company plans to be fully automated, both in its publishing operations and in its general business practices, with at least 50 Macintoshes linked to a minicomputer. The publisher followed *Equinox*, *Canadian Business Magazine*, *Harrowsmith* and Canada's *Globe and Mail*, which also opted for Macintosh.

■

TORONTO — The Ontario Securities Commission is pushing Canada's over-the-counter trading community toward automation. The regulatory body for the Canadian brokerage industry plans to set up an electronic quotation system, called the Canadian Over-the-Counter Automated Trading System, in conjunction with the Toronto Stock Exchange by the end of this year.

ITALY

MILAN — The Milan fairgrounds has been selected for the first Italian demonstration of a "wired city." A 640-km network of optical fibers will link a program production and distribution center with 14 user sites around the grounds. The experiment is being conducted by Italtel, the largest telecommunications manufacturer in Italy, and Sip, the Italian operating company for communications services.

Each user site in the network will consist of a telephone, a television screen, a video camera and a microphone and will provide interactive communications between users and the TV production center, a spokesman said.

The $5 million project will provide access to 19 television channels, according to Italtel. During the first 10 days of the experiment, more than 30,000 requests for broadband services were conveyed to the production center, Italtel said.

JAPAN

TOKYO — Toshiba Ltd. has unveiled the Tosbac G8050, a four-processor superminicomputer intended for computer-aided design and manufacturing applications. The system reportedly operates at 5.6 million instructions per second, features up to 4G-bytes memory and runs Fortran and AT&T Unix-based software under the vendor's OS/V operating system. The machine is expected to ship in October.

■

TOKYO — Seibu Information Center Ltd. has introduced a voice-mail service here. The pilot system has been in operation since April at the Seibu Department Store, a subsidiary here. The Seibu service is called Dengon-Kun. Seibu has also announced plans to implement a high-speed digital private line between Tokyo and Osaka this fall.

SWEDEN

STOCKHOLM — The typical Swedish computer criminal is 36 years old and has no drug problem or criminal record, according to a recent report on computer-related crime from the National Council for Crime Prevention here. The report said the criminal is the faithful "old servant" who has worked at the company for more than 11 years.

■

STOCKHOLM — All copying of computer software should be forbidden, including copying for personal use. So said the Swedish distribution company LKD, which recently presented its ideas to the Swedish Copyright Commission here. If copying were permitted, it could mean enormous losses to software companies, LKD argued. Sweden's traditional copyright protection does not include personal use and is not adapted to protection of software. "A book is always protected by copyright law and can never be copied so that the copy looks exactly like the original. A computer program can and should, therefore, be protected," an LKD spokesman said.

■

STOCKHOLM — IBM has announced plans to build a printer manufacturing facility here in Sweden. The plant will build IBM 4245 models 12 and 20 printers, according to Karl-Erik Johansson, who is in charge of new products at IBM Sweden. The facility will also create 30 new jobs.

■

STOCKHOLM — The Central Administration of Property Data (CFD) here was recently asked to create and manage a property registration system for the government of Singapore. The CFD will send 85 consultants to help design a data processing system for the registration authorities in Singapore, who are just about to automate their operations.

■

STOCKHOLM — Sweden's study on the vulnerability of a computer-dependent society has recently fallen under attack by Minister of Defense Anders Thunborg. The minister argued that the International Federation for Information Processing's efforts have not succeeded in raising the consciousness of government workers and the public at large about Sweden's vulnerability in the state departments.

WEST GERMANY

MUNICH — Apple Computer, Inc.'s subsidiary here is tightening its belt. Effective June 30, Apple GmbH will close its West German offices in Dusseldorf, Frankfurt, Stuttgart, Hamburg and here, it was learned. Nine regional sales managers will pick up the business from these closings.

■

NUREMBURG — Philips Communications AG publicly praised the West German Postal Telephone and Telegraph authority for its "innovative strength" and its "cooperation and support in implementing new networks and services." Philips Communications is a German subsidiary of the Dutch communications giant, with worldwide revenue of $5 billion.

■

BONN — A federally funded project to promote high-tech research and development is under way here. Some $150 million has been earmarked for the project, titled "Using Microelectronics," which is intended to help young companies. More than 3,000 companies have already applied for the the R&D grants, and more than 2,400 were accepted, a spokesman said.

■

DUSSELDORF — Software pirates have cost Data Becker GmbH between $10 million and $13 million, estimated Achim Becker, the software retailer's general manager. The sum is roughly equivalent to the firm's 1984 revenue, Becker said. While software protection has been a widely discussed topic in West Germany, legislation was enacted only recently, allowing West German software houses to copyright their products.

■

MUNICH — Job control software packages are used in only 20% of West German computer centers, according to a recent survey by Diebold Group GmbH. Of 7,500 mainframe computer installations surveyed, only 200 use job control software. The remaining 80% rely on manual commands from computer operators, the survey said.

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- while verifying, the previous and next records are displayed
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- search on match
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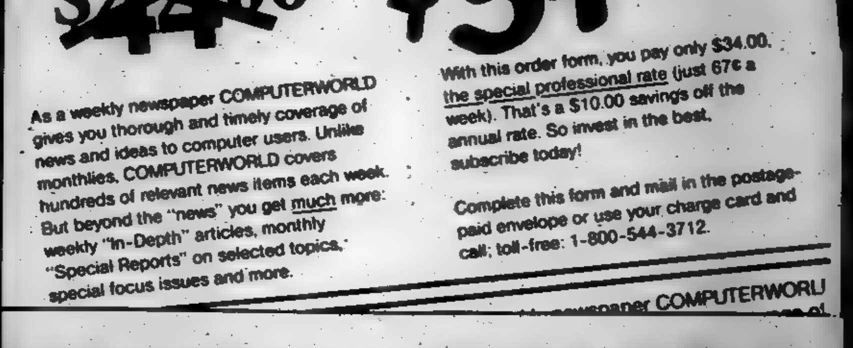

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1. **BUSINESS/INDUSTRY (Circle One)**
   End Users
   - 10 Manufacturer (other than computer)
   - 20 Finance/Insurance/Real Estate
   - 30 Medicine/Law/Education
   - 40 Wholesale/Retail Trade
   - 50 Business Service (except DP)
   - 60 Government—State/Federal/Local
   - 65 Public Utility/Communication Systems/Transportation
   - 70 Mining/Construction/Petroleum/Refining
   - 75 Other User ______

   Vendors
   - 80 Manufacturer of Computers, Computer-related Systems or Peripherals
   - 85 Computer Service Bureau/Software/Planning/Consulting
   - 90 Computer/Peripheral Dealer/Distributor/Retailer
   - 95 Other Vendor ______
2. **OCCUPATION/FUNCTION (Circle One)**
   - 11 President/Owner/Partner/General Manager
   - 12 VP/Assistant VP
   - 13 Treasurer/Controller/Financial Officer
   - 21 Director/Manager/Supervisor DP/MIS Services
   - 22 Director/Manager of Operations/Planning/Administrative Services
   - 23 Systems Manager/Systems Analyst
   - 31 Manager/Supervisor Programming
   - 32 Programmer/Methods Analyst
   - 35 OA/WP Director/Manager/Supervisor
   - 38 Data Comm Network/Systems Mgmt
   - 41 Engr/Scientific/R&D/Tech Mgmt
   - 51 Mfg Sales Reps/Sales/Marketing Mgmt
   - 60 Consulting Mgmt
   - 70 Medical/Legal/Accounting Mgmt
   - 80 Educator/Journalist/Librarian/Student
   - 90 Other ______
3. **COMPUTER INVOLVEMENT (Circle all that apply)**
   Types of equipment with which you are personally involved either as user, vendor or consultant
   - A. Mainframes/Superminis
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems

✓ CALENDAR

WEEK OF JULY 21

JULY 22-23, FORT LEE, N.J. — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 29-30 in Boston.

JULY 22-24, CHICAGO — **1985 Summer Computer Simulation Conference.** Contact: Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

JULY 22-24, CARY, N.C. — **SAS Macro Language.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

JULY 22-24, ST. LOUIS — **Standard Network Protocols: International and National Packet-Switching Networks.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015. Also being held July 29-31 in Boston.

JULY 22-25, FORT LEE, N.J. — **Vsam From Start to Finish.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 22-25 in Los Angeles.

JULY 22-25, WASHINGTON, D.C. — **IMS/DC (Data Communications) Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024

JULY 22-25, SAN ANTONIO — **CICS/VS MRO/ISC.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 22-25 in Denver and July 29-Aug. 1 in Fort Lee.

JULY 22-25, ATLANTA — **CICS/VS Application Design.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 29-Aug. 1 in Chicago and Los Angeles.

JULY 22-26, SAN FRANCISCO — **Siggraph '85: The 12th Annual Conference on Computer Graphics and Interactive Techniques.** Contact: Siggraph '85 Conference Services Office, 111 E. Wacker Drive, Chicago, Ill. 60601.

JULY 22-26, BOSTON — **CICS/VS Internals.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 22-26 in San Antonio and July 29-Aug. 2 in Atlanta and Denver.

JULY 22-26, CHICAGO — **CICS/VS Application Programming — Command Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 29-Aug. 2 in Fort Lee; Los Angeles; and Washington, D.C.

JULY 22-26, NEW YORK — **Data Base Development Workshop.** Contact: Elise Rabelais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2900 N. Loop W., Houston, Texas 77092.

JULY 22-26, HOUSTON — **Project Development and Control Workshop.** Contact: Elise Rabelais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2900 N. Loop W., Houston, Texas 77092.

JULY 23-25, DALLAS — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

JULY 24-25, FORT LEE, N.J. — **Recovery/Restart.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 31-Aug. 1 in Boston.

JULY 24-25, DALLAS — **SAS Report Writing.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

JULY 24-26, PARSIPPANY, N.J. — **Data Processing for the Non-DP Manager.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 24-26, WASHINGTON, D.C. — **Financial Information Systems: The New Generation.** Contact: National Institute for Management Research Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

JULY 24-26, WASHINGTON, D.C. — **Financial Information Systems — Integrating Personal Computers.** Contact: National Institute for Management Research Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

JULY 24-26, CARY, N.C. — **Principles of Regression Analysis.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

JULY 26, COLUMBUS, OHIO — **DOS/VSE Working With Shared Dasd.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

WEEK OF JULY 28

JULY 29-AUG. 1, OTTAWA — **The Urban and Regional Information Systems Associations' (Urisa) 23rd Annual Conference.** Contact: Urisa Secretariat, Suite 300, 1340 Old Chain Bridge Road, McLean, Va. 22101.

JULY 29-30, ST. LOUIS — **Southwestern Bell.** Contact: Telestrategies, Inc., P.O. Box 811, McLean, Va. 22101.

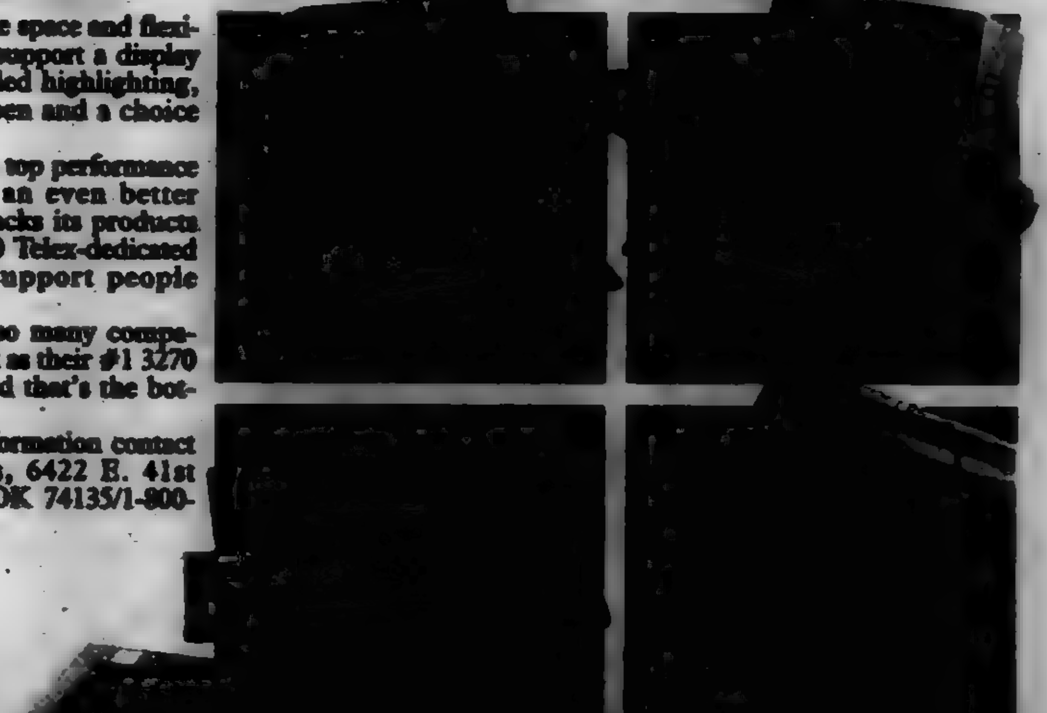
JULY 29-30, NEW YORK — **Integrating Voice and Data in the Private Branch Exchange.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 29-AUG. 1, NEW YORK — **IMS/DB (DL/1) Application Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JULY 29-AUG. 2, PARSIPPANY, N.J. — **CICS Command-Level.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 30-AUG. 1, CARY, N.C. — **SAS Basics.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

JULY 30-AUG. 1, CARY, N.C. — **SAS Programming for New Computer Users.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511. Also being held Aug. 12-13 in Toronto.



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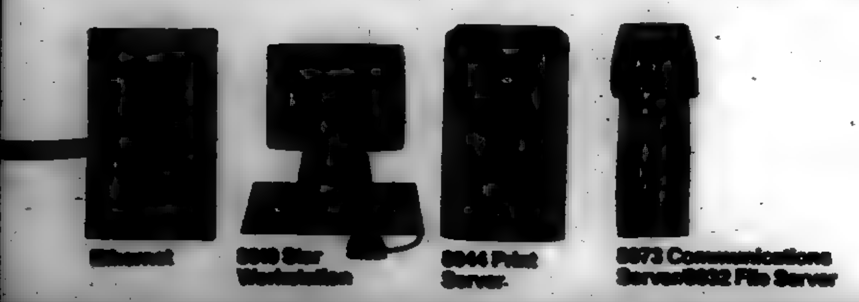

Matt's office has been winning a lot of new business lately. And it's really not much of a secret.

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EDITORIAL

DP's soldiers of fortune

'These are the times that try men's souls.'
— Thomas Paine

At a time when the U.S. economy is chugging along slowly but steadily after two years of rapid growth, the computer industry is mired in what is developing into the muddiest rut in its history.

The bad news pouring in so fast convinces us that this is a bad situation about to get worse. The massive layoffs at industry mainstays like Wang, DG and Apple (see story page 1) appeared in no analyst's crystal ball as recently as six months ago.

And the ongoing misery in the chip industry — which has triggered similar massive layoffs at Intel, TI, National Semi, Synertech and Signetics — has come at a time when most analysts had predicted an upswing. Instead, these companies' performance, a bellwether of things to come, attests that the situation will get worse before it gets any better.

The computer companies certainly have their problems, but how about you, the DP manager? In Thomas Paine's days — those grim years of the American Revolution — success came to those who learned to take advantage of turmoil. Those people assessed the global situation accurately and then saw how their personal fortunes could be maximized against such a stormy backdrop.

You can call it the shark ethic — eat the wounded — but there are a lot of ways you can take advantage of a climate that, over the next year or so, can truly be called a buyer's market. Virtually every vendor, from IBM to add-on board makers, will be hungrier than ever for your business. Alert yourself and others with buying power in your organization to the breadth of the industry's current dilemma, and you will have a leg up on any vendor trying to sell to you.

Look for and be wary of the following:

■ **High-pressured sales.** Some might say that every sale is a high-pressured one, but sales staffs will be under more pressure than ever in the coming months. IBM, for example, brought 400 sales representatives this month to a banking conference, which drew only 3,000 other attendees [CW, June 10]. For the companies that *have* announced layoffs — which does not include IBM — the coming six months might spell out the terms of long-term survival.

■ **Product delays.** With companies laying off 10% and more of their work forces, there are going to be delays. Be wary of anything other than firm delivery dates for equipment ordered.

■ **Degrading service.** In more than one case in the past, we have seen the service and maintenance end of a vendor's business begin to slide when trouble brews. This is by no means the rule, but it's something to watch out for.

■ **Great opportunities with IBM/great opportunities beyond IBM.** DP managers may lean more heavily toward Big Blue, observing that IBM is definitely in this for the long haul. Coupled with the fact that IBM will make its products as attractive as possible to meet its very lofty sales projections this year, this strategy has merit. But on the other hand, there will be some tremendous jockeying by IBM's competitors to maintain position.

The DP manager who has the needs of his shop and company clearly before him is about to encounter opportunities that he may never see again. You'd have to be blind not to know there's trouble aplenty out there and particularly sharp to turn it to your advantage.

Eyeball to eyeball

LETTERS

System provides 'inside-out' approach

The column "Basic design-phase flaws hinder system development" [CW, June 3] pointed a finger at the naked emperor. Even James Martin has recanted his enthusiasm for fourth-generation languages. Conventional fourth-generation language analysis and design methodologies take an "outside-in" approach: They specify all the single details and let the system generate the application.

The Pick Systems Pick operating system, by contrast, provides four languages for system specification. They are Dictionaries (data definitions), Proc (procedure definitions), Access (retrieval definitions) and Basic (data capture and manipulative definitions).

With these four languages, an analyst can prototype an application iteratively and let analytical software parse the final source statements to produce the detailed specifications. This is the "inside-out" approach.

A payroll system consisting of 80 functions, with 40 heavy-duty programs covering 30 files, can be built under the following timetable: phase one (all menus), 2 hours; phase two (all menus, screens, file dictionaries and reports), 50 hours; phase three (complete code), 800 hours; phase four (complete documentation), 200 hours.

This time line is typical of robust, custom systems being produced with appropriate software engineering methodologies under the Pick system.

C. David Fischer Jr.
Phoenix

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VIEWPOINT

The MIS alligators are alive and kicking

MANAGEMENT MATRIX
Walter F. Cuirle

I think I last heard this chestnut from an auditor who was swinging the cost-cutting ax in the direction of maintenance contracts. It goes like this: A man is standing on a street corner, snapping his fingers. Another man sees this and, puzzled, asks, "Why are you snapping your fingers?" The snapper answers, "To keep the alligators away." The questioner protests, "But there aren't any alligators around here!" Pleased, the snapper responds, "I know. See how well it works?"

Everyone has recognized this attitude from time to time. It's frustrating at best to have someone opine that part of your work is pointless. It is the kind of conflict you can learn to deal with, but there are some areas in which you are doing nothing simply because you consider the effort pointless. Sometimes you're right to do nothing, but other times there really are alligators out there.

Consider, for example, when there is a supervisory position available within your organization. Most managers prefer to fill such positions from within; the usual reasoning goes that there is less risk in filling such a position with someone whose personality and work you know well. That makes good sense. However, some people assume that filling a position from within means that training is unnecessary. This could be a mistake — this particular alligator is often real.

Let's say you have a senior programmer or analyst whom you want to promote to group leader or supervisor. The assumption is that because this person has worked under a group leader or supervisor, he knows at least the rudiments of the new job. But if you think about it a minute, you'll realize that a programmer sees only the part of the supervisor's job that affects the programmer — scheduling, for example. Work done in other areas, such as regular reports to management or users, may not be so visible to the person coming into the job.

> **"**
>
> *All you really need is some kind of a schedule that puts the supervisor, who produces the deliverables, in touch with each person who wants them.*

Some people elect to solve this problem of the "what" of a position with a job description. These little documents are certainly necessary, but they are usually intended for general personnel planning. There are more effective ways of defining "what." Suppose the supervisor is responsible for four deliverables a month, such as reports or estimates. Each of these items is due monthly on some particular person's desk at some particular time. Together, these items make up a standing "to do" list for the new supervisor. It's not the whole job, but it establishes just enough structure to get started. Who should make up this list? A good choice is the person to whom the new supervisor is responsible. The outgoing supervisor may be of help, but then who really has the vested interest in getting the job done right?

Once the "what" of the job is known, it's time to look at the "how." Everybody has a personal bag of tricks. A new job calls for a new bag. Suppose one of the regular deliverables required of the supervisor is a monthly contribution to a budget report.

Where is the best place to get the raw information? What is a typical percentage for overhead? What's a reasonable figure for productivity?

The person who wants the report is usually the one best suited to teach the best way to put it together.

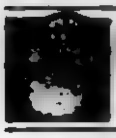
Does all of this mean that you should set up some kind of training for new supervisors? Absolutely. Unfortunately, many people will spend more time integrating some trivial piece of personal computer software into their personal operations than they will on getting a new supervisor settled in. But it does not necessarily follow that the training has to be formal — the idea that training means classrooms and instructions is often what prevents many managers from training supervisors.

It doesn't have to be that complicated. All you really need is some kind of a schedule that puts the supervisor, who produces the deliverables, in touch with each person who wants them. The time allotted doesn't have to be long — maybe only an hour or two a month with each person on the list — and it doesn't have to be particularly structured. Let them work out the topics they'll talk about. But it does have to be inviolate. This business is as important as — if not more so than — any other meeting that may come along.

It's easy, inexpensive and effective. So much so that some people may just tell you that alligator story. If they do, just smile and keep on snapping your fingers. And don't look back.

Cuirle is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

Poor systems planning impedes micro market growth



HUMAN CONNECTION
Jack Stone

America's changing attitude toward wines and spirits was not the only discussion dealing with sobriety in *Time* magazine's May 20 issue. In its business section, the well-publicized leveling out of sales of personal computers and peripherals was dramatically and soberly retold for the public in nontechnical terms. The average citizen was probably not surprised at the news, having survived the near total demise of the home computer market.

It is refreshing to read a carefully researched analysis of a segment of our noble industry by writers outside of it and savor an unbiased view of the massive deflation of the unruly, unwanted market projections of the expert forecasters within it. *Time's* editors, using engineering terms, figured about a minus 10 decibels' worth of growth difference from 1983 to 1984, contrasting an 11% gain in 1984 with 107% in 1983 — a situation that strongly suggests why so many manufacturers, software developers and even publishers have left the business for, presumably, more productive pursuits.

Certainly, part of the blame can be placed at the feet of the so-called experts who have talked DP centers, users and vendors alike into believing that the demand for personal computers is insatiable, infinite and inevitable. Their choice words have helped foul up the most creative vendor marketing strategies, the best laid of system plans by information managers and surely the fondest of user expectations.

> **"**
>
> *Large systems installed without the blessing of the computer center have greater than a 50-50 chance of being suspect and hence labeled too expensive, overpowered and underused.*

However, with all the personal computer players hopefully in an abstemious mood, perhaps a few thoughts on the reasons for the slowdown in personal computer sales will confirm what most DP managers have known all along and what many top executives are now starting to accept.

Let's look at several of the many industry axioms that the crystal ball gazers didn't grind into their forecasting algorithms.

First, users are not paid to plan complex systems, and those who try typically fall short of the mark. Basically, this is because users, by and large, do not focus on organization-wide systems needs, but only on computer services to support their local projects. As a consequence, they, like all red-blooded American end users, lobby hard for the most powerful, capable machine around without wasting an awful lot of time worrying about such arcane subjects as cost/benefit analyses, feature/function comparisons or certified user needs. Consequently, when the personal computer industry was in its infancy — when the 64K-byte personal computer was all the rage in end-user departments, for example — the impact on the master corporate systems plan was fairly straightforward, and support requirements were generally modest.

But times do change. Now that IBM Personal Computer AT-class machines are making their way onto corporate loading docks and sneaking into user offices, the systems game has shifted to an entirely new ballpark. Installing these powerhouses and all that is implied therein — integrated software, mainframe links and local-area networks, for example — requires a substantial amount of technical resource that is rarely found in end-user departments and cannot be sprung loose easily from the computer center.

What's the end result? A slowdown on personal computer orders from the larger business customers who have learned that large systems installed without the blessing of the computer center — those that are not part of the corporate plan and are subject to the same scrutiny as all other major acquisitions — have greater than a 50-50 chance of being suspect and hence labeled too expensive, overpowered and underused.

I don't believe for one moment that the demand for more powerful personal computer-class machines has subsided in the least.

I believe that corporate and government leadership is slowing down the pace of acquisition and spending more time in the long-range planning function to ensure that personal computers are properly integrated into the global information systems strategy.

Stone is a Washington, D.C.-based independent management consultant, educator and writer, specializing in DP human communications and personnel development.

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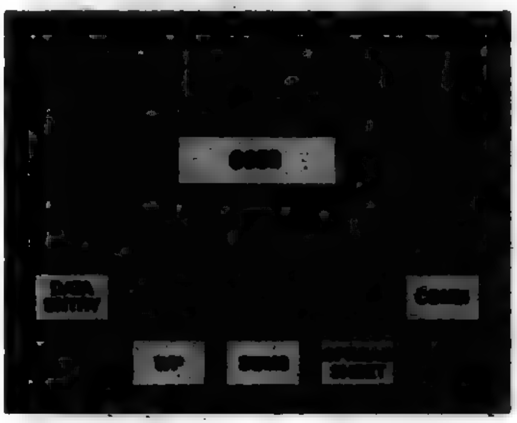

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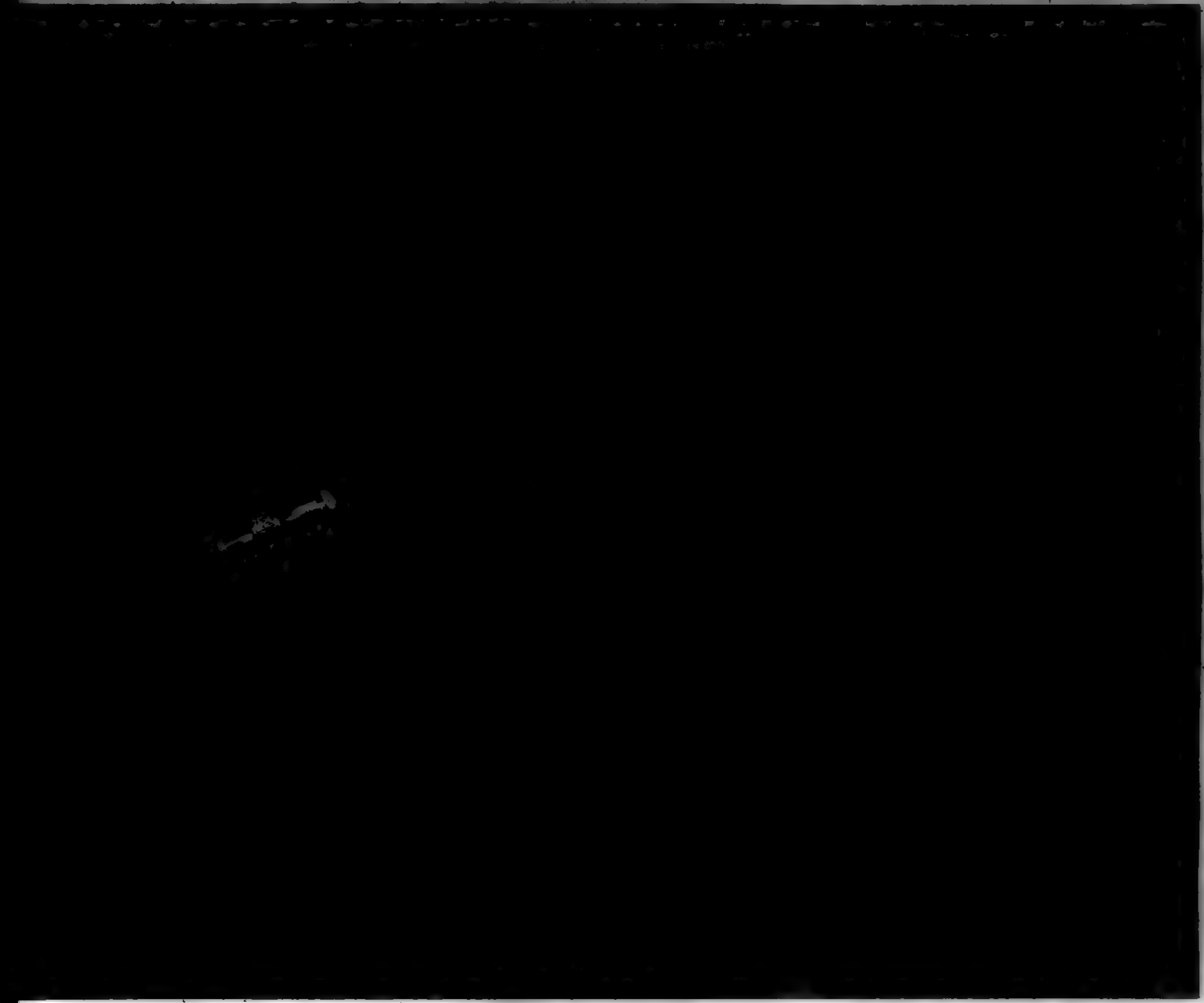

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SOFTWARE & SERVICES

SOFTLINE
Lee Gilliam

Early disaster plan pays off

When is the most appropriate time in the applications development process to address the subject of disaster recovery? Ideally, it would be in the early stages of design. But pressure from users for an urgently needed system often causes considerations of system security and recovery to be left until implementation time or later.

It would be wise to raise certain issues in the design stage or even earlier, perhaps during the feasibility study. For instance, if a given system is developed, will the company's business operation depend upon the availability of that system? If so, how long will the business be able to operate without it? Designers and users alike concentrate so intently on the functional design and implementation of the

See GILLIAM page 47

Firms' software testing practices found lacking

By John Desmond
CW Staff

ORLANDO, Fla. — A majority of companies do not assign staff members to software testing, do not train their staff in testing procedures, do not measure the effectiveness of testing and do not issue reports on test results.

Those were the findings of a 72-company survey on software testing practices conducted by the Quality Assurance Institute at the First National Conference on Software Testing held in Washington, D.C., in November. The institute offers seminars on software maintenance and quality assurance.

William Perry, executive director of the institute, said that "the two most logical steps toward more effective testing are to assign responsibility for testing to one person and to record defects by type and frequency to prevent the recurrence of high-frequency defects."

Respondents to the survey said most programmers have no previous training in testing, that testing needs more management support and that more testing tools are needed to reduce costs and improve quality. Most respondents indicated that no one in their organization was responsible for developing and monitoring the testing process, and few companies devote much development cycle time to testing.

Nearly half the respondents said programs had to meet certain basic requirements before being placed into production. Some requirements were to have users or maintenance personnel approve the programs, review the job control language to ensure it follows standards, present a clean compile of the program, have customers accept the programs or verify the software independently.

Few DP departments formally train their programmers in test methods. But most firms do require applications programmers to develop test plans for systems under development. For the DP departments that measure the effectiveness of testing, testing methods included basic statistics, test review, requirements match, production feedback, regression test streams and discrepancy reporting.

Many organizations perform testing in

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IBM unwraps enhanced AS

Features allow facility to run under VM, MVS

TAMPA, Fla. — IBM has announced an enhanced version of its Application System (AS) interactive applications development facility with features that allow the product to run under IBM's VM and MVS. IBM also introduced a version of AS available through its Information Network remote computing service.

According to a spokesman, AS provides non-DP professionals with commands, conversational facilities and option windows for use in developing decision-support-oriented and other interactive applications. AS Release 3.0, which was formerly called the VM/Application System, can be run under either VM or MVS/TSO, where it co-resides with other TSO applications. It can be called from an IBM ISPF dialog or by another TSO application.

In addition, IBM SQL/DS data bases may be accessed by AS Release 3.0 in VM/SP environments, extending the range of data available to users. Also, the graphics facilities of AS have been extended to allow users to take advantage of functions embodied in IBM's Graphic Data Display Manager (GDDM) Release 4. An added DRAW command allows the user to create and display graphics without knowing the syntax or commands of the AS Graph language.

In conjunction with Release 4 of GDDM, AS Release 3.0 provides support for the IBM 3270 Personal Computer/G and 3270 Personal Computer/GX. Release 3.0 also provides extended project control and language editing facilities, enhanced statistical capabilities, larger file structures and additional language support.

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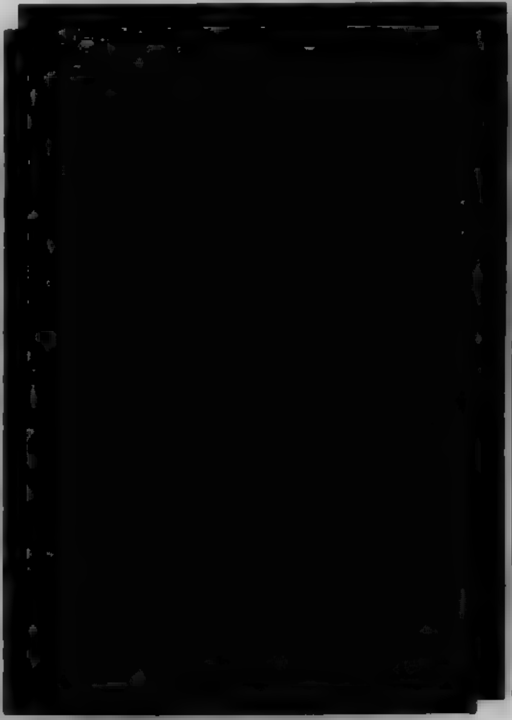

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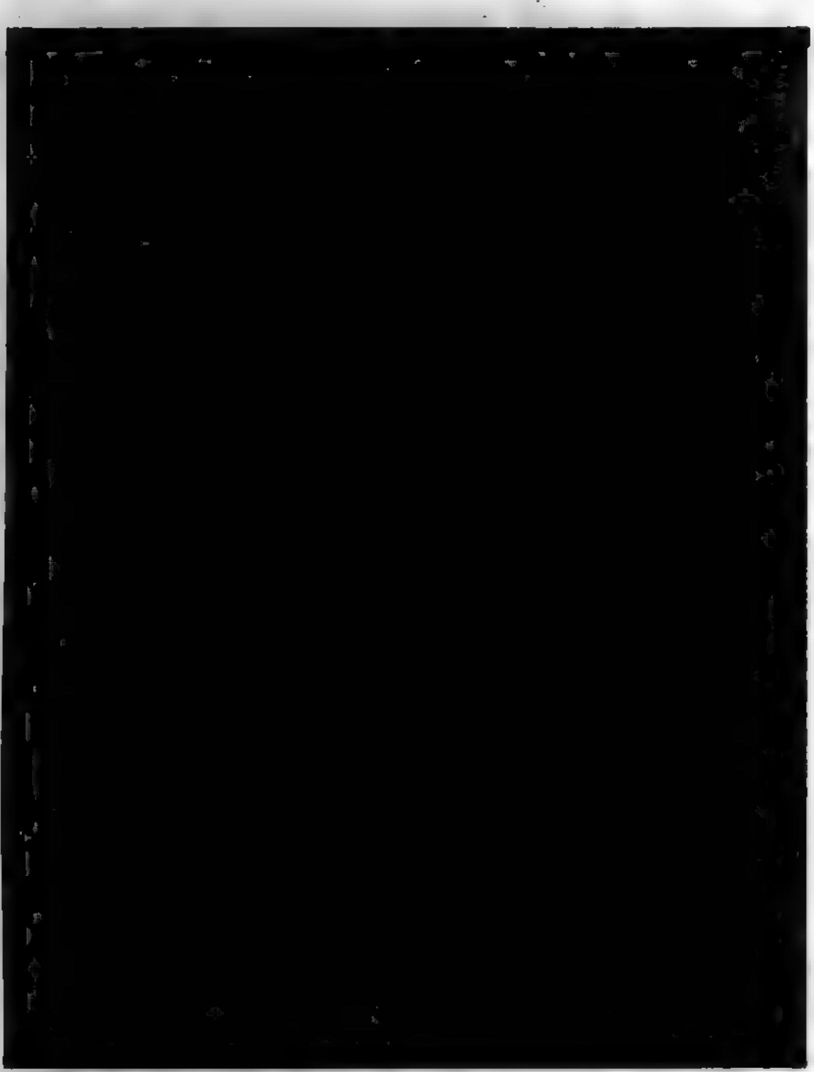


DBC/1012 tool upgraded

LOS ANGELES — Teradata Corp. has announced enhancements to the software for its DBC/1012 Data Base Computer system. Release 3.0 of the software reportedly facilitates data sharing between IBM's MVS and VM operating systems.

Enhancements include interface facilities for IBM VM/SP, a PL/I Preprocessor and DBC/SQL, a relational syntax compatible with IBM's SQL data manipulation language. The DBC/1012 is a special-purpose data base computer that attaches to one or more IBM mainframes and plug-compatible equivalents.

The VM host software facilities allow users of one or more VM mainframes to access relational data bases stored on the DBC/1012. The features of the VM interface are virtually identical to those supported for MVS, so that DBC/1012 users under MVS or VM need no retraining, the vendor said.

The PL/I preprocessor permits high-level, set-oriented relational data base requests to be embedded within PL/I source programs without the need for calls or special linkages.

The price for a complete host software for the DBC/1012, including Release 3.0, the PL/I and Cobol preprocessors, batch report writer and the MVS/CICS interface, is $60,000.

Teradata is located at 12945 Jefferson Blvd., Los Angeles, Calif. 90066.

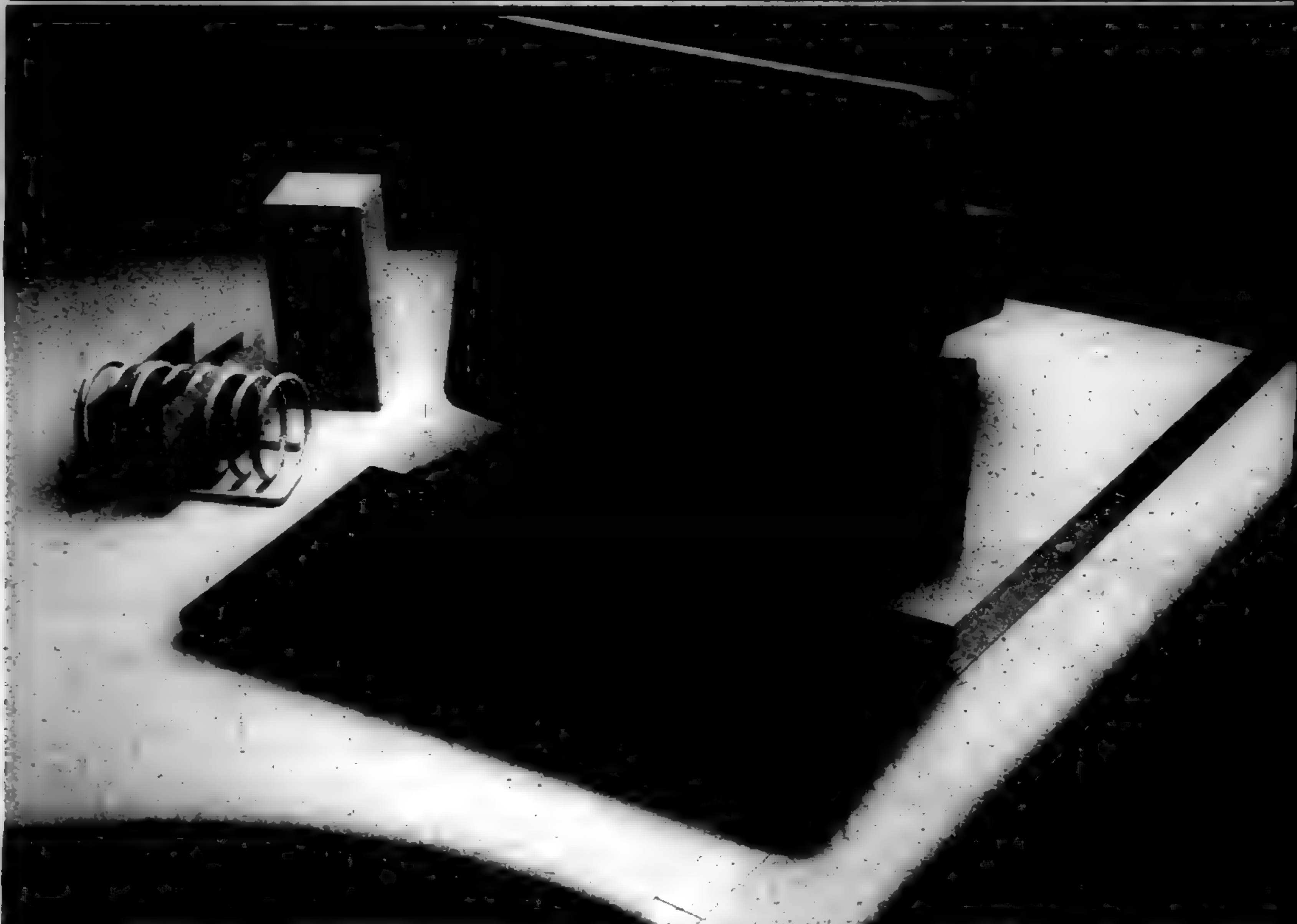
Pick release out for XA units

ROSEMONT, Ill. — Systems Management, Inc. has announced Pick/XA, a version of Pick Systems' Pick operating system that runs in IBM Extended Architecture (XA) environments.

Pick/XA is said to allow IBM mainframes to use up to 2G bytes of virtual and real storage and an increased number of I/O channels.

Pick/XA runs as a guest operating system under IBM's VM/XA or on any XA computer, including the 4381, 3080 and the recently introduced 3090 series. Pick/XA will support all peripheral devices supported by VM/XA. Pick/XA is compatible with Systems Management's existing Pick/370 operating system product. Pick/XA is now undergoing alpha testing and is scheduled for release in the third quarter of 1985. Prices have yet to be announced.

Systems Management is located at 6900 N. River Road, Rosemont, Ill. 60018.



Joiner enhances Jnet for DEC VAX/VMS

MADISON, Wis. — Joiner Associates, Inc. has announced Version 2.0 of its Jnet networking software for Digital Equipment Corp. VAX/VMS systems. Version 2.0 links DEC's All-in-One Office Menu and IBM's Professional Office System (Profs) to provide electronic messaging.

Version 2.0 succeeds Version 1.2, which allows transfer between VAX/VMS and IBM/VM systems. According to a spokesman, Version 2.0 allows bidirectional mail exchange between VMSmail or All-In-One users on the VAX and Profs or CMS Note users on the IBM. The translation between the different mail types is automatic and hidden from the user. IBM and VAX users do not need to know if the addressee's computer is an IBM or VAX system.

Version 2.0 of Jnet features a synchronous device driver for DEC's DMF32 interface, increasing the line speed to 19.2K bit/sec. The direct memory access feature of the DMF32 reduces CPU use to one-quarter that of DEC's DUP11 interface card, supported in an earlier version.

Version 2.0 also includes a Receive command to process incoming files. Receive provides a self-contained interface for automatic recognition and translation of binary or text files in IBM's Disk Dump and Netdata formats.

Jnet employs the protocols used by IBM RSCS Networking Program Product, giving VAX system users the same network communications capabilities as VM/CMS users. Electronic mail, file transfer, batch job submission, remote printing and management of RSCS networks are supported.

No special training is required to use Jnet to originate file transfers, mail and messages. Prices for Version 2.0 of Jnet range from $1,200 for the Microvax I to $14,500 for the VAX 8600.

Joiner Associates can be reached through P.O. Box 5445, 732 N. Midvale Blvd., Madison, Wis. 53705.

SYSTEMS SOFTWARE

■ **Software Corp. of America has announced Fastdasd Interactive Interface, the latest version of its Dasd performance and monitoring system. The package runs in IBM MVS environments.**

Fastdasd reportedly reduces Dasd contention by analyzing seek activity and recommending optimal data set placement to improve on-line and batch turnaround time. The product features an Interactive Interface option for IBM's ISPF, said to enhance that product's capabilities.

The Interactive Interface employs a series of panels that prompt the user for parameters necessary to create a collection and analysis job stream. Fastdasd allows users to modify reorganization recommendations on-line and see a simulation of resulting improvements. All Fastdasd reports can be reviewed on-line.

Pricing for Fastdasd Interactive Interface begins at $8,650 for a single-CPU permanent license.

Software Corp. of America, 960 Herndon Pkwy., Herndon, Va. 22070.

■ **VM Software, Inc. has announced Version 1.1 of its VMcenter software, which provides a single source of control for maximizing IBM VM efficiency.**

Version 1.1 features a minidisk utilization analysis utility for IBM mainframes running VM/CMS. The utility reportedly provides users with reporting capabilities that specify actions for recovering unused minidisk space. The utility also enables users to ensure optimal disk use by analyzing and reporting on selected volumes.

The VMcenter product issues 23 separate reports on a range of minidisk use information. The amount of space to be reclaimed is prescribed. A bar graph shows the number of minidisks at various use levels, giving a snapshot of Dasd utilization.

The price for VMcenter Release 1.1 is $33,000.

VM Software, Suite 355, 2070 Chain Bridge Road, Vienna, Va. 22180.

Enhanced ADR/Vollie introduced

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has introduced Release 3.4 of ADR/Vollie, its program development system for IBM's DOS/VSE operating system. The product now includes support for IBM's VSE/SP 2, a Virtual Machine Interface and batch utility enhancements.

According to ADR, the Virtual Machine Interface allows ADR/Vollie users to query IBM VM operating system queues and pass Control Program commands directly to the operating system. Query responses are returned to the Vollie user at the terminal.

ADR/Vollie's Batch Utility for its on-line library now allows the Vollie Table to be reloaded into the shared virtual area without an initial program load. The batch utility can now print member content directly from a backup file, rename a group of members or change a member control index in one step, according to the vendor.

Vollie, Release 3.4, is priced at $20,600.

Applied Data Research is located at Route 206 & Orchard Road, CN-8, Princeton, N.J. 08540.

SOFTWARE & SERVICES

■ Software Concepts, Inc. has announced Quick-Tran, a data compression program for IBM OS, DOS and CMS users.

Using Quick-Tran, users can increase data transmission speeds from four to 20 times without equipment upgrades, according to the vendor. Execution parameters can be adjusted to either maximize compression efficiency or minimize CPU time needed to compress data.

A batch utility is run to compress or decompress the data. Data security is ensured by having Quick-Tran on the receiving end decompressing data. A spokesman said files are reduced from 5% to 25% of original size with the compression algorithm.

Compressing data before transmission cuts communications costs, and compressing data on infrequently used files saves disk space, the vendor said.

Quick-Tran is priced at $3,500, the vendor said.

Software Concepts, Suite 1450, 250 Piedmont Ave., N.E., Atlanta, Ga. 30308.

PRODUCTIVITY AIDS

■ Database Technology Corp. has announced the Fast Reorganization Utility (FRU) for its Com-Pres/IMS data compression software for management of IBM's IMS data base management system.

FRU offers users of compressed data bases the ability to unload and reload their compressed data bypassing the normal expansion and recompression process, a spokesman said. In beta tests, users saved up to 70% of normal execution time and up to 50% of CPU time, the vendor said.

FRU is an optional component of Com-Pres/IMS, which is licensed for $3,000 per CPU processing unit.

Database Technology, Suite G-6, 21 N. Skokie Highway, Lake Bluff, Ill. 60044.

■ Spectrum International, Inc. has announced a manual and two software packages for integrating project management with fourth-generation language tools in system development. The products are intended to increase system development productivity and reduce applications backlogs.

The products are Spectrum/Productivity, a manual with a project management methodology; Spectrum/Estimator; and Spectrum/Documentor.

Spectrum/Estimator is an on-line interactive tool intended for developing estimates and plans for systems development projects. Spectrum/Documentor is an online tool for executing project task deliverables and creating system documentation.

The Spectrum/Productivity manual contains procedures for the use of fourth-generation language tools such as screen developers, report generators, graphics and design aids. It contains guidelines for project planning and estimating and descriptions of how to perform each development task.

Spectrum/Documentor runs in IBM TSO/CMS environments; Spectrum/Estimator, written in Martin Marietta Data Systems' Ramis II fourth-generation language, also runs in IBM TSO/CMS environments.

Prices for Spectrum/Productivity range from $15,000 to $30,000; the price for Spectrum/Estimator is $23,000; and the price for Spectrum/Documentation is $4,000.

Spectrum International, Suite 150, 6101 W. Centinela Ave., Culver City, Calif. 90230.

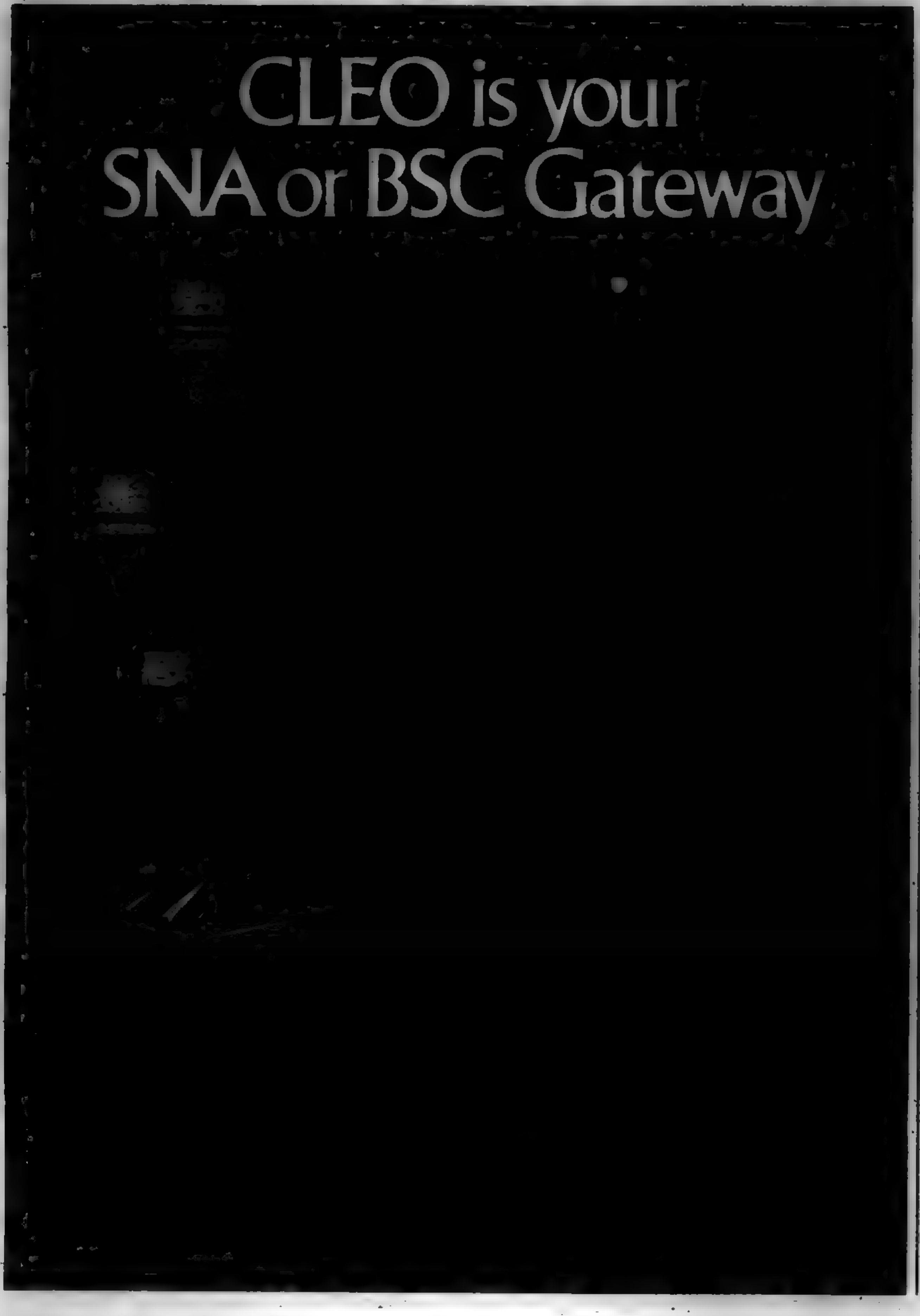
APPLICATION PACKAGES

McDonnell Douglas Automation Co. has announced that its Unigraphics II and Robotics software is available for Digital Equipment Corp.'s Microvax II.

Unigraphics is for computer-aided engineering, design and manufacturing. Unigrapics II features three-dimensional capabilities and an integrated data base, a spokesman said. Robotics software, which operates with Unigraphics, is used to simulate as well as program robots.

The price for the Microvax II with Unigraphics II software is approximately $65,000, according to the vendor.

McDonnell Douglas, 325 McDonnell Blvd., Hazelwood, Mo. 63042.



■ Marcam Data Systems Corp. has announced the Pivot RPGIII order processing, invoicing and sales analysis system for the IBM System/38.

Intended as an enhancement module for IBM's Mapics, Pivot can also be used as a stand-alone package, the vendor said.

Pivot provides on-line control of order processing from initial inquiry and order entry to final tracking of an order after shipment. The product also generates sales and commission analysis reports and updates general ledger and accounts receivable systems. The package can automatically print packing lists, bills of lading, shipping labels and invoices.

Pivot costs $4,200.

Marcam, 19 Crawford St., Needham, Mass. 02192.

■ Perkin-Elmer Corp. has announced that the SPM portfolio management system developed by TNL Data Services, Inc. of New York is now available for PE Series 3200 superminicomputers.

SPM can be used on Series 3200 superminis with the company's OS/32 operating system in Reliance environments. Reliance is PE's transaction processing and data base management system.

SPM provides tools for financial institutions, brokerage houses, family offices, private investment analysts and pension and profit planning departments. The system facilitates portfolio analysis and evaluation, stock and bond trade control, retirement plan control, trust management, foreign exchange trades and control, and dividends and split control.

The base price for SPM is $25,000, excluding customization.

PE, Data Systems Group, 2 Crescent Place, Oceanport, N.J. 07757.

■ Lasine Financial Solutions, Inc. has introduced a time management application for IBM's System/34 and 36.

The Employee Time Clock is a time management system designed to replace employee time card systems and perform cost analysis by job function, the vendor said.

To operate, employees enter their employee number at a terminal to clock in or out. The system generates a time card that incorporates time rounding, holiday considerations, job costing and other functions.

It costs $390.

Lasine Financial Solutions, 5224 Goddard Ave., Orlando, Fla. 32810.

LANGUAGES

■ Verdix Corp. has announced U.S. Department of Defense validation of its Ada compiler for Digital Equipment Corp.'s Ultrix operating system on DEC's VAX computers.

The Verdix Ada Development System (Vads) was validated for the Unix 4.2 BSD operating system in December 1984. The Ada compiler is included in the Vads system and can translate Ada language programs into instructions that can be understood by the computer.

Prices for the compiler range from $7,500 for DEC's Microvax to $30,000 for the VAX-11/785.

Verdix, 7655 Old Springhouse Road, McLean, Va. 22102.

REMOTE COMPUTING SERVICES

■ Aggressive Concepts has announced a data transfer service available for 200 different microcomputers and minicomputers, including the IBM System/34, 36 and 38 and the Hewlett-Packard Co. Series 125 and 9120.

The service reportedly provides data transfers between incompatible systems and data transfers to tape for microfiche production, long-term data storage and migration to new hardware or software.

Price for the service ranges between $8 and $20 per megabyte of data.

Aggressive Concepts, Empire Park, Suite B-210, 1325 S. Colorado Blvd., Denver, Colo. 80222.

■ General Electric Information Services Co. (Geisco) has announced that its Mark 3000 remote computing service now offers IBM's VM/CMS operating system.

According to a spokesman, the Mark 3000 Service VM provides users with development languages, data base and prototyping tools, full screen editors and utilities. Information management tools enables users to perform data entry, organization retrieval and reporting, create electronic spreadsheets and graphics. Users can also perform decision support, document preparation and electronic mail functions.

Ascii CRTs and IBM Personal Computers can access the Mark 3000 Service VM through Geisco's IBM 3270 simulation mode over dial-up lines, the vendor said.

Mark 3000 Service VM includes a communications register unit (CRU) processing algorithm with a billing rate of 65 cents/CRU during peak hours and $1.05/megabyte/day for on-line storage.

Geisco, 401 N. Washington St., Rockville, Md. 20850.

■ McDonnell Douglas Remote Computing Services Co. has announced an interface that links its Multiple Report Creation System (MRCS) with Information Builders, Inc.'s Focus fourth-generation language. MRCS is for use with IBM operating systems.

According to a spokesman, with the added interface MRCS users are no longer restricted to separate passes of the Focus data bases each time individual queries and reports

Continued on page 46

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SOFTWARE & SERVICES

Continued from page 45

are needed. MRCS reportedly handles multiple requests and can produce any combination of files, data bases and reports in one pass of Focus data bases.

The price for MRCS ranges from $2,500 for users with IBM's VM/CMS operating systems to $4,000 for users with IBM's MVS/XA.

McDonnell Douglas Information Systems Group, 325 McDonnell Blvd., Hazelwood, Mo. 63042.

■ Litton Computer Services has released an option for its Excecutation micro-to-mainframe communications software that reportedly allows users to transfer only the updated portions of files rather than retransferring entire files to record changes.

Called Version Control Facility (VCF), the software compares two versions of a microcomputer program, creates a file containing the updates, transmits the update file to any IBM Personal Computer, Personal Computer XT or AT with access to Litton's remote computing services and combines the update file with the previous version.

A site licensing agreement for VCF costs $5,000.

Litton Computer Services, 6 Kingsbridge Road, Fairfield, N.J. 07006.

ON-LINE DATA BASES

■ Informatics General Corp. has announced Release 2.1 of its Distributed Data Processing System (DDPS) for distributors and wholesalers that use the company's Distribution IV on-line subscription service.

The enhanced DDPS features expanded order processing and scheduling capabilities using an interactive reserved order system, local pricing and invoicing capabilities, an optional report retrieval system and a buyer's workstation.

Distribution IV is a management and control system for medium to large distributors accessed by customers through on-site computer terminals.

The price for DDPS ranges from $20,000 to $50,000, based on the number of modules purchased. Distribution IV ranges in price from $2,500 to $3,000 per month.

Informatics General, 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

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GILLIAM

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system that they ignore the consequences of system outages. If company operations will be severely impaired or curtailed when the system is unavailable, then a disaster recovery plan is necessary.

In the early days of computing, most applications operated in batch mode. Thus, the process of backup and recovery was fairly straightforward. Outages of a short duration, from a few minutes to a few hours, usually resulted in data center personnel just waiting until the completion of diagnoses and repairs and the restoration of the system. Recovery usually called for rewinding the tapes and restarting the job.

The disaster recovery plan for batch systems relied on off-site backup copies of the operating system, applications program libraries and data files plus a plan for off-site operation at another nearby data center. The backup data center was often another company with similar hardware, with which a mutual assistance agreement had been arranged.

Alternately, batch recovery plans involved a contract for a shell site, that is, an empty computer room where emergency hardware could be installed for interim use until permanent data center operations were restored.

Today, most companies have moved into the world of on-line systems and users are often absolutely dependent on the availability of an application to perform required tasks. This is especially true when the system serves the customer directly or controls some physical process.

Choices for on-line systems recovery

What are the alternatives available for on-line systems recovery? The first consideration in many cases is how well and for how long the business can survive with manual handling of the system services. For example, could customers be served using manual forms and handwritten receipts for some period of time, with master files updated at night or at a later date? Could physical processes be controlled by humans for an interim period until the system is restored?

Second, some companies have multiple data centers with similar or compatible computer systems. In this case, intracompany backup is possible with appropriate telecommunications arrangements and off-site backup of programs and files.

There now exist several companies that offer, for a fee, the opportunity to move your processing to one of their data centers if disaster strikes. The data center would have a computer similar or compatible with yours sitting in a ready state, which is why the facilities are called hot sites. But even this alternative requires that some special arrangements be made ahead of time, such as installing switchable telecommunications lines, and users must allow for a time delay from the outage point until the backup system is operational.

For at least one major line of medium-capacity systems there exists a mobile hot site, an operational system in a van, which can be moved to the customer site on short notice. Of course, as in the case of shell sites and hot sites, a prior agreement is required to use these facilities.

Once you have determined that a backup and recovery plan is needed and that at least one of the alternatives is feasible, the detailed disaster recovery plan can be prepared. Of course, having access to a hot site or any other alternative is useless unless you have backup copies of the programs and data files.

The failure of on-line systems while in operation presents a difficult situation in that you have to recover from the point of failure without losing data. Many of the larger and more advanced data base management systems offer transaction logging to a disk or tape to allow real-time recovery from system failures. But should a disaster strike and destroy the data center, the logging data tape would also be lost and only the information stored off-site would be available.

The disaster recovery planning process should include the identification of applications that are vital to the company's ability to continue in business. From there, the plan will explain the steps to recovery and the responsibilities of all the people involved. Usually, a number of recovery teams are formed to provide an orderly and systematic recovery; first to the interim site and then to the rebuilt, permanent site.

Keep in mind that if the data center is destroyed, there is also the possibility that terminals, documentation, user files and the workplace will also be wiped out. An alternate work site for both the user and the information systems group should be identified along with a plan for needed facilities and resources.

A well-prepared disaster recovery plan in an attractive notebook sitting on a shelf, and contracts to provide backup processing do not constitute a complete plan. If at all possible, the disaster recovery plan should be tested by switching processing to the hot site computer and proving to management that recovery can be achieved within the desired time frame.

Also, as systems, staff and facilities change, the recovery plan must be kept up to date if is to meet the objectives set forth by management.

Gilliam is an independent consultant based in Ponca City, Okla. He has almost 30 years experience in data processing and is a member of the Independent Computer Consultants Association. He is a regular contributor to Softline.

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TEST from page 41

more than one phase of the development life cycle. Most testing was done in the acceptance phase, followed by the programming phase, the conversion/installation phase, the design phase and the requirements phase.

Formal testing procedures

Most data processing departments have a formal procedure for testing changes made during maintenance of programs. Users were most often responsible for testing the functions of applications once in production. Others responsible were independent test groups, data processing quality assurance, electronic data processing auditors and systems analysts/programmers.

While most companies kept no record of the defects uncovered in testing, a majority did have a formal system for correcting the defects. In order of priority, errors corrected were fatal errors that stopped the system, nonfatal errors and faults that affected a capability but could be tolerated.

Test strategies for on-line data base systems differed from those employed for batch systems. Some users commented that on-line system testing was more sophisticated and more critically reviewed, that on-line systems were tested with an interactive test tool and that users were more involved in testing on-line systems.

A variety of testing documents were prepared by the companies. The documents prepared in order of frequency were system test plans, a list of test cases, a report on testing and a program test plan. In half the companies, test documentation was carried into the maintenance phase for use in testing program changes.

Users listed several ways in which testing could be improved in their organizations. These ways included planning for testing, adhering to test standards, improving requirements testing, incorporating test procedures throughout the system life cycle and winning more management support for testing.

The survey results cost $5 and are available from the Quality Assurance Institute, which is located at 9222 Bay Point Drive, Orlando, Fla. 32819.

AS from page 41

AS can be licensed for an initial charge, monthly charges or for a one-time charge. The initial charge is $53,000, and the monthly charge is based on the number of concurrently signed on terminal users (CSTU). The monthly charge ranges from $1,700 for 15 CSTUs to $8,025 for 120 CSTUs. A one-time charge is also based on the number of CSTUs. It ranges from $101,500 for 15 CSTUs to $292,500 for 120 CSTUs, the vendor said.

IBM's Information Network group also announced AS Release 7.0, which can be accessed via that remote computing service beginning in mid-November.

Release 7.0 includes licensed and proprietary programs developed to execute on the Information Network, the spokesman said. It can reportedly be accessed via terminals through either leased or dial-up communications lines.

Release 7.0 reportedly features extended high-resolution graphics and statistical capabilities, improved project control and language editing facilities, larger file structures and wider language support. AS Release 7.0 charges are based on use, the vendor said.

For further information, IBM can be reached through P.O. Box 30021, 3405 W. Buffalo Ave., Tampa, Fla. 33630.

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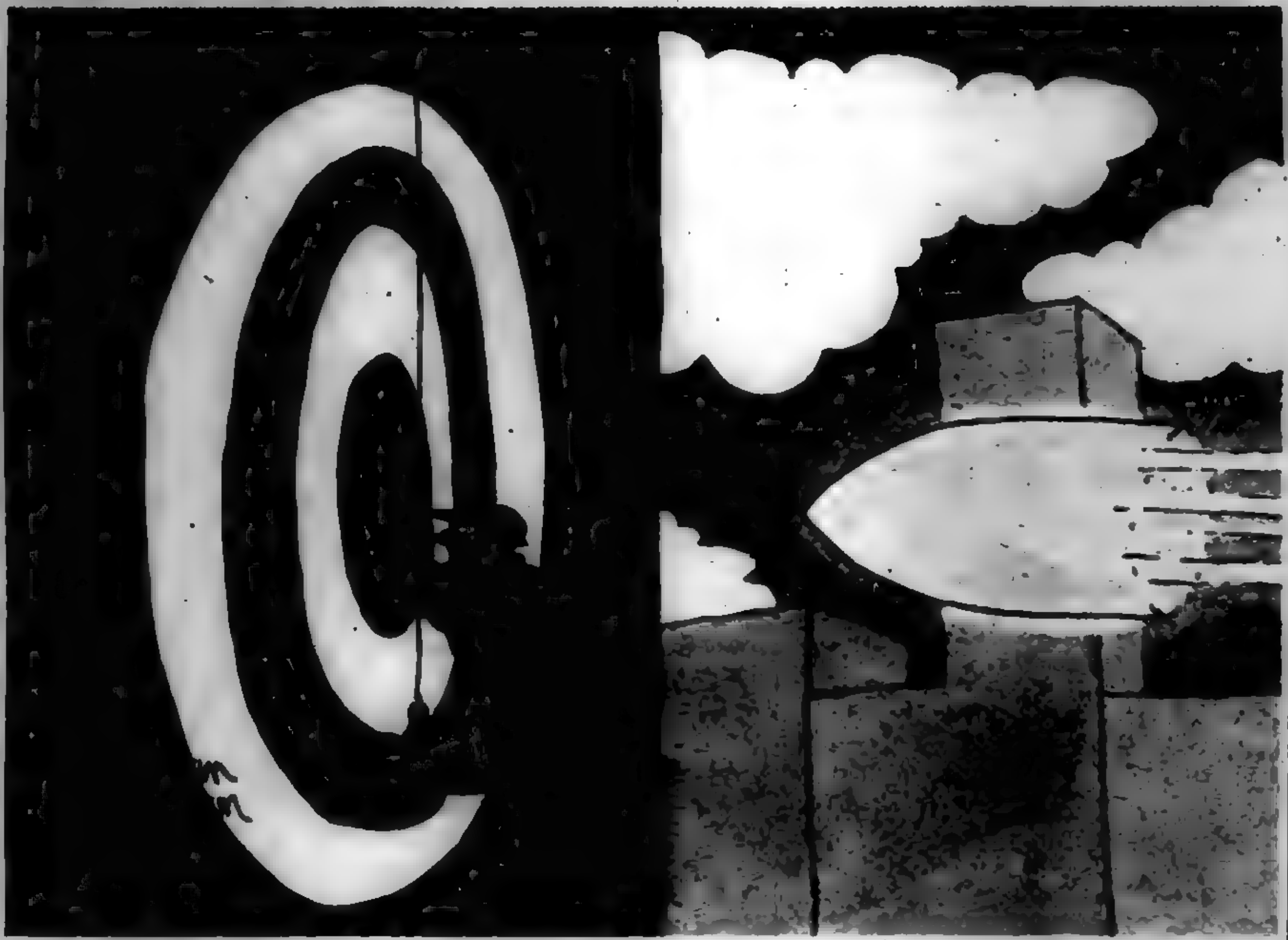

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WHEN THE COMPANY PICKS A CIO, WILL YOU BE IT?

There's a shortage of qualified candidates to become chief information officer. When corporate management looks for an internal candidate, MIS executives should be ready.

By Roger Sobkowiak

As corporations create a chief information officer position, the predictable scramble begins. Companies comb their ranks for qualified internal employees while executive search firms recruit outside candidates. Typically, both efforts fail.

A shortfall of able candidates exists and will continue to because the most likely candidates for the new post — current MIS directors — have not been groomed for corporate positions. It will be perhaps two to seven years before a new cadre of information systems executives will emerge. The development process will be traumatic and costly. Companies will painfully begin to realize both the individual and corporate changes necessary to manage the computer and information revolution.

The shortfall exists because MIS directors have been trained to be providers of corporate services, not corporate executives. The duties of the CIO are not those of simply managing bigger projects, but include strategically integrating information and knowledge. The CIO reports directly to the president and assumes

IN DEPTH/CHOOSING A CIO

equal status with similar high-level officers in marketing, engineering, manufacturing and finance.

In order to be effective, the CIO must have a deep appreciation for the perspectives and goals of these other functions. And more important, the CIO must be able to merge these perspectives and goals into an overall MIS strategy. If the CIO is an alumnus of one or more of these functions, this integration will be easier than it would be for the nonalumnus. Whoever the CIO is, however, he must perform integrative thinking to be successful.

The CIO will shape his position within the company. It is his prime responsibility to effect a new way of thinking about how work gets done. Therefore, the person seeking to become a CIO must be an agent of change. The irony is that those who understand the implications of creating a chief information officer position and the skills required to do the job are often the people who are the most logical internal candidates. But they hesitate to step forward as candidates because at some fundamental level, they know they are inadequately prepared to tackle this emerging and critical job.

This dilemma leads to the increased possibility that the CIO, if chosen from within the company at all, will be chosen on the basis of his executive skills and general managerial performance — from a business unit or function rather than MIS. When this happens, in-depth understanding of the technology takes a backseat to executive acumen. Aspirants to the CIO job from within MIS then receive an even stronger confirmation of their unpreparedness to assume the key leadership role.

• Managing the applications portfolio as an asset	• Setting a direction for information usage and control
• Managing diversified computer applications	• Managing diversity and functional applications of computer technologies
• Developing organization structures	• Creating a strategic information plan
• Planning	• Making corporate decisions
	• Developing managers

Two forces

In our efforts with four major corporations, we have worked with many MIS directors and software managers. We have observed the collision of two forces, one dynamic and the other static, that explain why MIS directors are so often poor candidates for the CIO position.

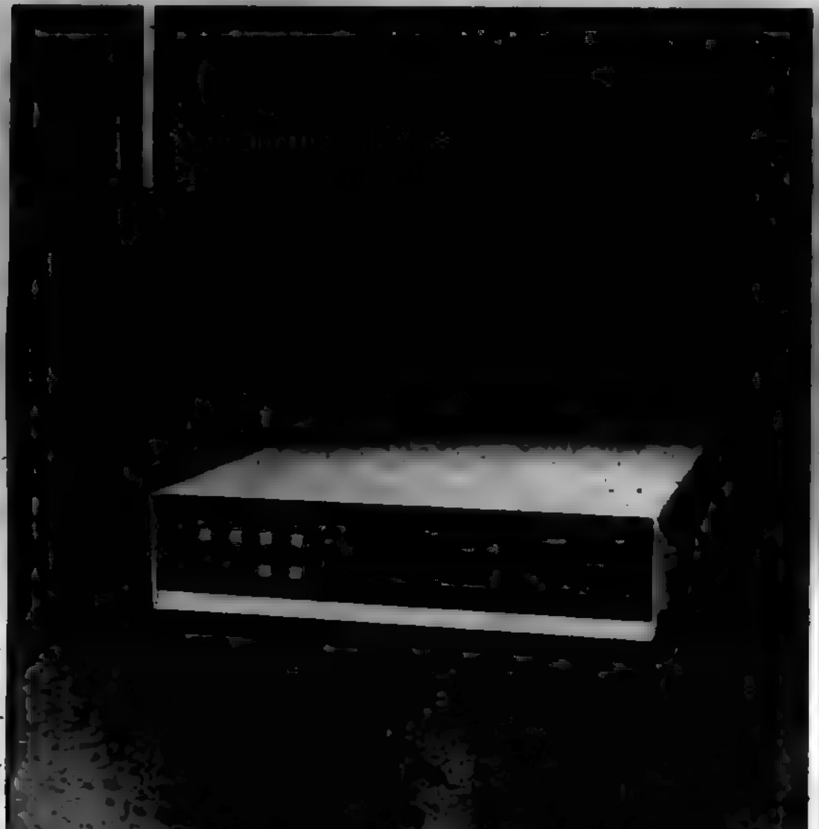
The first factor, the dynamic one, is that companies move through clearly defined stages of computer usage, but each company moves at its own pace. Nolan and Gibson, in their article published in the *Harvard Business Review* (Jan./Feb. 1974), discussed four stages of computer usage. Their work provides insights into the changing roles within MIS. In each stage, the MIS function assumes greater levels of responsibility, fresh relationships to the corporation and new and demanding mandates.

To be successful in each stage, the MIS manager must acquire significantly different knowledge and diverse skills. The most dramatic shift occurs when the company enters what Nolan and Gibson call Stage IV and creates the position of the chief information officer.

The second factor is the generally uninspected and therefore static notion of a development path consisting of a stationary hierarchy of positions that emphasize technical know-how and through which an employee unswervingly passes in progressing to the top MIS slot. A key objective of any career planning process is to guide the individual to increasingly responsible positions requiring the accumulation of advanced knowledge and highly refined skills.

A typical sequence for MIS jobs would be programmer, systems analyst, team leader, first-line manager and, finally, department manager. Such a sequential path can play an extremely useful role, but its strongest requirement is a stable environment where job predictability approaches certainty. The MIS and software arena is anything but such a stable environment. The consequence is that MIS managers who have followed that path have not been really helped.

In Stage IV, the adaptation of computer technology by corporations is happening so quickly, pervasively and totally that the structural foundation of the MIS function is crumbling. Technology is reshaping the development paths, but most corporations have not been able to take the time to stand back to understand and leverage this dramatic process.



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Count the number of software organizations that exist outside the traditional MIS organization — in engineering, manufacturing and marketing. Observe the allocation of hardware resources and discover who is making decisions about hardware and software purchases. List the functions that are supported by the central MIS organization. What is happening is that computer technology is not the private domain of the MIS organization, and managing the technology requires extensive knowledge of other business functions as well as collaborative skills.

Successful managers in Stage IV are those that can cope with issues such as technology transfer, user relations, decision systems and new ways to disseminate computer power.

Focus for a moment on two positions: the MIS director in Stage III and the CIO in Stage IV, and think about the responsibilities and the knowledge, skill and behaviors required to excel.

Note that the difference between the two columns (see chart) is the shift from operational to strategic and from technical to overall business considerations.

The implication drawn here is that for corporations concluding that they must develop their candidates internally, the task is formidable. The emphasis is on behavioral change, which is never easy. Simply sending MIS directors to a crash course at a high-quality business school will not achieve the goal.

The differences between being an MIS director and a CIO are principally not of knowledge but in the skills necessary to apply the appropriate knowledge in broader and more complex circumstances. It's a bit like the difference between a child who has been taught to walk and one who has been taught to negotiate a street crossing.

For MIS directors (Stage III) to prepare themselves to be CIOs (Stage IV), they must obtain first-hand, officer-level experiences. The problem is made especially difficult in two ways. First, other functions, such as engineering and manufacturing, are often unwilling to accept the MIS function as an equal; second, the MIS professionals themselves do not yet accept the new role as attainable.

The message for smart corporations is that they must capitalize on current trends, including end-user computing, expert systems, information centers, office technology, computer-aided design and manufacturing and teleconferencing. The proliferation of personal computers is drawing the MIS person out of traditional functional patterns. Technical gurus are and always will be important, but they won't be helping the corporation unless they can be helpful to users.

These trends are causing the MIS function to interact on a daily basis with other business functions, thus broadening its scope, areas of influence and overall business acumen. The leader companies will take advantage of these trends by rewarding managers who can step into the new roles and, at the same time, consciously use these jobs as a training ground to create the new breed of information systems executive. These companies will continually challenge MIS managers to rethink their roles.

The message for the few MIS professionals within the ranks who truly aspire to officer levels is simple: Aspirations can be achieved by leveraging technology trends to broaden management skills, while continuing to work toward technical mastery.

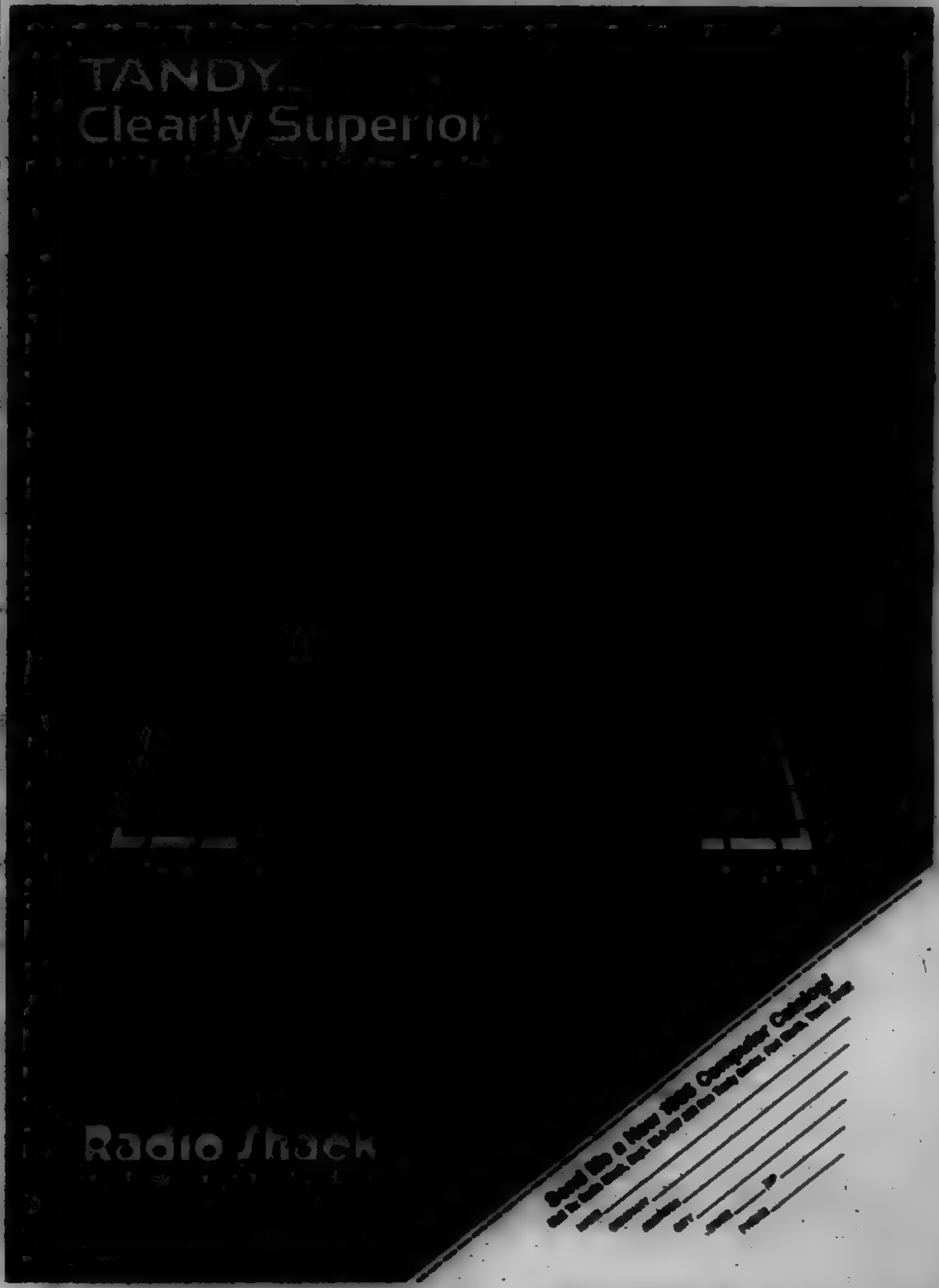
For example, MIS people must seek out and create, if necessary, temporary one- and two-year assignments in other business units or functions that are critically dependent upon computer technology as the basis for products and services. They must doggedly pursue opportunities for highly visible projects that contribute directly to the bottom line. They must demonstrate an eagerness to participate in management development, to chair cross-functional task forces and seek opportunities to contribute to key corporate decisions such as those required in an acquisition, divestiture, merger or start-up. In all possible cases, the aspirant must position his technical knowledge and business insights to form the right combination for making difficult business decisions.

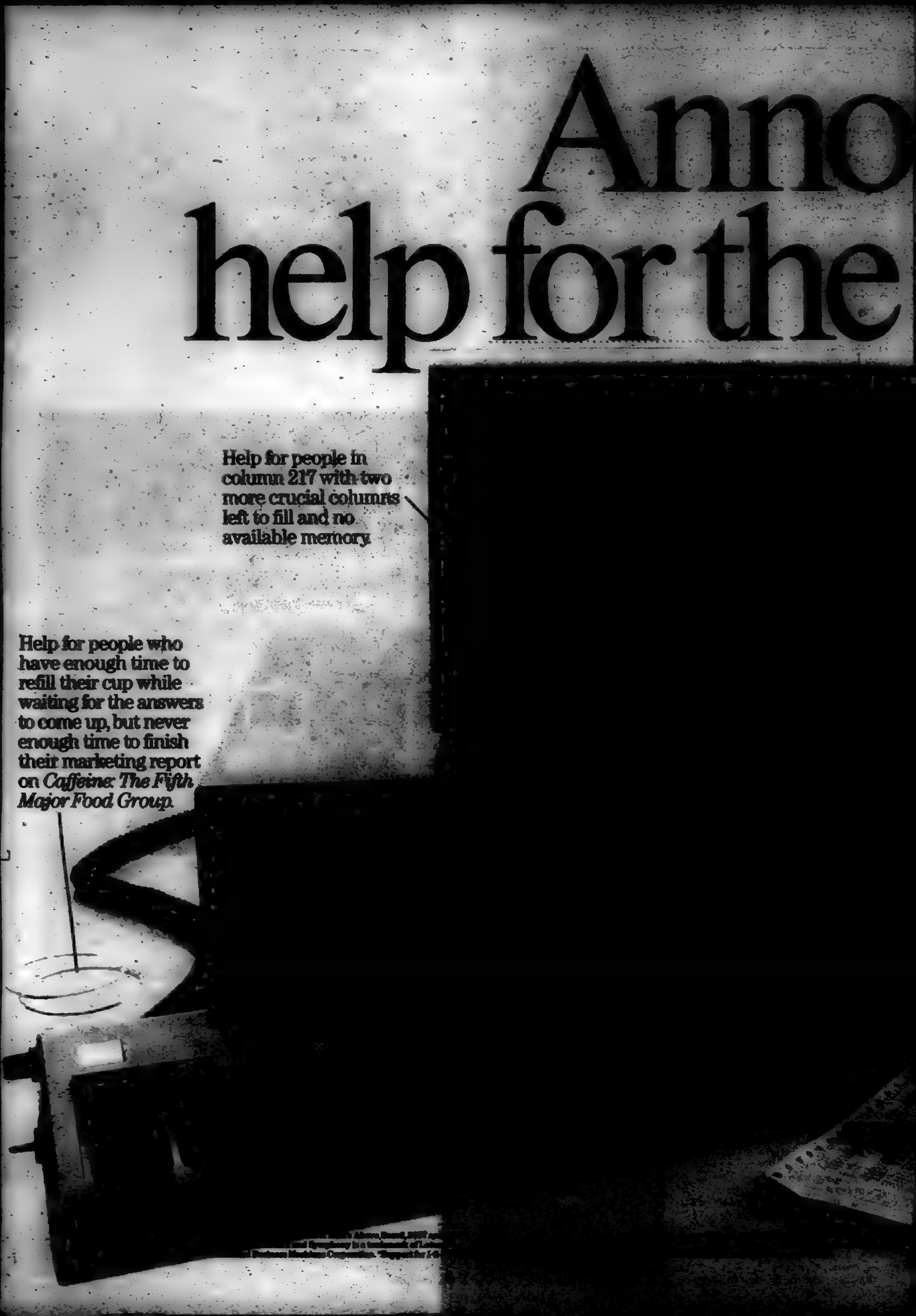
The shortage of CIO candidates from MIS ranks will continue for some time, but not indefinitely. Companies should develop a qualified manpower pool similar to a good major league farm club. They need to strategically place talented technical people who have the necessary interpersonal skills and business perspective in new user-oriented jobs. They need to move computer experts between functions and create new measurement systems to reward technology managers. Other companies will follow as they understand and face the problem and see it as one that doesn't go away simply by recruiting a candidate from another company.

MIS directors should understand what they need and demand to move ahead. Company chief executives who are about to select a CIO should look long and hard at the MIS talent base that they already have. If they need to go outside the company or outside the MIS function for a CIO, then appointing the person is just the prelude to the management work required to build an MIS organization that is something more than a utility function.

About the author

Roger Sobkowiak is the founder of Software People Concepts, Inc. of New Haven, Conn., a firm specializing in the general management and human resources issues of MIS organizations.





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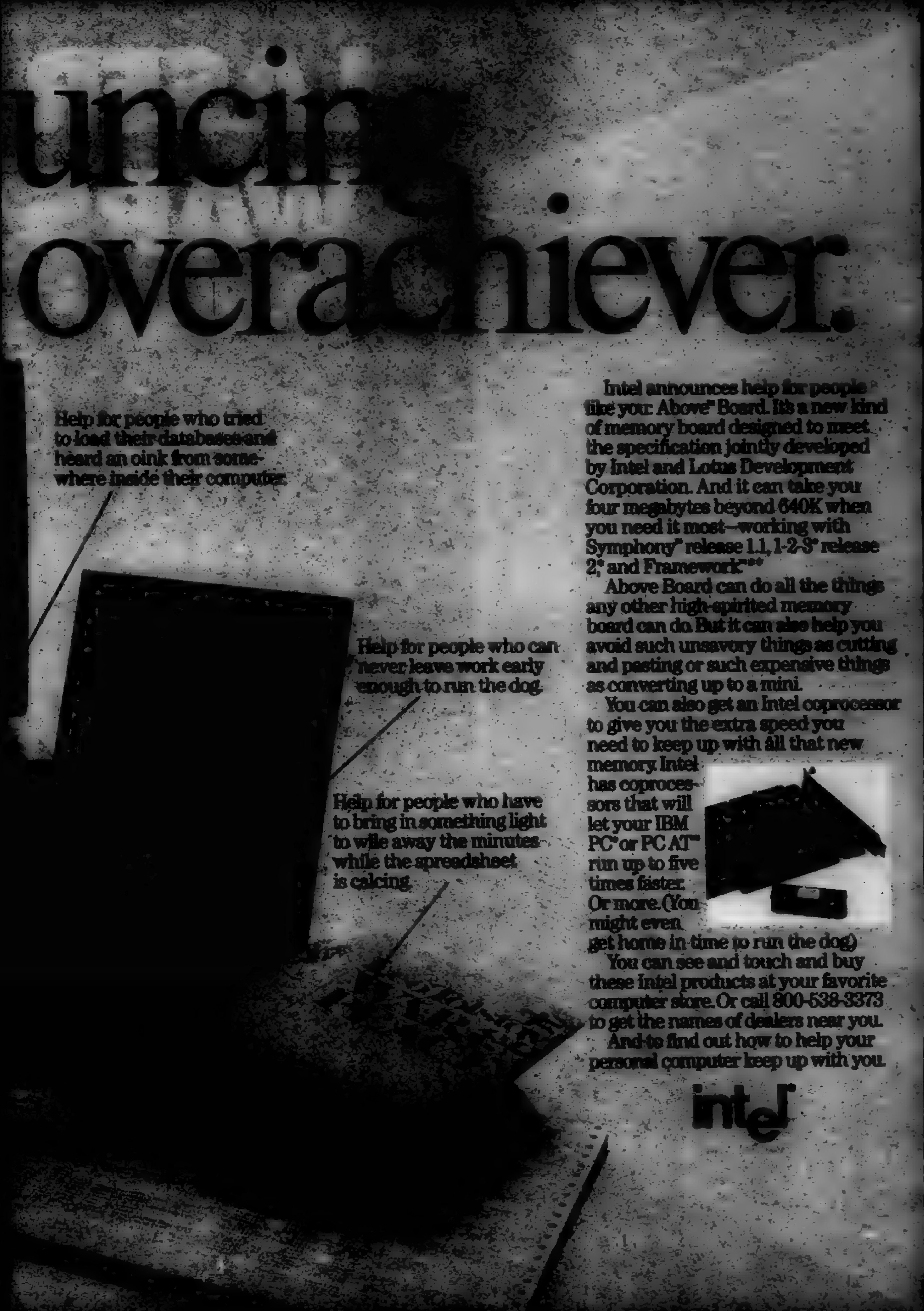

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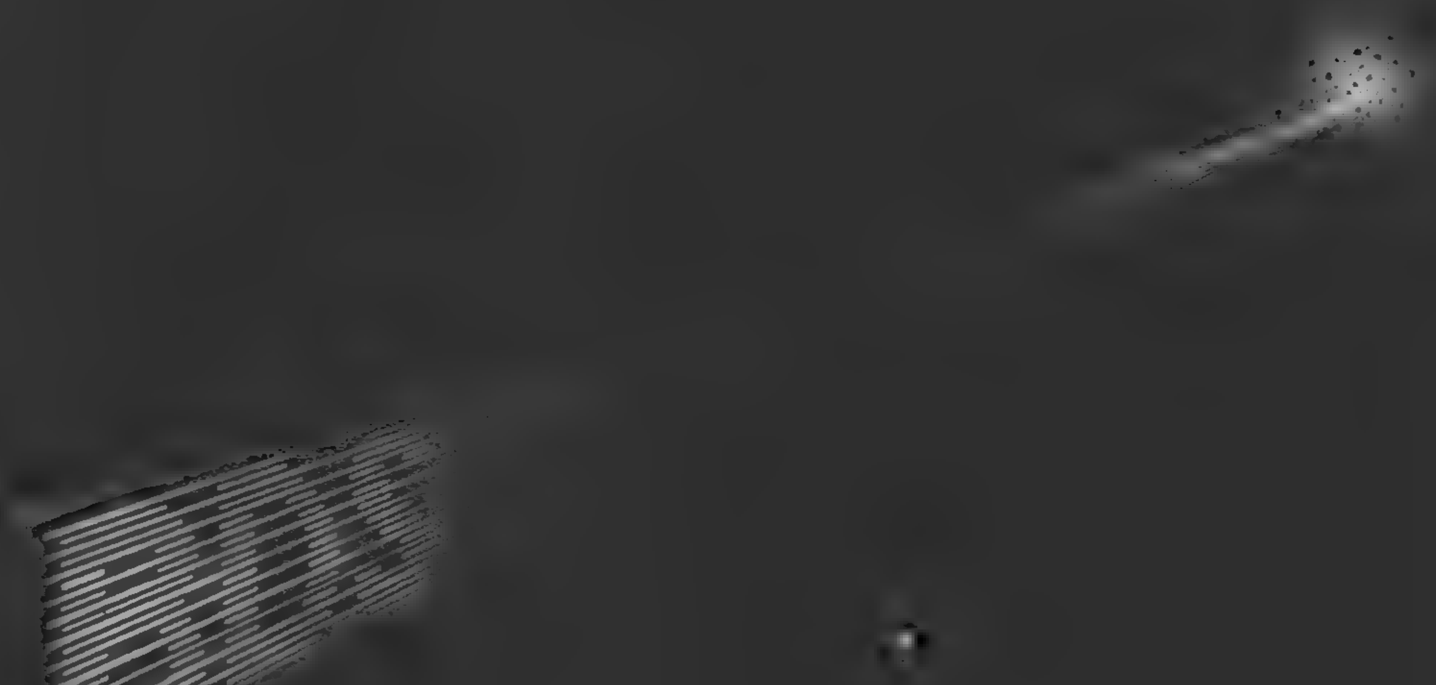

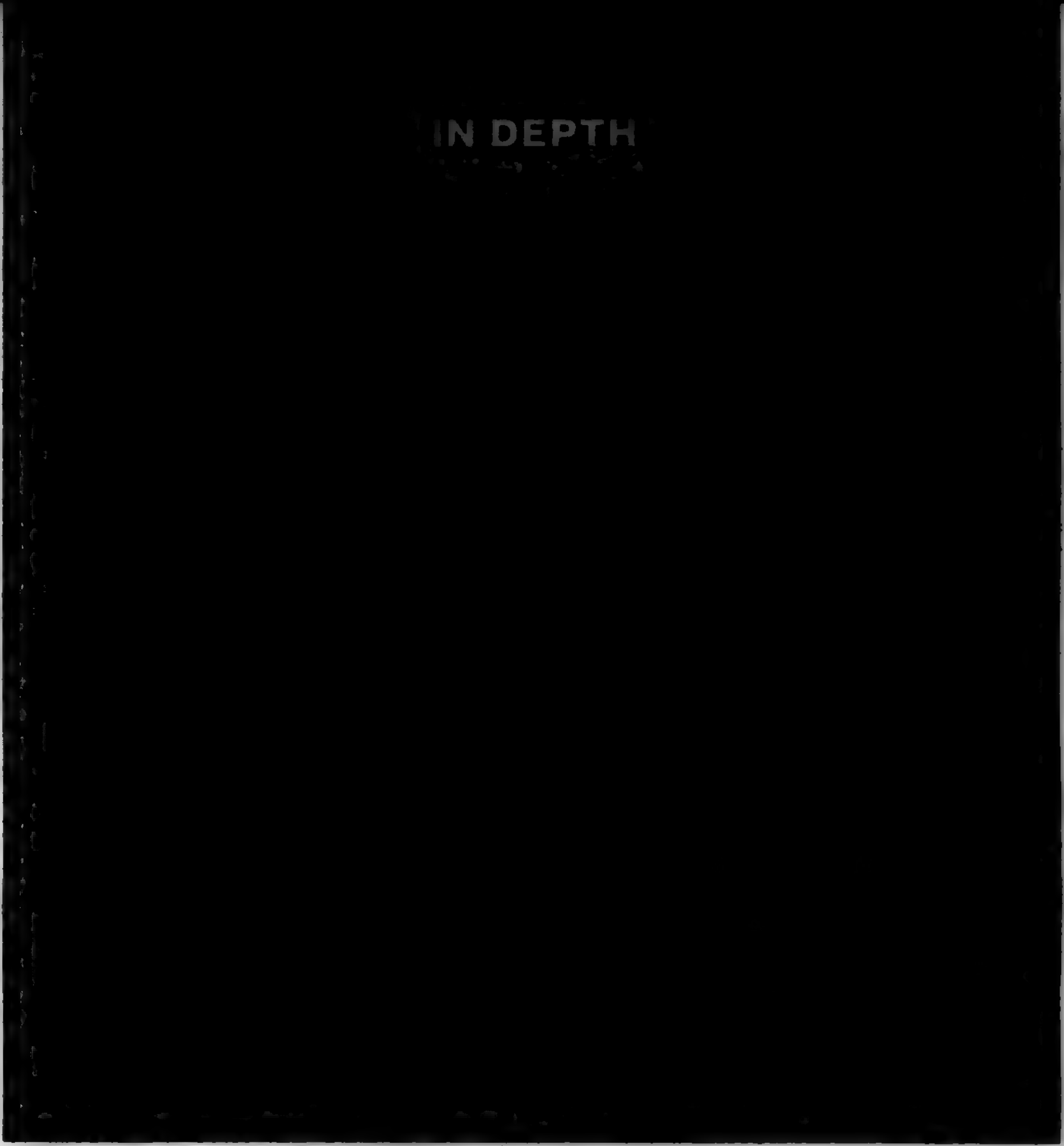

The long-term use of the personal computer is as an interactive workstation connected to corporate data bases. The role of DP is to make this goal reachable in the shortest time and at least cost possible to the organization.

By William Perry

Many years ago, a corporate controller wrote an article in a magazine about the computer titled "I hate you, computer — You ruined my nice, happy, quiet life." The controller felt in charge of his manual environment, but when the computer intruded, life was never the same again. Now, many data processing professionals feel the same way about the personal computer. There is no doubt it will change the lifestyles of data processing professionals in their organizations.

To many, the personal computer is viewed as a threat. One data processing professional stated that helping the personal computer user was like training your competitor to take your customers away from

Excerpted from The Micro-Mainframe Link: The Corporate Guide to Productive Use of the Microcomputer, *by William E. Perry. Copyright © 1985 John Wiley & Sons, Inc. Reprinted by permission of the publisher.*

you. There is no doubt that the computer is a threat to the way business is now conducted, but it is by no means a threat to information processing. The role of computers in an organization will accelerate rapidly because of the introduction of the personal computer.

Economists refer to a market as "elastic" when it can absorb all of the product that is placed in the marketplace. For the foreseeable future, the information processing market is elastic. There is a huge pent-up demand for processing, some of which is currently being satisfied by the personal computer.

When we consider that the personal computer is another information processing tool, then the role of the professional data processor is to provide leadership and direction in the effective use of personal computers in the organization.

The leadership role requires the data processing function to undertake those strategies and tasks needed to introduce and oversee the use of personal computers in the organization. As such, DP professionals should not wait until the situation is out of hand before acting, but rather should grab the bull by the horns and provide those services and facilities that will encourage potential users to follow those paths shown to be correct through many years of experience.

The direction will be provided in terms of selecting hardware, establishing training programs, developing programs and developing user groups.

The data processing function that provides the leadership and direction will be stronger 10 years from today than it is today. The function that avoids this leadership role may find that the information processing leadership has shifted to the users.

The data processing leadership role begins by developing a long-range information processing plan for the organization. It is difficult to provide leadership if one doesn't know where one is going. The long-range information processing plan becomes the blueprint for integrating personal computers into the business and then providing the needed direction to ensure that the personal computers, as well as all other aspects of the plan, work effectively.

Long-range plan

In the beginning, there was no centralized data processing. Each operational unit that needed data processed did it internally. Staffs of clerks in each operational area of an organization performed whatever paperwork was necessary to assist that unit in fulfilling its responsibilities.

When automated equipment came into existence, the time, effort and cost required to utilize effectively that equipment surpassed the capabilities of many departments. For this reason, organizations began to establish central data processing functions. The primary objective of this function was to provide the leadership, direction and expertise needed to process the organization's data on sophisticated equipment.

Recently, this centralization of data processing has begun to break down. The cost of computers has dropped significantly. Therefore, the cost issue for centralization is no longer pertinent for many uses. Computers have been made easier to use, and the skill levels of users have increased. Therefore, the technological barrier, which was a major reason for centralization, is beginning to break down.

One could hypothesize from the current trend that processing is decentralizing and that users will revert to their original role of processing the data they need to fulfill their mission. There is little doubt that some functions will remain centralized, such as payroll, but many could be decentralized and probably should be. After all, the users know more about their business than is known by the central data processing staff.

What's effective

The central data processing function needs to rethink its primary mission within the organization. The mission of doing all of the computer processing is no longer valid. The central function must rethink what aspects of information processing are most effectively done centrally and what are most effectively done decentrally.

The pattern that is emerging is a four-phase personal computer evolution process. If we study this process and then incorporate it into a plan, it shows a very clear mission for the centralized data processing function.

Listed below are the four personal computer phases restated as a long-range plan for the organization:

Experimentation phase — the decentralization of some processing applications. The long-range plan begins with a decentralization of selected data processing applications. The objective of this part of the plan is twofold. First, those functions that can best be done by the users should be done by users. This phase will introduce computing capacity to users, enabling them to identify which functions are best done in a decentralized manner.

Second, the use of the personal computer by users will increase their computer literacy. This long-term goal of the data processing function may finally be achievable through the use of the personal computer.

Stand-alone phase — selection of user-developed, maintained and operated applications. The long-range plan continues by redefining the processing location for application systems. This reallocation of application processing should be mutually developed by the users and the central data processing function. The central function can participate in application selection, provide

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guidance and training and lead users through the takeover of certain computer processing applications.

During this long-range plan phase, users will begin to realize their processing limitations. These limitations will come from three sources:

1. Technological limitations — The users will not want to invest the time and effort to master fully the technology in order to do all types of applications.

2. Hardware/software limitations — The capabilities available on the personal computer do not equal those on the central computer. It is reasonable to expect in the foreseeable future that certain functions that can be readily performed on the central computer will not be possible on the personal computers. While it is expected that personal computers will grow in capacity, they will not rival the capacity of the large central computer in the foreseeable future.

3. Data limitations — Many processes will require large corporate data bases. Users will not want to enter or maintain those large volumes of data. Even if they did, it would create multiple redundant data bases in the organization, which is an ineffective use of organizational resources.

Network terminal phase — eliminate the data limitation. The third phase of the long-range plan should be the elimination of limitations because of data. This can be accomplished by giving personal computers access to the organization's data bases. This access capability will probably be introduced in phases as controls are developed to protect the integrity and security of the centralized data bases. The phase will begin by downloading data and end when data can be uploaded from the personal computers.

Workstation phase — elimination of processing limitations (hardware/software limitations). This phase of the plan will put the processing capabilities of large computers in the hands of users through the introduction of workstations. The workstation will be able to utilize the processing capabilities of the large computer, as well as the data managed by the large computer.

At the end of the fourth phase, the cycle will have gone from decentralization back to centralization. The workstation phase is one of centralized control of processing, but in a manner and form different from that now performed. Currently, users have only minimal control over centralized processing. When the four-phase, long-range plan has been completed, users will have a more active role in the development and use of processing capabilities.

Backbone in future

The technological skill impediment is one that will not be solved by the user in the foreseeable future. It is the knowledge of technology, the selection of technology, the assistance and use of technology and the support of user applications that will be the backbone of data processing in the future. Much of the application development and associated support systems can be developed and implemented by users. What users cannot do effectively is devote full time to understanding and optimizing the use of information technology for the business.

> ”
>
> ***What users cannot do effectively is devote full time to understanding and optimizing the use of information technology for the business.***

The evolutionary period from centralized data processing to decentralized data processing to distributed processing will be many years in duration. The introduction of the personal computer is merely a step in the evolutionary process of opening computer processing to the information needs of the organization. The speed at which this transition occurs will be heavily dependent upon the role and support provided by the centralized data processing function. Individual users can develop the facilities necessary for their own personal use, but can do little to coordinate an overall corporate effort to expand data processing horizons.

Organizations that lack central direction and the support of data processing professionals may flounder for years in a battle for information supremacy. On the other hand, organizations with strong central leadership will achieve information processing benefits unparalleled in the industry.

The central data processing group must do the following in order to realize the full benefits of information processing in their organization:

Action 1 — preparation for decentralized information processing. Major transitions do not occur without detailed planning and preparation. Decentralized information processing is a new concept with no precedents to use for guidelines. The leaders will have to be innovative to be successful.

This corporatewide approach to information processing requires the development of a master plan showing the transitional steps leading from large-scale mainframe centralized processing to a system where the hardware, processing capabilities and information are distributed to the operational areas of the organization.

Action 2 — develop an effective working relationship with personal computer users. The initiative for

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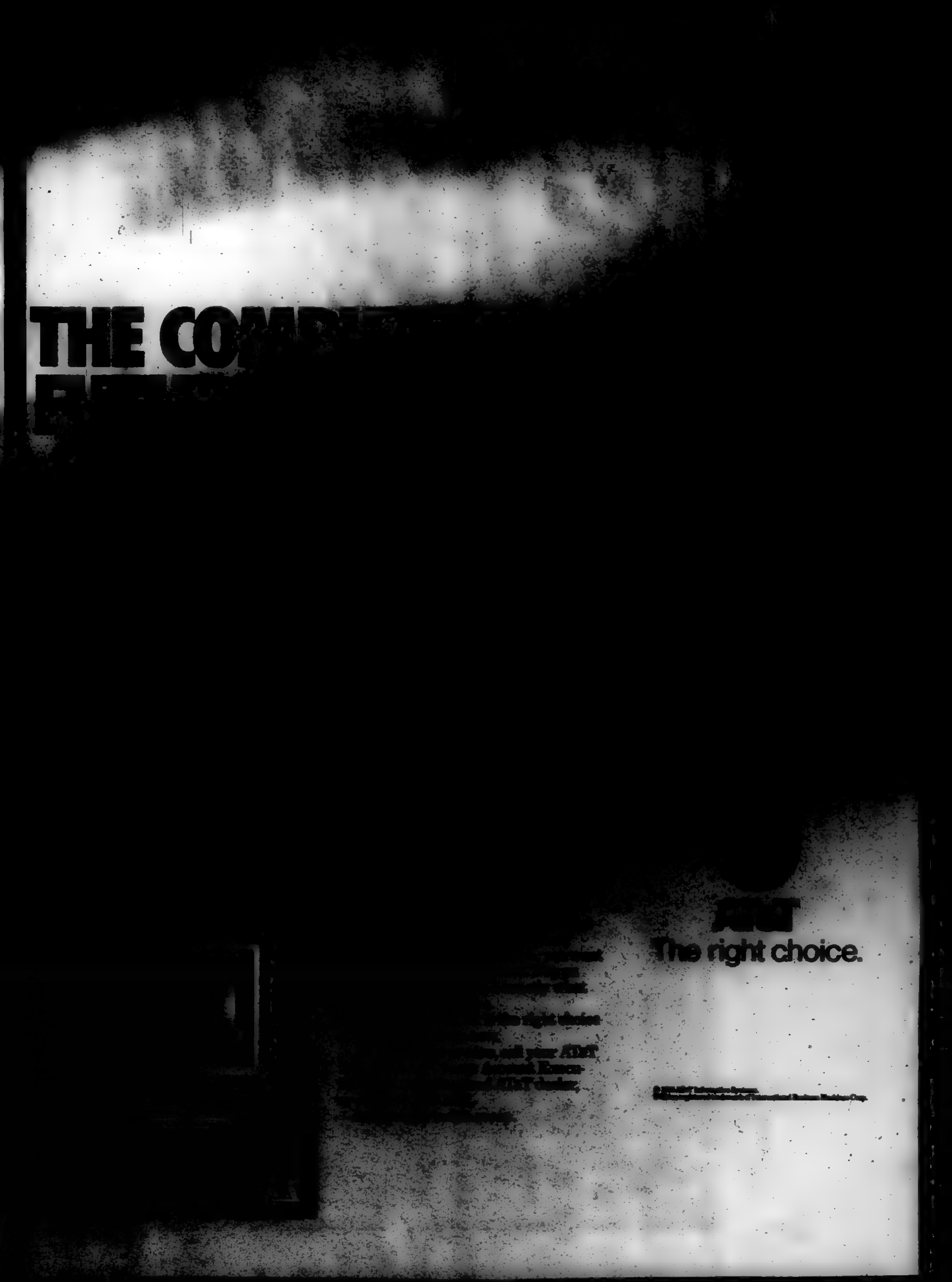

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an interaction between the central data processing function and personal computer users should come from the central group. In most organizations, the personal computer users will not know what they need, what questions to ask or what type of working relationship will provide maximum benefit to the organization. This guidance must come from the central function.

Action 2 — gain technical expertise in personal computer technology. Mainframe technology is different from personal computer technology. The capabilities, operating characteristics, uses, controls and other procedures that are effective on mainframe computers may not be effective on the personal computer.

An old adage states, "You will not know what it's like to be someone until you have walked in his shoes." The same adage holds true for an understanding of personal computer technology. Many data processing professionals have changed their attitudes and concepts about the personal computer once they have delved into and learned this new technology.

Action 4 — devote resources and support to the implementation of the long-range computing plan. The plan is only the beginning of the transition to distributed information processing. The plan does not become a reality until action occurs. Many plans are started in organizations, but few are finished. It takes strong support from centralized data processing management and a commitment of its resources to make the plan work.

The plan is the tool and the technique is the method for using the tool. For example, to drive a nail into a piece of wood, we use a hammer as a tool. The technique for using that hammer is as important as the tool, because without the appropriate swing and pressure behind the swing, the nail will not be driven into the wood.

The techniques that should be considered for the four data processing actions give organizations options in executing the plan. For example, a nail can be driven into wood by many small swings or a few very large swings. It may be the individual swinging the hammer who is best equipped to make the decision on technique. For that reason, a variety of techniques are described below for implementing a personal computer plan.

Action 1

The first few personal computers introduced into a business were viewed as toys in the hands of users. While the microcomputers were as powerful as some of the mainframes 20 years earlier, they were viewed by many as toys whose main purpose was for playing games. This misconception quickly vanished, and the power of the personal computer, as implemented through spreadsheet software, plus a rapidly growing library of other microcomputer software, turned the toy into a valuable decision support tool for the user.

The preparation that the central data processing function must do as a prerequisite to optimizing the equipment includes:

- Mental preparation — the data processing professional must view the personal computer in the proper information processing perspective.
- Planning preparation — a long-range information system plan needs to be developed.
- Organizational preparation — the information processing organizational structure needs to be reevaluated and reorganized to complement the characteristics of the personal computer.

In the performance of this preparatory work, the following techniques can be used by data processing professionals.

Technique 1. Develop personal computer programs. This technique breaks the plan into smaller controllable units. A program is an independent and controllable activity whose objectives can be defined and measured. Each program should involve establishing requirements, designing the procedures by which the program will be implemented and then implementing and evaluating the effectiveness of the program.

Unless the plan can be divided into controllable and measurable programs, it may flounder because of lack of direction and defined accomplishments. For example, the establishment of a computer store would be a program.

Data processing professionals learned the same lesson in the systems development process. Prior to phased development with specified deliverables, management could never determine an accurate status of development. This led to extensive overruns and delays. Personal computer implementation can fall into the same traps without an equivalent phased or programmed approach to incorporating the personal computers into a long-range information processing plan.

Technique 2. Provide personal computers with quality control tools. A quality control tool is a vehicle for use by personal computer users to assess the effectiveness of their work. These tools can be used to evaluate acquired capabilities, as well as to evaluate in-house-developed software and procedures. Examples of these quality control tools include:

- Software installation tool — provides a series of steps that should be undertaken to implement software.
- Software documentation checklist — contains a list of the preferred types of documentation included in an acquired or developed software package.
- File creation checklist — indicates all of the steps that should be followed to ensure the integrity of a created file.

Technique 3. Create a professional image for personal computer users. Many articles describe the inability of the personal computer user to do the job right. These attitudes were adopted years earlier to describe the inability of the user to define adequately requirements for application systems.

When these attitudes carry over into day-to-day relationships, it comes across as a superior/subordinate relationship. If personal computer users are looked down on as second-class citizens or given other attributes of incompetence, it will be but another example of the centralized data processing group "attempting to run the organization."

The attitudinal change techniques are the following:

- Management support of the personal computer program — senior management and data processing management making known that the positive impact of these programs on the business can change attitudes.
- Evaluation of personal computer capabilities — recognizing what these computers can do creates an awareness of the power of the equipment.
- Cross-fertilization techniques — providing data processing personnel with personal computers to use for their own decision support processes can show them the uses of these machines.

Technique 4. Budgeting and accounting for time expended on personal computers by DP professionals. The expended time should be recorded by job function and by user. Each personal computer user should be assigned an account number (if there are many personal computers in one department, a user departmental number may be used).

The type of functions that need to be accounted for include hardware/software selection, counseling, implementing and/or debugging software and discovering problems. While it is not necessary to charge back this time to users, it is important to understand where the time is being expended so that the benefits from the use of those resources can be determined.

Technique 5. — Focus on a single information system technology. Data processing professionals must look at information processing as a single program within their organization. To consider personal computers one type of technology, office equipment another technology, centralized data processing another and so on, defeats any cohesiveness of direction. Once all information processing is viewed as a single technology, it can then be planned, managed and controlled.

Action 2

Programs and actions occur by and through people. The more effective the working relationship, the greater the probability that the program will be successful. A good working relationship implies a commonality of purpose that helps ensure the success of a program.

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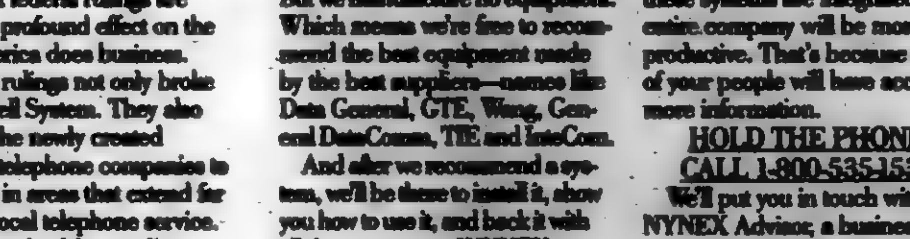

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processing group and its users, the easier it will be to build an effective personal computer relationship.

As with all other relationships, this is a two-way street. Both parties must want to develop the relationship. The catalyst for this desire to build a good working relationship can be the long-range information processing plan of the organization.

The following techniques can be used in building this centralized data processing-user relationship.

Technique 1. Provide the assistance requested. There is a tendency for data processing professionals to want to do what is needed, as opposed to what is asked. While the needed guidance may be given in good faith, it may not be welcome. It may be viewed as meddling and attempting to run the personal computer program in the same way the central group runs the mainframe computers.

Individuals working with personal computer users, particularly in the early days, should be strongly cautioned to provide the type of advice and tools requested and to delay the introduction of good practices and standards until a solid working base between the groups has been developed.

Technique 2. Hold a personal computer open house. The kickoff for creating a good working relationship between the central function and the users can be important to building a good working foundation. An open house showing both the central function and the personal computer's capabilities is an effective way to kick off a new relationship. The open house can be during or after working hours or even on a weekend. It should be widely promoted as an opportunity for those interested in personal computers to gather an understanding of how they work, observe and participate in demonstrations and meet the organization's experienced data processors in order to build a future working relationship.

Technique 3. Take a personal computer user to lunch. It is important to get to know personal computer users as people. This involves whatever methods work best for getting to know them. The open house is one technique — taking a personal computer user to lunch is another technique. Some data processing functions have set up personal computer tables in the company cafeteria and staffed them with data processing professionals. Those who want to learn about personal computers can then have lunch with that individual and discuss how to get involved in personal computer processing.

In addition, data processing professionals could go out and visit the major areas of the company to discuss the organization's personal computer program and how it might be enhanced and improved.

Technique 4. Issue a personal computer newsletter. An in-house personal computer newsletter can promote what is going on in the organization with personal computers. The newsletter can indicate who recently acquired personal computers, what they are doing with them, programs that the organization is putting in place to help personal computer users, tips and techniques on using personal computers more effectively, new hardware and software announcements and so on. These do not have to be very formal or expensive, but they should collect information from and about the personal computer users in the organization.

The concept can be started by asking for a volunteer in the data processing department who has some literary talent and interest in the personal computer program.

Technique 5. Hold midday matinees. There are a lot of good programs and films on the personal computer. These are available from vendors, from video educational services and from computer stores. These programs can be video, films, slides or speakers. The programs should be put on at lunch in a common area in the organization. Announcements about the availability, the topics and when these programs will be given should be widely distributed.

Action 3

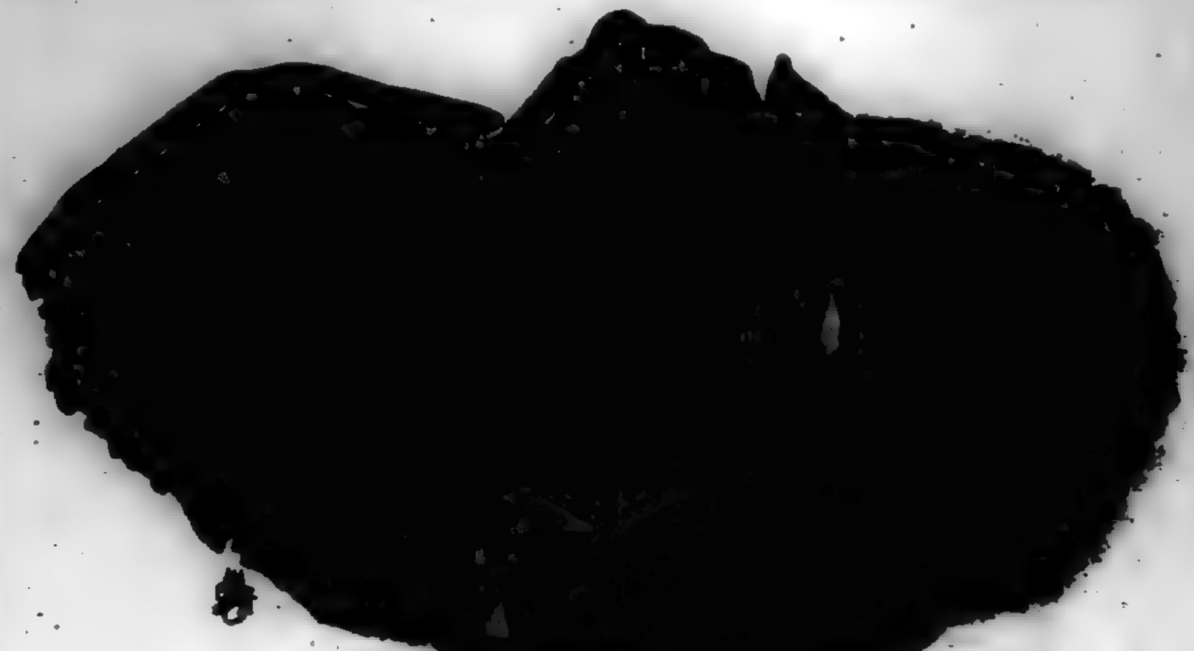
A major contribution that can be made by the data processing professional is improving the productivity of personal computer technology. From the user perspective, this may not be an overriding issue, but from the magnitude of the program and the potential performance improvement, it is a program that needs to be undertaken. The central data processing function, or a function established for personal computers such as an information center, is best equipped to fulfill this role.

The technological issues that need to be addressed include: hardware and software selection, standards, training programs, good programming practices and interconnecting of hardware.

Data processing professionals can use the following techniques to address the personal computer technological issues:

Technique 1. Create awareness of processing options. A user's first involvement with a personal computer may be his only involvement with computing. He may not recognize the options available to him personally and through his organization. For these reasons, work may be done on a personal computer that could best be done on a central computer or word processing equipment. In other instances, the incorrect software or hardware is selected for personal processing, when another significantly more effective capability is available.

Developing a program that identifies the options available and then creates an awareness among existing



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and potential personal computer users of these options can provide a very valuable service to the organization.

Technique 2. Develop the relationship on a business orientation. The personal computer was designed to assist users in fulfilling their day-to-day job responsibilities. In general, these users are unconcerned with the technology associated with accomplishing the job mission. The fact that the technology is not fully understood, may be used ineffectively or in many cases misused may be of little importance to the user. If some desired piece of business information can be obtained through using a personal computer, information that could not be readily obtained otherwise, the misuse of technology may seem relatively unimportant. The data processing professional must recognize this business orientation toward personal computers, as opposed to the technical orientation for which the professional is trained.

Technique 3. Learn the personal computer as a user. The understanding that is needed to gain technical proficiency must be learned by actually using the machines. Whatever personal computers are selected for the organization should be disseminated within the data processing function.

The individuals assigned to oversee the personal computer program should utilize those machines in the performance of their day-to-day functions. In conjunction with any personal productivity gains, there will be a technological comprehension of the intricacies of processing. This experience can then be used to develop more effective standards and practices for utilizing the equipment.

Technique 4. Develop personal computer practices. The data processing professional will develop a set of practices for use of the personal computer through experience. If several data processing professionals are using the equipment, the totality of knowledge of the group will produce better practices than any individual user. These practices should be codified and distributed to the users of personal computers in the organization. While the use of these practices is optional, many will welcome the opportunity to benefit from the experiences of another user with proven success.

Technique 5. Develop personal computer standards. The best practices should be incorporated into standards for the use of personal computers. If the standards are developed out of good practices, which in turn are developed by users, then the standards become the best of the practices. The development and use of standards is a prerequisite to control, which in turn is a prerequisite to placing full reliance on the results of personal computer processing.

Action 4

The objective of the first three actions is to establish an environment in which the long-range plan can be implemented. The preparatory action has created a plan and an atmosphere for implementation. The second action built a working relationship of mutual trust on which the plan could be built. The third action provided the necessary technical know-how to perform those tasks necessary to make the plan work. The final action relates to the actual implementation of the plan.

> ”
>
> *The fact that the technology is not fully understood, may be used ineffectively or in many cases misused may be of little importance to the user.*

The personal computer plan requires the same type of support necessary to implement any type of plan. If there is a difference, it is in the magnitude of the plan and number of organizational units involved in accomplishing the plan's objectives. Because of this, senior management support and involvement are essential to the success of the plan.

The techniques that data processing professionals can use to help implement the plan include the following:

Technique 1. Educate mainframe users about personal computers. The long-term success of information processing will be partially dependent upon the skill level of users. As data processing becomes more integrated into the day-to-day work of users, their knowledge of systems and systems architecture will assist in the effective use of those systems. Experience has shown that the more users know about data processing, the greater the probability of successful use of that technology. The personal computer provides these users a first-hand experience of how applications are constructed, implemented, operated and controlled. The personal computer should be used as a positive learning experience for users. This requires some central direction, oversight and counseling.

Technique 2. Measure personal computer limits and prepare for alternate processing. The personal computer will not have the power or capacity of the large-scale computer. The types of tasks assigned the personal computer by first-time users will be well suited for these machines.

However, over time the data bases, processes and needs will

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expand as they do in any other automated system. Within time, the processing limitations of the personal computer will be reached. These limitations may be disk storage, file access mechanisms, operator time or ability, processing constraints of software or the need for data that is not readily available to the personal computer user.

At this point, personal computer users will need processing capacity not readily available. The type of capacity needed will be associated with central systems and/or central data bases. The central group should define and measure these limitations so that they can anticipate the point at which the personal computer user will need central processing assistance. This technique provides a timetable for establishing a personal computer communications network, providing access to centralized data bases and creation of personal computer workstations.

Technique 3. Promote personal computer standards. The key to a quality data processing environment is the establishment and use of standards. This lesson was learned years ago in the central computer sites. The lack of life-cycle methodologies, standard data definitions and so on significantly increased the cost of data processing and undermined the credibility of completing projects on time, within budget and in accordance with user specifications.

On the other hand, the introduction of standards is a later step in the maturity of any technology. The centralized data processing function should be promoting the concepts early, and when acceptance is timely, be prepared to provide assistance in the development, implementation and training of users in personal computer standards. However, it is recommended that the standards be developed by the users and not by the centralized function.

Technique 4. Business systems planning. Business systems planning is a method of integrating MIS processing into the planning procedures of the organization. The objective is to focus high-level managerial attention on the priorities and problems of information systems. Many organizations currently do this with their centralized data processing. Those organizations need to integrate personal computers into their centralized information systems — business systems planning procedures. Those organizations currently not using business systems planning need to consider the development of committees made up of high-level executives to determine the priorities, directions and planning for using personal computers within the organization.

Technique 5. Checkpoint reviews. The quality of application systems has been significantly improved in the centralized area with checkpoint reviews. The objective is to conduct evaluations periodically throughout the development of an application to ensure that it is being properly implemented. The same concept should be used for the personal computer program in the organization. The program should be established as a long-range program with predetermined objectives and goals. Checkpoints can then be established throughout the implementation process.

Review groups

At these checkpoints, review groups should be formed. Review groups should be made up of the individuals having a vested interest in the success of the personal computer program — for example, users, executive management, auditors and centralized data processing management. The review groups should evaluate progress in implementing the personal computer program, challenge the long-range goals based on current business objectives and then provide assessments on the success and/or problems in implementing the personal computer program.

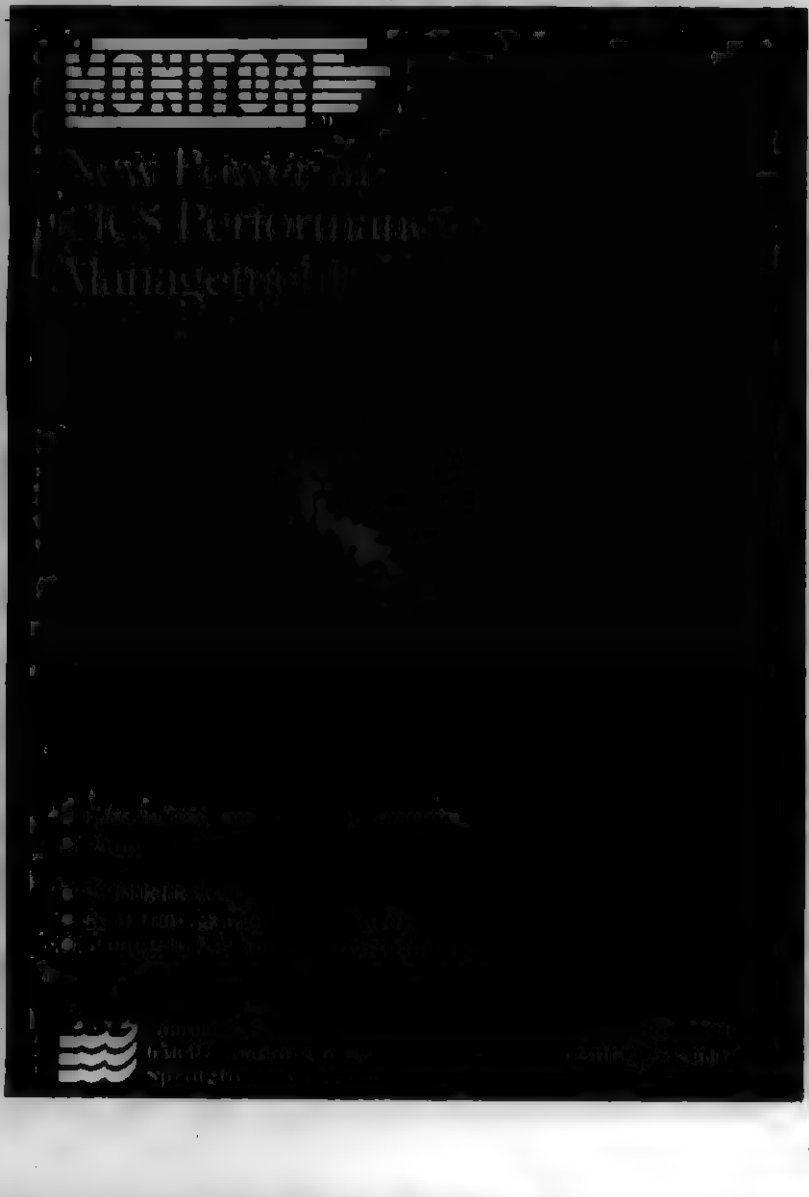
> ***Many users install personal computers, but the abandonment rate is high. Only a few will make truly effective use of those computers without central direction.***

The concept of personal computers is to extend the capabilities of the computer to any individual in the organization needing that resource. Introducing the concept is easy. Personal computers are placed in the hands of those individuals needing them: Ensuring the effective, efficient and economical use of those personal computers is an organizational challenge.

Going from a reality to an implementation requires planning and then the implementation of those plans. Sustained action and direction are required. Many users install personal computers, but the abandonment rate is high, and only a few will make truly effective use of those computers without central direction.

Successful use of the personal computer should be based on the following three foundations:

- Personal computer planning — well-developed plans that are fully supported by senior management need to be created.
- Action through centralized direction — plans only become reality when a catalytic function ensures sustained action. This is best accomplished through centralized direction.
- Evaluation — projects only work when there is good feedback regarding the results of the personal computer program. This necessitates the establishment of yardsticks by which to judge the success of the personal computer program, measuring performance against those yardsticks and making any necessary adjustments based on failure to achieve desired levels of performance.



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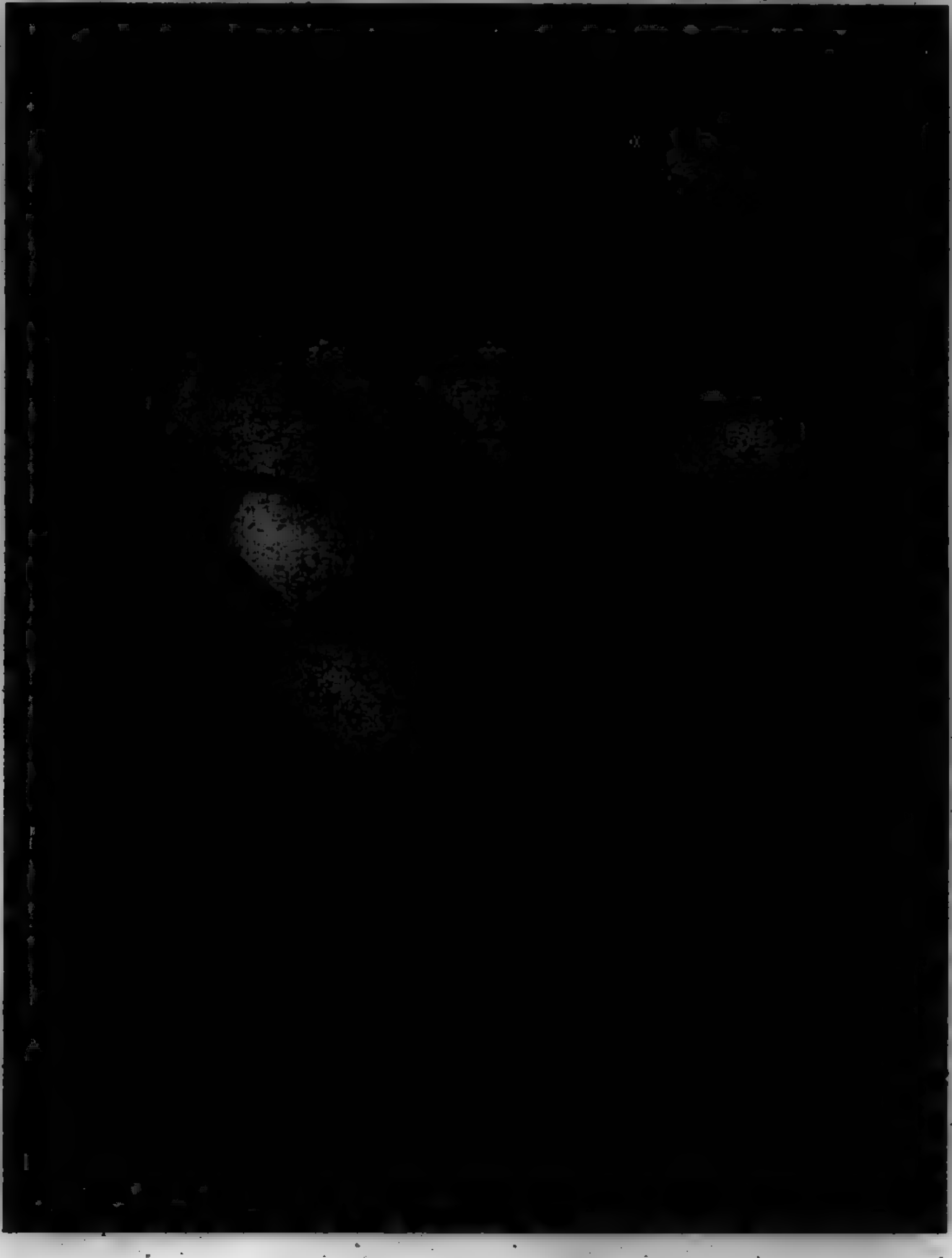
Special Report

Computerworld
June 24, 1985

Data Base Management Systems

Moving beyond relational software



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Inside:

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The new data base machines

SR/3
Six often-asked questions on DBMS and fourth-generation languages

SR/14
The principles of normalization

Will data base machines replace

Independent units offer relief to resource

By John Gallant
CW Staff

Some years ago, mainframes were relieved of the complex, repetitive processing involved in terminal communications. Rather than bog the host system down, designers reasoned, it was more efficient to off-load communications tasks to a front-end processor, such as a terminal control unit.

Today, corporate data bases hungrily devour megabyte after megabyte of storage capacity, and more users and applications vie for access to the shared data resource, straining the data management capabilities of the mainframe. In addition, end users and DP professionals demand the increased productivity promised by relational data base management systems. But the relational systems exact a toll in processing power.

Enter the data base machine, a specialized combination of hardware and relational DBMS software dedicated to performing efficiently and rapidly data management functions once available only in sophisticated DBMS software.

Proponents of the data base machine concept argue that, as with terminal communications, it is only logical to shift resource-intensive DBMS tasks from the host to such a back-end processor. Relieved of the data manipulation work load, the host — which serves as gatekeeper to the data base machine — is able to accommodate more users and applications. The data base machine becomes the independent data server, tying together a variety of machines and applications.

"One of the first steps in computer architecture was to take communications and put it outboard," said William Inmon, a director at Coopers & Lybrand in Denver and a noted author on the topic of data bases. "At one time, we had a machine that did everything. But we realised it was very complex doing terminal communications, so we off-loaded all of that to a front-end processor. The data base machine is the equivalent concept for data base processing."

The concept is one that fledgling data base machine vendors are hoping users will embrace but one that analysts are uncertain users will. In fact, the data base machine market is so young that most industry research firms do not maintain statistics on its size, nor do they make predictions as to its future growth. Indeed, individual analysts spar over current user interest in data base machines.

"Right now there is no significant user interest. [Data base machines] are just not being widely used," said Michael Geran, vice-president of research for the New York-based investment firm of E. F. Hutton & Co. "[Data base machines] look good in theory, but they are very application dependent. It is even too early to formulate any numbers because the market is so young."

Coopers & Lybrand's Inmon agreed. "I think it is a safe bet to say there are some people out there who are looking for interesting solutions like the data base machine. But the majority of users are looking for the cheapest, quickest solution they can find, and that generally means they are not looking for a data base machine."

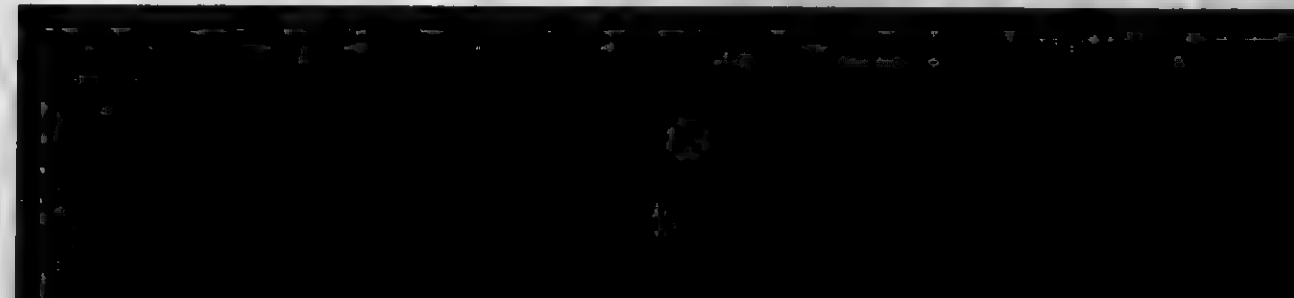
But, said Scott Smith, vice-president of the Stamford, Conn.-based Gartner Group, Inc. market research firm, the success of data base machine vendor Britton-Lee, Inc. has caused him to reevaluate his earlier assessment of the technology's market potential.

"We do not have any hard numbers on the market, but I think it is in a nascent stage, and it could be a big one," Smith said. "The market has already done better than I expected."

To get a sense of direction, Smith and other analysts said the market must be considered on a vendor-by-vendor basis. Los Gatos, Calif.-based Britton-Lee and Los Angeles-based Teradata Corp. are the acknowledged market leaders. Indeed, the two companies are perhaps the only vendors to have shipped production models of their data base machines.

According to President David Britton, Britton-Lee currently has close to 500 data base machines installed in some 150 different user sites. The company offers several models of its Intelligent Database Machine, which is targeted primarily at minicomputer sites including Digital Equipment Corp.'s VAX line. Britton-Lee intends to widen its market with upcoming product introductions, including a microcomputer network data base server slated for July release.

Despite their leadership status, Britton-Lee and Teradata have not clashed. Teradata's DBC/1012 is aimed at the high-end IBM mainframe environment, an environment one market analyst said is extremely difficult to penetrate. The DBC/1012 features a parallel processor architecture that can be configured with between six and 1,024 processors. The full-blown configuration, according to David Clements, Teradata's director of marketing, boasts a storage capacity of one terabyte, a trillion bytes of data. To date, he said, the company has installed about a dozen machines.



software?
demand

Clements said Teradata hopes to ship more than twice that many machines in its upcoming fiscal year, which begins July 1. A Britton-Lee spokesman would not reveal internal shipment projections but said the company expects 1985 revenue to be between $36 and $40 million, a growth of roughly 65% over 1984 revenue of nearly $22 million.

The current target audience for both vendors' products seems to be a narrow group of users with massive raw data manipulation applications, such as seismic research and computer-aided design and manufacturing. But both Teradata and Britton-Lee are gambling that certain pressures facing all users will spur an increasing need for data base machines.

According to Britton, the most important of those pressures is the demand for relational data management capabilities.

Productivity, performance provided

"The relational data model is very powerful, and it provides a very concise way of talking to data," he said. "But it consumes a great deal of the overhead of a general-purpose computer. You are getting a 10:1 increase in productivity, but you are eating up 50% of the resources of the computer. With the data base machine, you get the productivity, but you also get the performance, which is relatively low cost because hardware is cheap these days."

Another vital asset, Britton said, is that the data base machine can serve as a black box connection between a variety of processors in a heterogeneous computer environment.

Teradata's Clements highlighted two other forces prompting users to consider data base machines. First, research indicates more than half of large IBM sites are multiple-mainframe shops. Software DBMS, according to Clements, are not designed to serve more than one processor efficiently, unlike the data base machine.

In addition, Clements claimed, users are spending more on storage subsystems than on computer power for the first time. Thus, the costs of data storage are driving large shops to the massive storage capabilities of the data base machine.

> ”
>
> *'In the future, hardware will be radically different in its [data management] capabilities.'*
>
> — Ronald G. Ross
> Data Base Newsletter

Ample growth seen for mini DBMS market

By Ann L. [illegible]
Special to CW

The promise of data base technology has seduced industry professionals as the amount of information stored electronically has skyrocketed. To the great relief of users, data base management systems have undergone immense change since their commercial introduction in the 1960s.

Like most developments in the software industry, the evolution of DBMS has involved a process of absorbing advances in on-line programming, control and security, data relationships, program generation, screen mapping, end-user access tools and the like. Today, debates on the future of data base products hinge upon research conducted in distributing system resources and networking, high-level user-friendly languages, the improved performance of relational systems, hard-wired approaches, content addressable memory, parallel processing and other areas.

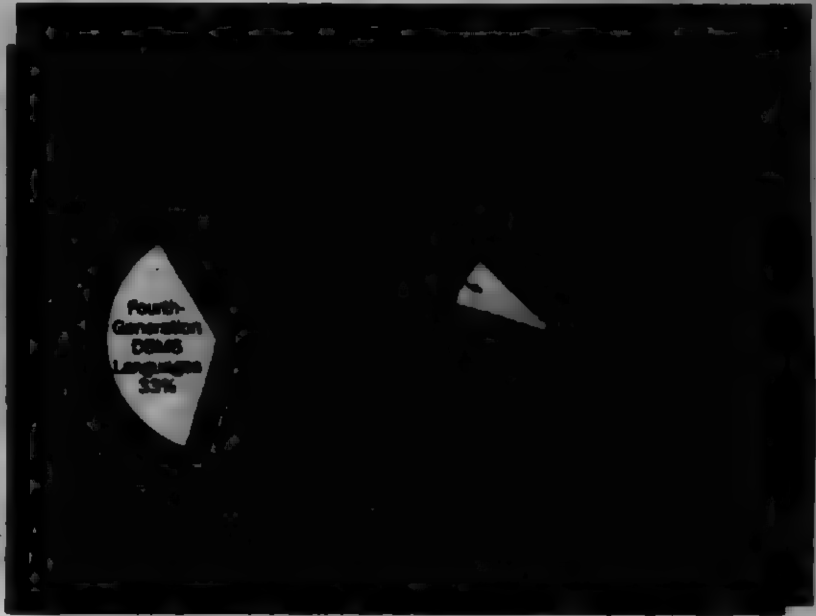
Until now, DBMS technology has been embraced largely by users of mainframe computers for central administrative applications managing large data bases. According to International Data Corp. (IDC), a Framingham, Mass.-based market research firm, 90% of the U.S. installed base of 3084 machines are running at least one of the commercially available systems; moreover, almost 70% of the 4381 population has implemented at least one.

Markets for DBMS software have been contested hotly since the early 1970s when independent suppliers like Cincom Systems, Inc., Software AG and Cullinane Database Systems, Inc. decided to tackle IBM on its own turf with products arguably superior to IBM's own. Notwithstanding the deep penetration made by these vendors into the IBM-compatible installed base, there is ample opportunity for them there for the next several years. However, there is movement afoot elsewhere:

- Software House, Inc., of Cambridge, Mass., recently announced that their System 1032 DBMS fully supports Vaxcluster — everything from VAX 8600 clusters to the new Microvax II.
- Information Builders, Inc., in New York, unveiled a DEC VAX version of Focus, its highly regarded fourth-generation DBMS-based language.
- Hewlett-Packard Co., based in Palo Alto, Calif., has announced the availability of Turboimage, an enhancement of the firm's proprietary DBMS, for HP 3000 customers.
- Relational Technology, Inc., located in Alameda, Calif., has announced a personal computer link for users of its DEC VAX Ingres data base system.

Moreover, DEC and Data General Corp. have both introduced relational data base management systems to shore up their positions among customers of their manufacturing and engineering products. Prime Computer, Inc. has introduced a popular fourth-generation DBMS-based language called Information, and *Per-*

See CHANGES SR/12



Symposium panel fields DBMS questions

By George Schussel
Special to CW

A regular feature of the National Data Base and 4th Generation Language Symposium (DB + 4GL) is a panel discussion featuring six or seven representatives from leading software firms and independent consultants. Questions are submitted by the symposium audience. Some of the more interesting questions that have been submitted recently for discussion are presented here.

Q **Will decisions to purchase applications software be affected by the improvement in productivity possible from the use of data base management systems and fourth-generation languages (DBMS) to generate custom systems?**

Current DBMS/fourth-generation language techniques are going to have an important impact on the applications software business. The fact that less time is required to generate a custom application means that many more organizations can now develop their own applications. DBMS/fourth-generation language code reduces, by a factor of from five to 10, the lines that have to be written for an application compared with Cobol.

Another impact of fourth-generation techniques is the narrowing of the distinction between the previously separate markets for applications software and systems software. Major applications houses, like McCormack & Dodge Corp., Walker Interactive Products, Inc. and Management Science America, Inc. either have or will be announcing fourth-generation tools. At the same time, DBMS and productivity tool vendors, such as Cullinet Software, Inc. and Cincom Systems, Inc. are now selling applications software products.

Q **How important is it to have the experience of a proficient data base practitioner when starting out using fourth-generation languages built on top of DBMS?**

The idea of total applications development without programmers has been discredited in most organizations that have tried it. Certainly it is possible for business analysts or other nonprogramming personnel to build applications featuring reporting or decision support as long as these applications do not support large numbers of transactions or contain complex procedural logic. Such applications are an important part of the new computing environment, and they can be built without the experience of professional programmers or data base administrators.

Most medium or large organizations, however, have found they need complex transaction processing applications. Professional data base administration and programming skills are needed in these environments, even with relational DBMS and fourth-generation languages.

Q **What are the differences between inverted-list data bases such as Computer Corp. of America's Model 204 and Software AG's Adabas and relational DBMS such as Oracle Corp.'s Oracle and Relational Technology, Inc.'s Ingres?**

Both inverted and relational DBMS support data models consisting of flat, two-dimensional tables. In the inverted model the user sees not only the tables but also the indexes that have been built as a retrieval mechanism on

See PANEL SR/6

Schussel is president of Digital Consulting Associates, Inc. of Andover, Mass., and chairman of the National Data Base and Fourth-Generation Language Symposium.

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PANEL

from SR/3

top of those tables. Many questions in the inverted environment can be answered by working with the indexes without accessing the data base at all. For example, the question of how many records meet criteria A and B but not C can be answered just from the indexes if indexes exist on the selection criteria.

In the relational model, all of the operators are set oriented. A single relational operator such as a SELECT will produce a set of records, which may consist of as few as zero or one record.

In inverted DBMS, the basic data manipulation language is usually record oriented, and set-oriented processes are handled through a query language.

Q What can be done about the performance problems of fourth-generation languages and relational DBMS?

In a broad sense, there are two different types of DBMS/fourth-generation language combinations:

- Relational DBMS and user-oriented fourth-generation languages such as D&B Computer, Inc.'s Nomad2; Information Builders, Inc.'s Focus; and Ramis II, developed by Mathematica Products Group, Inc., are frequently single threaded with English-like user languages.
- Other DBMS/fourth-generation language combinations, such as Cullinet Software, Inc.'s IDMS/R and ADS/O, Software AG's Adabas and Natural and Cincom Systems, Inc.'s TIS and Mantis have more programmer-oriented fourth-generation languages and more of a performance orientation, with multithreading access for building transaction processing systems.

This latter category of products does a better job of solving performance-oriented applications needs but is typically not available to end users. Since relational DBMS and fourth-generation languages are relatively new, such products are still early in their development. It is reasonable to expect enhancements of these products. Today, however, Cobol code with a structured low-level DBMS is going to offer more performance potential than higher level, easier to use software.

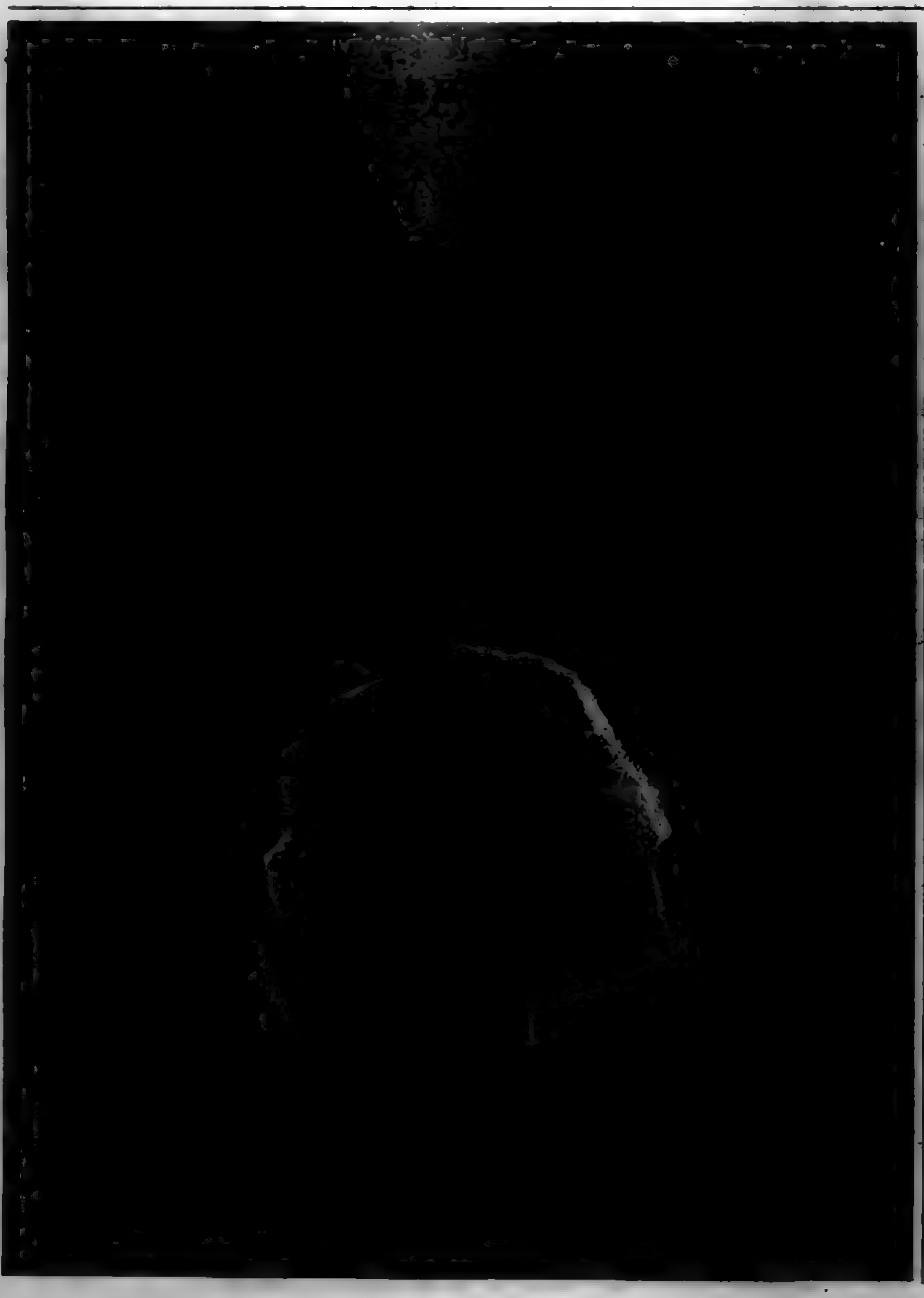
Q Several vendors describe their DBMS as relational when in reality they are hierarchical with certain user-friendly attributes or extensions. Do you have any comments?

The battle lines are drawn, and there is sharp disagreement on this issue. The relational pundits, led by Edgar Codd, the originator of relational DBMS theory, argue that "born-again" implementations such as IDMS/R, Datacom DB and TIS are not truly relational and are inferior. This group's arguments include the following:

- Sophisticated optimization techniques require detailed statistical analysis of a data base. Such components may be missing from the relational processing mode in a "born-again" system. As a result, performance-oriented applications require lower level, older approaches.
- "Born-again" systems provide a JOIN operator, which is less functional than true relational systems. Examples differ by product, but tables may not be joinable to themselves, or support may only exist for an EQUIJOIN, or the JOIN function may be only implementable through a looping verb.
- In a relational data language, the ability to create new views of data should be unlimited. "Born-again" systems with CREATEVIEW verbs are typically restricted in capability or available only to the data base administrator.

The vendors of the "born-again" relational systems argue that many of these points are of academic interest only. Their arguments take the tack that, in addition to supporting relational-like tabular views and verbs, their systems allow lower level, record-oriented processing. As a result of the performance potential of these lower level, less friendly processing modes, a system from a vendor like Cullinet or Cincom can be used for both information center and production center applications.

The proponents of these views argue that, if the user acquires a true relational system, such as IBM's DB2 or Digital Equipment Corp.'s RDB, then the vendor will sell the user two different data base systems, a hierarchical or network system (IMS for IBM and DBMS-32 for DEC) and a relational system for information center applications.



Q Within the next five years, will fourth-generation languages be significantly enhanced by artificial intelligence?

AI languages are starting to generate quite a bit of interest from DBMS users. The vendors of these tools now provide interfaces to a number of DBMS including Ramis II, DB2, IMS and Vsam.

There is a moderate amount of work in generating an AI language environment before it can be used. The lexicon, or data dictionary, of the product must be built. Such an effort has to be weighed against using fourth-generation languages for comparable queries. Fourth-generation languages seem to require more end-user training but currently have the potential for being implemented more quickly than AI languages. Fourth-generation languages can also have broader functionality.

The National Data Base and Fourth-Generation Language Symposium is scheduled for three upcoming cities and dates: Dallas — November 5-8; Boston — December 3-6; Sydney, Australia — February 24-27, 1986.

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Machine helps cigarette maker manage lab data

Coordinates collection of test information, serves as gatekeeper to mass storage devices

RICHMOND, Va. — At a laboratory here where thousands of cigarettes get smoked, weighed and otherwise analyzed each year, a data base machine helps researchers manage the millions of data manipulations that accompany their work.

Scientists at the Philip Morris Research Center test samples of Marlboro, Merit and other brands produced by Philip Morris USA, the nation's leader in cigarette sales. To keep tabs on competitors' brands, the center analyzes these too. Cigarette sales in the U.S. totaled $16 billion in 1983, with Philip Morris capturing more than one-third of the market.

In the lab, researchers check nicotine levels, tar values, paper porosity and other factors that will help the company find the best method of treating and curing tobacco and the ideal formula for blending different tobaccos to get a desired flavor. Hundreds of machines from a number of vendors — intelligent laboratory instruments, micros, CRT terminals, a minicomputer and a mainframe — capture and transmit information from the tests. The machines are linked on a network that Philip Morris calls its Laboratory Automation System (LAS).

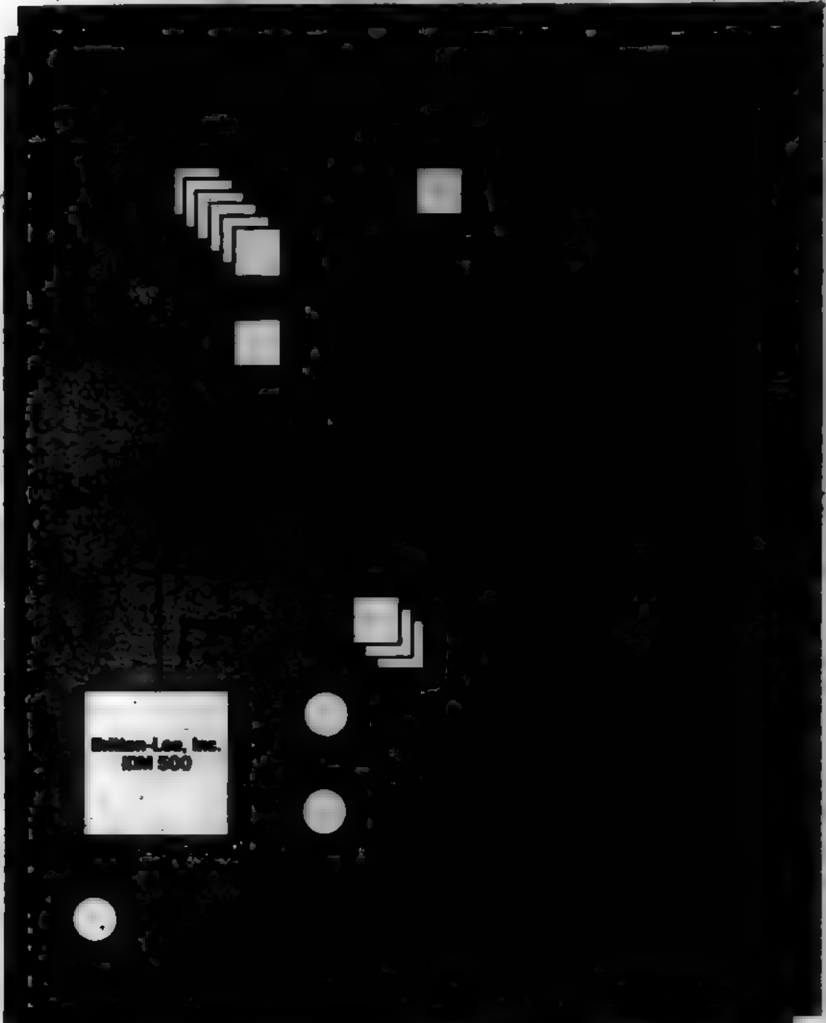
In 1984, the research work at Philip Morris accounted for 1.6 million data manipulations. The firm defines a manipulation as any point at which data surfaces, either for transmission from one piece of equipment to the next or for review by a scientist or other worker. It does not release other measures of research activity.

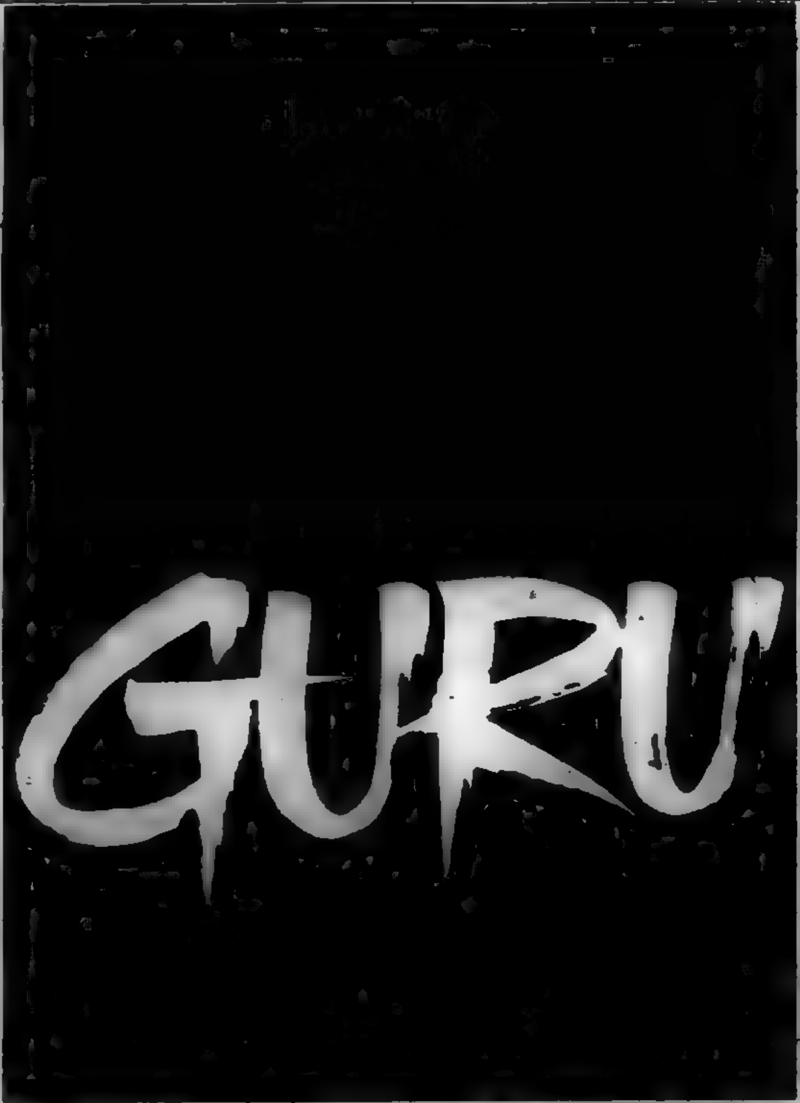
A Britton-Lee, Inc. Intelligent Database Machine (IDM) 500 coordinates data storage and exchange among machines. The IDM serves as a gatekeeper between the laboratory's machines and its stored data, which resides in two Control Data Corp. hard disk drives — one with 160M bytes of storage and the other with 675M bytes.

Philip Morris brought up the IDM in 1983 as part of its solution to a large data coordination problem. The lab's computer applications division, a data management group that produces reports and provides other DP support for many of the center's 500 scientists, technicians, applications personnel and managers, had trouble tying together data gathered during researchers' numerous analyses.

Computer printouts, hand-written notes and other forms of information arrived at the applications division after a cycle of reviews and compila-

See CIGARETTE SR/9





CIGARETTE

from SR/6

tions in the lab. Some of the information came in on printouts generated by the laboratory instruments. Some was on paper — scientists in the lab had jotted down data that had been displayed on lab instruments' CRT screens. Other reports were compilations; they had been drawn together by senior scientists and generated on the firm's host computer, a Scientific Data Systems, Inc. Sigma IX.

In the applications division, workers collated the information and passed it on to top scientists, who identified key data. Employees entered this data into the Sigma IX, and the applications division staff generated reports.

The cycle entailed about seven transfers of information from one piece of paper to another, according to Lucy Waller, the center's data administrator. At each transfer, people could misread data or make mistakes copying it. In addition, the process contained some duplication of effort: Some of the data entered into the Sigma IX at the end of the cycle had been generated earlier.

'I was somewhere up the creek'

"I felt, quite frankly, that I was somewhere up the creek," Waller said. "I needed the ability to pull this data together. . . . The data was coming in from different laboratories and different instruments. And yet the data had a common denominator of having come from the same sample — the same pack of cigarettes."

Waller began looking for a solution; at the same time, she had to find a replacement for the Sigma IX, for which support had been discontinued. The center bought a Digital Equipment Corp. System 2060 as its host; it then brought in the IDM to manage data base functions for the LAS, which would have overburdened the 2060. After a number of upgrades, the 2060 currently has 8M bytes of memory; besides supporting the LAS, it runs other business applications.

According to Waller, the data base machine approach had some potential pitfalls: The technology was new, it would represent a major change from the center's old operations, and Britton-Lee had not yet established a completely solid standing. "It was considered by us to be very high risk," she said. But the center's management, a group oriented toward research, decided to take the chance.

The center tied its lab instruments and data processing machines into the IDM with a Sytek, Inc. broadband cable. Software on each processor calls subroutines in the IDM's data base software, Britton-Lee's SQL-based Intelligent Database Language (IDL). The subroutines transform data from the different machines to a common format. Most of the machines use Fortran programs to call the IDM subroutines, but IBM Personal Computers on the network use Freeform, a software package from Dimension/IDM Partnership Ltd.

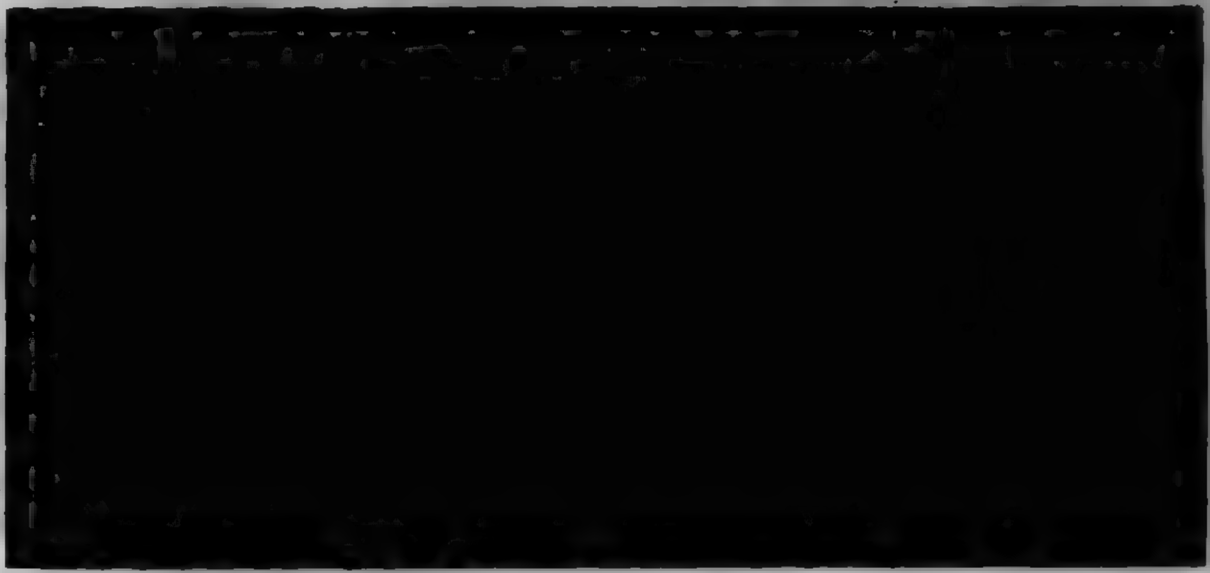
With the network and the data base machine, the center has solved its problems of duplications and manual information transfers. Information follows a pipeline from the original data collection machine to the data base. At the data base, it is accessible to anyone along the line.

Waller said analyses on cigarette samples still take about as long as they did with the old setup — an average of two weeks. But they are more detailed because scientists can spend more time interpreting data and less time transcribing it.

"We've reduced the number of people performing the tasks, and we're doing things we've never done before, especially in the reporting area," she said. "We're able to prepare views of data that previously just weren't done. We're able to add more statistical perspective."

The IDM's data base language has also helped the firm. Waller said that although IDL falls short of being a fourth-generation language, it does have some tools that help programmers develop applications. Development jobs that would have taken her staff about 2½ years to complete now take about nine months, she said.

Philip Morris chemist analyzes samples. Research work at the cigarette manufacturer accounted for 1.6 million data manipulations in 1984.



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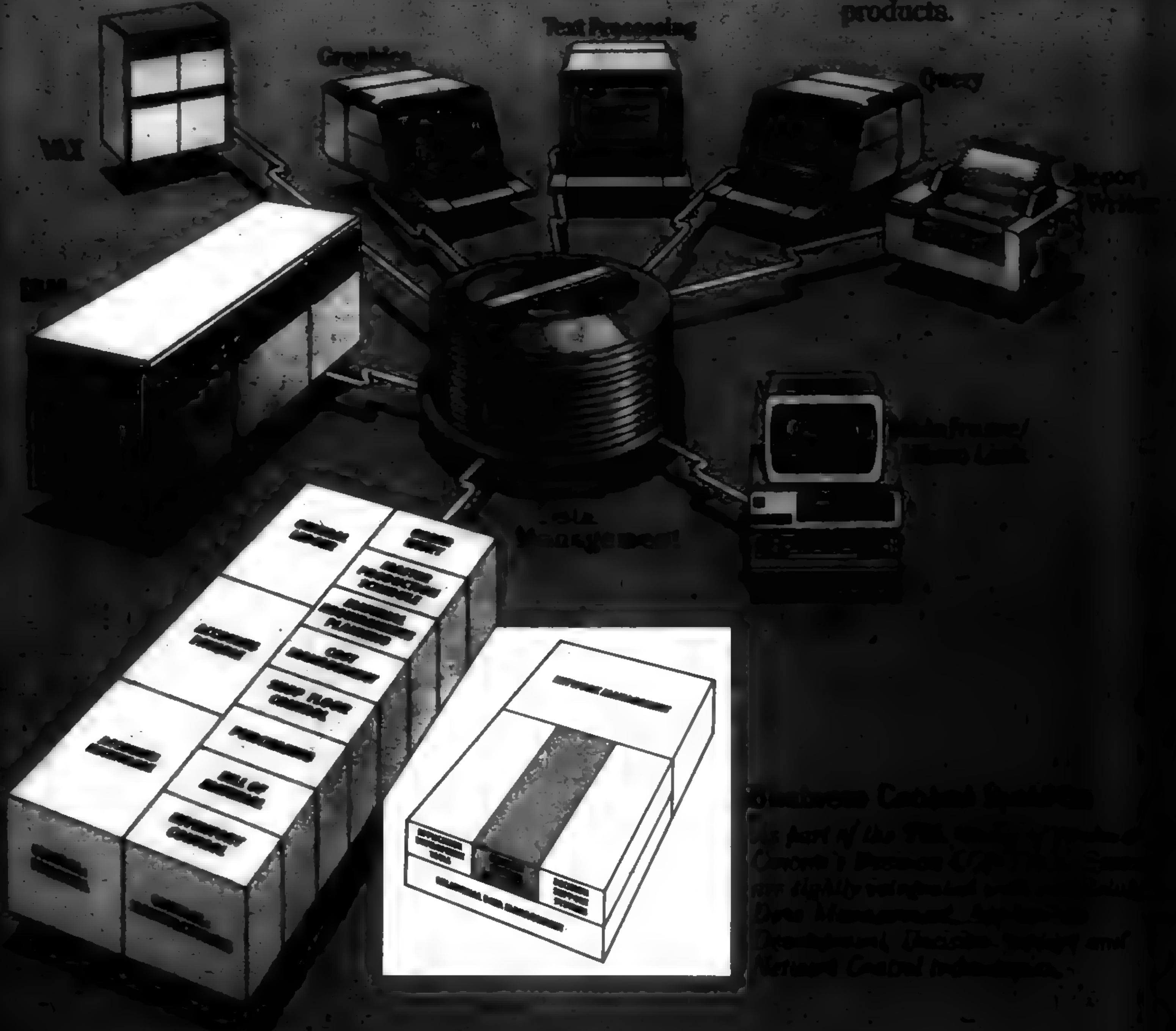

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CHANGE

from SR/3

kin-Elmer Corp. and Tandem Computers, Inc. have continued to invest in and enhance their own proprietary systems.

Vendors — to date, DG, DEC, Wang Laboratories, Inc. and HP — looking to give their customers a tie-in to Big Blue have taken a hike to Westwood, Mass. and talked to Cullinet Software, Inc. about links to the Information Center Management System.

The independents are typically writing code for the machines that sell best. Hence, there are a number of familiar powerhouses looking to DEC's commercial installed base to pad the bottom line.

Cincom Systems, Inc. and Software AG of Reston, Va., contenders in the IBM mainframe sweepstakes, have joined the ranks of Relational Technology, Oracle Corp. based in Menlo Park, Calif., Software House and Britton-Lee of Los Gatos, Calif., each of which has staked out territory there.

Henco Software, Inc. of Waltham, Mass., has done well selling to the Prime installed base, although it is still licking wounds inflicted in Honeywell, Inc.'s ballpark.

Supermini market opens up

The market for data base technology is finally opening up among the installed base of superminicomputer users.

IDC has long predicted that this would happen in the middle of the decade and that it would offer both the independent software vendor and the hardware manufacturer significant new opportunities.

There are a number of reasons for all of this frantic activity happening now:

- Supermini users are beginning to support larger and larger data bases with the advent of more powerful machines like DG's MV/10000 and DEC's VAX 8600.
- Advances in data base technology, particularly the commercial introduction of viable relational DBMS, have paved the way for users to embrace the technology without a tremendous — although still significant — increase in overhead costs.
- The distribution of computing resources coincident with the introduction of new tools for end-user access and applications development are inspiring new organizational response to data management.

And the evidence is overwhelming; despite all the headlines, Ethernet, Systems Network Architecture (SNA) and AT&T's Unix are not key user concerns.

When asked to rate the importance of an assortment of hardware and software products to the supermini environment in which they operated, respondents to a recent IDC survey revealed their priorities in the following descending order:

- DBMS
- Real-time operating systems
- Floating-point performance
- Third-party software
- Multiprocessor configurations
- Support of standard buses
- Fourth-generation languages
- Integrated office software
- Third-party peripherals
- Ethernet, SNA and Unix.

Considering the overwhelming number of respondents — some 34% of the IDC sample who indicated that data base management was most critical to their operating environment — there were not many supporting a DBMS. Approximately 50% of them did indicate that they were running a data management tool of one kind or another, but only 70% of this sampled group had actually installed a DBMS.

Overall, only 36% of the sites sampled by IDC had installed a DBMS by year-end 1984.

This percentage is deceptively high because HP bundles Image, its DBMS entry, as part of the fundamental operating software offered to its clientel. If the Image sites are removed from the count, the number of sites running DBMS software last year plunges to a mere 18% of the entire supermini sample.

System supplier looked to for software

Supermini users typically buy their data management software from their hardware manufacturer. IDC data indicates that about 70% of them, in fact, looked to their system supplier for programming support.

The independent software houses have not made the kind of impact among these users that they have in IBM-compatible markets largely because they are small — but fast growing — and because minicomputer users are accustomed to investing in bundled system solutions.

As most everyone is aware, IBM has lost market share to the independents in the DBMS marketplace; at year-end 1984, IDC estimated that they had installed just about half of the DBMS software licenses for mainframe computers.

Because it is a marketplace far from maturity, IDC expects the DBMS marketplace for minicomputers to grow at much healthier rates than its mainframe counterpart. Users will spend approximately $150 million in 1985, which represents growth of some 35% to 40% over total spending last year.

Packaged software sales to superminicomputer sites are not just a matter of rumor anymore. Software houses nationwide are taking a second look.

Morley is editor of "Software Watch," a newsletter on software industry issues and trends that is published monthly by International Data Corp., a market research firm based in Framingham, Mass.

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Switch to in-house data base musters interest in DSS

NEW YORK — When the publisher of a 19,000-page industry directory needed a way to analyze its massive data base — a repository for information about 127,000 manufacturers and their 60,000 different products — it switched from a service bureau to an in-house data base system.

Thomas Publishing Co. here, publisher of the annual "Thomas Directory of American Manufacturers," made the move last year after it recognized its need for on-demand decision support system (DSS) services and the service bureau's inability to provide them.

"The [bureau's] system was fine for updating and storing information," according to Al Klein, Thomas' special projects consultant. "But essentially it was a canned operation. Every time we needed to manipulate the data differently, it was a huge undertaking."

The firm had kept its data on a Data General Corp. minicomputer in the service bureau's data center. Whenever Thomas needed an ad hoc report, it had to arrange for the service bureau to format the report, schedule time on an IBM 4300 mainframe, dump data from the mini, load it onto the mainframe and run the program.

Weeks or months would pass before the entire process, including proposal preparation and other administrative tasks at the publishing house, was complete. "Sometimes it would never get done; people just wouldn't bother to ask for the information because it wasn't worth the trouble," Klein said.

He decided the key to generating enthusiasm for decision support was to bring up an in-house system that allowed users to do their own work. Under Klein's direction, the firm installed a 6M-byte Digital Equipment Corp. VAX-11/750 and Oracle Corp.'s Oracle data base management system, a relational DBMS based on SQL. The company's directory data takes up about 350M bytes of storage on one 470M-byte Fujitsu Ltd. Eagle disk drive.

Users enter and retrieve information with Televideo Systems, Inc. 970 and Lear-Siegler, Inc. ADM 2A terminals, with IBM Personal Computers and through terminals on a multiuser Dynabyte, Inc. Monarch microcomputer. The Monarch is hard-wired to the VAX, and the other machines have dial-up access.

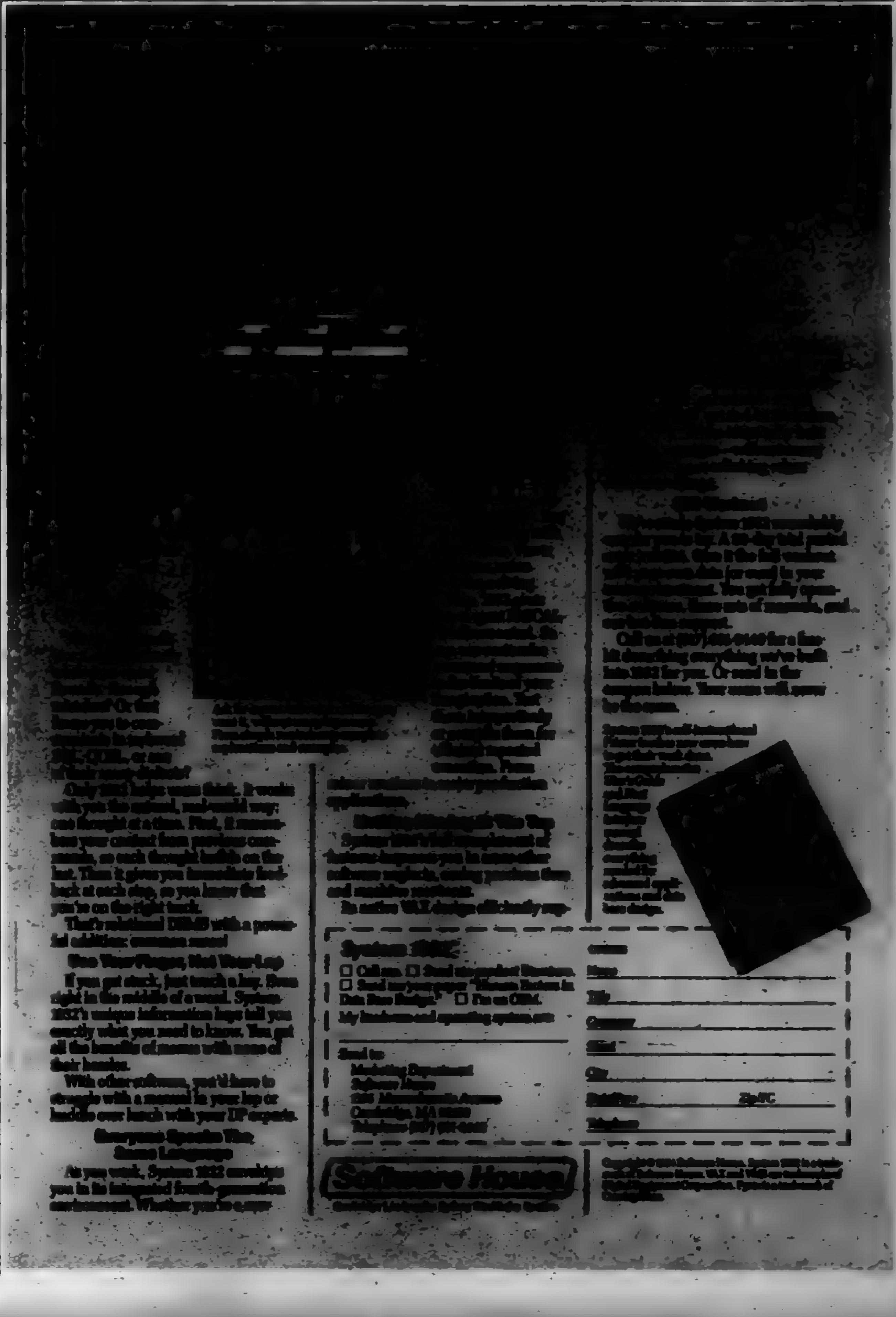
For Thomas' first data base project, an application for the firm's editorial department, Klein set up a series of 12 tables: seven for different categories of information about companies listed in the directory and five for product headings. The largest table, one that lists companies' product offerings (ranging from "abacus" to "zirconium"), is 1.1 million rows long.

When users want to do ad hoc DSS reporting, they can implement SQL to access, search and join tables. If they want to find out, for example, the names and directory product headings for all the products a manufacturer makes, they can join a table that contains company names with the product table and the heading tables.

Klein said users can learn the basics of SQL and generate reports without much training, an important consideration in getting people to use DSS tools. "Most people are not interested in becoming computer experts," he said. "They want to put a little energy into learning and then get a lot out of it. With SQL, they can start out with just a few commands and get results."

Users' early data base queries usually generate information too broad to be of much use, he said, but the positive reinforcement pos-

See THOMAS SR/30



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Special Report

Normalization facilitates data design process

By Robert M. Curtice
Special to CW

Although many organizations are applying data management in an effective and modern manner, there still seems to be a lag between advanced ideas and actual practice in the area of data design.

One topic in current data design practice that remains somewhat misunderstood by the average user is normalization.

Normalization is the foremost buzzword in modern data design methodologies. Any data base designer of merit knows the three basic normal forms by heart, and the topic has been the subject of countless master's degree and doctoral dissertations that explore the world of fourth and fifth normal forms and beyond.

Although the definition of normal forms began with Edgar Codd's relational data base concepts, many people have commented, and rightly so, that the fundamental principles have been applied by good designers ever since computerized files became a subject of study. The principles of normalization are sound and apply to nonrelational structures just as they do to relational data bases.

There are two points that should be addressed with respect to normalization: one deals with how it is achieved, and the other deals with the first normal form in particular. Many methodologies introduce normalization as a separate process. That is, some sort of unnormalized design is derived, and then this design is normalized. A preferable approach is to include the considerations for normalization in the basic design process itself, so that a separate step is not required. In other words, normalized data structures should be designed from the start.

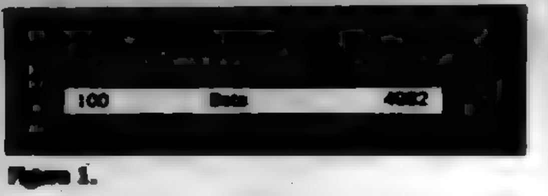


Figure 1.

Both second and third normal forms depend on the concept of functional dependency — the dependency of the value of one data element (column of a relation) on another data element. To ascertain functional dependency, the criteria by which the value of an element of data varies — for example, what it depends on must be determined. Thus at any point in time, a license plate number will vary by vehicle and not, for example, by the owner or operator. A different operator does not imply a different plate number. But a different vehicle does. So a good data structure will have the license plate number closely related and dependent on the vehicle; it is not a property or function of the operator.

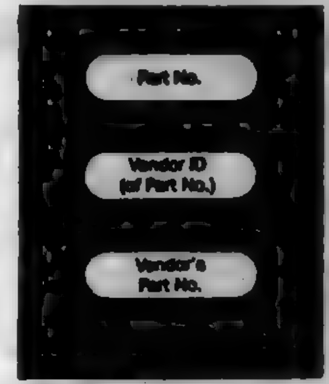


Figure 2.

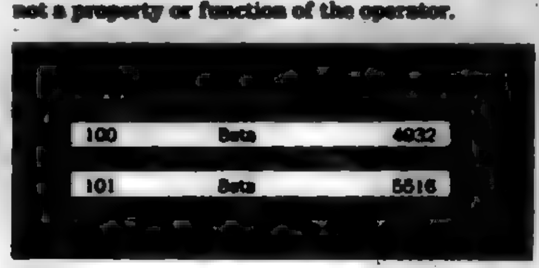


Figure 3.

Notice that we make these decisions by examining the real world. We observe the way the world works: A car has a license plate attached; different drivers come and go, but the plate stays. It is not difficult to imagine a world where the operator takes the plate with him and attaches it to each vehicle he operates. The functional dependencies are different, and the data structure must be too.

From the above scenario, it is difficult to see why normalization is routinely carried out as a separate step after an initial design has been formulated. Getting the functional dependencies right is fundamental to the process; it is not an adjunct process.

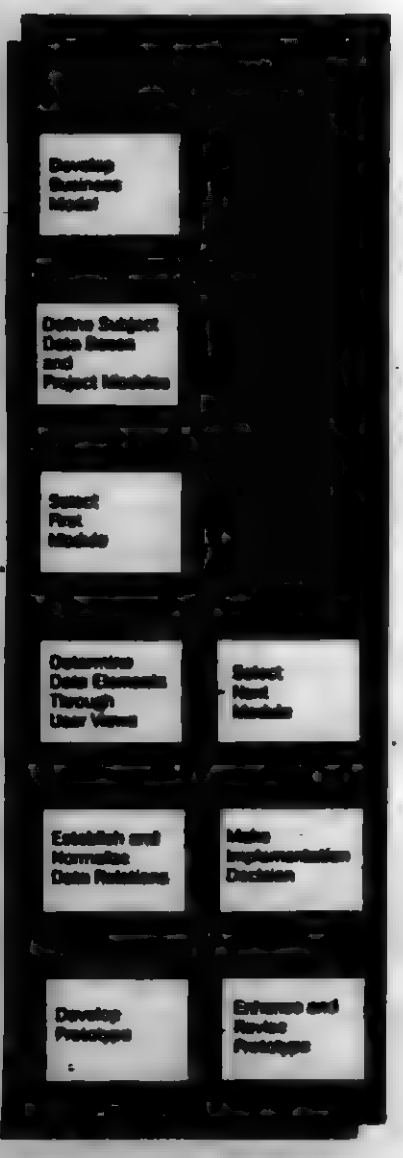
In addition, the answers to the questions that determine functional dependency are empirical — they come from observations about the real world or discussions with users. Bill Kent, a member of IBM's Data Base Research Center in San Jose, Calif., suggested that bad data designs can be normalized into bad normalized data designs. He said he prefers to design for normalized structures directly.

Peter Chen of the Graduate School of Management at the University of Louisiana, whose Entity-Relationship Model has proven popular in some circles, described normalization as "following the top-down Entity-Relationship Model approach. . . . You can get there quicker and easier than is possible through normalization."

It is a disservice to the important concepts behind normalization to regard it as a separable pro-

Clear goals pave road to central data base

By James Huling
Special to CW


Develop Business Model
Define Subject Data Bases and Project Modules
Select First Module
Determine Data Elements Through User Views
Select Next Module
Establish and Normalize Data Relations
Make Implementation Decision
Develop Prototype
Enhance and Revise Prototype

Many organizations that intend to convert a patchwork of applications-based systems to a corporate data base begin without fully defining either the destination or the road to get there. Most of them never arrive.

Instead, they wander for months or years in a maze of minor projects, hoping to somehow tie them together at the end. The result is a collection of applications systems that makes use of data base technology but ignores data base concepts.

The first step toward successfully implementing a corporate data base is to define the destination. Organizations should strive to put together a single pool of information, out of which different individuals can use different combinations of data elements. The data base system that provides the combinations may relate to applications, but the information resource must be viewed as an all-encompassing, nonredundant entity.

This concept forces the resolution of inconsistent definitions and the relinquishing of redundant data luxuries. The data element "department," for example, can no longer have one meaning for payroll purposes and another for general ledger.

Whether the data base is physically implemented as a single entity or as several is not important; it is important to break the rigid concept of applications-defined data and replace it with a concept that views all information as supporting the business functions that constitute the organization.

Once an organization defines its exact destination and its managers agree on it, a project leader can construct a plan to get there. The successful route will include the following important landmarks:

Development of a business model. A business model is a graphic representation of the major areas of a business and the functions within those areas. Definition of these functions is essential, as is agreement on the definitions.

Through interviews with management, the project leader and project team members should first identify major business areas — management, production, sales and the like — then isolate the various functions within each area. Budgeting, personnel and acquisitions, for example, are usually functions of the management area.

Each of these functions uses information centered around various entities — employees, plants and so on. The project team should identify the entities then combine them into logical groups, or subject data bases.

The cross section of business functions and subject data bases forms the basis of the corporate data base. The project team can document the relationship between the business functions and the subject data bases by placing the functions horizontally by area across a page then listing the subject data bases vertically, down the left or right margin. To indicate the use of each subject data base by a particular business function, team members should make a mark in the appropriate row and column.

This seemingly academic exercise can have surprising results. Top-level managers may have completely different views of their areas and of the entire business. The graphic model facilitates resolution of these differences and will provide, in the end, the business context needed for the project team's in-depth data analysis.

Identification of data base modules. Through the business model, the project leader can determine the logical boundaries of the business function — subject data base relationships. These boundaries indicate the individual modules that will make up the data base.

A module may contain an application, such as payroll or accounts payable, or it may contain only a portion of an application. In either case, these modules will be the individual projects, whose successive development will lead to the completed data base.

The module containing the core data (the information that is needed by the greatest number of other modules) should be developed first.

Modular development. The development of a data

See MODULE SR/26

Huling is a systems analyst and project leader at Vulcan Materials Co., a Birmingham, Ala.-based chemical and materials company.

cess. (Some data design aids claim to automate the normalization process. Perhaps they operate on a different concept of normalization.) The foundation of normalization — functional dependency — should be used to design normalized data structures directly.

The rule for the first normal form states that each cell in a relational table must be an atomic data value — in particular, repeating groups or structures is not permitted. Observe that this rule is quite different from those covering second and third normal forms that involve functional dependency. The rule for first normal form is structural, not empirical. What, then, is the basis for disallowing substructures within relational tables?

> ***The principles of normalization are sound and apply to nonrelational structures just as they do to relational data bases.***

The answer has to do with the fact that relational algebra does not provide for concepts such as relations that are composed of other relations. Other theories and their associated mathematical apparatuses do. The point is this: The ideas behind second and third normal forms are not tied to relational data structure — they apply to any approach. But the idea behind first normal form is only meaningful in a strictly relational system that adheres to relational algebra.

There is nothing wrong with repeating groups. Consider this example: For each account, a manager wishes to record the balance in the account at the end of each month for a period of one year. He could establish 12 distinct elements of data, such as January account balance, February account balance and so on. Clearly such an approach satisfies all three normal forms:

- Each element is atomic.
- Each element is functionally dependent on the key: the account number, for example.
- No nonkey element is dependent on any other nonkey element; February's balance is unrelated to January's.

But what if, instead, the 12 elements are established as follows: Account balance occurs 12 times.

This is merely shorthand for naming the 12 entries in each cell rather than forcing a separate element name in each cell. The differences between these two descriptions of data are miniscule at most.

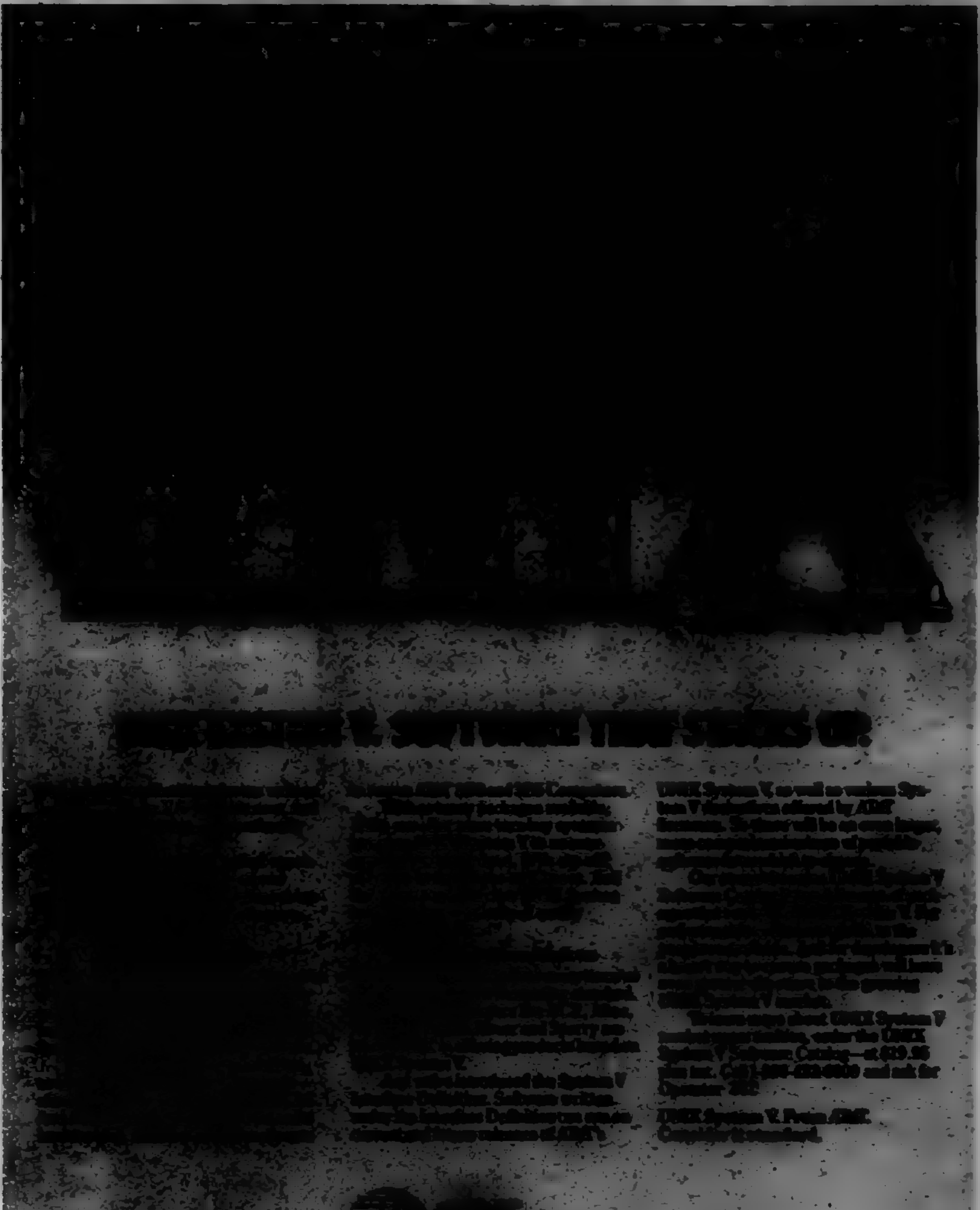
Consider the relationship in Figure 1.

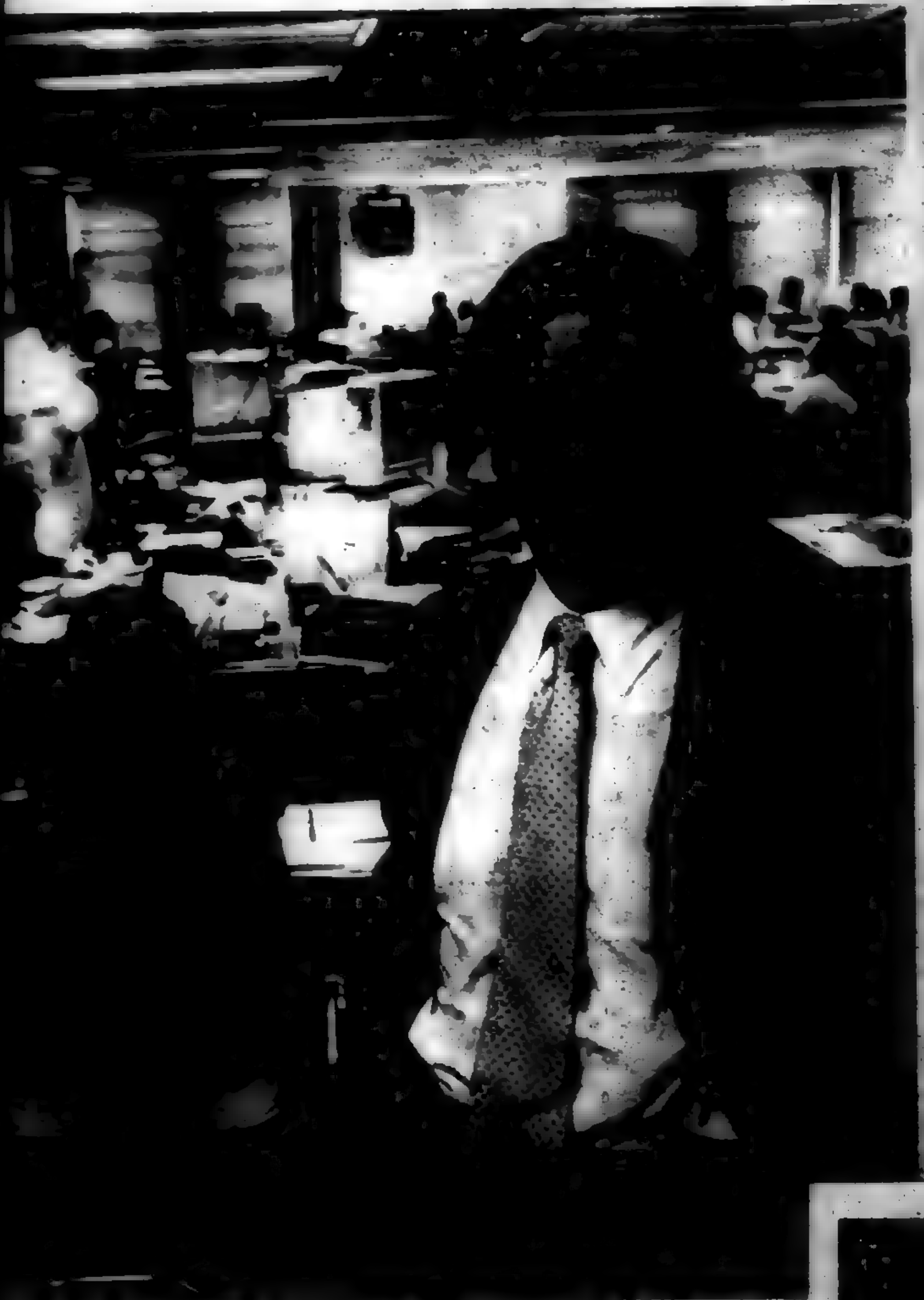
We know from the formulation of relational tables that there is a functional dependency between the vendor's part number and the part number plus vendor ID. Quite independent of the relationship between the vendor's part number and the key is another relationship between vendor ID and part number. In fact, there is a multivalued dependency. This dependency would like to argue that we have substructures of a kind within relationships; that we are, in reality, dealing with at least a hierarchy (Figure 2).

In others words, the above relational table implies a hierarchical relationship: Each part number can be associated with more than one vendor ID (a one-to-many relationship). But this implication is hidden in the table. Thus, for example, there is no way to actually specify that the relationship is many-to-many, as would be the case if the Figure 3 relationship were encountered.

With first normal form restrictions, the substructures within a relation must remain hidden. Again, we are dealing with form and not substance in first normal form. This form is a simplification that is fine in some cases but not helpful in others. It really does not add to the understanding of good data design. Yet, many people think normalization is equivalent to having no repeating groups in their records.

Curtice is manager of data management consulting at Arthur D. Little, Inc., a management consulting firm in Cambridge, Mass.





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Evaluation process yields standard system for retail chain

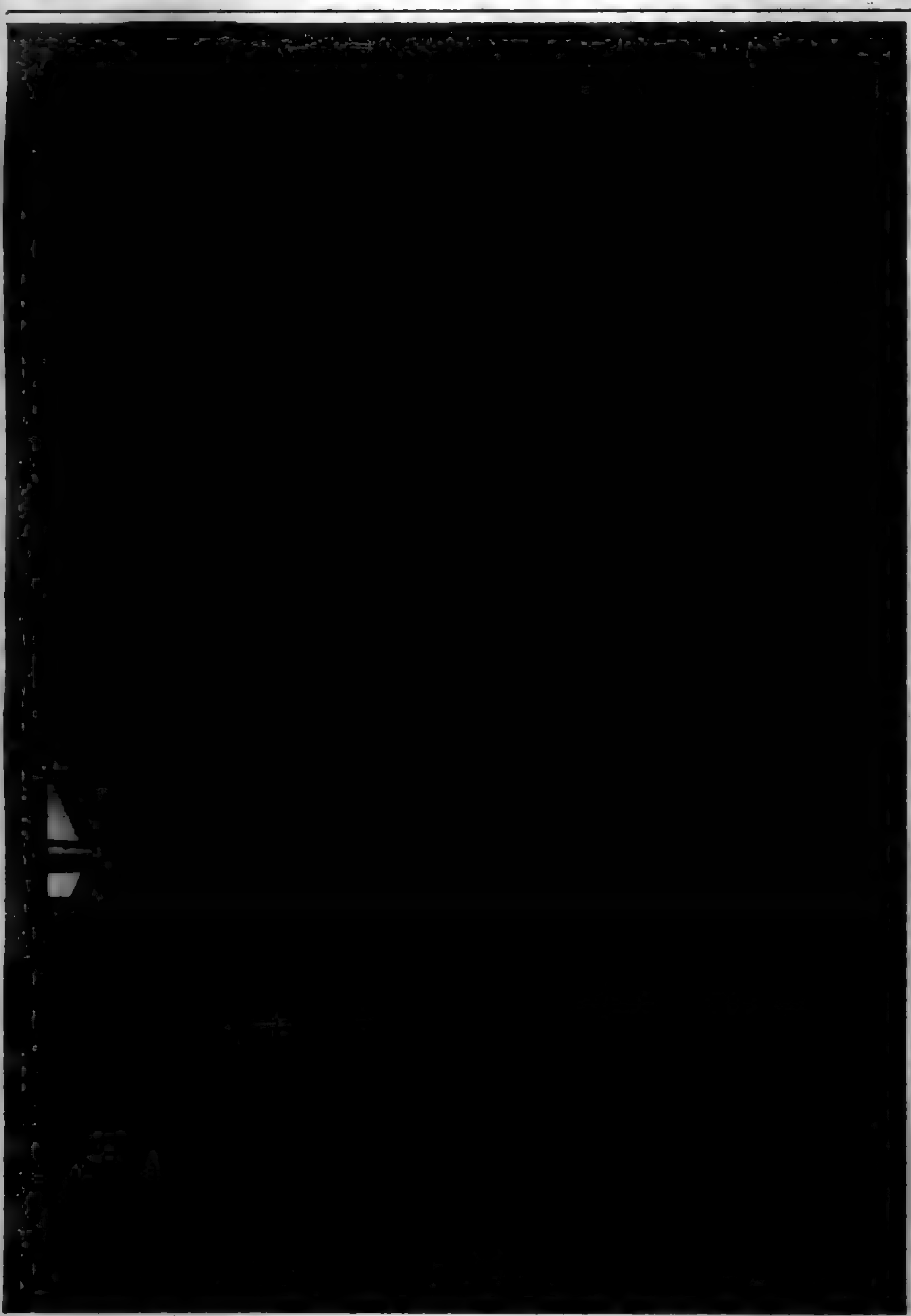
NASHVILLE — After a retail chain based here evaluated more than 200 microcomputer data base management systems during a search for a standard package, it learned that its two main requirements — flexibility and ease of use — were almost mutually exclusive.

"We needed a system flexible enough to accommodate multiple corporate applications at the single-user level," said Richard Taylor, a senior MIS staff analyst at Service Merchandise, Inc. "And it had to be user-friendly because many of the DBMS users also would be first-time users."

Service Merchandise, which operates a chain of 280 catalog showroom outlets, made trade-offs between the two criteria when it chose DBMS software for more than 100 micros. In its final choice, the firm sacrificed some desired simplicity to get the capabilities it needed, he said.

Taylor organized a three-month evaluation of DBMS software that began last July. Service Merchandise wanted a package that could support stand-alone applications on more than 100 IBM Personal Computer XTs at its corporate headquarters and other administrative offices. The firm was evaluating mainframe packages at the time but needed a micro DBMS to handle immediate user needs.

Users wanted to perform a variety of functions, including personnel management, finance, records management, loss prevention and internal auditing. Their jobs, and the job of the two-person information staff that trains Service Merchandise's end users, would be made easier if the firm standardized around one DBMS, Taylor said.



> *'Had we simply gone out and purchased the most popular package or purchased the one that looked the best . . . we would have made a half-million dollar mistake.'*
>
> **— Richard Taylor**
> **Service Merchandise, Inc.**

Specifically, standardization would provide three benefits:

- It would streamline user training, easing the burden on the small information center staff.
- It would give all users the same software so that people who switched from one department to the other would not have to learn to use different programs.
- A standard DBMS would ensure data interchangeability, which would help the firm with a future goal: the implementation of a standard link between the Personal Computer XTs and the firm's mainframes. Service Merchandise runs an IBM 4381 and two Honeywell, Inc. machines, a DPS 88/82 and a dual-processor DPS 8/70. The firm is installing an IBM 3083 next month.

Taylor set up a detailed list of criteria (see chart SR/33) and matched potential packages against it. After he eliminated software that lacked the features the firm needed, he ran benchmark tests on the packages that remained. During the benchmarks, he checked whether the different DBMS could operate under the Personal Computer XT's 256K-byte memory and whether they provided adequate response times.

With the evaluation procedure, the firm aimed to meet

See SEARCH SR/33

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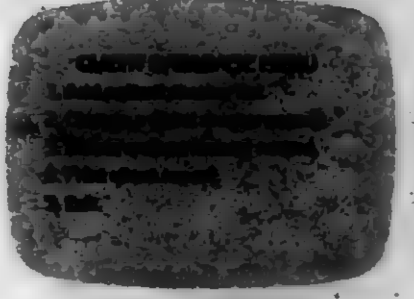

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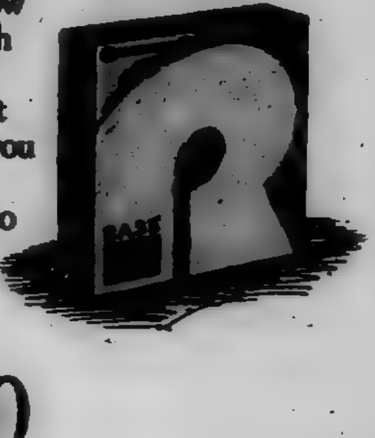

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Data base development project explores China's past

Promotes videodisk as medium for information storage, retrieval

XIAN, China — Two thousand years after the end of his reign, China's first emperor is still at the center of potentially great change both for the nation he helped create and for students, researchers and data base administrators worldwide.

Information about Emperor Qin Shi Huang Di, including video and still pictures of artifacts unearthed near his tomb outside this ancient capital city, is being compiled and entered into an integrated visual, audio and textual data base. Researchers will use the data base both to develop courseware for use in the U.S., China and other countries and to promote the videodisk as a medium for intensive data storage and retrieval.

When it is completed next year, "Project Emperor-I: China's Treasure Revealed Via Videodisk Technology," will allow researchers and students to tap into a data base containing about 4,000 still images, 200 segments of motion video and more than 4,200 related records of text.

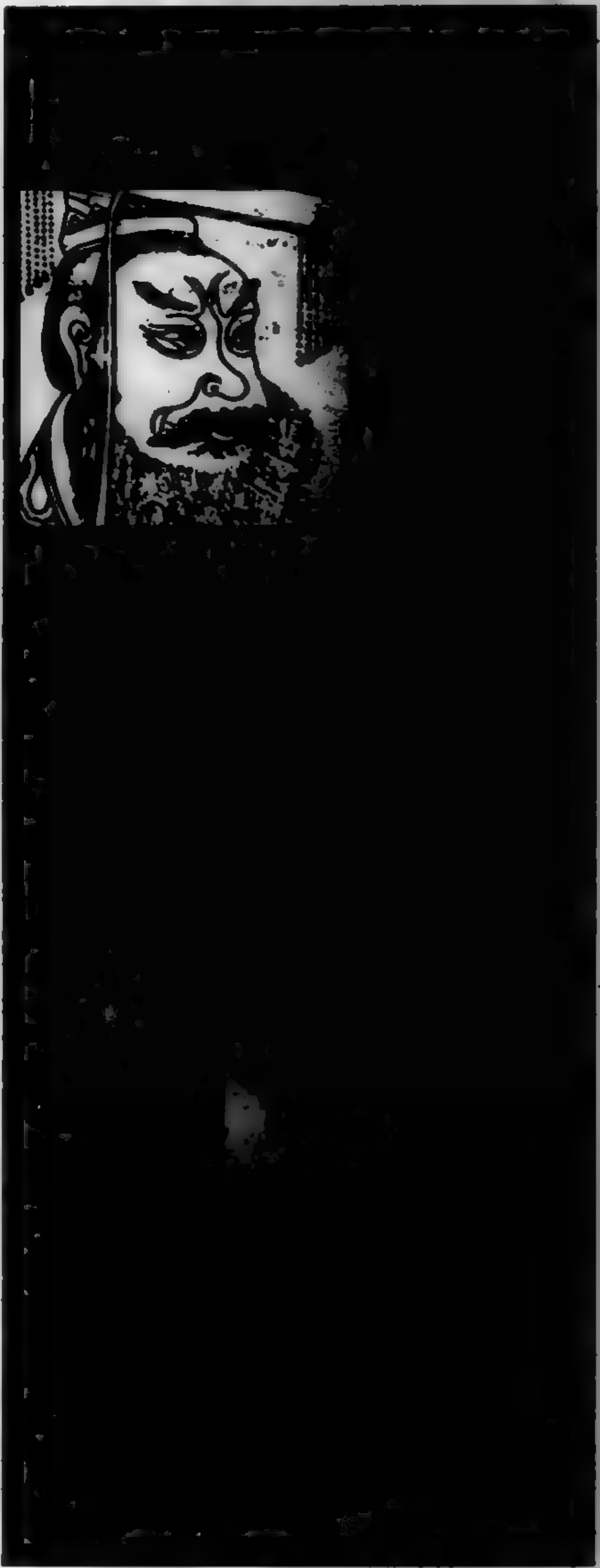
Users will be able to call up Ascii files and Chinese calligraphic text, as well as still and motion pictures from the archaeological excavation and a number of museums. In addition, they will be able to see and hear a series of oral histories — taped interviews with a number of experts from different Chinese cities.

"Information science is moving into a multimedia age right now. We are no longer satisfied with [3- by 5-in.] cards, books and periodicals alone," according to Ching-chih Chen, principal investigator and project director of Emperor-I. "We want to have the printed format, but we also want to see with our own eyes, hear the sound, see the motion."

The project's multimedia data base, which is about to go into production, will allow researchers to do just that, according to Ben Gant, a research fellow at MIT's Center for Advanced Visual Studies. Gant is in charge of the data base construction.

He plans to use an applications generator — most likely the Microcomputer Picture Archive and Communications System (Mpacs) from Artum Ltd., an Israeli firm — to design a data base management system that is part rela-

See CHINA 38/23



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More than 6,000 life-size statues have been unearthed near Xian, China.

CHINA

from SR/22

tional and part hierarchical.

The project team has not yet made a commitment to the Mpacs system, but it has set up data relationships that will depend on flexible data base development and data retrieval capabilities. Data collected at the archaeological site and at other locations has been coded to fit within hierarchical data structures that are relationally cross-referenced.

Researchers have recorded detailed information, for example, about more than 6,000 life-size terracotta statues of soldiers and horses that archaeologists have unearthed here, according to Robert D. Stueart, research director of the project. For each statue, they have identified facts such as whether or not the statue is painted, what parts of it are painted and what the positions are of its arms.

These discrete facts will reside within specific fields (paint on arms, for example), the fields within screens (paint, for example) and the screens within sub-data bases (warriors, for example). The sub-data bases, in turn, will reside within a comprehensive data base for statues. Inverted keyword searches will allow users to branch through this information hierarchically.

The statue data base — like other data bases the project team creates — will also have sub-data bases for text, photos and video. Information in these sub-data bases will have a variety of cross-references to other information, and users will rely on relational capabilities to bring all the data together.

Emperor-I project team members will store still and motion pictures as well as text and sound on videodisks. They will store additional text on magnetic microcomputer disks. To retrieve data, they will use Digital Equipment Corp. Interactive Video Information System (Ivis) hardware.

The Ivis configuration for the project consists of a DEC 350 personal computer, a 10M-byte mass storage subsystem, a 13-in. color monitor, a videodisk player and a central Ivis unit, which provides an interface between the micro and the videodisk player.

With the hardware and DEC's Producer courseware authoring software, project workers will develop as many as seven interactive courses for different levels of users. Course developers will design branching routines that help general users, such as undergraduate students, navigate through data bases. They will also design programs that enable advanced users, such as research archaeologists, to pull information from different data bases into notebooks, or personal data bases.

Portability central to success

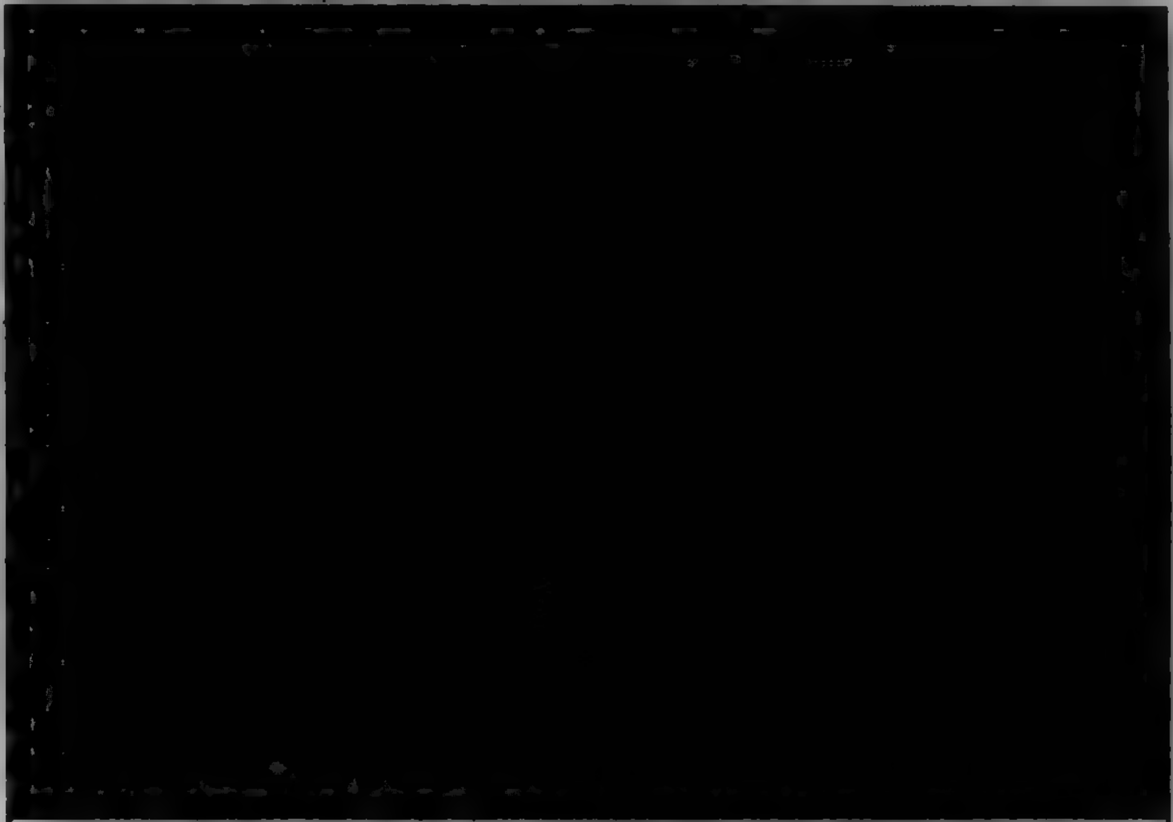
Project members also hope to develop courses with a system similar to Ivis that uses IBM hardware and software. Portability across different kinds of equipment, different subject areas and even different nationalities is central to Emperor-I's success, according to Gant.

"It is very important that the project not result in a one-of-a-kind system." Rather, he said, the project should serve as a general prototype "for how you gather information, store it and write instructional materials from it."

Chen said she hopes, in addition, that the project will raise the videodisk above its current status as a recreational tool and position it as a serious medium for information storage, processing and retrieval — for educators and information scientists alike.

"If all the project does is to help reveal something of China's history and culture to the western world, that would be enough," she said. "But we also have an opportunity to demonstrate how to use technologies that are practical and available today in bringing information to people throughout the world."

By September, the project team hopes to have some courses ready for user testing, and the courseware is scheduled to be completed by the end of next May, Gant said.



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FUTURE from SR/2

Michael Geran, vice-president of research at E. F. Hutton & Co. in New York, also cited preparation as an obstacle. "Operating systems have specialized routines for data base processing, and existing applications are tied to these operating systems. To pull these applications out from the operating system [for use directly with a data base machine] would require a lot of up-front work. Users would rather devote that effort to new projects."

The investment in existing applications was also cited by William Inmon, a director at Denver-based Coopers & Lybrand. "One of the big barriers to success for the data base machine is that investment. The data base machine may be a wonderful idea, but if the vendors tell users 'throw away your existing systems and build them my way' they are going to fall flat on their faces."

According to Ronald Ross, editor of the "Data Base Newsletter," published by Boston-based Data Base Research Group, the primary concern among users is productivity. Users are not certain, he said, that the data base machine is the solution to increased productivity.

"Right now, users' attention is focused on one issue — productivity. From that stems the interest in relational DBMS, fourth-generation languages and so forth," Ross said. "Productivity is the problem people are trying to solve, not the problem of large-capacity data bases and tying together heterogeneous processors. Companies will need a lot of experience with relational data bases of the size that cause performance problems before they look to data base machines."

But in the future, Ross said, a ground swell of interest in data base machines may arise when users migrate existing production applications to a relational DBMS. "That shift might point the way to a better relational engine. But it is at least three years away. Most companies have not gone relational yet, and they clearly have not built up relational data bases to the size that performance is a problem. Neither have they switched transaction applications to relational."

But Ross and others agreed that the appeal of hardware specifically designed for data management will grow, albeit slowly. "There is no doubt that in the future hardware will be radically different in its [data management] capabilities. Whether the current experiments with data base machines will be the shape of things to come is still up in the air."

Change is coming, James agreed. "The future? Yes, I believe it lies with the data base machine. Not everyone will adopt the technology. . . . But a change is coming in DBMS, and as the data base machine technology moves along, it will drag people in."

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>
> *'People just do not know how to use a data base machine.'*
>
> — David James
> Riggs National Bank

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MODULE

from SR/14

base in modules offers three important advantages over the all-or-nothing approach:

■ First, it provides deliverable data base functions in less time than a nonmodular approach does. Management and users will be understandably skeptical if they are told that a project will take years to complete; during that time, business needs will change, expertise will be lost to employee turnover, and interest in the project may disappear. By undertaking the project as a series of modules, the project team can deliver a portion of the data base quickly. In addition, user interaction with a finished product early in the project can enhance the remaining development.

■ The second advantage modular development offers is the opportunity to revise subsequent estimates and schedules and make design changes before beginning the remaining modules. An organization that attempts to convert completely to a data base has little historical data to use in making estimates or projecting schedules. Each module offers a new opportunity for the project team to review and revise.

■ Finally, modular development allows the time needed to absorb the dramatic changes that accompany implementation of a data base. Applications that traditionally have been batch oriented may become on-line, interactive systems. This will change or even eliminate job functions. Management and users need time to understand and acclimate to the new environment. If sufficient time and communications are available, the changes will not be threatening. Modular development and implementation will provide this time.

> ”
>
> ***Modular development allows time to absorb the dramatic changes that accompany implementation of a data base.***

Individual development life cycles. Each module should have a separate development life cycle (see chart SR/14). The project team should begin by determining the individual data elements used in the module and their relationships as seen by the user. It should then normalize the relationships for maximum clarity and efficiency.

At this stage, a fourth-generation language will provide more benefits than a traditional one because of the increase in productivity and ease of revision it provides. With a high-level language, the project team can construct a working prototype in a minimal amount of time, allowing the user to interact with the development process early. This allows the remainder of the development to be an evolution between the user and the system.

Coordinated implementation. When a module is complete, the project manager must consider the best time to implement it. If immediate implementation would require the project team to develop many interface and conversion programs, the manager may find it beneficial to wait for the completion of a subsequent module and implement the modules together.

The nature of the data can also affect the timing of the implementation. A module that supports strictly annual data, for example, may be better implemented in January than in October. Management and users must be involved with the project team in each implementation decision.

Organizations converting from applications-based systems to a corporate data base are in for a long and difficult journey. The improvement in quality of the information resource and the organization's use of it will be worth the effort. Agreement on the destination will ensure that the project arrives.

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Technology, intelligent software guide market growth

By Shaku Atre
Special to CW

In the past five years data base technology has been maturing and taking a catalyst position in automated data processing. In some installations the data base management system is used not only as a fancy access method for one application system but is shared by a number of application systems.

The DBMS is also extending beyond the terrain of the mainframes and progressing aggressively in the micro-and supermicro areas in the information center setup. End-user computing is claiming about 20% of the current millions of instructions per second (Mips) today, and it is predicted to reach 60% to 75% of Mips usage by 1990. A major part of the Mips usage could be by data-based applications. As a result, the prediction of $5 billion of revenue intake by the DBMS and ancillary products' vendors by 1990 seems to be easily achievable.

In what areas would data base technology need to make its mark in order to ring in $5 billion in the not-too-distant future? The following sectors are advanced enough, as far as technology is concerned, to move into a production environment from the esoteric research and development environment of the vendors' camps. Software-oriented products will provide:

- Vertical integration of application software with DBMS as the driving force.
- Distributed data bases together with intelligent directory or data dictionary systems and mainframe-to-micro connections.
- The means for cooperative coexistence of the development, production, information and automated office centers with the DBMS as a common denominator.

All of these sectors will be using the conventional general-purpose data base management system.

A data base environment is I/O intensive, however. The three areas listed above are software oriented, and software alone is not known for relieving I/O-intensive work. Isn't I/O really hardware oriented? Wouldn't it then be appropriate to look for a hardware solution geared toward I/O-intensive data base work? Precisely. For this reason two areas that will advance rapidly in the coming years may be data base machines and intelligent data bases.

A data base machine consists of data base system software, hardware or firmware that is dedicated and tailored to perform some or all of the data base functions. It must use some hardware that is specially designed for data base management.

Two types of machines

There are two types of data base machines. One type still performs number crunching, in a linear processing mode using von Neumann architecture, and is used as a back-end processor. The other type performs parallel processing, which is a departure from von Neumann architecture, but also is used as a back-end processor. A data base machine may or may not use content-addressable memory. A data base machine may coexist with a host or may exist by itself as a minicomputer.

Looking back thirty years, most DP professionals would agree that software was invented to simulate what hardware was supposed to do in the first place. There were so many varied and intriguing uses of software that software itself established a self-perpetuating life. But software is limited by whatever hardware can or cannot do. Software is restricted to Add, Subtract and Shift. By comparison, the basic data manipulations in a data base environment are Search, Retrieve, Update, Insert, Delete and Move, rather than Add, Subtract and Shift. The mismatch of the von Neumann design to nonnumeric applications is the main cause of the complexity and inefficiencies of the present systems.

If technology can be matched more closely to data base applications, then perhaps the following technologies will be more practical: high-level query languages; access of data base records using natural languages, speech and pictures; and problem solving using inference systems, with the help of expert systems utilizing intelligent data bases rooted in a knowledge-based management system. Inference drawing requires parallel processing. The relational data model with high-level data languages, exhibiting a high degree of data independence and ease of use, are requirements for improving human productivity in today's and tomorrow's offices.

Two bottlenecks affect performance

In conventional data base environments there are two major culprits affecting performance: the staging bottleneck and the communications bottleneck. To stage data into main memory from auxiliary storage is time consuming. Since data transfer from geographically dispersed areas is time consuming as well as expensive, data redundancy is introduced.

But these techniques introduce new problems in the areas of data updating, recovery, integrity and security. Special-purpose hardware, tailored toward distributed data base management and supporting data communications, would help alleviate these problems.

The technology is here, as can be seen from implementations by a number of data base machine manufacturers such as Britton-Lee, Inc., Teradata Corp., Intel Corp., Amperif Co., HDR Systems, Inc., Corem International and Mega/Net Corp., to name a few. But why isn't this field taking off faster? One reason is that one of the major players, IBM, hasn't shown its cards as of yet, and new ideas in this industry require a blue stamp in order to be considered as viable solutions for the marketplace.

Atre is president of Rye, N.Y.-based Atre International Consultants, Inc.

DB2, SQL/DS will fail if firms ignore training

By Joseph E. Weir Jr.
Special to CW

Almost every major IBM installation will at some time in the near future implement, or at least seriously consider implementing, IBM's DB2 or SQL/DS relational data base management system. As with any implementation, training will be a major factor in the system's success or failure.

That the two DBMS will gain wide acceptance should come as no surprise: Relational technology offers great flexibility, high-level query languages and other features that users find attractive. In addition, IBM's two relational systems — DB2 for MVS shops and SQL/DS for DOS/VM and VM environments — are the first major DBMS the firm has released since the late 1960s, when IMS came out.

That proper training is crucial to successful use of a DBMS is no surprise at all: Nearly everyone remembers the horror stories associated with the early days of IMS. Certainly, IMS had some inherent bugs that needed fixing, but the vast majority of disastrous implementations came about because of a lack of proper training.

IMS implementations brought forward the idea that incorrect use of data retrieval and updating commands can dramatically increase demands on hardware and decrease processing efficiency. If users are not adequately trained in DB2 and SQL/DS, history may repeat itself.

Relational features like flexibility and ease of use should not lull management into complacence. Training requirements for DB2 and SQL/DS are somewhat different from those for IMS, but training should be no less stringent or extensive.

Most of the audiences that require training for DB2 and SQL/DS are no different from those that needed help with IMS. The following groups of people must all have some instruction:

- Managers.

See TRAINING SR/32

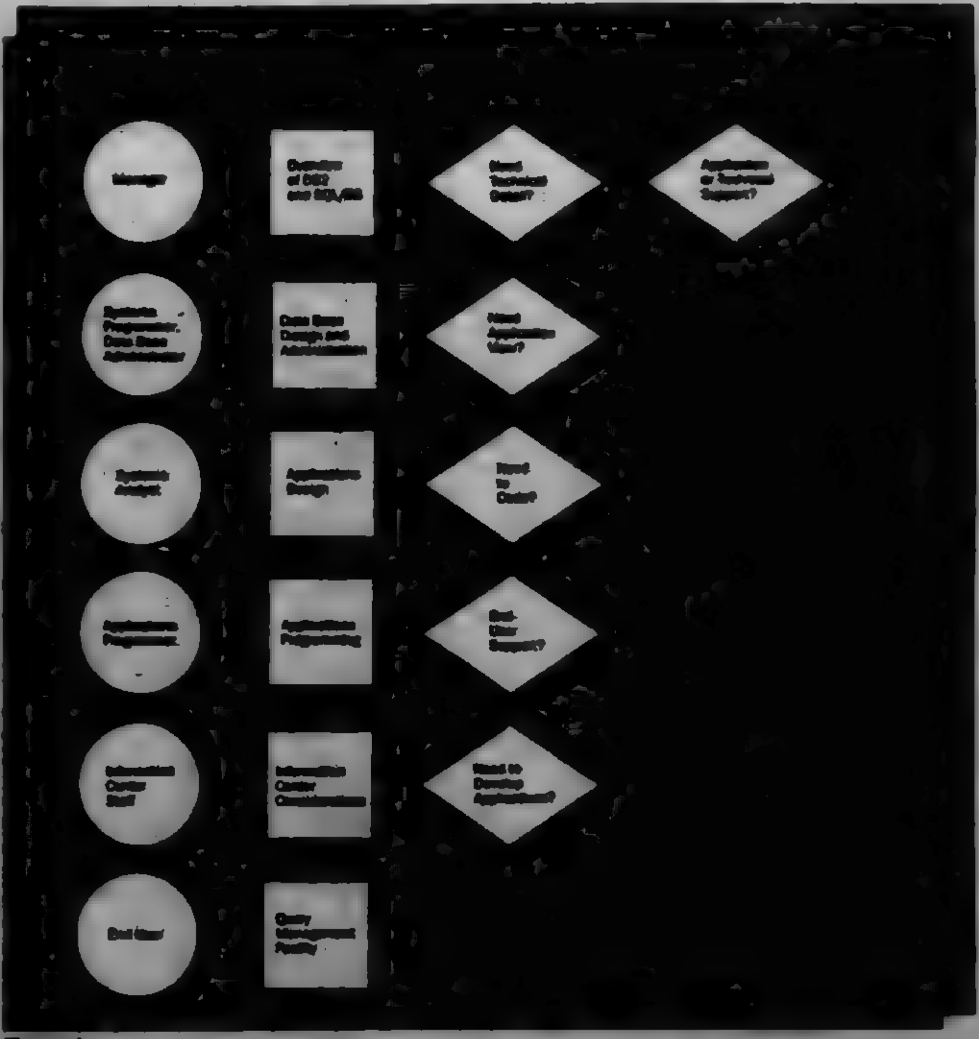
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Figure 1.

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Special Report

Selecting a DBMS: Match every application's demands

By Eugene W. Oson
Special to CW

All commercial data base management systems have their strengths and weaknesses, which prospective users must consider carefully. Identifying a package's inherent value, however, is not sufficient: Organizations looking for a DBMS must also identify their applications requirements and match them with different products' capabilities.

To select the best DBMS for a particular set of applications, an organization must set up — and follow — the following six-step evaluation:

- Establish an evaluation and selection team.
- Describe applications requirements.
- Identify evaluation criteria.
- Assign weights to the criteria.
- Rate each DBMS' capabilities against the criteria.
- Calculate overall DBMS ratings.

Naturally, the staff time devoted to each of these steps and the level of complexity required will depend on the scope of the project. Small, micro-based projects require less formal and less complex analyses than larger projects do, but they require analyses nonetheless.

Establish an evaluation team. The team must include both knowledgeable user representatives and people with technical DBMS expertise. Including both groups should eliminate the possibility of a technocratic slant or of user disappointment with the final choice.

A team leader should take responsibility for assuring an impartial and expeditious evaluation. The leader will be the focal point for all team activities and will be responsible for an open line of communication with other managers.

Describe applications requirements. To select the proper criteria for judging the DBMS, team members must understand system requirements. They also must have a thorough knowledge of the applications requirements to assign proper "weights" to the various selection criteria.

The idea of using a DBMS usually arises from a desire to use one or more of the following general DBMS capabilities:

- Variety of access methods.
- Flexible user interfaces.
- Data integrity.
- Data independence.
- Central control over physical storage.
- Hierarchical storage device support.
- Data concurrency.

The team should examine these capabilities and determine which ones best serve the organization's applications and to what extent. Team members must also pinpoint the specific demands that the organization's applications will make on a DBMS (see story SR/31). Once the team determines these demands, it must establish their fulfillment as a necessity.

DBMS packages that do not meet the special requirements of an organization's applications must be eliminated from consideration: No one would buy an otherwise perfect package that did not run on his organization's computer. Likewise, no one should consider a DBMS that does not support his firm's applications.

Identify evaluation and selection criteria. Before the team can make an evaluation, it must develop a comprehensive list of criteria. The list should be derived from a combination of user requirements and available data base technology.

The following list is a sample of what an organization might identify as desirable DBMS features:

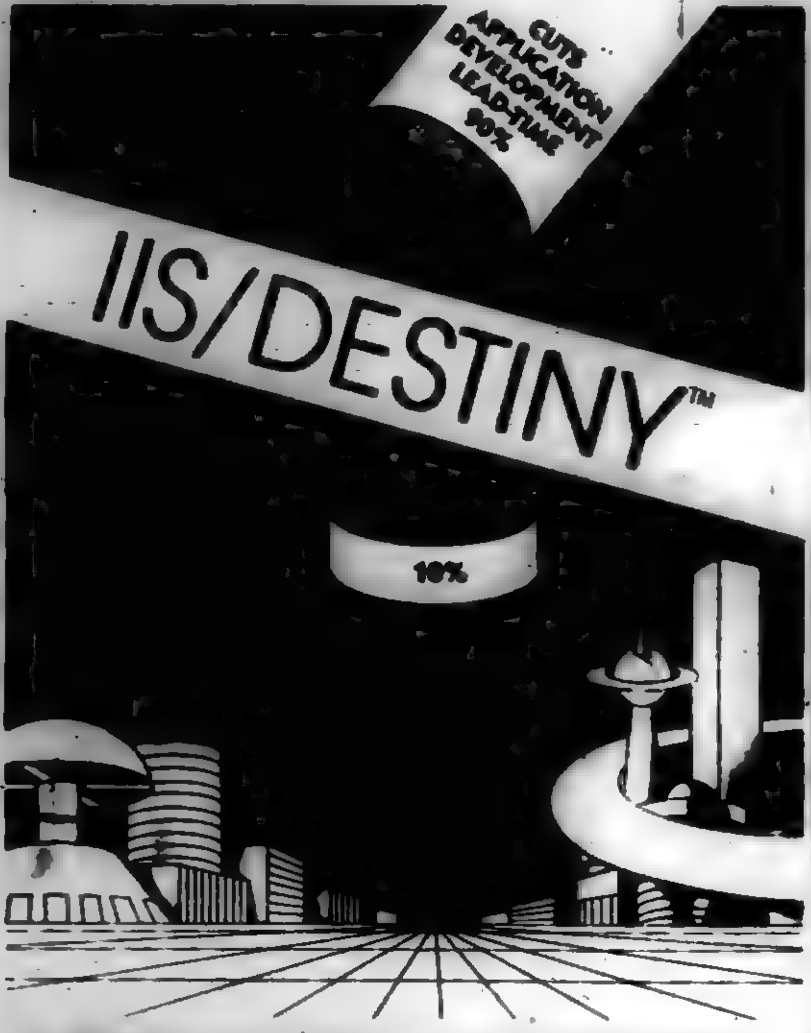
- Data definition and representation capabilities.
- Support for different data structures.
- A variety of access methods and retrieval capabilities.
- A specific host language interface.
- Ease of installation, use and/or change.
- A convenient interface with an operating environment.
- Flexible and powerful query processing and report generation.
- Backup and recovery capabilities.
- Security and privacy.
- Realistic peformance overhead.
- Efficient management of physical storage.

Assign weights to criteria. Based on the previous identification of system requirements, user requirements and selection criteria, the team should assign each criterion a number that represents its relative importance, such as a value system from 1 to 10, with 10 the highest value.

Rate different DBMS packages. Several techniques are available to produce a common rating scale for fairly objective criteria — such as whether or not a DBMS supports a given data structure — and more subjective criteria — such as how good a package's documentation is.

A common technique is to measure how well — on a scale of 0 to 9 — a DBMS meets a certain criterion. A

Oson is a computer specialist for the data base technology and control section of the Internal Revenue Service's Standards Branch in Washington, D.C.



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to product's capabilities

"0" indicates the DBMS does not meet the criterion at all; a "9" indicates that it meets the criterion completely. On such a scale, "yes" and "no" answers to objective questions such as "Does the DBMS support a given data structure?" are rated as "9" and "0," respectively. Answers to subjective questions such as "How good is the documentation?" can fall anywhere within the scale's range.

Naturally, a package that would receive a "0" rating for a capability the organization has deemed critical should have been eliminated from consideration by this time.

Team members can tap in to a variety of resources that will help them evaluate the level of a DBMS' compliance to selection criteria. Some of these follow:

- Vendor documentation and presentations.
- Articles, trade sources and reports from research firms.
- Evaluations made by government agencies and private industry.
- Hands-on experience.
- Consultants.
- Interviews with current users.

Calculate the score for each DBMS package. For every package under consideration, the team will now multiply a rating by a weight for each criterion. The sum of all the results is the score for any given package.

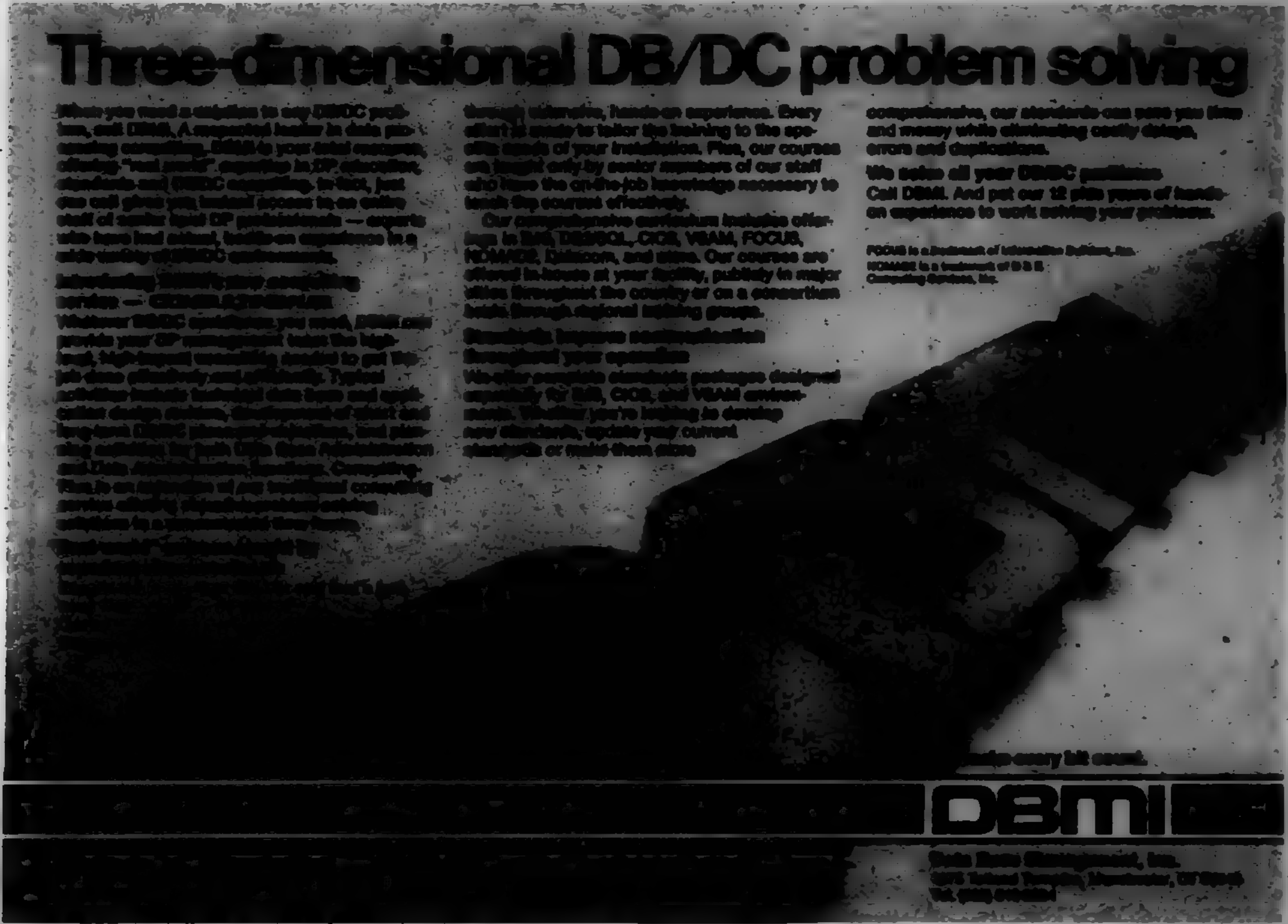
Now the team should present its organization's management with a report for review and/or approval. The report should include the names of the packages that earn the highest scores, copies of the team's evaluation, a narrative account that justifies any recommendation the team decides to make and any hard-copy source material that has been collected during the evaluation.

An organization that follows this six-step methodology should meet with general success in its DBMS selection. To do so, however, the organization must go beyond the letter of the evaluation structure and keep two overriding ideas in mind.

First, this methodology for DBMS selection requires extensive preparation — not only prior to DBMS selection, but also prior to the selection of selection criteria. This is deliberate and very important.

Second, the methodology involves the user at all levels. Only through heavy user involvement throughout the selection process can a DBMS meet with success and acceptance once it is implemented.

This article is a condensation of a larger document, "Evaluation and Selection of Data Base Management System Packages," copies of which are available free from the IRS, D:C:H:S, Suite 1410 — BXR, 1111 Constitution Ave. N.W., Washington, D.C. 20224.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TRAINING

from SR/27

- Technical support staff members.
- Data and data base administrators.
- Applications developers.

The type of training that each group must receive, however, has changed. DB2 and SQL/DS entail fewer technical considerations than earlier DBMS, so training for technical support staff members will be reduced somewhat. Training for data and data base administrators will emphasize on data administration.

But one additional audience — that composed of end users — must receive training. This is an audience for which IMS training was not provided at all. End users will want to take advantage of the fourth-generation language capabilities of DB2 and SQL/DS.

Figure 1 (see SR/27) indicates the paths that different audiences should follow to mastery of DB2 and SQL/DS. Each path contains one or more of the following segments of an overall, six-course curriculum:

- Overview.
- Data base design and administration.
- Applications design.
- Applications programming.
- Information center considerations.
- Query Management Facility (QMF) use.

Overview. This should be aimed primarily at managers, who need a brief, practical introduction to DB2 and SQL/DS. The overview will enable managers to understand the intent of DB2 and SQL/DS; the DBMS' relationship to existing IBM software such as CICS, IMS and TSO; and the concepts and terminology associated with DB2 and SQL/DS data bases. With this knowledge, managers can install, administer and manage functions affected by DB2 and SQL/DS with awareness of how the DBMS will affect user communities.

Data base design and administration. This should be oriented mainly toward technical support staff members, such as data base administrators and senior applications personnel. The course will provide these employees with an in-depth understanding of the more technical capabilities of DB2 and SQL/DS. It should concentrate on logical data base design and administration.

Applications design. This course should be oriented mainly toward systems analysts and senior programmers, who will be involved in designing applications that use DB2 and SQL/DS data bases. Applications design training will provide students with an understanding of a DBMS' intent and with knowledge of the system's concepts and terminology. The course should also identify the advantages and disadvantages of DB2 and SQL/DS, compared with IMS, Vsam and other access methods.

The students in this course should be provided with tools they can use to select the best access method for a specific application. After they have the necessary tools, they can design DB2 and SQL/DS tables to allow for flexible and efficient processing.

Applications programming. This course should be aimed primarily toward applications programmers, who need to code SQL statements to access DB2 and SQL/DS data bases. The main purpose of applications programming training is to provide information on how to retrieve, insert, update and delete information from DB2 and SQL/DS tables.

> ”
>
> *End users received no instruction in IMS, but they will need DB2 and SQL training.*

Information center considerations. Many end users become aware of high-level tools and learn how to use them through information centers, which have become popular in large organizations. This course addresses the training requirements of information center staff members, who will be charged with helping end users learn DB2, SQL/DS and the language to access the data bases.

The course's primary purpose is to provide a basic knowledge of the DBMS' capabilities — specifically as these relate to end-user needs — so information center staff members can support end users and their business requirements.

QMF use. This course, aimed primarily at end users, should provide training in QMF, the fourth-generation language that accesses DB2 and SQL/DS data bases to create reports and maintain information. A major topic in the course should be how to perform query by example.

These six courses fully address the range of training required in an organization. Courses may be combined, expanded or segmented differently to lead to a different structure of offerings. Regardless of the number and structure of course offerings, however, the above topics and audiences must be addressed by any comprehensive DB2 and SQL/DS curriculum.

Wehr is vice-president of Data Base Management, Inc., a Manchester, Conn.-based firm that provides data base and data communications consulting and educational services to Fortune 1,000 companies.

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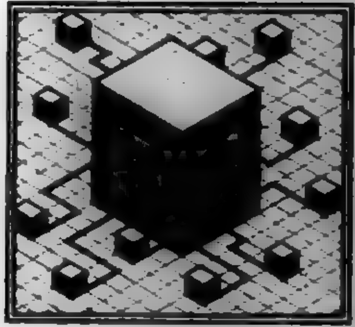

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SEARCH

from SR/18

its needs exactly in order to avoid the pitfalls of a poor DBMS choice. Taylor said any critical applications the software could not handle would translate to thousands of dollars worth of lost potential, as the potential would be lost for more than 100 users. "Had we simply gone out and purchased the most popular package or purchased the one that looked the best in the advertisements, we would have made a half-million dollar mistake," he said.

Based on its evaluation results, Service Merchandise decided to standardize around Innovative Software, Inc.'s Smart Data Manager. Taylor said the package fell short of the firm's requirement for ease of use because its documentation was not as precise as the firm had hoped. The documentation was poorly indexed, he said, and it lacked specific examples that could help users understand some advanced features.

But Smart Data Manager met more of Service Merchandise's critical requirements better than other packages did, according to Taylor. In general, he said, DBMS packages that offered sufficient flexibility were too difficult for nontechnical employees to learn and use, and software that users could learn easily did not offer enough capabilities.

The firm began installing the DBMS on its micros last fall. Since then, the information center staff has trained about 75 users. Employees have set up applications to track the whereabouts of financial records that circulate among employees, to run statistical analyses of showroom operation factors and to generate a number of management reports.

Most of the applications have been helpful in reducing the number of man-hours required to analyze data and produce reports, which employees had done manually. Taylor said the firm also gained the ability to run cross-tabulations on data, which had been virtually impossible to do by hand.

Service Merchandise, Inc. micro data base management system criteria

[illegible]

- Supports 30,000 records per file and 30 fields per record
- Performs relational analyses
- Supports printed forms output design and data base field addition and deletion
- Accommodates diverse corporate applications at end-user level

[illegible]

- Offers on-line Help information
- Has clear documentation
- Can learn basic system in less than three days
- After training, first-time users can operate system without assistance

[illegible]

- Receives and transmits Ascii and Data Interchange Format data files

[illegible]

- Basic DBMS structure and design allow for easy upgrades
- Vendor has track record for enhancing product and spending funds for R&D
- Vendor financially stable

[illegible]

- Easily transfers information to graphics displays or WP documents

[illegible]

- Includes passwords at data entry and file levels
- Backs up and saves data files at convenient points during operation

[illegible]

- Runs on 256K bytes of memory or less
- Runs efficiently on IBM Personal Computer XT, with adequate response time and efficient use of hard disk
- Supports standard printers and plotters

Source: Service Merchandise, Inc.

Service Merchandise, Inc. matched vendors' micro DBMS offerings against this detailed list of criteria to find a standard package for the more than 100 microcomputers at its corporate headquarters and other administrative sites.

THOMAS

from SR/13

ple get from producing actual results can interest them in more advanced work. Since Thomas brought up its data base, about 10 managers have become relatively proficient users.

"What has happened . . . has surpassed my expectations," Klein said. "People got so good at Oracle in a short period of time that they began to go into other departments and teach each other what they knew."

Two of the applications that users have designed are the following:

- An advertising system that tracks information on the more than 60,000 ads that run in the directory. A supervisor in the firm's production department put the application together. "By trade, he's a master printer," Klein said, "and he'd never laid eyes on a computer before." The only help the man required was with a program to integrate a bar-code reader into the system.
- A telecommunications application to track bills, equipment requests, change requests and facilities such as Wats lines. Thomas' telecommunications analyst designed the system. "[She] would never have called up our old data center and requested the application," Klein said. "Users don't know what's possible, or what's necessary, until they dig in and create something for themselves."

Users' familiarity with decision support systems will play an important role in the company's future, as decision support tools will allow managers to identify opportunities in emerging fields like electronic publishing, according to Klein. "When employees can make data work for them . . . they begin to look at the information with new eyes," he said.

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Data independence, integrity key to relational DBMS

By Kenneth Sweeney
and David Ditmars
Special to CW

Data base management system design experts have long been discussing what is essential in a relational data base management system. The two most important and most overlooked features in these discussions are that a complete relational DBMS must have enforceable data independence and referential integrity constraints. If a system lacks either of these key features, it is not a complete system and will not provide the control of data processing it should.

A relational DBMS employs the relational method to store, manipulate and retrieve information. For data to be processed using relational operations, it must be organized in independent constructs, referred to as two-dimensional tables or relations. Various types of data, for example, numeric and textual information, reside in these tables so that they are logically independent of the information in other data base tables.

The relational operations are exercised upon the data in the relations using their values to create tables. The user specifies what tables and values are involved using English-like commands. This dynamic extraction and combination of data from the tables is what gives the relational DBMS its flexibility and power.

The principal relational operations are projections, restrictions and joins. Figuratively, the projection makes a vertical slice through a relation, selecting columns by name and extracting the values contained in those columns.

A restriction makes a horizontal slice through a relation, selecting record values as specified. And the join creates a relation from two or more existing relations by associating common column names, referred to in relational vocabulary as "attributes from a common domain."

All this manipulation is based on the element values in the relations, which is why relational DBMS are called value-based systems.

Conceptually, extracting information from tables using an English-like command language is relatively simple. Novice users can quickly grasp how to be productive, since they are performing tasks in much the same way they have performed them manually. Most everyone agrees that this simplicity and ease of use are the key benefits of relational systems.

The complexity lies in the design underlying the easy-to-understand relational data base organization, data query and manipulation. Establishing and maintaining data independence and integrity within a relational data base is the challenge. To be truly independent, not only must data be organized in tabular relations, but it must also be independent of its conceptual representation in the data base's logical description and from users' individual representations or views of the data base.

This data independence needs to be enforced at three levels using the three following discrete models:

- The structural (physical).
- The logical (conceptual).
- The local (user).

Few systems have such multilevel data independence. And those that do support one or two data models do not necessarily enforce data independence.

The three-tiered approach enables changes to be made to the way the data is physically stored without necessarily affecting how the data base is defined to the users. Similarly, changes may be made to the data base as defined at the logical level, where element and record names are specified, without necessarily affecting the way the data is viewed by individual users.

Finally, the users' views of the data base may be altered without affecting its physical or logical organization. The three models enable data base modification without having to dump or reload data or recode their relationships. And when the three levels of data independence are enforced, users cannot inadvertently corrupt the data when making modifications.

Enforcing data integrity

Enforcement of data integrity is achieved by various mechanisms, especially validation techniques and constraints. Of the latter, referential integrity constraints are particularly helpful and valuable. Referential constraints are rules specified in the data base's central data dictionary that establish relationships among tables and elements within them.

The system enforces the constraints so any attempt to enter data that violates them is rejected, thus maintaining data base integrity.

The referential integrity rules enable the data base administrator who designs the configuration of specific applications to specify hierarchical and network relationships among the data base record types or tables.

Sweeney is the chief designer of DM, a relational DBMS from Battelle Software Products Center, and Ditmars is a product manager for that firm, located in Columbus, Ohio.

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MICRO BITS

Will Jazz start business singing Mac's song?

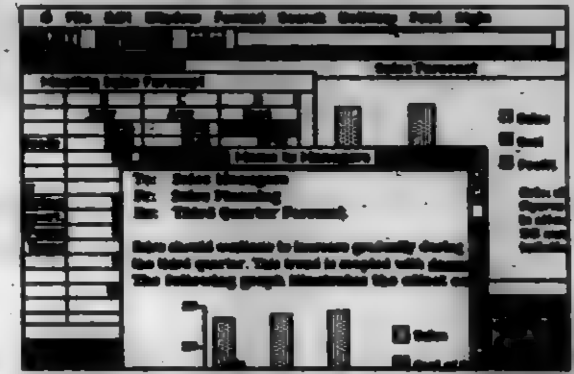
By Rick LePage
Special to CW

After more than a year of hype and speculation, Lotus Development Corp. has finally placed Jazz in the stores. The five-function integrated package for the Apple Computer, Inc. Macintosh offers spreadsheet, graphics, word processing, data base and communications modules. It sells for $595 and has been billed as the software cornerstone to Apple's Macintosh Office plans.

Whether Lotus' package will live up to all the expectations will not be known until at least the end of the year, but initial reports indicate that Jazz is being taken very seriously by the end user.

Jazz does perform the tasks that Lotus claims it does. Whether it will do them efficiently and completely enough for constant use is a question users will have to answer. If Jazz could run on a Macintosh with 1M byte of random-access memory (RAM) and a 20M-byte hard disk drive, it would approach the ideal business software.

LePage is industry editor of "Macintouch," a Framingham, Mass.-based newsletter for Apple Computer, Inc. Macintosh users.



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Re: Third Quarter Forecast

Lotus Development Corp.'s Jazz permits Macintosh users to view several open documents simultaneously and to move between documents easily.

The first impression a Jazz user gets is one of opulence. Before Jazz is even running on the Mac, it is obvious that Lotus put quite a bit of time and thought into its design. The package weighs at least five pounds and comes with three manuals, four disks, a portfolio that holds the manual and disks, a disk wallet and a number of pamphlets. The manuals are spiral-bound on thick, shiny paper; the ribbed, black rubber portfolio could be mistaken for a car mat when it is folded out; and the disk wallet holds six disks and folds up easily enough to be slipped into a briefcase.

Lotus makes it very easy to get Jazz started. One pamphlet gives step-by-step instructions on how to get Jazz up and running. Once it is loaded, a Jazz primer lets computer novices learn the basic ins and outs of the program. The primer is well organized and the examples are very good. Provided that a user is comfortable with the Macintosh, it should be no problem learning to maneuver around the separate parts of Jazz.

Jazz is a true integrated package — a user can have a number of different files open on the screen at one time, depending on the amount of memory that each file requires.

At one point, I had six different file types averaging 20K bytes open on the screen and had no problems working in each one. However, when I opened a seventh file, I received two error messages: one stating that there was not enough memory to perform a search, another stating the same problem with regard to a cut-and-paste operation. My best advice would be to close any unnecessary files when you are done working on them.

Jazz's Hotview feature allows users to link data across file types. The user can set up a "what-if" situation in a spread-

See JAZZ page 69

Users praise Gold Hill's micro-based Common Lisp

Called low-cost tool for AI development

By Eric Bender
CW Staff

Golden Common Lisp, a Common Lisp subset offered by Gold Hill Computers, Inc. of Cambridge, Mass., is finding many roles in artificial intelligence software development, applications delivery and training on IBM Personal Computers, according to early users.

Tailoring the Common Lisp standard to fit within the microcomputer's tight hardware constraints, Gold Hill made reasonable trade-offs, users said, and they generally gave Golden Common Lisp high marks. Their most frequent request was for a compiler.

"Before we bought Golden Common Lisp, the only real alternative in terms of a development environment was a $100,000 Lisp machine," said William Brodie, president of Brodie Associates in Boston, a consulting firm specializing in AI software.

Starting work on a programmer's tool kit for natural-language interfaces, Brodie evaluated several microcomputer Lisp packages. Golden Common Lisp offered the richest development environment, he said. Additionally, at the time it was the only personal computer Common Lisp, "which was important in terms of portability."

William Brodie of Brodie Associates has developed natural-language software with Golden Common Lisp.

Another Golden Common Lisp customer, a large scientific instrumentation supplier, delivered an experiment-planning expert system on a personal computer. The expert system, which includes roughly 1,000 production rules, was developed with Xerox Corp.'s Interlisp on a Xerox 1108 and then ported over to Golden Common Lisp.

"It was hard porting down, but that was not necessarily Gold Hill's fault," said a senior AI engineer at the instrumentation firm. "They were excellent to work with." His complaint, instead, centered on Com-

See LISP page 58

AI on micros stirs debate

SMALL TALK
Eric Bender
CW Senior Editor

Are artificial intelligence and personal computers still mutually exclusive?

Opinions varied wildly, but many attendees at a Future Computing, Inc. forum on that topic held in Dallas two weeks ago maintained that today's personal computers cannot handle genuine AI applications, however AI may be defined. Following are other snapshots from the conference:

■ AI is now an ideal "dilettante's marketplace," commented Ann Winblad, a San Francisco-based consultant. As AI hardware and software improve and prices drop, MIS personnel can learn about technologies much more inexpensively than in previous years, she pointed out.

■ "There's more to AI than expert systems and natural language," according to Larry Tesler, Apple Computer, Inc.'s manager of new architectures. AI-based software could identify users for security purposes, perhaps by examining typing patterns, Tesler suggested. Or, the software might take note of tasks and infer user preferences or extrapolate sequences of actions.

Software packages could act in the way some describe as "intelligent agents," Tesler noted. "The idea is that they're an entity representing you in the computer." Among the roles software could play, he suggested, would be to "represent the client." As one example, users could build their preferences into a scheduling program that "goes out and negotiates with other people's agents."

■ No one should expect an AI equivalent of Lotus Development Corp.'s 1-2-3 package, said Beau Shiel, manager of product development at Xerox Artificial Intelligence Systems. "The leverage of AI programs is in the specific knowledge, and the more specific the knowledge, the narrower the program," Shiel said. "Information management is going to be the hot area for AI on personal computers, more than expert systems," predicted Paul Weiss, vice-president for research and development at Arity Corp. "Expert systems tend to be vertical."

■ Artelligence President Paul Robertson gave a wry description of an optimistic scenario for acquiring knowledge bases: "The expert sits in front of system for a day and spits forward his life's knowledge onto a floppy disk for future gener-

See AI page 56

IDC survey: Maintenance ranks high in system selection

By [illegible]
CW Staff

FRAMINGHAM, Mass. — Not unlike their large-systems colleagues, buyers of microcomputers and workstations consider maintenance services to be an integral factor in the purchasing decision, a study here has found.

International Data Corp.'s (IDC) "Customer Satisfaction Survey: Maintenance for Workstations and Micros" reports that more than 85% of surveyed microcomputer and workstation buyers consider service when buying a particular system. Among these buyers, response time and the availability of on-site services are two critical factors. Least important maintenance factors cited were the ability to service multivendor systems and optional service methods, the survey said.

Although maintenance was an important factor in the decision to buy a particular system, users are spending little on micro and workstation maintenance, the survey said. Approximately 60% of the respondents said their annual service costs fell between 1% and 10% of the price that they paid for the equipment, while another third said service costs ranged from 10% to 20%.

System manufacturers are netting the majority of the service contracts, according to IDC. Of the 192 responses from microcomputer and workstation users throughout the country, 66% relied on vendors for workstation maintenance, 15% selected third-party maintenance organizations, and only 6% selected dealer maintenance services.

Approximately 9% of the users said they did not care who maintained their systems, and 4% said they preferred to maintain their own equipment, IDC noted.

No organizations are providing fast enough service, according to the IDC study. Approximately 85% of the users said they have needed emergency services in four hours or less, and 75% wanted services within four hours for nonemergency situations. However, only 47% of the users got this type of response during emergency situations and only 44% received it in nonemergency situations.

According to IDC, third-party organizations responded to emergency service calls in an average of 12.4 hours, compared with 8.6 hours for those using the manufacturer's service organization.

On-site maintenance was preferred by three-quarters of the workstation and microcomputer users, while 12% preferred carry-in services. According to IDC, 6.5% of the respondents requested service on a time-and-materials basis. Mail-in services, extended warranty and courier services accounted for less than 7% of the service options chosen by respondents, IDC noted.

Customer satisfaction with vendor maintenance services varied depending on the vendor. For example, the IDC survey noted that one-third of the users of Wang Laboratories, Inc. microcomputers and workstations who also used the company for maintenance services said they were getting less than their money's worth in services, compared with 20% for Hewlett-Packard Co. microcomputer and workstation users and 8% for IBM equipment users.

Nevertheless, users said they were "reasonably satisfied" with service organizations, the study said. "About two-thirds of the sample said they get value equal to or greater than what they paid for the service, and 91% of the respondents said they would renew their existing service arrangements."

The report costs $2,500 and is available from IDC, 5 Speen St., Framingham, Mass. 01701.

Kaypro unveils hard-disk release of IBM micro-compatible machine

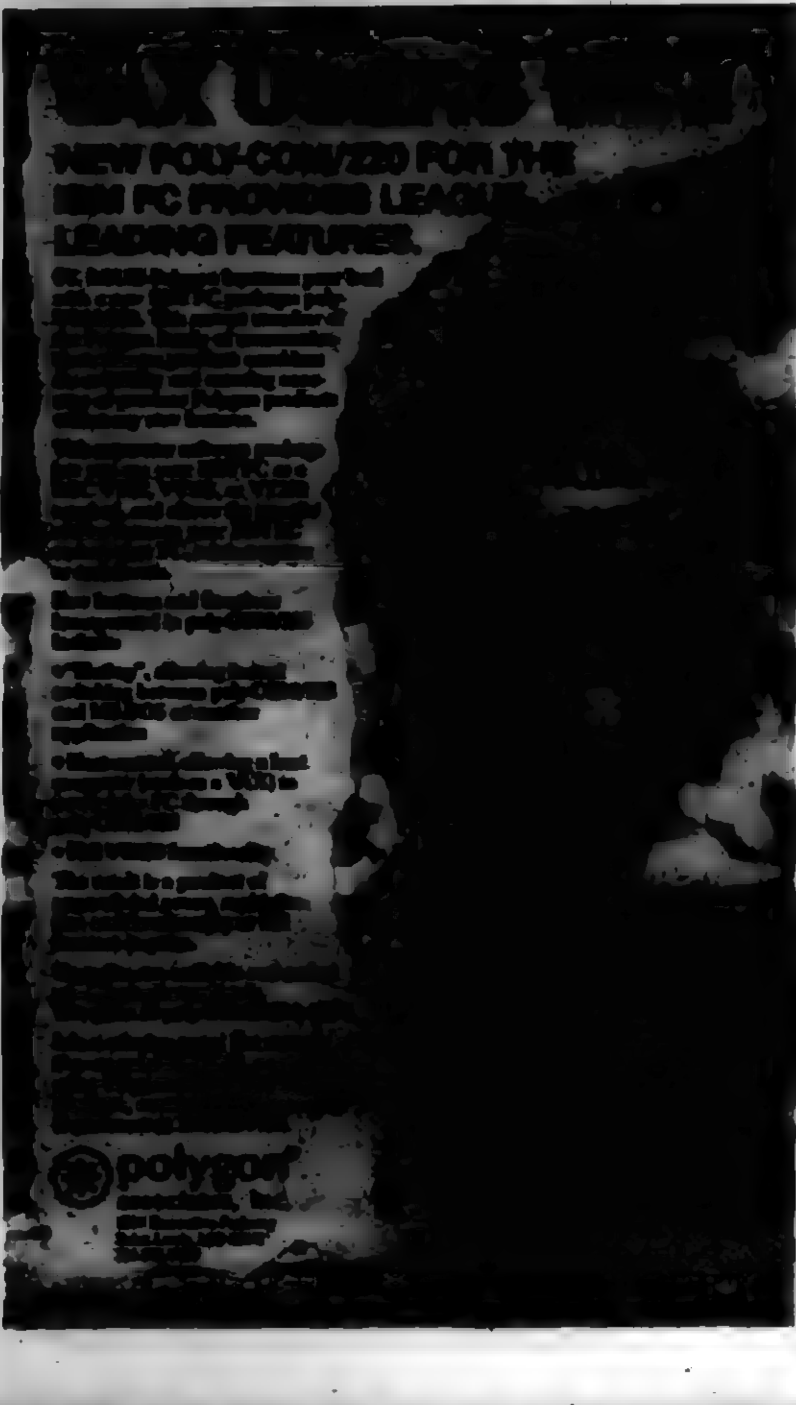
SOLANA BEACH, Calif. — Kaypro Corp. has announced a hard-disk version of its 286I, a machine said to be compatible with the IBM Personal Computer AT.

The 286I Model C, priced at $4,795, reportedly offers 20M bytes of formatted hard-disk storage. It also includes 640K bytes of random-access memory and Microsoft Corp.'s GW-Basic programming language, the vendor said.

Also included are a 1.2M-byte diskette drive and seven open expansion slots. According to Kaypro, the machine offers parallel and serial ports and support for up to eight additional users.

The unit is currently available, the vendor said.

Kaypro is located at 533 Stevens Ave., Solana Beach, Calif. 92075.



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MICROCOMPUTERS

Polygon Associates unveils terminal emulation package

ST. LOUIS — Polygon Associates, Inc. has introduced its Poly-Com/220 terminal emulation and file transfer software, an addition to the company's family of terminal emulation and file transfer programs.

The Poly-Com/220 package reportedly allows the IBM Personal Computer to be used as a Digital Equipment Corp. VT52, VT102 and VT220 terminal and allows file transfers between the IBM Personal Computer and another IBM Personal Computer or a DEC minicomputer.

Poly-Com/220 resides in the microcomputer's memory and can be accessed by a hot key.

All VT100 and VT200 keys are implemented, as are DEC's international 8-bit character set and the Compose key, according to Polygon Associates.

The system is backward compatible with previous Poly-Com packages. Users of previous versions can upgrade to the Poly-Com/220 version for $52.

The package costs $200, the vendor said.

Polygon Associates is located at 1024 Executive Pkwy., St. Louis, Mo. 63141.

TI dot matrix printer out for IBM micros

AUSTIN, Texas — Texas Instruments, Inc. has introduced the Omni 800 Model 880 AT dot matrix printer for use with the IBM Personal Computer XT and AT, TI Business-Pro and Professional personal computers and the Apple Computer, Inc. Macintosh.

The Model 880 AT reportedly was designed for shared-resource environments and offers printing at 300 char./sec. draft mode and 75 char./sec. correspondence printing mode.

It also includes four read-only memory sockets for optional fonts and character sets, according to the vendor.

The Model 880 AT, available this month, is priced at $2,195.

TI's Data Systems Group can be reached through P.O. Box 809063, Dallas, Texas 75380.

SOFTWARE

■ Group L Corp. has introduced Textbank/PC software for managing textual information on the IBM Personal Computer XT and AT.

Textbank/PC reportedly allows users to build and search an information base, which, unlike a data base, can accommodate unstructured information. It is said to handle such textual materials as reports, correspondence and contracts.

Using Textbank/PC, a search reportedly can be made of the information base for any word, part of any word, word combination or word proximity.

Textbank/PC is priced at $995.

Group L, 481 Carlisle Drive, Herndon, Va. 22070.

■ Sentry Software has introduced Disksafe security software for hard disk drives in use with the IBM Personal Computer XT and AT and 3270 Personal Computer.

Disksafe reportedly protects a user's hard disk from unauthorized copying, viewing or manipulation. To operate, authorized users insert a

Continued on page 96

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MICROCOMPUTERS

Continued from page 55

"softkey" diskette into the A drive and enter their password. Disksafe then automatically locks or unlocks the disk. If the softkey is not inserted in the A drive, use of the appropriate password will not provide access.

The software, which requires IBM's PC-DOS 2.0 or later, costs $40.

Sentry Software, P.O. Box AL, Los Gatos, Calif. 95031.

■ Structured Software Systems, Inc. has announced HPL-Plus, an enhanced version of Hewlett-Packard Co.'s HP Language (HPL) operating system for HP's Series 200 desktop computers.

HPL-Plus includes the features of HPL Version 2.1 and also supports the HP 9133 Winchester disk drives running the double-sided, 3½-in. microfloppy disk.

HPL-Plus costs $600.

Structured Software Systems, 1072 Irick Road, Mount Holly, N.J. 08060.

■ Polytel Computer Products Corp. has announced Version 1.6 of its Keyport 300 system and development software for the IBM Personal Computer and Personal Computer XT and AT.

Keyport 300 is a touch pad with 300 programmable keys that are used to display a program's command functions with labeled or illustrated overlays. Version 1.6 includes conditional execution, which reportedly is the ability to program a key to execute only if a condition is true or false. Conditions can be set to include finding which key was previously pressed and certain clock times or dates. The version includes numeric and string variables, which can be assigned, passed, mathematically manipulated and tested.

Also featured is the ability to load and save a Key Definition Table (KDT), a file of previously defined Keyport keys, by pressing one key, the vendor said. Subdirectory path names can be used by an application developer to load or save a KDT for a novice end user.

Current Keyport 300 users will receive Verson 1.6 for a $10 handling fee. The price for new users is $195. Predesigned overlays and commands for programs such as Micropro International Corp.'s Wordstar and Lotus Development Corp.'s 1-2-3 cost $79 each.

Polytel, Suite 310, 1250 Oakmead Pkwy., Sunnyvale, Calif. 94086.

■ Dinan, Inc. has introduced insurance applications software for the IBM Personal Computer and Personal Computer XT and AT.

Compare allows insurance agents to identify small-group health plans and provides agents with a benefit comparison of plans that meet the clients' benefits requirements, the vendor said.

The product can outline the 60 most competitive medical plans in the marketplace, ranking from least to most expensive, the vendor said.

Rates and benefits information reportedly is provided to the vendor by the plan's home office and is updated monthly. Compare costs $1,295.

Dinan, 6455 Almaden Expwy., San Jose, Calif. 95160.

■ Provue Development Corp. has announced enhancement of its Provue data base management package for the Apple Computer, Inc. Macintosh.

Provue is now said to include charts, macros, relational joining of data bases and the ability to zoom between single- and multiple-record layouts. It reportedly can produce bar, column, line, area and pie charts directly from data without cut-and-paste operations.

The package will still cost $295.

Provue Development, 222 22nd St., Huntington Beach, Calif. 92648.

See SOFTWARE page 62

AI from page 53

ations to enjoy."

But Robertson advised against expecting software "that will automate the building of expert systems, except for very standard, stereotyped systems."

■ "The marketplace is bottlenecked by support and training issues," which personal computers will help to address, said Stan Curtis, president of Gold Hill Computers, Inc.

Maintenance issues may also favor microcomputers, according to Curtis. "Walk around an AI show, and you see Lisp machines go up and down in the course of a week."

■ New applications tend to see "slow, gradual adoption," remarked Lightyear, Inc. President Terence Garnett.

"Look at spreadsheets — it's taken five years to get where we are, and that's merely an information grid that people put numbers into," Garnett said.

■ Natural-language techniques need to be more robust, give better detection of ambiguities, provide the ability to show why, and offer automatic learning capabilities, said Microrim, Inc. Chairman Wayne Erickson.

However, "if you customize natural language too much, expertise may be hidden," Erickson warned. "The need for some sort of standardization is still there."

■ Speaking of natural language, the number of AI definitions floating around more than matched the number of attendees. Among them were "anything impossible," "anything interesting" and "whatever hasn't been done yet."

"AI is not something that a program either has or doesn't have," according to Arity's Weiss. "Symbolic processing fills the gap between conventional programming and [AI]."

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LISP

from page 53

mon Lisp. "There are features in just about every other Lisp that aren't in Common Lisp," he said.

Like other users, the engineer is looking forward to a Golden Common Lisp compiler. In the worst case tested so far, the experiment planning system took five minutes to run, he said.

"Lisp is rather enormous in its memory requirements," commented Greg Kearsley, chief scientist with Courseware in San Diego, which creates customized training courses and is looking at ways to add "intelligent tutors" to its software offerings. Courseware is likely to end up developing programs in Lisp and then rewriting them in Pascal for runtime versions on personal computers, Kearsley said.

Work so far has concentrated on studying expert systems written for larger machines and then moving the software to micros, using a variety of tools. Among the AI languages used, "Golden Common Lisp was the best implemented and the best supported," he said. "It had the best code, ran the fastest and had the most complete functions."

David Touretzky, a research associate in the Computer Science department at Carnegie-Mellon University in Pittsburgh and author of a popular Lisp textbook, emphasized training rather than development. Gold Hill "probably has [created] the best introductory programming environment that I've ever seen," he said.

Ideal for teaching languages

"Lisp is the ideal language for teaching languages to humanities students," Touretzky maintained. Beginning this September, Golden Common Lisp will be doing exactly that, running on classroom micros at the university as part of an introductory computer science course.

Although the software "is not a full Common Lisp implementation," it is the closest microcomputer equivalent, Touretzky said. "It has a nice programming editor," he added. "The windowing is fairly crude, but it is there — they made a reasonable trade-off." He also praised the ability to call up on-line documentation while continuing to type in functions.

Touretzky did criticize Gold Hill for bundling a Lisp tutorial with the program, saying that many users might prefer to buy the program alone.

However, Bruce Johnson, partner in charge of AI worldwide at Arthur Andersen and Co. in Chicago, gave the tutorial good marks. Arthur Andersen uses the program primarily as a teaching aid, he said. "We're a large, distributed organization, and it's important to have people get some training before they come to our AI centers."

First shipped in November 1984, Golden Common Lisp costs $495 and includes an interpreter, editor, tutorial, on-line Help, a Lisp textbook and a Common Lisp reference manual. It requires 512K bytes of random-access memory and IBM's PC-DOS 2.0.

Eugene Wang, Gold Hill marketing vice-president, said the firm will deliver a second release of Golden Common Lisp, with a lexically scoped interpreter, in November. A compiler, priced at $495, is also scheduled for November shipment.

Additionally, a $695 native-mode version for Personal Computer AT-class machines that can address up to 16M bytes of memory will be available in December, Wang said. Users agreed that the large-memory software could make the AT particularly attractive as a low-cost Lisp development machine.

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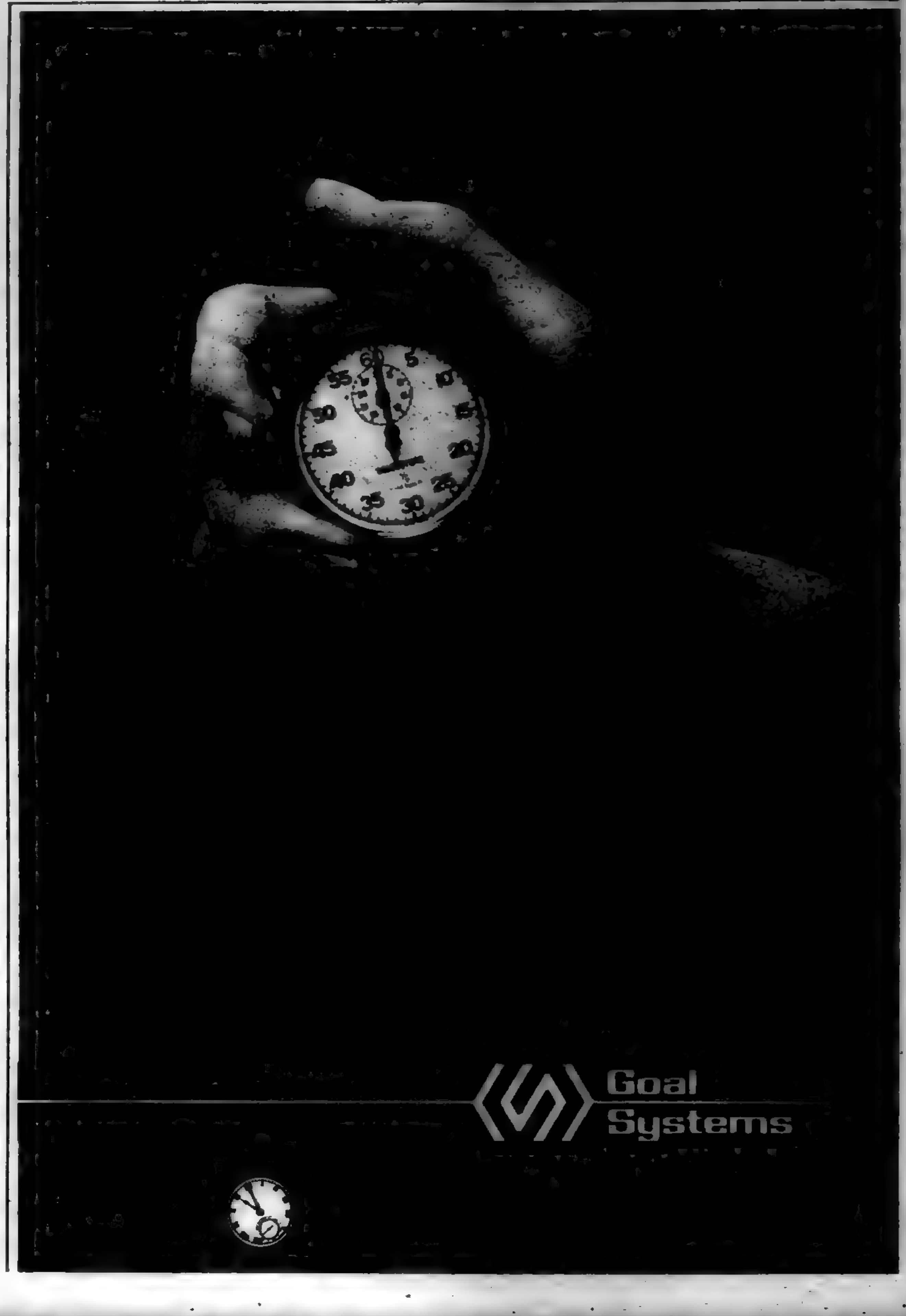

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of a phone system?

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SOFTWARE

from page 56

■ The Cadware Group, Ltd. has announced computer-aided design and engineering software that is said to allow users to create and manipulate icons for layouts and designs on the IBM Personal Computer, Personal Computer XT and AT.

The Design Graphics Software (DGS) system is said to track interactively and detect any design errors based on the design rules established by the engineer during the icon definition stage. The DGS user interface operates via a mouse-controlled cursor, the vendor said.

The DGS system requires 640K bytes of main memory, 10M bytes of hard-disk capacity and a high-resolution monochromatic bit-map graphics controller.

The single-unit cost for the software, including mouse and documentation, is $3,500.

The Cadware Group, 869 Whalley Ave., New Haven, Conn. 06515.

■ The MacNeal-Schwendler Corp. has released an interactive program that is said to automate the solution of equations used frequently in structural and mechanical engineering applications for use on the IBM Personal Computer and compatibles.

The MSC/Case program, developed by DVSE, Inc. of North Haledon, N.J., is said to have a data base that contains solutions to problems used in all phases of engineering analysis and design.

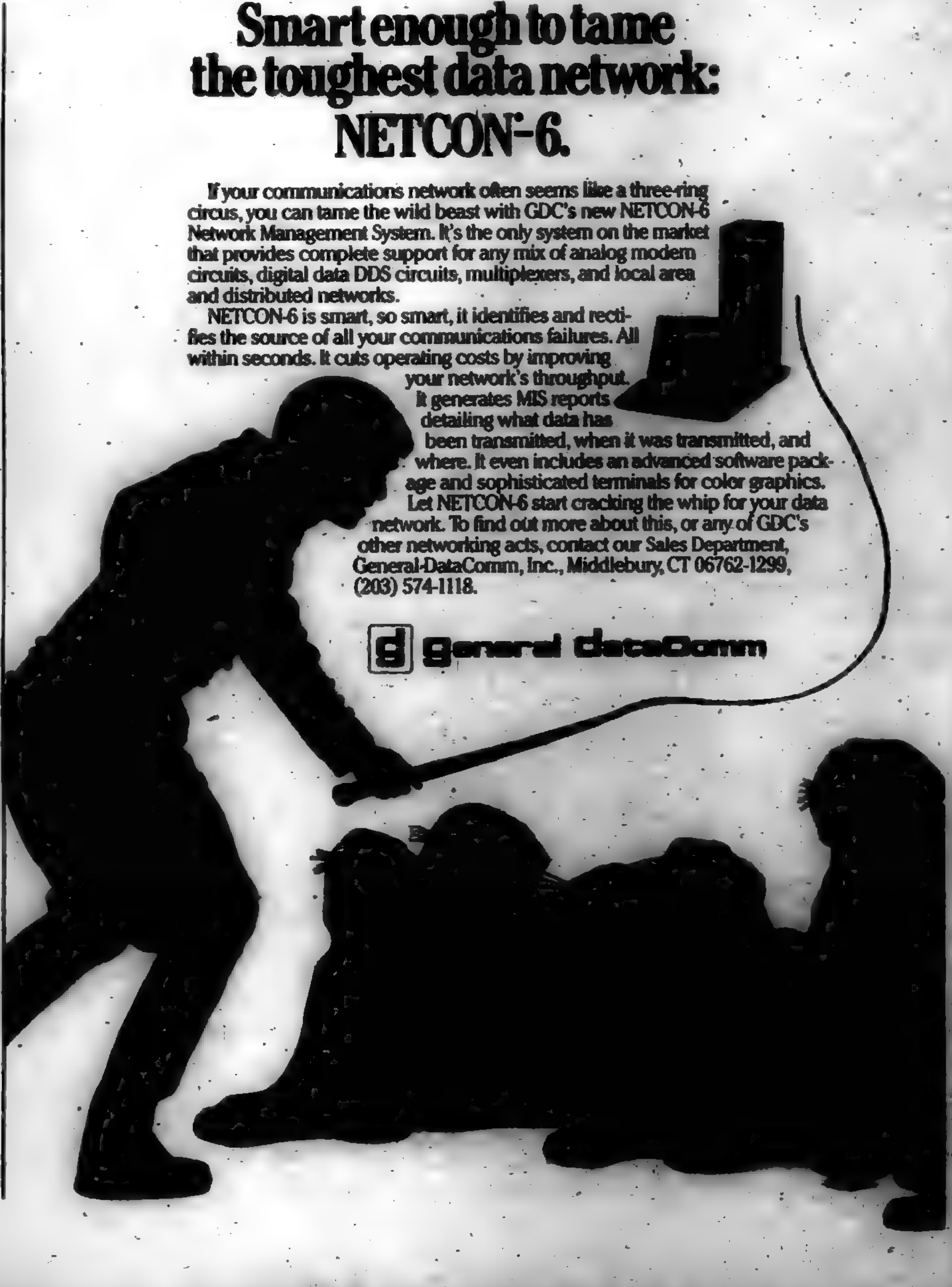
The program is said to contain the following five basic problem types: geometric and material properties; beams and columns; rings, cables, arches and frames; plates, shells and pressure vessels; and natural frequencies.

It also includes equation solutions for various stress problems. Users may append their own special-purpose programs to MSC/Case, the vendor said.

The software requires 192K bytes of random-access memory.

The package costs $895, with an introductory price of $595 available for the 90 days after first shipment, which should begin on July 1, the vendor said.

MacNeal-Schwendler, 815 Colorado Blvd., Los Angeles, Calif. 90041.



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Let NETCON-6 start cracking the whip for your data network. To find out more about this, or any of GDC's other networking acts, contact our Sales Department, General-DataComm, Inc., Middlebury, CT 06762-1299, (203) 574-1118.

General DataComm

JAZZ

from page 53

sheet, create a chart from that information and paste the chart into a word processing document. Then, if the user wants to change the numbers in the spreadsheet to reflect different conditions, they will be automatically updated in both the chart and the word processing files. This is a very slick utility, and it will be used often in businesses that have high-volume processing needs.

Jazz includes the following modules, which by themselves are fairly solid:

■ The spreadsheet is extremely powerful, offering more than 100 mathematical, financial and statistical functions, as well as a number of time and date stamps and calculations. The module is easy to use, and the user can perform tasks by pointing the mouse, using a menu or the keyboard. I created a 1,000-row by 20-col. work sheet and experienced no memory problems or lags in recalculation time.

> *The official Lotus position has been that macros are not necessary due to the ease of use the Jazz and Macintosh interfaces offer.*

The spreadsheet does not, however, offer any macro functions, which has caused much consternation. The official Lotus position has been that macros are not necessary due to the ease of use both the Jazz and the Macintosh interfaces offer, although company sources indicate that Jazz will have a macro capability in a future release.

Aside from the lack of macros, the 1-2-3 user would seem to feel at home here. One nice feature of Jazz is the ability to convert 1-2-3, Symphony and Microsoft Corp. Multiplan files to Jazz spreadsheet files. One hitch is that once they are in the Jazz format, files cannot be converted back. Lotus has promised this enhancement for Jazz.

■ The graphics module works hand in hand with the spreadsheet. To create a graph of data, one only has to define the range of cells desired, copy them to the Clipboard, open a new graphics file and "paste" them into that document. Once the values are in the chart, the user can choose from a variety of chart and plot types. Embellishing the chart with text, headers, footers and the like is very simple. A finished chart can be printed on its own or pasted into a text file and printed as part of a report.

■ The word processing module is vanilla — no indexing, special margin or multicolumn text options — but it should do the job for most average office uses. It is almost a carbon copy of Apple's Macwrite, though it does offer a few enhancements, such as Hotview, a backward search and time-, date- and page-stamping features.

Memory availability was a problem. I frequently was unable to perform a search or to cut and paste text due to insufficient memory. While I never lost any data, in order to continue I had to close all open files on my screen. One time I received the insufficient memory message when the document was the only open file.

■ The data base and forms generation module is also very basic and not at all

See JAZZ page 64

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Each directory of computer installations lists 16,000 computer users covering the NY Metro Area (NY, NJ & CT), and the Mid-Atlantic States (PA, VA, MD, DC, WV & DE).

Each site includes a profile of the hardware installed, software installed, (languages, databases, etc.), consultants used, future plans, applications and DP executives' names, titles, and phone numbers. An index provides quick access to 133 cross references by hardware, software and industry. Price: NY-$370 and MA-$295. Call (212) 683-0606. Computer Management Research, Inc. 20 Waterside Plaza, NY, NY 10010.

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JAZZ

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suited to high-powered reporting. It offers sort and query facilities that are quick (a 2,000-record sorted on three categories in under 10 seconds) and you can use relational operators to find records. This module could be used effectively for a small (fewer than 4,000 records) data base, but any user who needs a data base that offers linked records and high storage capacity should look elsewhere.

The reporting facility is not as user-friendly as are the other modules. In creating a basic report, it took four tries before I got what I wanted.

■ The communications module again offers basic functions that the average user would need but that a more advanced user might feel stymied by. Users can send and receive files via another computer or an information service.

I was unable to hook into the Compuserve network. It seems that Jazz has a problem with control sequence characters, and Compuserve requires a Control-C to log on. Aside from that, almost all of the parameters are variable — bit/sec. rate, stop bits, terminal emulation and protocol, for example.

Some misgivings about Jazz include the following:

■ Any user who plans to use Jazz with frequency should get a hard disk drive. Jazz is billed as a program for a 512K Macintosh with an external floppy drive, though when I used Jazz with this configuration, I found access times and program response times very high. The program takes up huge amounts of space, both in the system and on a disk, and requires a fair amount of disk swapping when storing data files. When Jazz was installed on a hard disk, the speed picked up to the point where calculations and operations were extremely quick.

A related point is that the instructions for putting Jazz on a hard disk are confusing and very short.

While the documentation is generally excellent, the main handbook does not offer any real troubleshooting help. If you have a problem or get a cryptic error message, your only hope is a toll call to Lotus' Jazz support line. The support personnel have been courteous and helpful, but they will be very busy if any serious problems come up.

Jazz is copy protected and, while a backup disk is provided, a program disk must be kept in the disk drive. The possibility of a new user or a power glitch accidentally erasing the disk does not sit well with me. The only recourse in such a case is to send the disk back for a replacement, which is free during the 90-day warranty period and costs approximately $25 thereafter.

> 99
>
> *The support personnel have been courteous and helpful, but they will be very busy if any serious problems come up.*

Impressive software

Jazz is a very impressive piece of software. Almost all of the major bugs seem to be cleared out of the package, and I was able to crash Jazz only twice — both times when using the communications module and a hard disk.

Jazz's communications module defaults to the modem port, which some hard disks use as the connection to the Macintosh. Users can change a file so that it uses the printer port as the modem port, but they cannot change the default. This is more of a Macintosh problem than a Jazz problem.

In terms of integration, Lotus has done a very nice job. Hotview allows almost all data on open files to be updated, and the feature can be turned off as easily. Switching between files and modules also is simple. Lotus deserves praise for the simplicity of the interface — everything can be called up via menu choices regardless of the module being worked on. Going from one open file to another is not instantaneous, but it is generally quick.

Lotus claims to have conducted a great deal of research into integrated software and states that Jazz is its answer to the office worker's needs. This could very well be true. Time and sales will tell.

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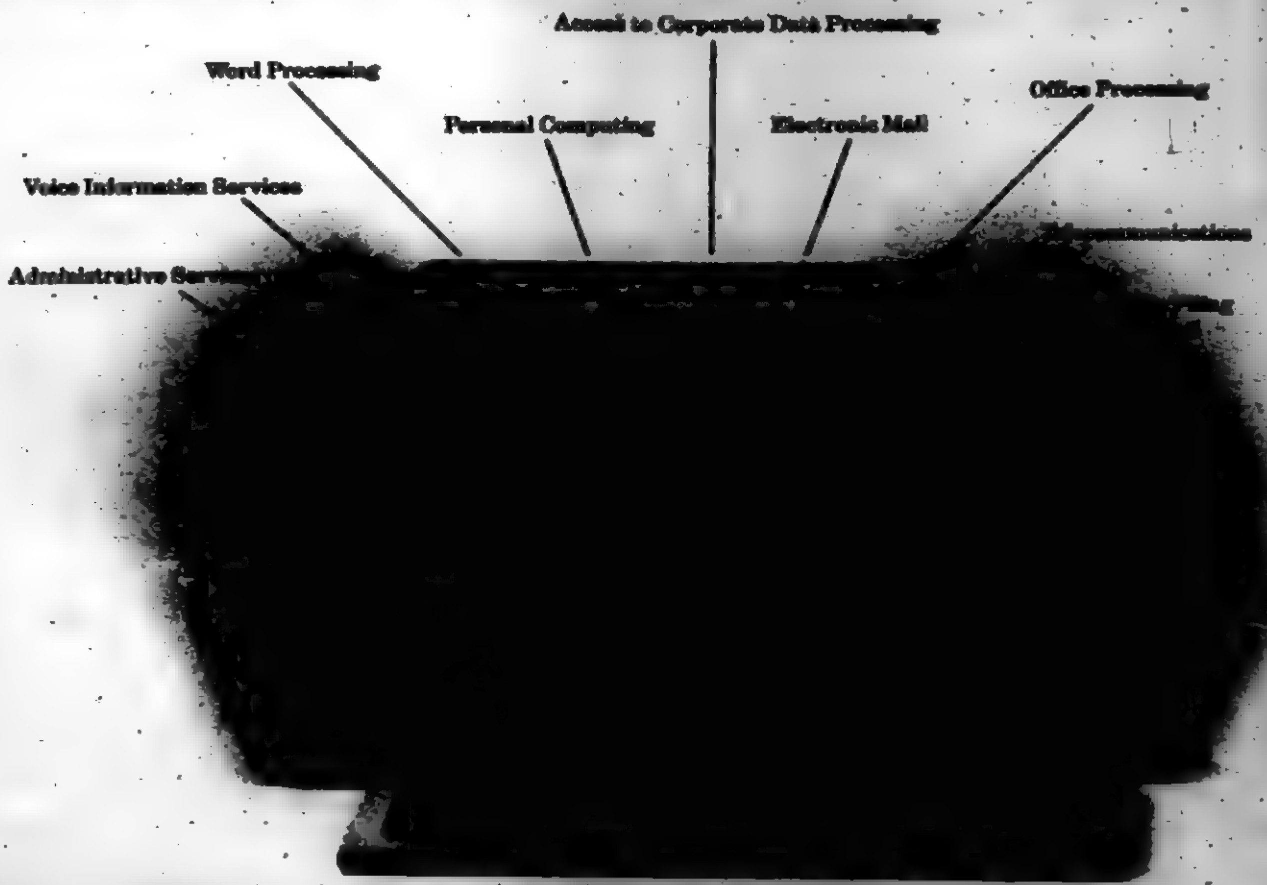

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COMMUNICATIONS

DATA STREAM
John Dix
CW Senior Editor

Will networks tell Big Brother all?

The Orwellian concept of Big Brother has been beaten to death, but developments in communications merit pulling the metaphor out of the attic for yet another flogging.

Over the last several years the general public has become more aware of privacy breaches that are being made possible through the common use of computers and communications.

For now, most people are indifferent to the information that, for example, large credit authorization companies can amass regarding personal data such as how much you spent where and on what. This is indicative of a blind — most would say necessary — trust we have in these institutions.

Credit authorization is only the most visible spot of vulnerability. Thankfully, in the documented cases of abuse the villain is not the network or service operator nor typically associated with government. But consider the growing number and type of networks and how vulnerability grows proportionally.

Financial institutions and their networks can provide a wealth of personal information. Beside tallying monthly transactions, the banks track movement with records of where, when and how much money customers remove from automatic teller machines. Their tentacles reach across the country as participants in credit card organizations, tirelessly tracking and logging data on where people stay, where they eat and what type of entertainment they prefer.

The advent of the smart card — credit cards outfitted with memory circuitry that can store whatever the issuer may wish — will exacerbate the situation, serving as color- and number-coded tags stapled to our ears like those used to study wild animals "for their own good."

The gaps in the reach of standard bank revolving credit card accounts are already

See BROTHER page 69

Racal-Vadic introduces statistical multiplexer

MILPITAS, Calif. — Racal-Vadic, Inc. has introduced a four- or eight-channel asynchronous statistical multiplexer that can reportedly be used with leased or dial-up lines.

The 7400 Series Statistical Multiplexer is available stand-alone or with an internal 4.8K bit/sec. or 9.6K bit/sec. leased-line modem or a 2,400 bit/sec. dial-up modem.

Both the four- and eight-channel device reportedly can support channel speeds of up to 9.6K bit/sec. over a 2,400 bit/sec. dial-up link when outfitted with that modem option. This is made possible with the use of buffers and because of the inherent idle time associated with asynchronous devices, according to Racal-Vadic product manager Ric Clania. "Data comes in at 9.6K [bit/sec.], is stored and [is] clocked out at 2,400 bit/sec.," Clania said.

The 2,400 bit/sec. modem autodials the line when a port user hits a return key and takes the link down after a predetermined amount of idle time.

Users with heavier demand can outfit the 7400 with an internal 4.8K bit/sec. or 9.6K bit/sec. leased-line modem. Both of these modems have a dual-dial back-up capability whereby both modems call each other if the leased circuit goes down. The devices automatically switch back to the leased link when it is restored.

Another 7400 option is the Help mo-

See RACAL page 69

INI announces VLSI chip set

SANTA CLARA, Calif. — Industrial Networking, Inc. (INI) has developed a very large-scale integration (VLSI) chip set that meets General Motors Corp.'s Manufacturing Automation Protocol (MAP) specifications for factory networks.

The two-chip set works with Cmos gate-array technology and is said to be compatible with Level 1 and Level 2 of the IEEE's 802.4 token-passing bus standard. These levels define standard physical and data link layers for a local-area network.

The chip set will be used by INI in its MAP products and will not be sold separately, the company reported. INI will supply Intel Corp., Motorola, Inc. and GM with MAP components and systems.

INI is a joint-venture company formed by Ungermann-Bass, Inc. and General Electric Co.

Ultimate's Ultinet out

EAST HANOVER, N.J. — Ultimate Corp. has announced Ultinet, a network system for its family of minicomputer systems for data base management.

Ultinet is said to enable Ultimate data base systems — which consist of a coprocessor, proprietary operating systems and either a Digital Equipment Corp. or Honeywell, Inc. computer — to be interconnected with local-area networks, wide-area networks or public data networks through gateways.

Based on the International Standards Organization's Open Systems Interconnect architecture, Ultinet is said to support communications through Ethernet-type local networks, the High-Level Data Link Control protocol and GTE Telenet Communications Corp. and Tymshare, Inc.'s Tymnet

See NETWORK page 68

■ RAD Computers has announced a miniature two-channel time division multiplexer with a built-in short-haul modem/68

■ NCR Comten recently unveiled a release of its Comten X.25 interface to Packet-Switched Data Networks/68

■ American Photonics has introduced a multiplexer that combines 24 RS-232 channels over a fiber-optic link at distances up to 10 kilometers, or with optional wire output, over T1 metallic circuits/68

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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis, and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from mainframes to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

■ Why not Cullinet, ADR or Focus? There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as *the* standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language - each one painting the user into its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few shops nowadays run only IBM mainframes. Why, then, even consider a database solution that runs *only on IBM mainframes?* Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE *are* identical.

FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

■ Why not just go with DB2 or SQL/DS? A relational DBMS simplifies but does not by itself eliminate application programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are somewhat unlikely ever to run on another vendor's system). ORACLE runs on more IBM hardware and operating systems than do IBM's relational products.

■ What about Goldengate, dBase III, Symphony or Framework? PCs need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload.

ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 1060.

CONTROLLERS

■ MDB Systems, Inc. has announced a communications controller for Digital Equipment Corp. Unibus-based systems that is said to support up to 256 users and provide the asynchronous capacity of 16 DEC DHU11 controllers.

The MDB-DHU-A32 runs under DEC RSX11-M, RSX11-M Plus, RSTS/E and VMS operating systems. The controller is said to offer better performance than DEC DZ and DH11 controllers because of its capability to switch between direct memory access (DMA) and programmed I/O silo mode. Short messages are sent directly via programmed I/O mode, where there is no DMA setup time involved, while longer messages sent via DMA are not broken up, the company said.

The board supports slave boards through a parallel bus interface. This bus interface uses dual 34-conductor I/O cables to interconnect up to 16 slave boards that can be located at distances up to 1,000 ft, the vendor reported.

The MDB-DHU-A32 costs $3,200.

MDB Systems, Box 5508, 1995 N. Batavia St., Orange, Calif. 92667.

■ NCR Comten, Inc. has announced a version of its Comten X.25 Interface to Packet-Switched Data Networks, a software product that is said to provide features equivalent to IBM's NCP Packet-Switching Interface (NPSI) Releases 3.1 and 4.0.

The Comten NPSI module is said to offer an optional module that enables users to access applications programs designed for IBM's NPSI.

The product consists of a number of parts that carry yearly license fees: Basic X.25 Network Interface with a fee of $3,300, Network Administrative Profiles with a fee of $528, NPSI Packet Adapter with a fee of $1,045 and Extra Capability Modules with a fee from $1,650 to $3,520.

NCR Comten, 2700 Snelling Ave. N., St. Paul, Minn. 55113.

SOFTWARE

■ Western Union Corp. has introduced communications software that enables users of Digital Equipment Corp.'s VAX processors to access Western Union's Easylink electronic mail and telex network.

Developed by Alisa Systems, Inc., the Alisa Connection provides two-way communication between VAX electronic mail system and Easylink.

Message delivery options include an Easylink mailbox, Mailgram messages and Express Document.

The Alisa Connection costs $1,850 per Easylink account.

Western Union, One Lake St., Upper Saddle River, N.J. 07458.

MULTIPLEXERS/ MODEMS

■ American Photonics, Inc. has introduced a multiplexer that combines 24 RS-232 channels over a fiber-optic link at distances up to 10 km, or, with optional wire output, over T1 metallic circuits.

The APM2320 can be daisy-chained together to provide multidrop or modified drop-and-insert capabilities that enable intermediate nodes to be recognized or bypassed, the vendor said.

On the channel side, the device is said to accept up to three duplex data channels per conductor, or combinations of data and control channels such as one data channel and two control channels.

The product supports asynchronous data transmission at speeds up to 19.2K bit/sec.

The multiplexer costs $1,500, the vendor said.

American Photonics, P.O. Box 299, 71 Commerce Drive, Brookfield Center, Conn. 06805.

Multiplexer with built-in modem unveiled

RAD Computers, Inc. has announced a miniature two-channel time-division multiplexer with a built-in short-haul modem.

MMM is said to support either asynchronous or synchronous full-duplex transmission. Each channel operates at speeds up to 19.2K bit/sec. in synchronous mode or 9.6K bit/sec. in asychronous mode. Link speeds range up to 38.4K bit/sec. over four-wire cable at distances up to five miles.

The integral modem is synchronous and works with Eurocom D1 modulation. It features transformer isolation that provides lightning protection and blocks out noise.

The unit weighs 7 oz and costs $350.

RAD Computers is located at 40 N. Van Brunt St., Englewood, N.J. 07631.

NETWORK

from page 67

packet networks.

The gateways are said to support file transfer and terminal emulation capabilities.

A network management package enables a user to configure a system, perform network diagnostics and obtain performance statistics.

Ultinet costs approximately $38,000 per network CPU.

Ultimate is located at 717 Ridgedale Ave., East Hanover, N.J. 07936.

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LOCAL-AREA NETWORKS

■ Bridge Communications, Inc. has introduced a modem for broadband local networks that reportedly supports High Level Data Link Control (HDLC), Synchronous Data Link Control (SDLC) and bisynchronous protocols.

The synchronous Model 316 Broadband Modem supports point-to-point or multidropped connections on two-way coaxial cable nets at speeds up to 64K bit/sec. Up to 20 simplex or 10 duplex channels can be operated in each 6 MHz broadband channel, the vendor reported. The product's frequency-agile design enables the transmitter or receiver to operate at any of 20 300-KHz subchannels.

The modem's biphase data encoding provides protocol transparent transmission. An on-board micro enables link testing with remote loop-back in-band signaling and local loop-back. The product costs $1,795.

Bridge Communications, 1345 Shorebird Way, Mountain View, Calif. 94043.

■ Cabletron has introduced TDR 5000, a portable device that tests coaxial connections on a local-area network.

The product, a time-domain reflectometer, checks a network's coaxial cables, connections and taps. The product employs a negative pulse technique that tests faults on baseband or broadband networks. When testing with negative impulse, baseband networks can be tested while idle.

The product works with a number of networks including those from Applitek Corp.; Digital Equipment Corp.; Wang Laboratories, Inc.; Bridge Communications, Inc.; Corvus Systems, Inc.; Excelan; Interlan, Inc.; Sytek, Inc.; Ungermann-Bass, Inc.; Xerox Corp.; and 3Com Corp., the vendor reported.

TDR 5000 costs $4,500.

Cabletron, 196 Pleasant St., Ashland, Mass. 01720.

TEST EQUIPMENT

■ International Data Sciences, Inc. has introduced its 5000 series of network test equipment.

The series consists of the Model 5100 hand-held data communications test set, the Model 5200 multispeed data communications test set and the Model 5300 data network/protocol analyzer.

The products can be used separately or in concert, according to the vendor. For example, a Model 5300 can transmit software over an asynchronous link to a Model 5100 or a Model 5200. Test results can be sent back to a Model 5300 where they can be analyzed.

The test equipment is said to provide a number of functions including testing of low- and high-speed error rates, trap and monitor transmission and polling. Each product has an RS-232 remote control port that allows test software and results to be transmitted to various locations.

Product prices range from $895 to $3,995.

International Data Sciences, 7 Wellington Road, Lincoln, R.I. 02865.

RACAL

from page 67

dem, an AT&T 103-type diagnostic modem with autodial and answer capabilities. This modem reportedly calls a preset telephone number to report problems.

The 7400 reportedly enables all channels to be prioritized and provides both in- and out-band flow control. Configuration is said to be performed though software.

The basic four-channel 7400 costs $1,295. The 2,400 bit/sec. modem option costs $995, the 4.8K bit/sec., $1,100, and the 9.6K bit/sec., $1,550. The Help modem costs $165.

Racal-Vadic is located at 1525 McCarthy Blvd., Milpitas, Calif. 95035.

BROTHER

from page 67

filled in by such things as retail and gasoline company credit cards. Now some of the nation's largest retailers — many of which are conglomerates controlling such things as banks and real estate firms — offer transaction processing services to other companies. The retailer's power as information controller is further strengthened by the fact that many chains also accept payments for utilities.

Telephone companies also collect reams of data. Beside the monthly bills outlining places called, call holding times might indicate use of telecommunications facilities for computer use. Travel is documented through use of calling credit cards and records document use of mobile telephones. When you're not on your phone, Big Brother might be peering into your home by monitoring the use of cable TV.

All these points of vulnerability presume that a malicious entity is waiting to exploit them. Perhaps an even more ominous threat is the idea of that entity being a machine — a machine that gathers information and calls other machines to deposit the cache.

While nonthreatening, it may be telling that some soda machines are now equipped to call the distributor who services them and report when they need filling or when they are damaged. On a higher plateau, IBM's recently announced 3090 processor series is said to be capable of automatically calling IBM service representatives to report problems.

Couple this capability with the networks outlined above and you can come up with a rather chilling scenario.

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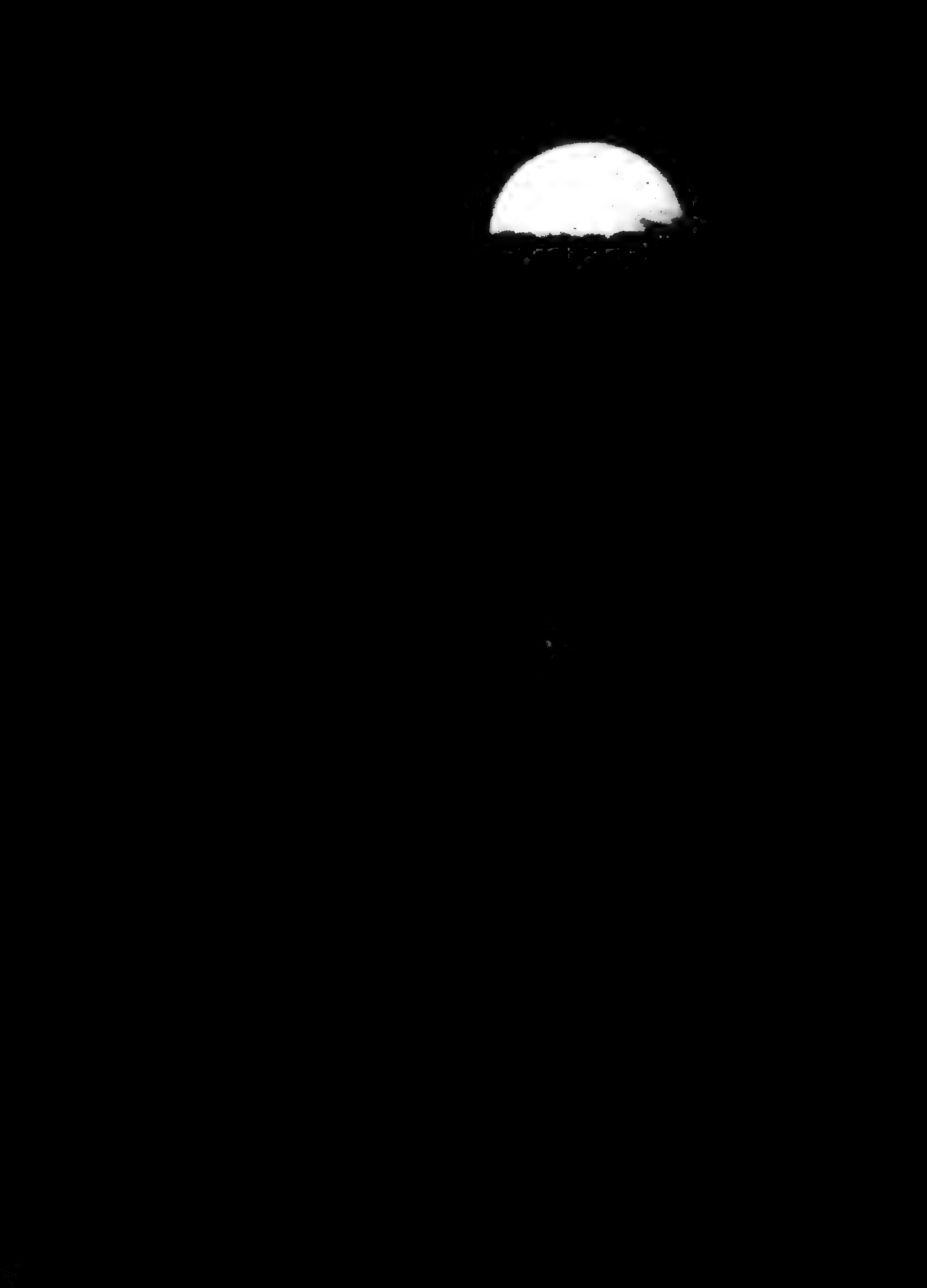

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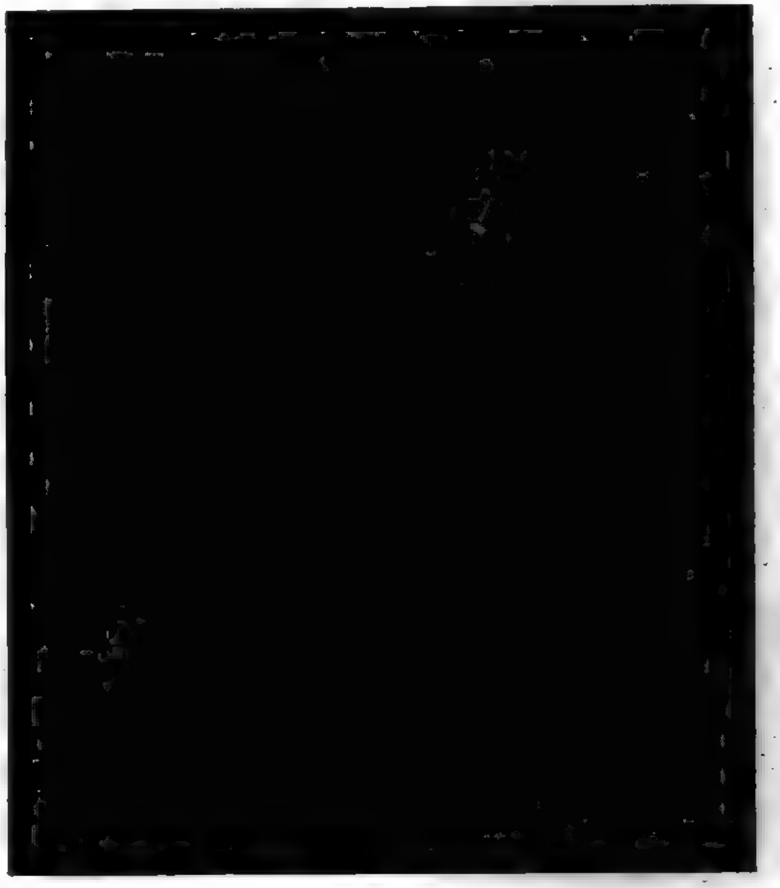

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SYSTEMS & PERIPHERALS

DEC unveils single-user workstation

Ada machine enhances program development

MAYNARD, Mass. — Digital Equipment Corp. has announced a single-user development workstation system for Ada language programmers.

The Ada Programmer's Vaxstation II, which runs under DEC's MicroVMS operating system's workstation version, allows users to develop programs with the government-validated VAX Ada compiler. The machine is a special configuration of the Vaxstation II workstation, the company said.

The workstation is said to operate as a stand-alone system or can be networked to other VAX-based computer systems. It features an editor, networking capabilities, windowing capabilities and a 1,024- by 864-pixel resolution monitor, the vendor said.

A configuration consisting of a Microvax II system with 3M bytes of memory, expandable to 9M bytes; a 71M-byte Winchester disk drive; a ¼-in. streaming tape cartridge; a 19-in. monochrome terminal with a three-button mouse; a keyboard; a Decnet/Ethernet interface; and associated network software costs $39,300. It includes licenses for the MicroVMS operating system's workstation version, the VAX Ada software, the VAX Graphic Kernel System package, the VAX Language-Sensitive Editor and the Decnet end-node software.

Additional information is available from DEC, which is located in Maynard, Mass. 01754.

Ridge Computers adds four Risc processors

SANTA CLARA, Calif. — Ridge Computers added four processors to its line of reduced instruction set computer (Risc) systems that are aimed at computationally intensive tasks.

Called the 32/110, 32/130, 32/310 and 32/330, the units differ in terms of size, the number of users supported, the number of peripherals that can be attached and the amount of main memory, the company said.

The 32/110 features the company's standard CPU, a 78M-byte disk drive, a 1M-byte floppy disk drive, 4M bytes of main memory and four expansion slots. It costs $39,000.

The 32/130 comes in the same basic cabinet as the 32/110 but includes a 150M-byte disk drive, a 1M-byte floppy disk drive, 4M bytes of main memory and four expansion slots. The unit also includes an enhanced CPU, which is said to improve execution of floating-point instructions by 100% to 300%. The system costs $47,000, the vendor said.

The 32/310 includes a 150M-byte hard disk drive, a 1M-byte floppy disk drive, a standard CPU, 4M bytes of main memory and nine expansion slots. It costs $56,000.

Ridge's top-of-the-line 32/330 includes 8M bytes of main memory, a 150M-byte hard disk drive, 1M-byte floppy disk drive, eight expansion slots and the CPU

See RIDGE page 75

Parallel Computers introduces two Unix-based mini models

SANTA CRUZ, Calif. — Parallel Computers has taken the wraps off a pair of minicomputers, based on redundant, self-checking architecture, that use the AT&T Unix operating system.

The 300 Extended Reliability (XR) series, composed of the Model 30 and Model 40 machines, has duplicate CPUs, memory, disk subsystems and power supplies so that if a component fails, its twin maintains operation, the vendor said. The computers are said to be safe from external power problems by uninterruptible power supply systems.

The Model 30 supports eight users and has 1M byte of main memory, an 84M-byte hard disk drive and a ¼-in. streaming tape drive. It costs $59,900.

The Model 40, which costs $74,900, supports 16 users and has 2M bytes of main memory, 168M bytes of hard-disk storage and the ¼-in. streaming tape drive.

Both machines can be expanded to support 32 users. A five-year warranty costs $9,000. The previously released 300 family can be field upgraded to the 300 XR series and is then eligible for the warranty.

Additional memory is available in increments of 1M byte, 2M bytes and 4M bytes per processor, as it is a dual-processor system, and the memory costs $8,600, $16,200 and $30,400, respectively.

Parallel Computers, 3004 Mission St., Santa Cruz, Calif. 95060.

- Competitive Computer Systems unveiled two supermicros based on National Semi's 32016 microprocessor/74
- System Industries introduced a band printer for DEC PDP-11 and VAX series processors/75
- Digi-Data announced a tape subsystem that offers a serial communications link between RS-232 ports and IBM-compatible tape drives/75

INSIDE

Processors/74
Graphics Systems/74
Data Storage/75
Terminals/75
Printers/Plotters/75

Survey predicts IBM 3080 demise

FRAMINGHAM, Mass. — Despite its claims to the contrary, IBM may soon lay its 3080 line of mainframes to rest. According to a market research firm here, if IBM extends its midsize 4381 line upward to the 12 million instructions per second (Mips) range and announces a low-end version of its 3090 processor operating in the 14-Mips to 15-Mips range, the 3080 series machines could be squeezed from the market. (Last week, IBM announced a 6% price reduction on its 3080 base model and Model X machines.)

International Data Corp. (IDC), in its Quarterly Residual Value Memo for the second quarter of 1985, noted that at present, used 3080 machines are in short supply. Current fair market values for 3080 machines as of late March ranged from 60% of their list value for the 3081 Model D to 70% for the 3084 Model Q. Inexpensive imports of the 3080s that had been coming over from Europe have ceased, and user installation of additional 3080 machines to meet current performance requirements have caused the prices on used 3080s to rise somewhat, the report stated.

Users of 3084 Model QX machines seeking more power will either have to invest in the $5 million 3090 Model 200 or turn to the used 3081 Model K and 3084 Model Q market for their purchase or lease alternatives, the report said. The 3081 Model K user must weigh the cost advantage of a 3084 upgrade against how quickly his performance needs are growing.

There will also be a lot of activity in the market for used 4381 machines. IDC said that 30.6% of the superminicomputer users surveyed expect their processing power to grow from 26% and up through 1987. A secondary market for 4381s has developed, with machines coming over from Europe as a result of the exchange rate. With 4381 Model 3s due to ship this quarter, the 4381 will continue to be the mainstay of IBM's mid-range systems for some time, the report said.

Spark in 4341 mart

The higher end 4341 market continues to show some spark, the report said, because users realize the bargain prices these machines currently have. Any upturn in the 4341 marketplace will be short lived, as the machines are not upgradable. Demand for used 4331 and 4361 machines is sluggish.

In the used IBM disk product market, the older 3380s show a fair market value of 88% of their IBM list price. There is not an abundance of these units on the market, the report said. This disk drive is still a product worth considering, even though the old units are not upgradable to the 3380 AD4s, BD4s, AE4s and BE4s, IDC said. Current fair market value for the 3880 Model 1 controllers is in the low 70% range, while the Model 3s are around 80%, the report stated.

See 3080 page 74

Plexus announces supermicro system

SAN JOSE, Calif. — Plexus Computers, Inc. has released its Plexus P/20 supermicro that incorporates dual Motorola, Inc. 68010 microprocessors, a small computer systems interface (SCSI), an Intel Corp. Multibus interface and the AT&T Unix System V Release 2.0 operating system.

The machine, which costs $10,950 in single quantities, is part of the Plexus P/15 family and is said to be suited to office automation, transaction processing and industrial applications. The system's SCSI bus will accept up to seven storage devices, including 142M bytes of Winchester hard-disk storage. The Multibus permits addition of an eight-serial-port controller board to provide up to 16 serial ports, the vendor said. The board costs an additional $3,450 in single quantities and $2,070 in OEM quantities, a spokesman said.

The dual-processor architecture incorporates a job processor and a supplementary direct memory access controller for I/O, the vendor said. Both processors access the same block of memory.

The eight-user P/20 system, with a 24M-byte hard disk, 1M-byte unformatted floppy disk and 512K bytes of memory, costs $10,950 in single quantities and $6,025 in OEM quantities.

More information is available from Plexus Computers, 3833 N. First St., San Jose, Calif. 95134.

PROCESSORS

■ Competitive Computer Systems, Inc. has released two supermicrocomputers based on National Semiconductor Corp.'s 32016 chips, which provide a 32-bit environment with demand page virtual memory and a floating-point processor.

Both systems use an Intel Corp. Multibus interface and National Semi's Genix operating system. The Series I machine comes with 1M byte of random-access memory (RAM), a 40M-byte hard disk drive and a 1M-byte, 5¼-in. floppy disk drive for backup.

The Series II multiuser machine (for up to 12 users) features a 300M-byte hard disk drive and a Pertec Computer Corp. ½-in. streaming tape backup. It has 1M byte of RAM and a serial board hooked to 12 serial ports. It comes with Genix, C and Fortran compilers.

Options available include added tape backup, ports, terminals and hard-disk storage.

The Series I costs $17,995, and the Series II costs $39,500.

Competitive Computer Systems, Suite 211, P.O. Box 269, 48 W. Chestnut St., Lancaster, Pa. 17608.

GRAPHICS SYSTEMS

■ Perkin-Elmer Corp. has announced that the Tektronix Corp. family of computer graphics products is now available to users of its Series 3200 superminicomputer.

The Tektronix applications range from text editing to computer-aided design and manufacturing. The Tektronix 4100 and 4110 series display terminals feature high resolution, color and local graphics segment manipulation. Color graphics copiers are available for both terminals.

The 4695 copier functions as both a hard-copy device and dot matrix character printer, the vendor said. The 4691 copier, compatible with the 4113 and 4115 terminals, is said to produce copies for up to four terminals concurrently. The Tektronix Plot 10 software reportedly provides a set of tools for developing graphics applications on Tektronix terminals.

Prices for the Tektronix graphics packages range from $3,995 to $22,950, depending on module quantity. The color graphics copiers range in price from $1,595 to $12,950. The Plot 10 interactive graphics library costs $4,000 to $18,000, and the Plot 10 terminal control system costs $2,000.

PE, Data Systems Group, 2 Crescent Place, Oceanport, N.J. 07757.

3080

from page 73

The market for IBM 3350 disk drives may disappear within the year, the report said. There is an abundant supply of 3350s, and their fair market value is around 10% of retail.

The 3370 A1 and B1 information shows that the product is in demand. The A1s are at 55% of fair market value. The 3370 boom may be experiencing positive backlash from 4300 user demand, the report said. Values of the 3375 disks were up to approximately 70%, probably because of the lack of 3380s on the market.

IBM 3480 tape drives are starting to hit the street, creating a surplus and driving current fair market values down, the report said. The 3420 Model 4 is fading fast. It goes for about 35% of the list price for single-density machines and 40% for dual drives. Prices of the Model 6 have declined, but IDC expects DP shops to pick those up to replace Model 4s. Trades are reportedly at 56% for dual-density drives.

Perhaps the last viable 3420, the Model 8, has also shown a dip in residual value. The Model 8 drives, which, because of a shortage from IBM, had been selling on the used market for above IBM list prices, have begun to decline. IDC said single-density 3420s now sell for about 85% of list value and the double-density models sell for about 86% of list.

IBM's contention that the 3420 will not immediately vanish from most computer rooms — it said it expects the average future shop will consist of 30% 3420s and 70% 3480s — will continue to enhance the Model 8's longevity, the report added.

Because IBM can now meet user demand for 3803 Model 2 tape controllers, the price has fallen to 94% of list.

IDC, 5 Speen St., Framingham, Mass. 01701.

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DATA STORAGE

■ Digi-Data Corp. has announced a magnetic tape subsystem said to provide users with a serial communications link between an RS-232 port and an IBM-compatible tape drive.

The subsystem includes Digi-Data's Model 1000 controller, which accepts 7- or 8-bit data at asynchronous transfer rates from 110 to 19.2K bit/sec. It also includes Digi-Data's Model 2010 nine-track, 1,600 bit/in., ½-in. magnetic tape transport. The drive is said to accept any Ansi/IBM standard ½-in. tape on reels up to 10½-in. in diameter. All 1,600 bit/in. tapes produced by the drive are said to be interchangeable with those produced on any Ansi/IBM-compatible phase-encoding transport.

Prices for the single-density tape subsystems start at $4,850.

Digi-Data, 8580 Dorsey Run Road, Jessup, Md. 20794.

TERMINALS

■ Industrial Computer Technologies, Inc. has announced that it is distributing a Chinese-English display terminal manufactured by Asia Technology, Inc. of China.

The Panda-2000 is said to work with Alphamicro Systems, Inc. computers running under Alphamicro's proprietary operating system.

The Panda-2000 translates Chinese into English and vice versa, the vendor said.

The Panda terminal — including the monitor and Chinese character generator — costs $2,400 in single quantities.

Industrial Computer Technologies, Suite E, 369 Cliffwood Park St., Brea, Calif. 92621.

PRINTERS/ PLOTTERS

■ System Industries, Inc. has released a Digital Equipment Corp. LP-27-compatible band printer that can be used with DEC's PDP-11 and VAX machines.

The SI-1200 reportedly prints at 1,200 line/min. The basic unit costs $24,000.

System Industries, 1855 Barber Lane, Milpitas, Calif. 95035.

RIDGE

from page 73

with enhanced floating-point performance. It costs $69,000.

Current users of Ridge 32C or 32S systems can upgrade their systems. A CPU optimized for floating-point processing costs $11,500; 4M bytes of main memory consisting of a circuit board made up of 256K-bit memory chips costs $17,500; Risc-optimized C and Pascal compilers cost $1,500; an Ethernet connection costs $4,000 and a 19-in. monochrome display costs $9,900.

Ridge has also announced that it is offering three specialized configurations for specific applications that are targeted at electrical and mechanical applications.

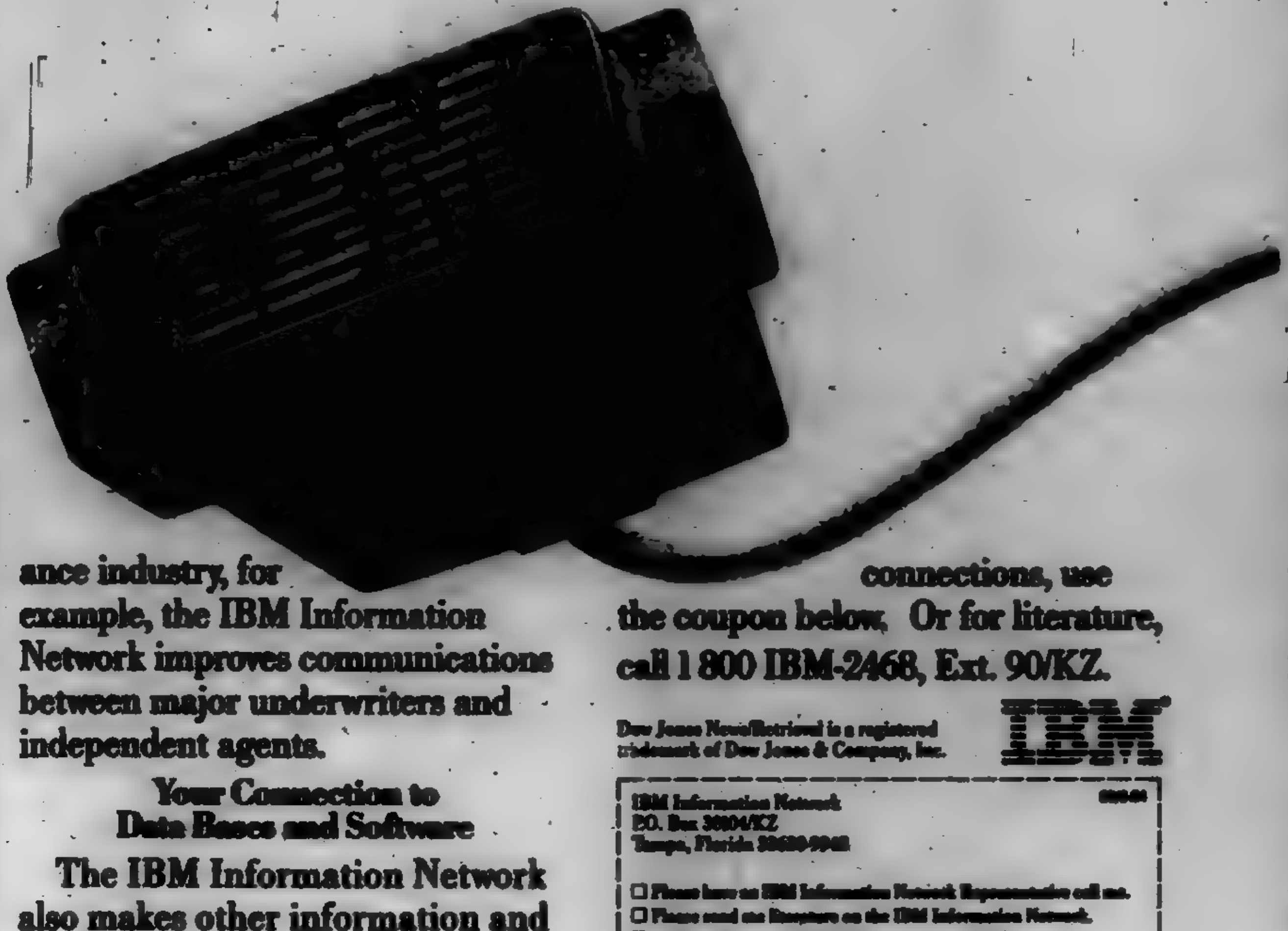
Design and Analysis System 1 was based on the 32/110 and includes a 150M-byte hard disk drive, direct Ethernet local-area network connection and a Fortran compiler. It costs $34,000.

Design and Analysis System 2 features a 32/130 system with 2M bytes of main memory, Ethernet connection and Fortran compiler. It costs $45,000.

Design and Analysis System 3 uses the 32/330 system and includes a dot matrix printer, a 1,600/3.2K bit/in. tape drive for backup, a 445M-byte hard disk drive and a Fortran compiler. It costs $75,000.

All announced systems will be available in August, the vendor said.

Ridge Computers is located at 2451 Mission College Blvd., Santa Clara, Calif. 95054.



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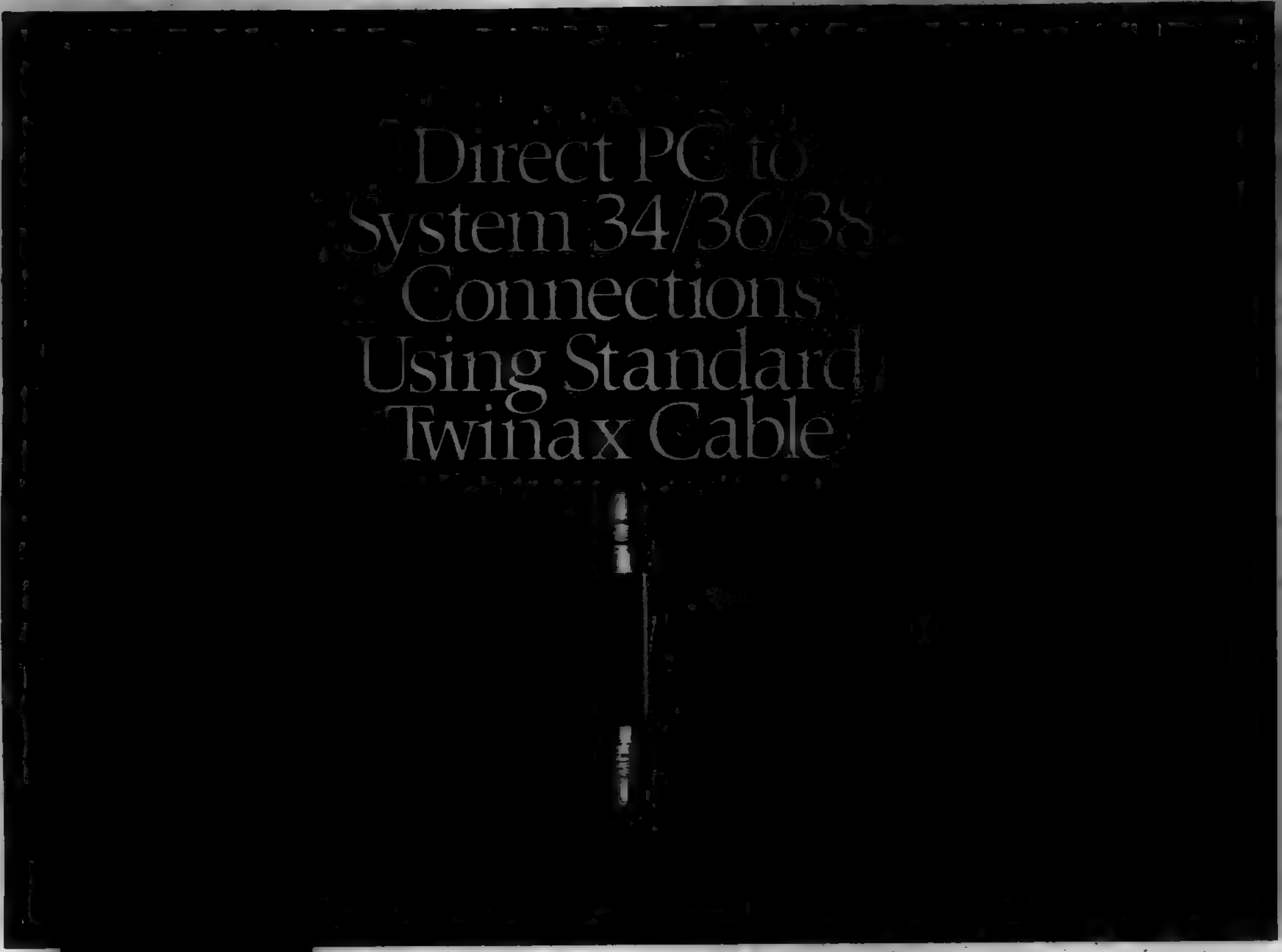

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COMPUTER INDUSTRY

Apple's cuts solve some of its problems

By Kathleen Burton
CW West Coast Bureau

CUPERTINO, Calif. — Apple Computer, Inc.'s sweeping cutbacks will make the company more competitive, but they alone will not reverse the company's sagging fortunes, according to analysts.

Apple recently announced that it will cut its work force by one-fifth, or 1,200 workers, and will close three of its six production plants.

Apple officials said costs associated with the plant closings and layoffs will result in a loss for the third quarter ending June 30, the first loss in the company's eight-year history. Analysts have estimated the loss could total $15 million after taxes.

The company's earlier reorganization merged the Apple II and Macintosh production divisions, removed Chairman Steven P. Jobs from operational control and divided the company into two units, marketing and manufacturing.

John Sculley, Apple's president, said, "We expect these steps to significantly reduce the break-even point of the company."

Sixty percent of the layoffs occurred in Apple's manufacturing divisions, according to a spokesman. The remainder spared only Apple's research and development group and impacted employees in the sales, marketing, finance and administration divisions.

About half of the marketing layoffs were in California's Silicon Valley, where Apple employs about 2,400 people, and the rest were in other parts of Apple's worldwide operations, the company said. After the layoffs, approximately 4,600 workers will remain at the company.

Over the next three months, Apple will close plants in Carrollton, Texas; Garden Grove, Calif.; and Millstreet, Ireland. Ap-

See APPLE page 87

IDC: Global success, conservative approach

THIRD OF A FIVE-PART SERIES

By Maura McEnaney
CW Staff

FRAMINGHAM, Mass. — A data base of computer installations in the U.S. and the "Gray Sheet" newsletter were the first two products launched with the 1964 founding of International Data Corp. (IDC), the granddaddy of computer market research firms.

IDC has grown from a two-person staff working from a house in a Boston suburb to a $25 million company in 1984 with 300 employees in 13 international and seven domestic offices. Its holdings include Yates Ventures, Inc., a market research firm specializing in AT&T Unix based in San Francisco, and Link Resources, a market research firm based in New York.

IDC was founded by Patrick McGovern and is now one of the two main components of International Data Group, Inc. (IDG); the other component of IDG is a group of 57 computer-related publications, including *Computerworld*. McGovern launched IDC out of his basement after getting a hunch that computer companies such as Xerox Corp., Burroughs and what is now Sperry Corp. could use information about computer installations. With the help of local high school students, he began data collection for IDC's first data base.

IDC views itself as a conservative company. "We don't sit down and pontificate about what's going to happen or give blue sky opinions based on our gut feeling. We combine that with reality," said William Ford, vice-president and general manager of the firm.

Perhaps it is IDC's dominant position — claiming approximately 25% of the total of a U.S. market estimated at about $150 million — that prevents it from sticking its neck out as far as its competitors have, observers believe. The company emphasizes its 20-year-old reputation more than the press attention it receives. "We're the old-

See IDC page 83

Analyst sees rebound ahead

By Clinton Wilder
CW Staff

BOSTON — Despite its current moribund state, the U.S. computer industry will rebound strongly by the end of this year, according to Infocorp Executive Vice-President Grant S. Bushee.

Bushee, speaking at Infocorp's mid-year forum here earlier this month, based his optimism on significant products from major vendors scheduled to be shipped in volume later this year. He also cited the growth potential for networking products as the office automation market demands more and more communication among micros and large systems.

As products such as IBM's 3084 and 3090 Model 200 mainframes, Digital Equipment Corp.'s VAX 8600, Prime Computer, Inc.'s 9955 superminis and DEC's Microvax II supermicros begin to ship in volume toward the end of the year, the industry will pick up, Bushee said. "I think the current downturn will be very short-lived," he said. "With these new systems having been announced or shipped, I foresee a rebound by the fourth quarter at the latest."

But Bushee, a cofounder of Cupertino,

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■ The semiconductor slump showed no signs of abating, with chip maker Advanced Micro Devices announcing a four-day workweek and executive pay cuts and equipment vendor Siltec cutting 13% of its work force/78

■ Even Computerland chimed in with layoffs recently, and Storage Technology layed off another 500 workers but also resumed five-day workweeks. Meanwhile, Cullinet Software had its head above the clouds with 50% growth in the fiscal year just ended/79

Start-up finance wide open

OUTSIDE LINES
Robert H. Stevens

Despite the tarnished image of initial public offerings, the entrepreneurial spirit remains alive and well with a healthy appetite for investment capital. Gone are the days of sublime infatuation between the stock market and high technology. Start-ups going public overnight are now the stuff of legends rather than common occurrences. Nevertheless, entrepreneurs today can choose from a host of creative approaches.

Within the venture capital community, there remains a staggering sum of capital available, though consolidated in fewer investments. Today, venture capitalists, overextended in time, are spurning marginal business plans in favor of fewer but higher quality opportunities. And they are increasingly interested in investing in second, third or even fourth rounds of financing due to the soft initial public offering market and the resulting shortage of mezzanine or bridge financing.

Much of the action taking place today is centered on corporate partnering, or investments that large corporations make in an existing company. Many large companies believe that the innovation and development they require can be accomplished best outside their own bureaucracy. As a result, enormous

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Stevens is a partner at Coopers & Lybrand in San Jose, Calif.

Office information networks require management OK

By Clinton Wilder
CW Staff

BOSTON — The office automation market will not take off until corporate management sees office information networks as truly enhancing productivity, according to Bennett C. Wiseman, an Infocorp market research analyst who spoke here recently.

Wiseman said networking has so far failed to reach what he called "critical mass," or the point at which employees decide that such office information functions as electronic mail are indispensable. "Once they have it, they say they couldn't be without it, even though they don't remember why they wanted it in the first place," he said.

Addressing the third annual Infocorp mid-year forum, Wiseman said successful vendors in the growing office information network market will sell solutions rather than products. "People don't yet know what they need networks for, but they know they have information problems that need to be solved," he said. "Vague ideas about how people are going to work better or [more intelligently] won't get the purchase order signed."

Wiseman began his presentation by debunking what he called the myths of networking, such as the terms OA and "paperless office." "[OA] has confused rather than enlightened everyone because it means so many different things," he said. "The 'integrated office' is in reality a disintegrated tangle of different communications standards, and the 'paperless office' has about as much chance of becoming reality as the paperless bathroom."

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The chips are down: AMD, Siltec deal with cutting costs

Evidence of the continuing slump in the semiconductor industry surfaced again recently as a major chip maker, Advanced Micro Devices, Inc. (AMD), and a leading wafer and chip manufacturing equipment vendor, Siltec Corp., announced that they were taking significant cost-cutting measures.

AMD, one of the top five U.S. integrated circuit vendors, announced it will institute four-day workweeks in the quarter beginning July 8. AMD also cut its top 100 executives' salaries by 15% and froze raises for all of its employees.

The Sunnyvale, Calif.-based company said it instituted the measures to maintain its no-layoff policy and that the company policy will continue.

Short workweek affects 90%

The shortened workweek will affect about 90% of AMD's 8,000 U.S. employees. Members of AMD's field sales force, field applications engineers and selected sales support and production personnel will continue to work full-time.

AMD President and Chief Executive Officer W. J. Sanders III said the moves were designed to cut excess production capacity and bring production in line with the falling demand for chips.

Sanders said the company had been hurt by severe price cutting by Japanese competitors, which AMD has also cited in calling for trade barriers on Japanese imports [CW, June 17].

"Predatory pricing on [erasable programmable read-only memory chips], which are 20% of our business, has taken us from profitability in that product line to an expected level of losses such that . . . an overall operating loss for the current quarter seems unavoidable," Sanders said. The company said tax credits from capital investment in research and development, however, should allow AMD to post a modest net profit for the quarter ending June 30.

Sanders said "no upturn is currently in sight" in the hard-hit semiconductor business and that AMD's sales are not expected to improve in the next quarter.

Concurrently with the shortened workweek, AMD announced that some key engineering and production employees were asked to work a 5½-day week for their current salaries in order to spur development and introduction of products.

Siltec lays off 13%

Siltec announced it will lay off 13% of its work force, consolidate its Menlo Park, Calif., wafer fabrication facility into its plant in Salem, Ore., and restructure the management of its Silicon Business Unit.

Siltec said it will lose between $8 million and $11 million in the current quarter. The figures include approximately $7 million to cover the costs of the Oregon consolidation and the establishment of a $2 million reserve fund to reflect current inventory values as a result of slackened demand and falling prices.

The company, based in Menlo Park, said reducing its 750-member work force by 100 would "substantially reduce the company's break-even point" but that it does not expect to be profitable "until the health of the U.S. semiconductor industry improves."

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FUSION.

Cullinet's yearly profits up 50%

WESTWOOD, Mass. — Cullinet Software, Inc. announced that fiscal-year profits were up 50% over the previous year, even though fourth-quarter profit growth dipped below the 50% mark for the first time in several quarters. The company said revenue for the year was $184.1 million, up 53% from $120 million a year earlier. Profits were $24.7 million, or 81 cents per share, up 50% from $16.9 million, or 54 cents per share.

In the fourth quarter, Cullinet said, revenue increased 50% to $52.7 million, from $35.1 million a year earlier. Profits of $6.8 million, or 22 cents per share, did not quite meet the 50% growth benchmark of the past several quarters, but was still up 42% from year-earlier profits of $4.8 million, or 16 cents per share.

Robert N. Goldman, president and chief operating officer, said, "Based on the excellent fourth-quarter and fiscal-1985 results, we are confident that in fiscal 1986 Cullinet will continue to exceed industry growth rates."

STC restores five-day week, lays off 500

LOUISVILLE, Colo. — Five hundred more employees of struggling Storage Technology Corp. (STC) received layoff notices last week, bringing the total number of layoffs at the debt-plagued disk drive manufacturer during the past 18 months to 6,500 and reducing STC's worldwide work force to 9,300.

Remaining STC employees received good news, however, as the company announced it would return to a five-day workweek. The layoffs will come primarily from the manufacturing and manufacturing support areas.

STC is currently under protection from its creditors under Chapter 11 of the Federal Bankruptcy Act. The company filed for protection Oct. 31, 1984.

STC Chairman Ryal R. Poppa said the company plans to submit its scheduled reorganization plan to its creditors this week. He said the work force reduction was caused by the industrywide downturn in computer peripherals and computers, rather than by a specific recent downturn at STC.

"While our disk order rate is up, our tape order rate is below expectations," Poppa said. "Therefore, we are reducing current manufacturing capacity to match this order rate."

Retail chain to cut staff

OAKLAND, Calif. — Computerland Corp. recently announced the first layoffs in its nine-year history, trimming its domestic corporate staff by 10%, or 128 employees.

The personal computer retail chain also said it will reduce nonpersonnel-related expenses. Computerland maintains 810 franchised retail stores and employs about 1,120 people worldwide, 80% of them in the San Francisco-Oakland, Calif., area.

"Based on the current flattening of the personal computer market, this is the responsible course to take in order to ensure that Computerland can continue to provide key services to our franchises," said Computerland President and Chief Operating Officer Barbara J. Millard.

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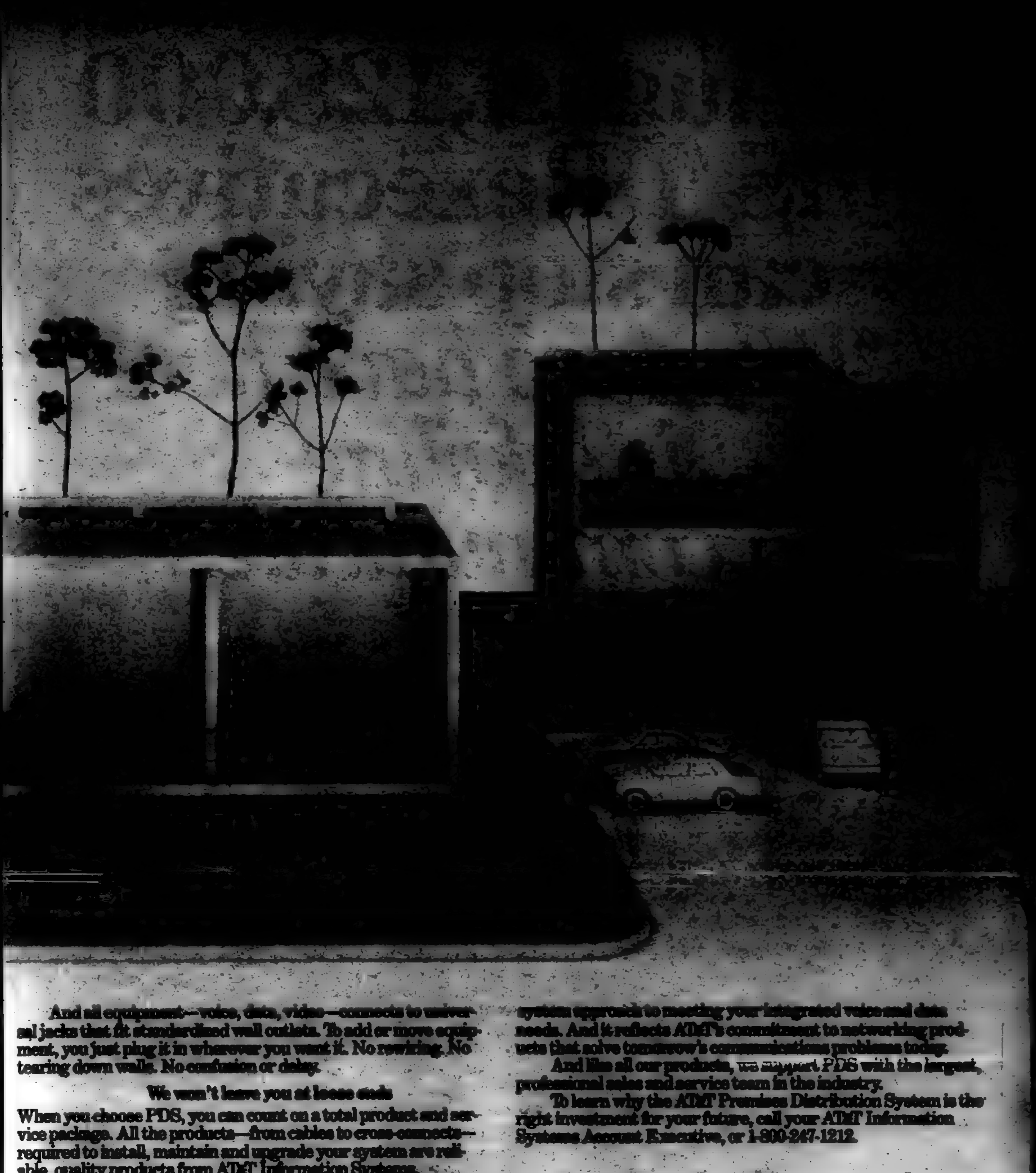

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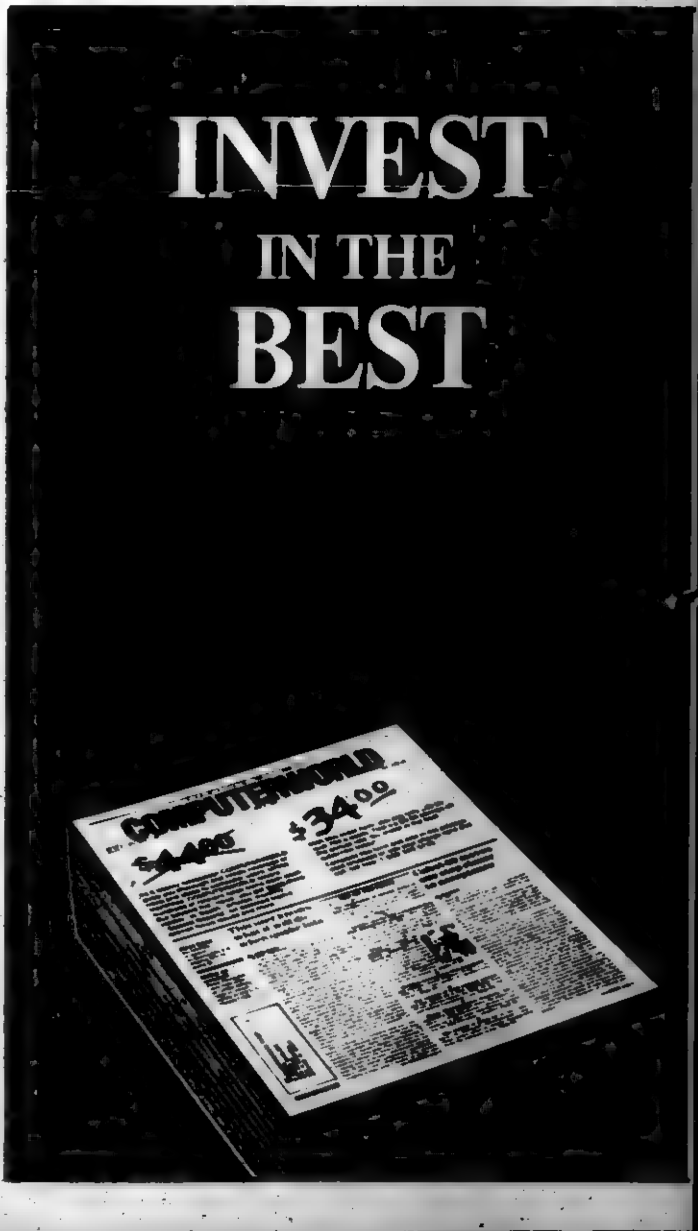
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IDC

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est in the business and have proven to be the most reliable," said IDC President Peter Rowell. "We have not taken part in very hype-filled predictions," he added.

Rowell joined IDC's UK operations nine years ago and shortly after was made managing director, building up the European operations to include six subsidiary offices and eight agency offices. Two years ago, Rowell was brought to the U.S. to take the reins at IDC's corporate offices.

The company's business "is to provide a hand-holding service to our clients," which consist of vendors, computer users and financial firms, Rowell said. "We are a service organization where the responsiveness to clients, answering their day-to-day questions and providing basic information is of paramount importance."

IDC covers all sectors of information processing, including data processing, communications, office automation and software. The products fall into one of four categories: data bases, which are sold to more than 1,000 clients annually; continuous information services, said to be the most profitable of IDC's products; custom consulting; and newsletters.

Approximately 60% of IDC's 3,000 international clients are computer vendors seeking information on market share and product direction, according to Rowell. About 30% of the firm's clients are computer users from Fortune 500 companies. The remaining 10% of the clients are firms in the financial service industry.

The company published more than 250 reports last year, along with seven special reports on topics ranging from a computer industry review and forecast to IBM strategy and personal computer networks. This year, IDC will add 10 more studies covering topics that include text retrieval systems, factory communications and Apple Computer, Inc.'s Macintosh Office system.

Ford said that while competitors view IDC as a number-crunching service, the firm provides much more than that. IDC does rely heavily on "primary data," Ford said, but that data is later combined with analysis in its final reports.

Although some of its analysts such as William Zachmann, vice-president of corporate research, and Jack Hart, vice-president of International Services, enjoy notoriety in both the trade and general press — Zachmann was one of the few industry observers who predicted the current industry downturn — IDC sees itself as somewhat subdued, compared with its competitors.

"We are a conglomerate of individual personalities," said Rowell, who is less visible than his counterparts in other market research firms. "Some of our competitors are built around the personalities of certain individuals," he noted.

IDC's dominance in the market place has been eroded somewhat by younger companies such as Dataquest, Inc., the Yankee Group, the Gartner Group, Inc. and Future Computing, Inc.

"Back when there weren't too many market research companies, IDC was king," said former IDC vice-president Harry Henry, who left IDC a year ago to form his own consulting firm. But, he noted, as the computer industry grew into areas outside IDC's domain, IDC was left open to competition. Each of IDC's competitors today got its start by emphasizing an area not fully serviced by IDC, Henry said.

When IDC was slow to pick up on the emerging growth of the microcomputer industry — a blunder that Rowell clearly recognizes — Future Computing was born.

Recovery from micro error

"We missed the boat in micros to begin with," he said. Today, IDC is attempting to recover from its judgmental error by concentrating on micros in a few specific areas, including the value-added reseller end. "Our microcomputer services is one of the fastest growing services," he said.

For Rowell, maintaining IDC's approximate 30% annual growth rate means a "more-of-the-same" approach. "We must do more of what we've been doing," to compete against firms like Dataquest, Gartner Group and Future Computing, he said. "I want to build our expertise in all areas, to cover absolutely everything. But we're being forced, marketwise, to concentrate on certain issues."

IDC remains committed to building up its client base, with some specific directions in mind. "We want to be more flexible in our user services," Rowell said. Right now, he noted, "We have a number of very rigid services aimed at senior management within large corporations."

The First National Bank of Chicago has been an IDC client since it first formed its MIS department seven years ago. "When we started looking for a consulting service, [IDC] was the only one that offered us what we needed," said systems officer Jack Phillips. The bank primarily uses IDC's Information Systems Planning Service, which provides four reports, the "Gray Sheet," bulletins, conference admission and phone inquiry.

According to Phillips, IDC's telephone inquiry services "give us a place to go for answers to questions about other users. For the bank's purposes, some of IDC's services are "getting far afield" from its needs, he said. "We're really not interested in a lot of the industry-related marketing stuff like the future of the computer market in Japan."

IDC may shift its focus to attract

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AT A GLANCE

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INVEST

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amounts of money are being plowed into this strategy to acquire new products, services and technologies quickly and cheaply.

There are three primary advantages to this financing method. First, the corporate partner can supply large sums of capital, often at a cheaper cost than venture capitalists.

Second, it can arrange for marketing the new company's goods, often a tremendously capital-intensive function. If the new company is a manufacturer, the corporate partner can provide manufacturing capabilities under contract.

Finally, a corporate partner can provide a second source of the product. Of course, a downside for the entrepreneur may be giving up future flexibility; the corporate partner's goals may differ from those of the new company.

Partnerships as financing vehicles

Equity partnerships continue to be used as financing vehicles among start-up high-technology companies. An equity partnership is frequently a traditional venture capital investment, with the company starting out as a partnership that allows tax deductions to flow through to some or all of the backers.

Following the development period, the partnership will be "rolled up" into a corporation. Depending on the tax needs of the investors, these partnerships can be very attractive, as the available deductions serve to reduce the investment risk. The entrepreneur benefits through these tax deductions by gaining leverage in negotiations with the investors.

To remain viable and competitive, companies need a commitment from every employee to achieve success. One response to this need has been the increased use of employee stock option plans. These plans provide a new source of financing to high-tech firms, since the new tax laws allow banks to treat a portion of the interest received from employee stock option plan loans as nontaxable.

Loans from stock option plans

As a result, companies may be able to secure loans from banks by use of leveraged employee stock option plans in situations where the loan would otherwise be too costly. Variations of a stock option plan loan often play a part in leveraged buy-outs and corporate divestitures. Although not a new financing scheme, the practice is growing steadily in popularity.

Young companies seeking financing for fixed assets often find that banks require substantial compensating balances to be maintained until several quarters of profitability have been achieved. This puts a big restriction on available cash — often hard fought for in an earlier venture capital financing.

Venture leasing allows a firm to offer warrants to purchase stock in the company at a fixed price to the leasing company or bank and can eliminate the compensating cash balance. Warrants can also be offered to OEMs that commit to large purchase orders. In these cases, the OEM customer earns more warrants at higher and higher levels of purchases and, therefore, has an incentive to continue buying.

Warrants may be issued up front at a fixed price and earned as the company actually buys predetermined levels of products or structured so that the price is not fixed until the warrants are earned. In either case, the accounting implications of these arrangements must be carefully analyzed in advance.

Although not strictly a financing method, warrants can encourage customers to enter into early and significant contracts with the expectation of acquiring stock and profiting through the success of the company.

Least common among the variety of funding alternatives available to a start-up is debt financing. While companies who are shipping products and have investments and accounts receivable can obtain credit lines, it is very difficult for a young company to collateralize fully a loan without assets.

When used by small- to medium-size companies, debt financing increasingly involves a combination of debt and equity. By adding warrants, lenders gain the benefit of upside potential if the company is successful, and warrants allow companies to obtain debt that would otherwise be too expensive or unavailable.

Research and development partnerships have fallen into some disfavor as a result of high risk and diminished tax advantages for many private investors. Until recently, many companies raised money through R&D partnerships, whereby an existing company contributed technology to a partnership, which raised capital from limited partners. Investors took 80% to 90% tax write-offs in the first year, with promises of 30% to 40% after-tax returns. Investment bankers oversold these vehicles; investors blindly went into them without appreciating the risks involved; and the high-tech companies often failed to communicate with their investors. Thus, the investment and business communities are more wary of R&D deals now.

However, money from an R&D partnership is cheaper than equity money because investors look for substantial tax savings. The partnership concept remains a useful, if somewhat abused, tool. Companies should enter such agreements with caution. For instance, if a research and development deal is royalty based, the company must bear a percentage of sales or part of its costs. If the technology is acquired with stock, the current fair value of the stock must be amortized over future periods, which puts additional strain

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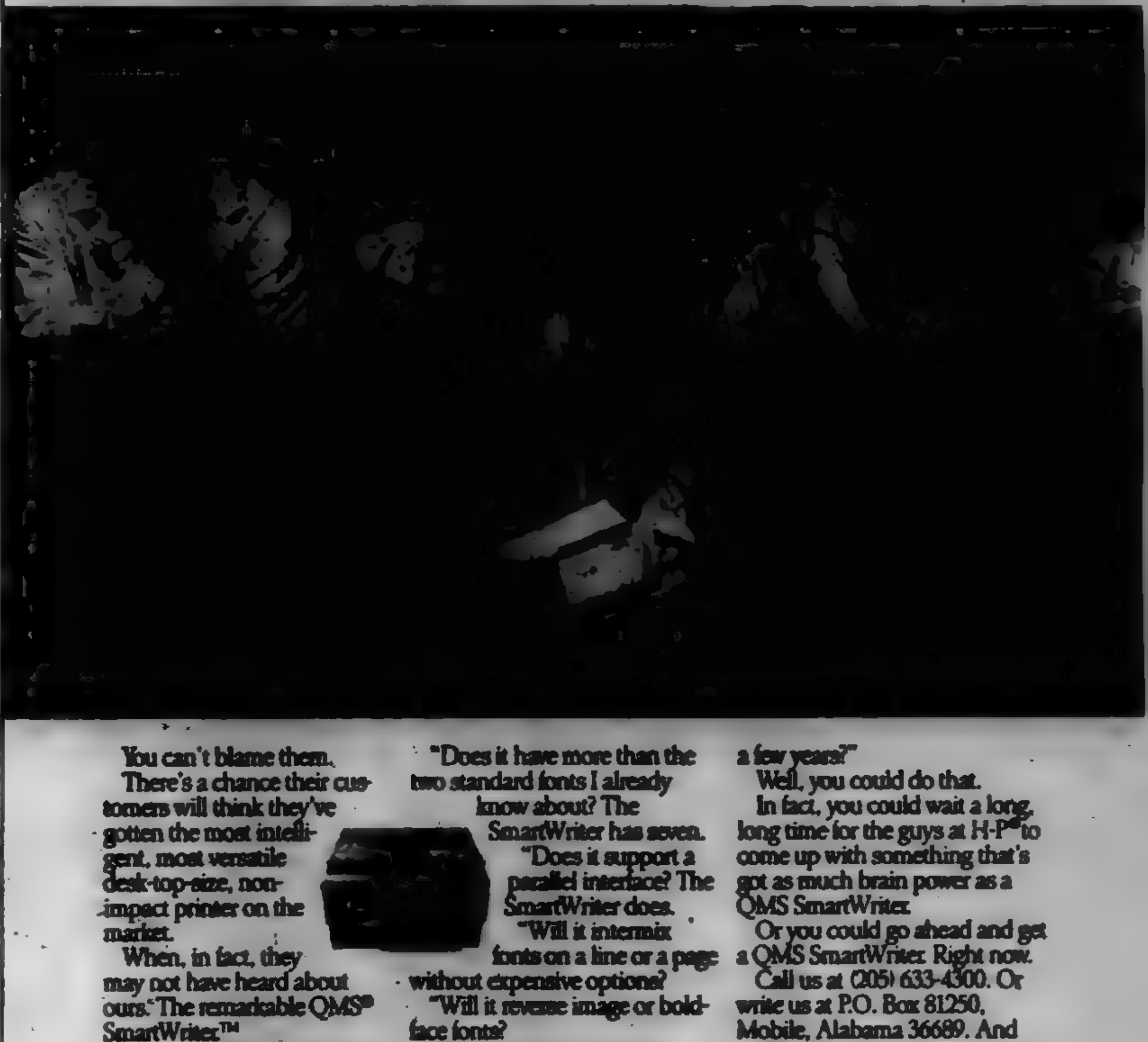

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OA

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Wiseman, director of Cupertino, Calif.-based Infocorp's fledgling office information network market research service, said the technology and price/performance ratios of office computers have grown by leaps and bounds, while their ability to communicate with each other has lagged far behind. "In 1965, an IBM Selectric typewriter cost $12,000, or the price of two Cadillacs," Wiseman said.

"In 1985, you can buy 12 word processors for the price of one Cadillac. But the problem is similar to the early days of the auto industry — not enough good roads. Office computers need the equivalent of the interstate highway system — the interoffice information system."

In the near future, hierarchical networks such as micro-to-mainframe links will see greater success than peer-to-peer network connections, Wiseman predicted. "Large organizations like the hierarchy of their mainframe and its software systems at the top," he said. "With workstation-based local-area networks, the anarchy [that is] implied goes against their grain. In general, organizations are slow adapters."

For similar reasons, Wiseman's network market forecast is based on the assumption that users want to link their current installed base rather than purchase computer hardware to run on a network. According to Wiseman, "The installed base will drive the workstation market, and the workstation market will drive the demand for printers and file servers."

Opportunities exist to gain market share

Wiseman concluded that wide opportunities to gain market share exist in the office information network business, largely because the market contains many diverse niches and has no clear market leader.

He predicted the largest future office information network market will consist of current noncomputer users in an office who will eventually choose electronic replacements for "their telephones, in-baskets and notepads."

"These are people who don't like computers and never will," Wiseman said. "But if vendors offer them solutions to a problem, they will buy."

UP

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Calif.-based Infocorp, qualified his optimism with a warning about the health of the U.S. economy. He does not expect overall capital investment and the Index of Leading Economic Indicators to fall significantly over the course of the year but said that the computer industry will suffer if they do.

"I'm assuming the economy will remain strong," he said. "If it turns sour, we could be in for a lot longer downturn than anyone expected."

Bushee said that the absence of local-area network standards and other interconnection shortcomings have contributed to the current downturn, but at the same time, they represent a major potential growth area for the industry.

"In the early 1980s, organizations spent heavily on computers, especially micros," Bushee noted. "Now they all require system interconnection — the key issue facing the industry today. It has been an Achilles' heel to date, but it also represents the most golden opportunity."

Bushee said the lack of networking reliability has contributed to a big problem facing vendors: user dissatisfaction. "As users become more and more familiar with computers, they find out the shortcomings — that the promise has exceeded the reality," he said.

The most successful vendors in the future will be those that market their products as solutions to specific office, industry and home problems rather than as technological wonders, Bushee predicted.

Bushee said the industry's most important growth areas in the near term will be solutions that tie users together through office information networks, file servers, multiuser systems and departmental systems such as a Microvax II or a Hewlett-Packard Co. HP 3000 Model 37.

Bushee concluded that as the industry approaches 1990, there will be significant growth in scientific/technical niche markets, portable computers and artificial intelligence systems.

Introducing The Single Solution To Many Problems That Can Tie Up Your Personal Computer.

APPLE

from page 77

ple's automated plant in Fremont, Calif., will continue to produce IIc and Macintosh computers, while production of Apple IIe products will be shifted to Singapore, and the Cork, Ireland plant will continue European distribution.

"In recent weeks, the mood here has been serious and somber," said William V. Campbell, Apple's vice-president of U.S. sales and manufacturing. "During the layoffs, there were tears mixed with a great deal of optimism about the future. The mixed mood is difficult to describe, but the morale of those remaining is good."

According to Campbell, 21% of Apple's work force was eliminated because the reorganization caused a duplication of marketing and manufacturing efforts within the company. Now, the company's costs will be lower, and it will be able to bring products to the market faster, Campbell said.

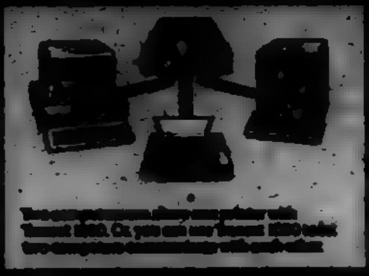
Although the shake-up was larger than expected, analysts have said it will leave Apple more competitive. "It will mean a stronger Apple over the long haul," said John Dean, a computer analyst at Montgomery Securities in San Francisco.

However, several fundamental problems must still be resolved, he said. According to Dean, the company's largest obstacle will be to deliver the products it has announced. Immediate priorities, he said, are a file server and personal computer network card for the Macintosh Office.

Because of the sales slowdown in both home and business computers, sales for the current quarter will be about $390 million, approximately 10% less than the $435.2 million for the previous quarter, Dean said.

Apple's plant consolidations were necessary for the company's survival, said Aaron Goldberg, an analyst at International Data Corp. in Santa Clara, Calif. Apple's manufacturing operations were running at 60% of capacity since February because it was selling less than 25,000 Macintosh computers a month.

According to Goldberg, the reorganization and layoffs indicate that the company is now operating as a financially disciplined Fortune 500 firm, "not like an entrepreneurial outfit still run from a garage."



INVEST

from page 85

on the profits of an emerging firm.

Finally, the ownership of the developed technology should be made as clear as possible to make it harder to find investors.

IDC

from page 83

smaller client companies, Rowell said. "There are many organizations that have no interest in and cannot afford the type of service we're providing," according to Rowell. "We can restructure some new services to focus more on smaller users," he said. Providing more strategic services to users is also a future direction for the company, he said.

For MIS managers in medium-size businesses, IDC has recently introduced "Information Systems: Issues '85," a program focusing on hardware vendor strategies, organizational trends, software engineering and communications. The program gives MIS managers eight IDC reports, telephone consultations on those report topics, newsletters, bulletins and access to the company's Fall Executive Conference. Annual cost of the program is $7,500.

The company is also attempting to make its mark on the investment community. IDC announced a $1 million contract with Goldman Sachs & Co. that will give the investment firm access to IDC research information.

But IDC's attempt to cover all aspects of the computer industry has its drawbacks, former Vice-President Henry believes. "When you are the biggest out there, people come to expect everything from you. It's nice to be big, but it sure is a heavy cross to bear sometimes."

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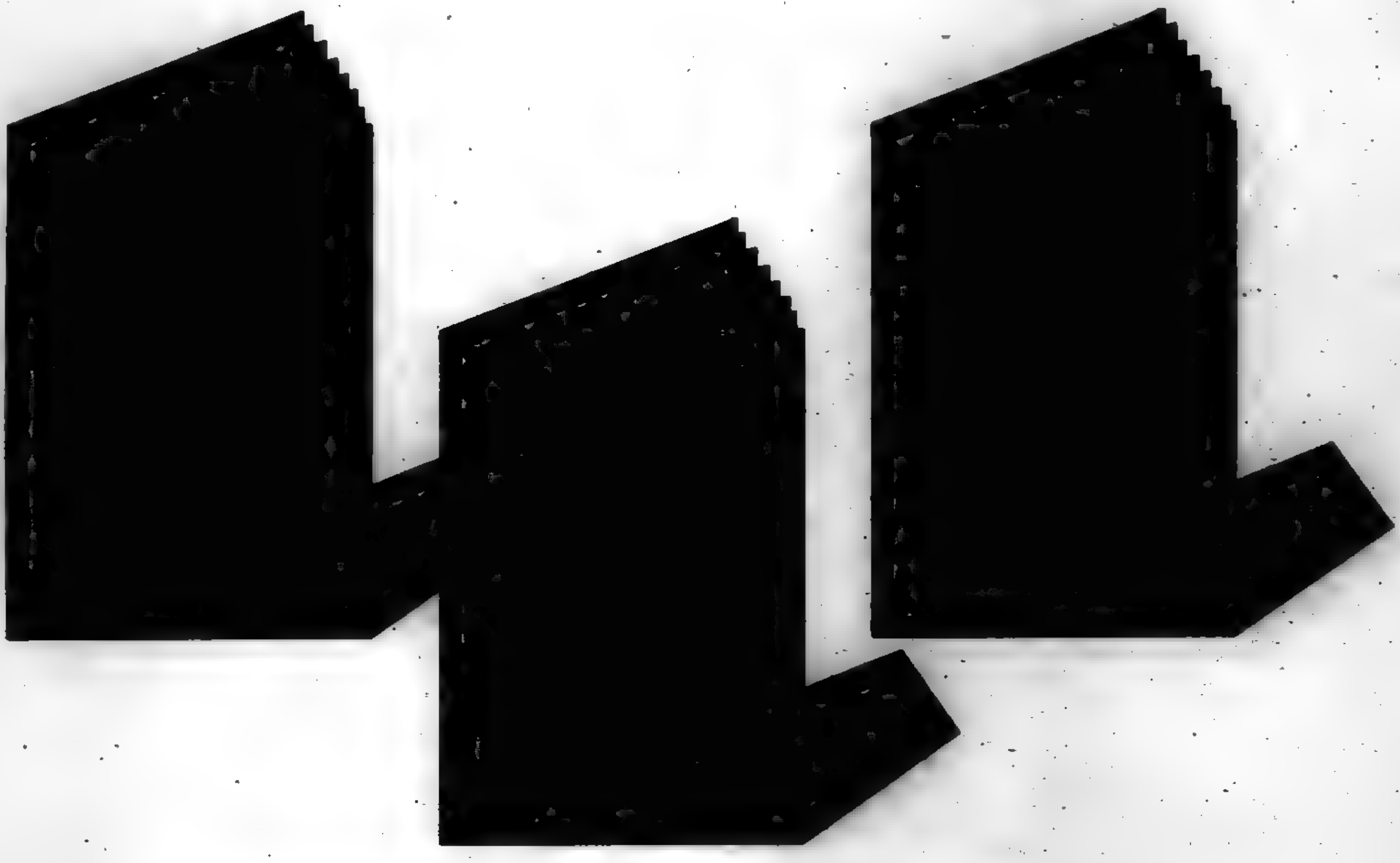

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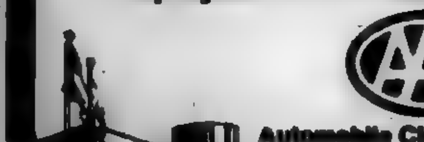

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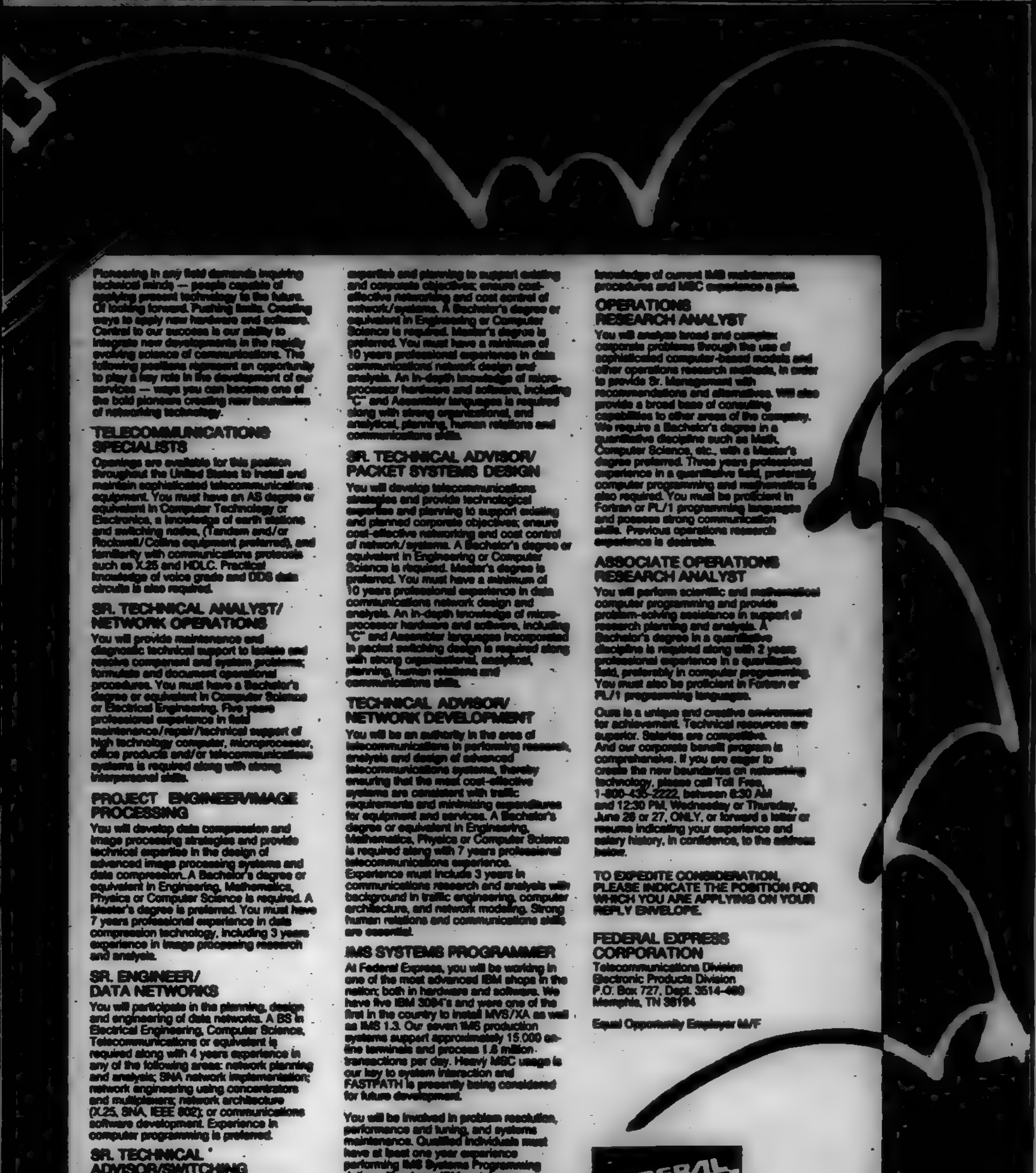

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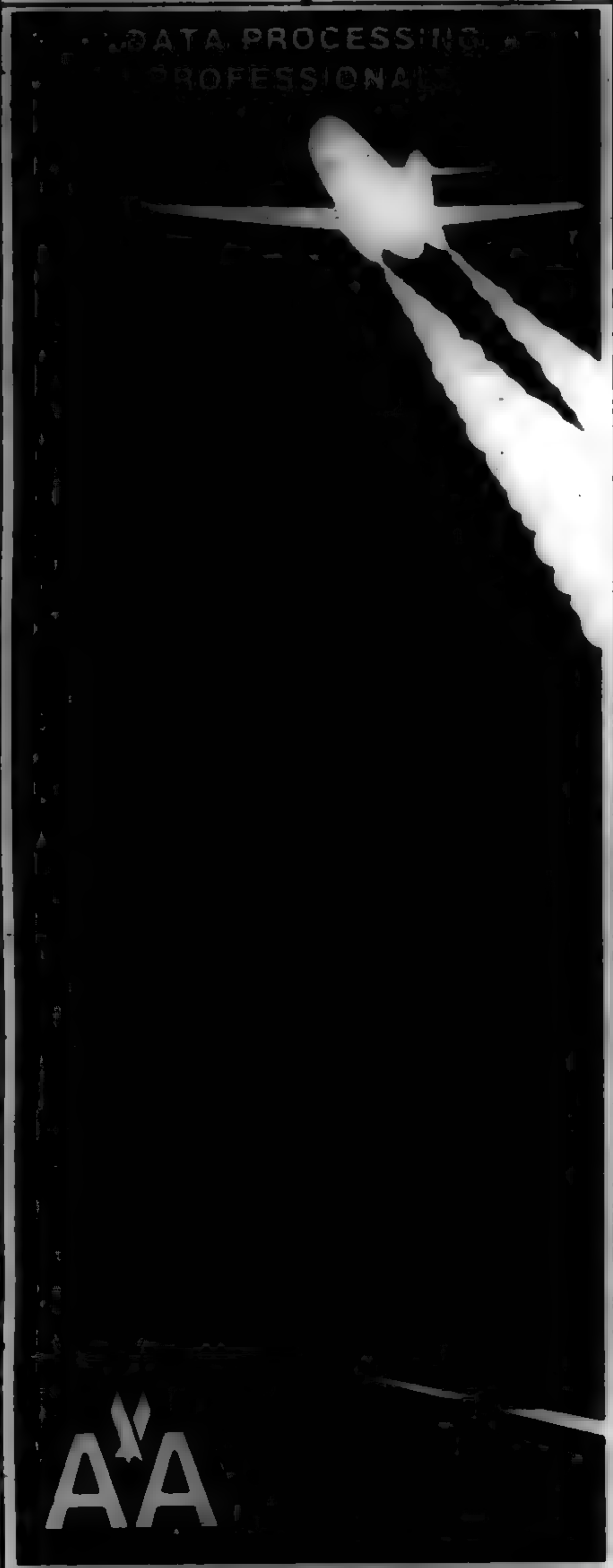

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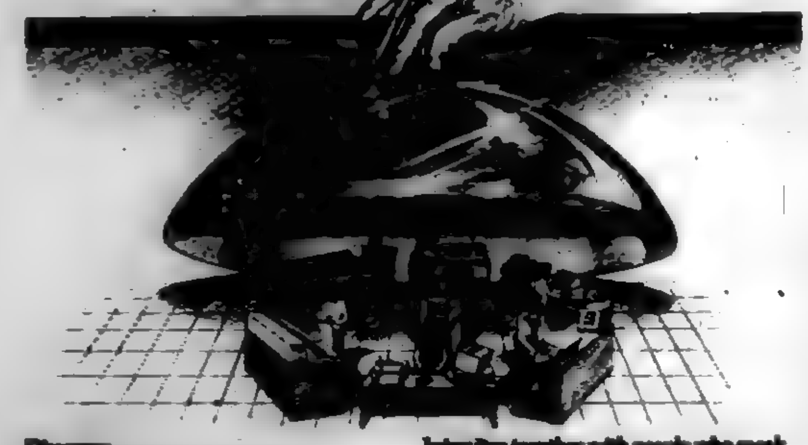

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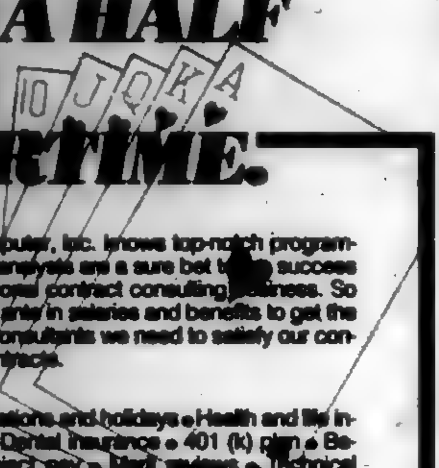

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Programmer/Analyst applicants must have 2-5 years experience in [illegible] with particular emphasis on the [illegible] and ASSEMBLER code.

Also seeking Programmer/Analyst with database experience. Must have 2-5 years COBOL experience. Honeywell [illegible], TOTAL Database Management System and criminal justice information systems experience a plus.

Liberal fringe benefits. Salary commensurate with training and experience. Send resume and salary requirements to:

[illegible] COMPUTER SYSTEMS, INC.
TELECOMMUNICATIONS [illegible]
[illegible] LIBERTY LANE
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ACP Systems Programmer/Analyst required. Will be responsible for software and hardware evaluation of computer systems. Will be working with ACP environment using a CMS software system and Assembler (ALC) programming language. Applicant must possess high school education and three years prior experience with ACP programming and must be familiar with CMS and ALC and large scale IBM mainframe computers.

Minimum to be $[illegible] per year for a 40 hour work week, however, an additional salary up to $44,[illegible].00 per year will be paid for additional education and/or experience.

Interested applicants should contact Oklahoma Employment Security Commission, 3105 East Skelly Drive, Tulsa, Oklahoma 74105. Phone: (918) 749-[illegible]. Refer to Job Order No. [illegible].

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Helena, Montana [illegible]
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[illegible]

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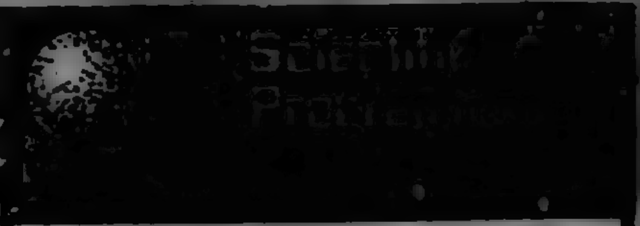

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Joe Sorensen
TAD-175
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Boise, Idaho 83729

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[illegible]

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(314) [illegible]

VAX VAX VAX

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TSI Technical Support, Inc.
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[illegible]

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

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PROGRAMMER

Project Leader

[illegible] NY City location.

[illegible]

- System 38
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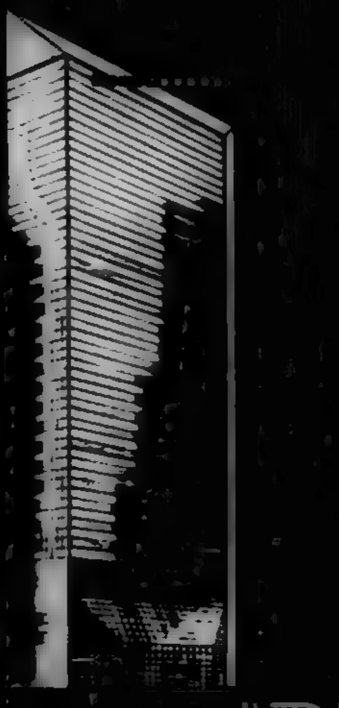

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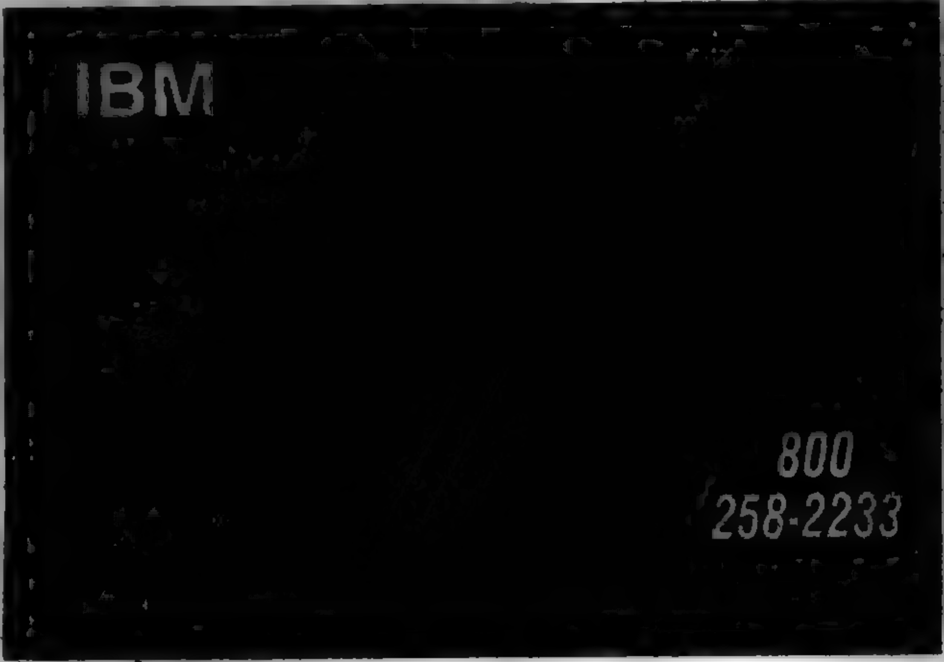

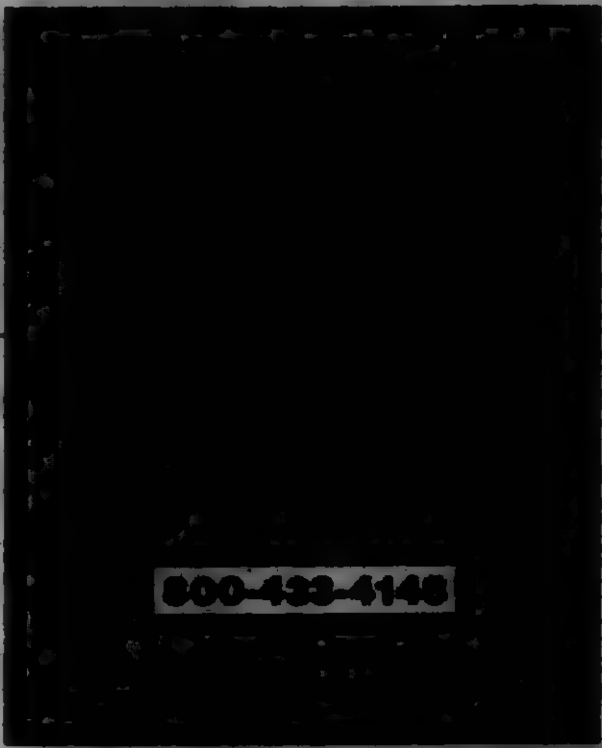

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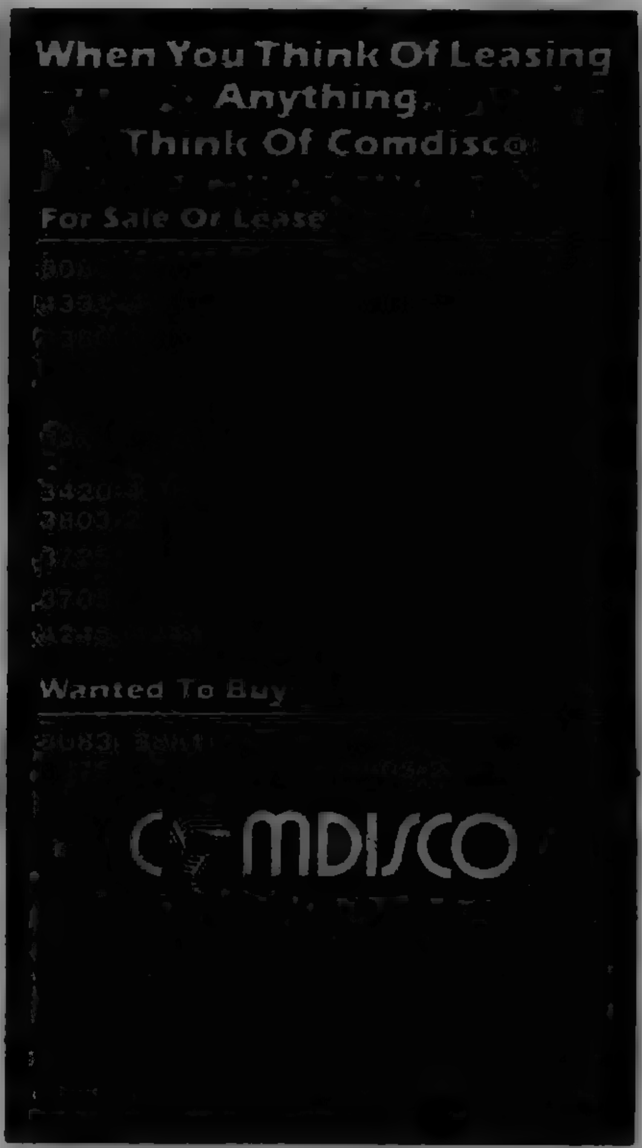

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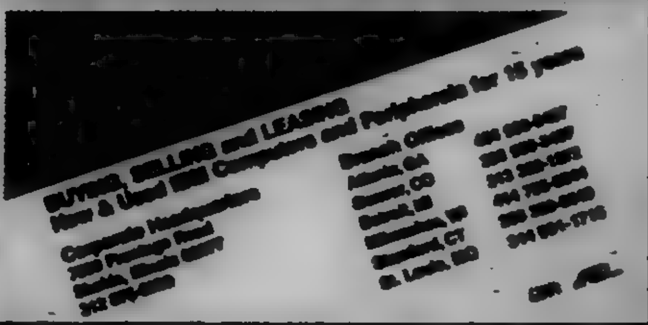

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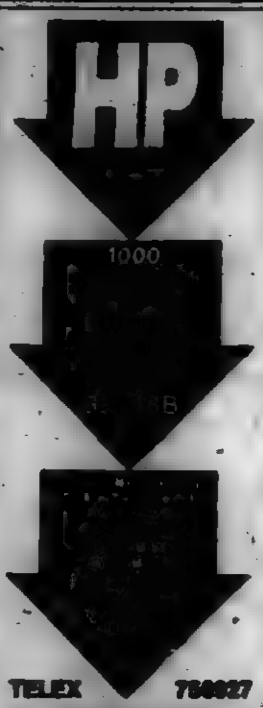

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Respondents must be able to offer an appropriate team of employees [illegible] in or near Chester County and must demonstrate substantial relevant experience performing similar services.

The bid package will be available o/a July [illegible], 1985. A pre-bid conference and facility walk-through will be held on July 23, 1985 at 2 p.m. at the Chester County Courthouse, Fifth Floor, High and Market Streets, West Chester, PA 19380. Proposals are due August [illegible], 1985, and the contract is scheduled for award by August 27, 1985.

A bidders list is now being prepared. Please address bid-package requests and questions regarding this procurement to Ted Jacobs, Purchasing Coordinator, Office of Commissioners, County of Chester, at the above address, or call him or Mark Rogers at (215) 431-6100.

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The bid package will be available o/a July 29, 1985. A pre-bid conference will be held on August 1, 1985 at 10 a.m. at the Chester County Courthouse, Fifth Floor, High and Market Streets, West Chester, PA 19380. Proposals are due August 20, 1985, and the contract is scheduled for award by September 17, 1985.

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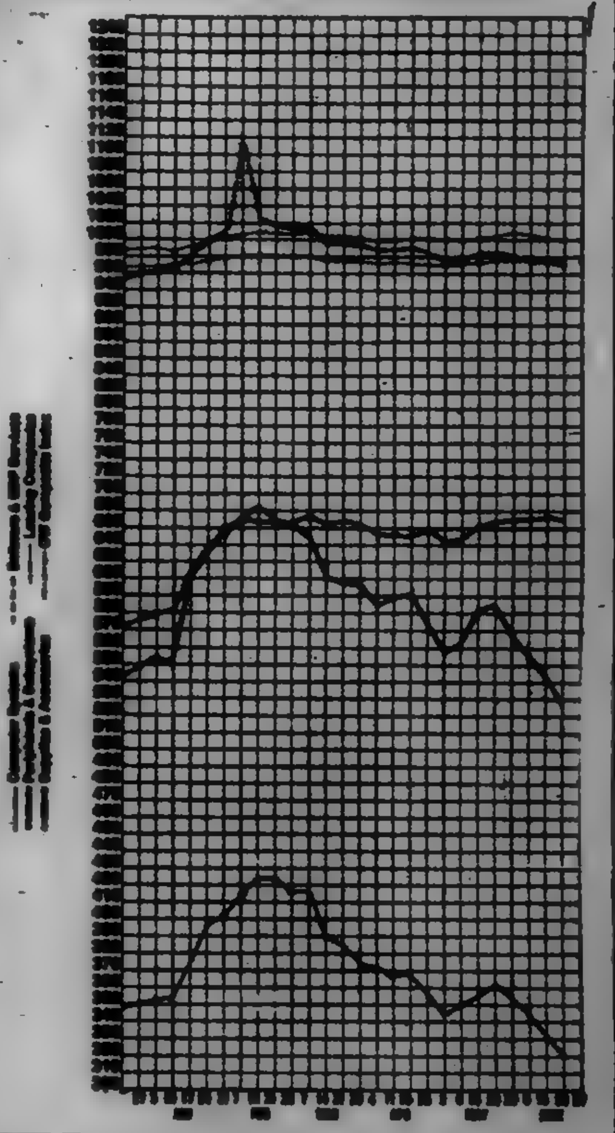

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AT&T reaches out

Tools permit limited file exchange between 3B line and IBM mainframes

By Paul Korzeniowski
CW Staff

LINCROFT, N.J. — AT&T last week announced its first set of tools that enables an AT&T 3B computer to communicate with an IBM mainframe.

Included in a deluge of AT&T product announcements were two models of the 3B, four communications products for the 3B line and a version of AT&T's Unix System V Release 2 that runs under IBM's VM operating system (see story page 6).

The communications products include two controller emulation packages, a file transfer program and a communications processor. The products provide IBM 3274 controller and 3278 terminal emulation and supply file transfer capabilities between a 3B system and an IBM mainframe.

The communications products were considered essential to AT&T's strategy for selling its computers to large companies (see story page 6). The announcements establish the 3B2 line as a competitor to Digital Equipment Corp.'s Microvax II supermicro

See AT&T page 6

IBM gives up SBS for 16% of MCI

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — IBM last week initiated a major push into telecommunications by selling its 60% ownership interest in Satellite Business Systems to MCI Communications Corp. in return for an immediate 16% stake in MCI, the second largest long-distance carrier. The agreement permits IBM to acquire up to 30% of MCI during the next three years, and IBM indicated it will invest up to $400 million in MCI's network expansion plans.

William McGowan, MCI's president and chief executive officer, said the two companies will align their businesses to target large business users. These users, he said, want to integrate their data communications, data processing and voice links.

IBM and MCI claimed MCI's acquisition of SBS would yield the largest digital communications network in the world, comprising MCI's optical fiber and digital microwave systems and SBS' digital satellite capacity.

"The combination of MCI and IBM is ideal," McGowan said, ad-

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TOP OF THE NEWS

Computer crimes against the U.S. government are typically motivated by personal financial crises or job dissatisfaction. Page 2.

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Following the murder of two Wang employees in El Salvador, some companies are reassessing aspects of international business travel. Page 4.

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Software International unwrapped a series of products designed as an initial step toward integrating its mainframe applications line. Page 7.

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Both NCR and Charles River Data Systems unveiled supermicrocomputers that are based on Motorola's 68020 microprocessor. Page 14.

■

Amdahl supercomputers bow

By Jeffry Beeler
CW West Coast Bureau

SUNNYVALE, Calif. — Amdahl Corp. last week extended its supercomputer line both upward and downward by announcing two additional vector processors, one with performance exceeding one billion floating-point operations per second.

With the introduction of Models 1400 and 500, Amdahl's family of IBM-compatible number crunchers, built by Japan-based Fujitsu Ltd., now consists of four machines. The other two are the Models 1100 and 1200, announced last September.

Rated at 133 Mflops, the entry-level 500 reportedly provides exactly half the internal throughput of Amdahl's 1100 and roughly 40% the performance of Cray Research, Inc.'s X/MP-1.

The top-of-the-line 1400, meanwhile, reportedly executes 1.14 Gflops, compared with 533 Mflops for the 9-month-old 1200, and outperforms the X/MP-1 by approximately 400%.

Each of the four Amdahl machines runs the same software and can be upgraded in the field to its next larger sister system, according to the company.

Although the four machines have nearly identical machine cycle times of 7 or 7.5 nsec, the 1400 produces eight vector results per cycle, compared with four, two and one for the 1200, 1100 and 500, respectively, a source said.

Like the middle systems they bracket,

See VECTOR page 4

INDUSTRY SPOTLIGHT

European firms take varied aim at U.S. market

By Peter Bartolik
CW Staff

Japanese manufacturers approach the U.S. market for computer equipment from a position of strength: They control or can at least defend their own domestic markets.

The same cannot be said of the leading European vendors, which come to the lucrative U.S. market from a continent where IBM has carved out a dominant position and where other U.S. manufacturers have claimed substantial market shares.

The barriers erected by the Postal Telephone and Telegraph authorities have served to protect somewhat the telecommunications markets for indigenous vendors in each country. However, commercial computer customers have welcomed the leading U.S. manufacturers to Europe with open arms, according to statistics from IDC Europa, Ltd., the London-based office of International Data Corp.

According to a report published last year by IDC Europa, 59% of all large-scale systems installed in Western Europe at the end of 1983 were manufactured by IBM. No European vendor claimed more than 5% of medium-scale system installations, while IBM, Digital Equipment Corp., Hewlett-Packard Co. and Wang Laboratories, Inc. manufactured 49% of the total base.

The market for small-scale systems — those accommodating one to 16 users and ranging from the IBM Personal Computers to the DEC VAX-11/730 — was more diverse: DEC had the leading share of installed systems, at 11%, while European vendors' shares of the installed systems ranged from 4% to 6%.

Even the small-scale systems market seemed to be adopting an IBM trend. Ing. C. Olivetti & Co. shipped the greatest number of units in 1983, but IBM, which shipped 3,600 fewer units than Olivetti, made more money than any other vendor.

Nonetheless, six major European vendors with revenue ranging from more than $1 billion to more than $16 billion have established subsidiaries in the U.S. in the hope of capturing shares of the largest market in the world.

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NEWSPAPER

Federal DP crooks profiled

Stress, financial problems tagged as primary catalysts

By Mitch Betts
CW Washington Bureau

> *'I had personal problems because I was $20,000 in debt. But I had also worked my butt off for them, and they passed me over for a promotion. I was good and deserved more . . . I decided to get back at them.'*
>
> **— A federal program manager and perpetrator of a computer crime**

WASHINGTON, D.C. — Perpetrators of computer crimes against the U.S. government typically steal money in response to stress or a crisis, such as a financial problem or disgruntlement on the job, according to a government study based on confidential interviews with 46 computer criminals.

Three quarters of the computer criminals interviewed by the U.S. Department of Health and Human Services' (HHS) inspector general fit that profile. The others were tempted by accidental discovery of a vulnerability in the system or influenced by boredom or free time, the study said.

"Connie," for example, was a terminal operator for a state program who enjoyed exploring the computer system. She discovered there were no security screens for making emergency payments under $1,000. "When it started I was playing on the terminal on a break. I typed in my friend's name and then I hit return; it was processed. I could have canceled it, but I didn't," she reported.

No significant crime barrier

Not surprisingly, most perpetrators said computer security and internal controls in their offices were weak and did not pose significant barriers to their crimes. "They described identification numbers and passwords as simplistic, edits and screens as known and therefore avoidable and supervision as lax or naive regarding automated systems," the study said.

According to a state claims examiner, "Everyone had an ID number, and there was a password to bring the system up. But the codes and ID numbers were [posted] on the wall, so everyone and anyone could see them. No one cared."

HHS Inspector General Richard P. Kusserow reported that the average loss per computer crime was $45,000, and about one-fifth of the cases exceeded $100,000 in losses.

A key finding of the study was that the perpetrators were insiders — federal employees or employees of state or private agencies administering federal programs — and not outside hackers. In general, they were considered good employees, it said.

Kusserow reported that one-fifth of the perpetrators had a prior criminal record. He recommended that government managers reevaluate personnel security policies for persons in positions of trust, including all jobs with access to payroll and payment data.

In a related development, Kusserow reportedly has begun a computer matching program to identify HHS employees who have jobs dealing with sensitive data and have criminal records.

Typically, the perpetrators committed the crime by manipulating input data to trigger the issuance of government checks, and most were aided by co-conspirators who provided a false ID and/or received the checks, the report said.

Recommended actions

To combat the problems highlighted in the interviews, Kusserow's report recommended the following actions:

- Routinely interview perpetrators of computer crimes to better understand their motivations, how their crimes were committed and the effectiveness of security.
- Strengthen computer security by enforcing "personal accountability" for actions taken on automated payment systems; limit user access to only those programs, records or transactions required by the user's job; and periodically review the adequacy of all computer security controls.
- Security specialists should educate program managers about the importance of computer security, and the existence of security controls should be advertised to employees to indicate that "someone is indeed watching."
- Because federal agencies rely on state and private agency computers for many payment programs, vulnerabilities at those installations should be "addressed with the same vigor as those in federal systems."

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El Salvador murders prompt review of business travel

By Clinton Wilder
CW Staff

Some major computer vendors are rethinking aspects of overseas business travel after last month's murder of two Wang Laboratories, Inc. American employees in El Salvador, but most agreed little can be done to guarantee safety from terrorist and guerrilla attacks.

A Wang spokesman said the Lowell, Mass.-based office automation vendor will consider ways to schedule future meetings on U.S. rather than foreign soil since some of its distribution companies are located in politically volatile countries.

"In light of these incidences, we're looking at alternatives that would not expose Wang employees to danger," spokesman Peter Connell said. "We certainly want to service our customers around the world, but we will look at safer ways to do it."

Wang's director of distributor sales in Central America, George Viney of Coral Gables, Fla., and international marketing consulant Robert Alvidrez of Lexington, Mass., were among 13 people killed on the evening of June 19 when several gunmen opened fire on a sidewalk cafe in San Salvador. Also killed were three Salvadoran employees of Interdata, the local firm contracted to distribute Wang products in El Salvador.

Viney and Alvidrez had made the trip to train Interdata representatives in the sale and marketing of Wang's new Pace data base software in El Salvador. Connell said both had traveled extensively on Wang business in Central and South America in the past. "These men were frequent travelers, and they knew the situation [in El Salvador]," he said.

Few other companies said they planned to scale back, relocate or reschedule business travel in politically unstable countries. But some firms planned smaller changes, such as Data General Corp.'s revision of employee travel guidelines to include safety-related "dos and don'ts" in politically volatile nations.

"It's one way of providing some guidance to our employees," said Harvey Burstein, director of corporate security for Westboro, Mass.-based DG. "But we don't want overreaction, either. We certainly want to protect our employees and assets, but without an awful lot of justification. We don't want to turn our overseas sales offices into Fort Knox. We don't want to alarm employees and scare business off."

'The best you can do is pray'

Burstein conceded that there was little a company could have done to anticipate the San Salvador shootings, which U.S. officials said they believe were the work of leftist guerrillas and had no relation to Wang's activities in the country. "Sometimes, when dealing with terrorists, the best you can do is pray," he said.

DG sales and marketing representatives meet often in foreign countries with DG distributors such as Team Computer and Systems Ltd. in Israel and Bedouin Trading Est. in Kuwait, spokesman Ken Donoghue said. "Overseas distributors are extensions of our sales force, so it's important that they're kept up-to-date on what's happening in the company," he said. "If our employees felt they were in any danger, they would be called back."

IBM's policy of staffing its international sales offices with native employees means few American IBM employees would be in the situation of Wang's Alvidrez and Viney, an IBM spokeswoman said. Employees of IBM distributors are normally trained by members of the nearest IBM sales office in the region, she said.

Corporate monitoring of political climates around the globe is an ongoing process, according to Bob Marshall, director of corporate security for Morristown, N.J.-based AT&T International, Inc. Marshall declined to discuss specific AT&T travel policies but said the San Salvador shootings "have brought security from the back to the front burner in people's minds. Every company has to make its own analysis of each situation, weighing the importance of the business vs. safety considerations."

Richard Cole, author of the book *Executive Security* and security director for a Fortune 50 manufacturer, said companies should be aware of how their presence in a given country is perceived as well as be aware of the level of political unrest there.

"Security requires a more holistic approach than just knowing what nations are terrorist-prone," he said. "Know who you are, what it is you're selling, your marketplace and what is and is not acceptable there."

Cole said changes in the way companies handle business in such countries may come from the bottom up, with employees wary of travel in specific areas requesting not to be sent there.

Belden Menkus, a Middleville, N.J., management consultant specializing in security, predicted that increased terrorist violence will drive U.S. companies out of some nations in the future.

"There comes a point when some of this [business] just isn't worth doing any more," he said. "I know one company that is about to walk away from a major investment in Guatemala. What happened to the Wang employees suggests it might be wise for people to rethink the way they're doing business in the Middle East, Northern Ireland and Central and South America."

VECTOR

from page 1

the 500 and 1400 have access to 83 vector processing instructions. Otherwise, however, the two additions to Amdahl's supercomputer family use the same IBM 370-class instruction set and architecture as IBM or IBM-compatible scalar mainframes such as the 3080 and Amdahl's 580 series, according to the source.

The resulting compatibility with Big Blue's large-scale, general-purpose systems reportedly enables the four vector processors to be attached directly to 370-style disk systems, terminals and other peripherals.

Applications development aid

IBM compatibility also aids the Amdahl supercomputers in the area of applications development, the company said.

With the 500 and 1400, as with the rest of Amdahl's vector processing line, programs are typically written in Fortran on an IBM or IBM-compatible scalar system running under MVS or MVS/XA, the company said.

After the raw source code is created, it is run through a scalar compiler, where it is converted from IBM Fortran to its Amdahl counterpart. The compiler constitutes one of seven applications development utilities that complement the 500 and 1400's Vector Processing System (VPS) control program.

Other VPS utilities reportedly enable the compiled Fortran code to be translated from scalar statements or subroutines to vector instructions and then to be debugged and fine-tuned.

Available since September

Each of the seven application development aids has been available since last September, when Amdahl entered the supercomputing field with the introduction of the 1100 and 1200.

As with the coding itself, all compilation, debugging and fine-tuning of the Fortran code is said to take place on an IBM or IBM-compatible scalar mainframe, which is loosely coupled to one of the four Amdahl vector processors.

The finished programs can then be transferred from the scalar front end to the supercomputer, where they can be run without changes, according to the company.

Like the existing 1100 and 1200, the 500 and 1400 are entirely air cooled and incorporate 400 and 1,300 gate/chip emitter-coupled logic circuits with 350 psec switching times, the source added.

Pricing

The 500, which holds 32M bytes to 128M bytes of main memory, ranges in price from $4.9 million to $9.7 million and reportedly will be available for shipment during the fourth quarter.

The 1400, by contrast, expands from a minimum of 64M bytes of central storage to a maximum of 256M bytes and costs $12.5 million to $21.8 million. Deliveries of the 1400 will begin in about a year, the company said.

Amdahl is headquartered at 1250 E. Arques Ave., Sunnyvale, Calif. 94086.

Manufacturer/ Model	Cray Research, Inc.: X-MP	Cray 2	Denelcor, Inc. HEP 1000 series	ETA Systems, Inc. Cyber 205	National Advanced Systems Corp. 9100 series	Amdahl Corp. 500	1400
Floating-Point Operations per Second	1.4G[1]	1.6G[1]	10M-160M[2]	50M-800M	50M maximum	133M	1.14G

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WHODUNIT

Sortland Yard warns against "Raffles-type sort programs."

Call (201) 568-9700.

Ask for Inspector SyncSort!

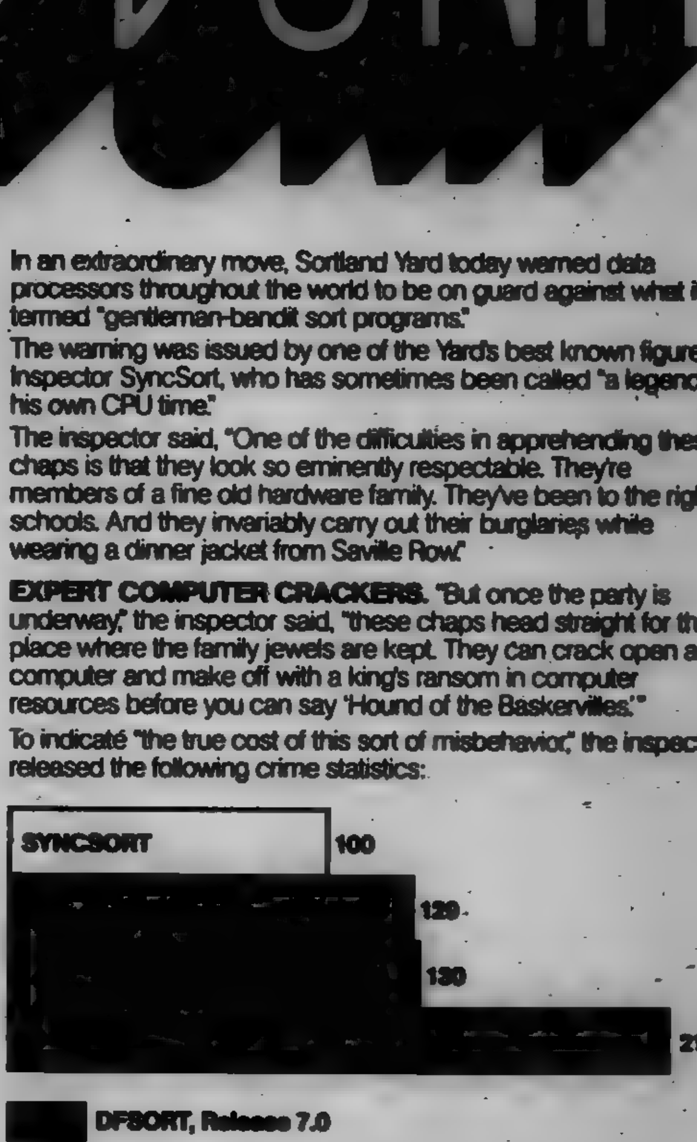
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied, "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

syncsort INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

AT&T boosts computer line with supermicro, supermini

By Tom Henkel
CW Staff

LINCROFT, N.J. — AT&T beefed up its mid-range, Unix-based processor line last week with the 3B2/400 high-end supermicrocomputer and the 3B15 low-end superminicomputer.

The 3B2/400 32-bit system is based on Western Electric Co.'s 32100 microprocessor. It is available in four basic models featuring 1M to 4M bytes of main memory and can be configured with a math accelerator coprocessor — a Western Electric 32106 CPU — for floating-point applications. AT&T said the unit has a performance of roughly 1.1 million instruction/sec.

The 3B2/400 supports one or two integrated 30M- or 72M-byte hard disk drives, and by using expansion disk controllers and expansion modules, users can configure a system with up to 720M bytes of disk storage, AT&T said.

An integrated 23M-byte streaming tape drive is included with the 3B2/400 for data backup, and the unit is equipped with up to 46 RS-232C ports and 11 parallel ports, according to AT&T.

Available in October, the 3B2/400 was designed to use the firm's Unix System V Release 2.0 operating system, which is included with the purchase price. AT&T said the system was designed to support from 10 to 25 simultaneous users. However, up to 46 terminals can be physically connected to the system.

A basic 1M-byte configuration costs $19,950 and a 4M-byte configuration is $34,950. Similarly configured systems geared for scientific applications cost $21,550 for a 1M-byte configuration and $36,550 for a 4M-byte configuration. The optional Math Accelerator Unit costs $2,200 and will be available in November. A demand paging feature for the Unix operating system costs $360 and will be available in December, AT&T said.

The 3B15 32-bit superminicomputer can support up to 60 simultaneous users and is based on the Western Electric 32100 microprocessor and the 32106 Math Accelerator Unit.

The 3B15 can accommodate up to 16M bytes of main memory, and up to eight disk drives can be attached to it. Four tape drives can also be used with the 3B15.

AT&T offers two types of tape drives — a single-density, 1,600 bit/in. drive or dual-density, 1,600 bit/in. or 6.25K bit/in. drives. Both can be controlled by either of two AT&T Intelligent Tape Controller cards, the company said.

AT&T's Unix System V Release 2.1 operating system is supported on the 3B15.

A basic 3B15 Model 101, consisting of five I/O slots, two general-purpose slots and four memory slots, costs $54,500. Two larger models, the 201 and 301, with 15 I/O slots, four general-purpose slots and eight memory card slots each cost $64,500. The two models differ in the types of disk drives that can be attached. All three models will be available in the third quarter of 1986.

More information can be obtained from AT&T, 1 Speidwill Ave., Morristown, N.J. 07960.

AT&T from page 1

and the IBM System/36 as a departmental computer and the 3B5 as a rival to IBM 4300 mainframes in the low-end mainframe market, AT&T said.

The four communications products include the SNA/3270 Emulator+, the BSC/3270 Emulator+, the 3270 Application Program Interface (API) and AT&T Communication Processor.

The SNA/3270 Emulator+ is a software package that runs on the 3B2 or 3B5. It emulates an IBM 3274 cluster controller and supports four to eight 3278 Model 2 terminal or 3287 printer sessions, AT&T said. The device works with IBM's Synchronous Data Link Control (SDLC) protocol.

The BSC/3270 Emulator+ is said to supply the same capabilities as the SNA/3270 Emulator except that it supports IBM's Binary Synchronous Communications (BSC) protocol, not SDLC.

Both emulators require an expansion card and work with an RS-232 connection at speeds up to 19.2K bit/sec. An Intelligent Synchronous Controller card works with a 3B2 and an I/O Adapter/Synchronous Data Link Interface fits in a 3B5 system expansion slot. When a 3B system is emulating a 3274 controller, a user can run other Unix applications.

The 3270 API provides file transfer facilities between a 3B and an IBM mainframe. The software is made up of a library of routines that enable a user to write programs to transfer data between an IBM mainframe and a 3B.

The product can be used in conjunction with the two emulators to select data from applications that support SDLC or BSC protocols.

The Communications Processor provides a gateway between 3BNet, AT&T's Ethernet network, and an IBM host. It reportedly supplies IBM 3274 controller emulation and protocol conversion capability. The device converts asynchronous transmissions into SDLC protocol, AT&T said. The product is available in two models. The Model 1 can attach directly to an IBM mainframe channel and was designed for local use, AT&T said. The Model 2 was designed for remote use and can be used over dial-up telephone lines.

The Communications Processor consists of a disk drive, microprocessor and random-access memory. The product, which will not be available until the first quarter of 1986, was designed to link a number of 3B machines to an IBM mainframe at speeds up to 19.2K bit/sec.

The emulator packages each cost $700 for a 3B2 version or $1,500 for a 3B5 model. The 3270 API for the 3B2 costs $150; the 3B5 version sells for $250. The communications processor costs $27,000.

AT&T is located at One Speldwill Ave., Morristown, N.J. 07960.

AT&T ties to IBM world key to long-term strategy

By Paul Korzeniowski
CW Staff

The jury is still out on whether AT&T can become a major player in the computer market. However, industry analysts have said AT&T's announcements last week (see story page 1) produced evidence that the communications company can compete with IBM.

Dixon Doll, chairman of DMW Group, Inc., an Ann Arbor, Mich., consulting firm, noted, "AT&T is catering to the real world. If it has any chance [of surviving] in the computer market, the communications company has to recognize the importance of IBM and its pervasiveness in the market. To sell equipment, AT&T has to make it very easy for a user to connect an AT&T system with an IBM product." Jim Renalds, an analyst at Dataquest, Inc., a San Jose, Calif., market research firm, added, "The communications links were the most important part of the announcement. I think that AT&T had to speed up the timetable for these introductions because MIS managers had demanded that AT&T products work with IBM equipment."

Some analysts saw the links as only a first step toward true integration with IBM systems. "AT&T has supplied 3270 terminal support for [AT&T Unix] applications," stated Kim Myhre, director of communications industry research at International Data Corp. (IDC), a Framingham, Mass., market research firm. "It's an important step. But to succeed, AT&T must add value to its links. It has to offer something beyond terminal emulation, such as peer-to-peer communication for enhancements like IBM's LU6.2."

Peter Lowber, manager of the information systems group at the Yankee Group, a Boston consulting firm, concurred. "The AT&T announcement is no big deal, since it only supplies the lowest level of connectability," he said. Other firms such as Digital Equipment Corp. and Wang Laboratories, Inc. are a few steps ahead of AT&T, according to Lowber: "These companies are supplying sophisticated links to items such as [IBM's Document Content Architecture]," he added.

Connectability key

Connectability is becoming a key issue for many companies that use a number of different computer systems. "Not even IBM can connect its systems together," noted Eric Arnum, research analyst at International Resource Development, Inc., a market research firm in Norwalk, Conn.

IBM has begun to address this problem with a series of communications products. "IBM is making a concentrated effort to connect its systems, and AT&T has to keep pace," IDC's Myhre said. "It has to add items such as [IBM's Distributed Office Support System] bridge to the 3B line."

DMW Group's Doll said that most vendors offer the same capabilities that AT&T supplies. "AT&T is addressing connectivity issues with its cabling plan and Information Systems Network," he noted. "The company realizes it has to address problems of higher level protocols. AT&T is close to offering the capabilities that other companies supply. One should realize that these companies are also having problems linking their systems to IBM."

While analysts saw the links as necessary, some doubted AT&T's 3B products could entice IBM customers. "The 3B line cannot stand on its own," Dataquest's Renalds said. "It has to be sold as a supplement or a complement to another line."

A principal reason for this is that the 3B line was built on outdated technology, Renalds added. Another problem is the lack of 3B applications software. There are approximately 4,000 packages for the IBM System/36 and only a few hundred for the 3B line, said International Resource Development's Arum.

System V-VM allows IBM users to 'exploit' power of AT&T Unix

LINCROFT, N.J. — AT&T last week took on IBM in the heart of Big Blue's territory with the introduction of an operating system for IBM's 370 architecture mainframes.

AT&T unveiled a version of its Unix System V Release 2 — dubbed System V-VM — that runs as a guest under IBM's VM operating system on IBM mainframes. The AT&T product is similar to IBM's Interactive Executive for the IBM 370 (IX/370) System V version that IBM announced in February among its 3090 processor introductions [CW, Feb. 18].

According to an AT&T spokesman, System V-VM allows IBM mainframe users to "share existing hardware resources and provides a cost-efficient way of exploiting the power of Unix." The AT&T mainframe operating system reportedly features enhanced systems and operations facilities for the mainframe environment.

In addition, the spokesman said, System V-VM provides support for IBM 3270-type terminals, an interface between VM and IBM's MVS and full-duplex communications for the use of Ascii terminals. The product also offers University of California at Berkeley additions, full screen editing and text processing capabilities and AT&T's Documenter's Workbench software.

System V-VM is currently under controlled release and is scheduled for general availability in October. Yearly lease costs will range from $20,000 to $25,000, depending on whether source code is supplied. IBM's IX/370 is also slated for October shipments and its price, based on the number of concurrent users, ranges from $10,000 to $40,000.

— John Gallant

Software International moves to link mainframe tools

By John Gallant
CW Staff

ANDOVER, Mass. — Software International Corp. is expected today to announce the first offerings in a series of products that will eventually tie the capabilities of the company's existing line of applications software.

The company, headquartered here, took up the torch of integration from mainframe software brethren Computer Associates International, Inc. and Uccel Corp., both of which fueled the flames with recent announcements of the integration of their lines of systems software products [CW, June 10, June 17].

Today's product introductions are said to be the first phase in the release of Software International's Masterpiece series, which will feature the firm's current applications enhanced and restructured to utilize the common query and systems management components of the new product line.

Masterpiece products

Regis Kaufman, manager of product marketing, said the Masterpiece products include new releases of Software International's general ledger, accounts receivable and payable, fixed assets and manufacturing resource planning packages, a purchase order package, the Masterquery inquiry and ad hoc reporting system and System Manager. All are slated for availability by the end of this year.

The System Manager includes Master Security, On-Line Help and Menu and Screen Navigation modules. System Manager is said to link Masterpiece applications with Masterquery. The modules provide a single logon facility and application-specific Help text capabilities for moving from screen to screen within an application or between applications.

According to Kaufman, the Masterpiece products are the result of a major development effort aimed at creating what Software International is calling an "intelligent architecture." Within that architecture, application-specific code is isolated from common components such as the query and system management tools. Those common facilities allow users to gain access to and utilize information from the applications, he said.

Future phases of Software International's development effort will involve the removal from the applications of code specific to data base management systems and teleprocessing monitors. In addition, microcomputer-to-mainframe link and production report writer modules will be added to System Manager.

System Manager tools will be made available with the first Masterpiece application a user purchases, Kaufman said. Other applications can then utilize the components. The first application, general ledger, is slated for a September release.

According to Kaufman, current users will receive upgrades to the Masterpiece series at no cost. In addition to the ability to utilize Masterquery and System Manager, the Masterpiece versions of the applications are said to feature significant functional enhancements.

Masterquery will be available this month for the current general ledger system and will include an interface to the Masterpiece series general ledger. It will be priced at $30,000; subsequent interfaces to other Masterpiece products will be priced at $5,000 each.

The Masterpiece products will operate in IBM's OS and DOS environments. Under a special pricing offer, the applications will be priced between $30,000 and $60,000 through 1985. Subsequently, prices will be increased to between $45,000 and $95,000 per application.

Software International is located at One Tech Drive, Andover, Mass. 01810.

DOD to install AT&T 3B line

GREENSBORO, N.C. — AT&T Technologies announced last week it has been awarded a contract to provide and install its 3B line of computers at the U.S. Department of Defense.

The contract, which AT&T said could be worth almost $1 billion, was seen as a major victory by AT&T over a field of computer vendors.

Since its entry into the computer market in March 1984, AT&T's product line has been scorned by analysts, who claim the company entered a highly competitive market with a product lineup that technologically trails those of other vendors.

Under the terms of the contract, AT&T will install and maintain 3B hardware and its Unix System V operating system. "This is a very large procurement, which we worked very hard on for more than a year," said Warren Corgan, vice-president of AT&T's Federal Systems Division, which bid on and will manage the contract. "The customer is a very sophisticated user of computers, and it is very gratifying to be chosen over the other major suppliers."

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Telephone __________ Ext __________

Proof is in the product: Users guarded on IBM-MCI move

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — "I think AT&T is going to have a real contender."

That is how Jerry King, manager of telecommunications for General Electric Co., evaluated last week's announcement of the intended deal which would turn Satellite Business Systems (SBS) over to MCI Communications Corp., while, in return, granting IBM a 16% stake in MCI.

GE is one of many large corporate accounts held by SBS, the satellite communications company held jointly by IBM and Aetna Insurance Co. Other SBS users reacted last week with surprise and caution, mixed with interest, over the deal. Users said they would reserve judgment on the IBM-MCI strategic alliance until products and services were demonstrated.

"Obviously, IBM is a real viable player now in the telecommunications business as a result of this," said Al Ladwig, manager of telecommunications for J. C. Penney Co., located in New York. Penney uses SBS services mostly for the company's voice communications.

"I've got to be shown that this is good for me," Ladwig added. "AT&T is a big company with a lot of plant in place. This deal won't change my attitude overnight because IBM has a piece of MCI. There is a lot of business out there, and MCI can't go after all of it."

"We'll watch how this thing shakes out," Ladwig said. "If we don't get the support [from SBS], then we'll change."

Ladwig admitted to being surprised at the IBM-MCI alliance. "I suppose I shouldn't be. Whether they will be able to serve our needs remains to be

AT A GLANCE

MCI COMMUNICATIONS CORP.

MCI

Divisions
— MCI Telecommunications Corp.: Domestic long-distance service
— MCI International, Inc.: International long-distance, Telex services
— MCI Digital Information Services Corp.: MCI Mail and data services
— MCI Airsignal, Inc.: Mobile telephone paging services

1984 Revenues - $1.96 billion
1984 Profits - $59.2 million
Assets - $3.89 billion
Shares outstanding - 235.5 million
Customers - 2.5 million

AT A GLANCE

SATELLITE BUSINESS SYSTEMS
(Partnership: IBM 60%, Aetna Life & Casualty Co. 40%)

SBS

Divisions
— SBS Skyline Services: Long-distance services
— SBS Network Services: Voice and data networks for large businesses
— IBM/SBS Joint Marketing: Information and communication systems
— SBS Real Estate Communications Co.: Shared tenant services

1984 Revenues - $290 million
1984 Losses - $100 million*
Assets - $1.1 billion
Customers - 200,000

MCI from page 1

ding. "we take it as a compliment that they think we can do it better than the others. We can now deliver performance for very sophisticated users."

McGowan said one principal market being targeted by MCI and IBM will be the Fortune 500 companies, which, he said, plan to spend an estimated $1 billion on new telecommunications services in the next few years.

MCI in the last year has invested $1 billion in expanding its nationwide telecommunications network, installing 10,000 miles of fiber-optic cable and increasing its already almost ubiquitous microwave links — all in a push to attract the large business customer.

Nevertheless, MCI's marketing effort has not met with success in attracting the businesses and corporations that comprise the largest volume and largest revenue portion of the long-distance business, according to some analysts, because its service was seen as inferior in quality compared to AT&T.

The agreement in principle between the two companies is expected to be finalized in the next month, McGowan said. It also must face Federal Communications Commission review as well as similar scrutiny from the Department of Justice.

Formal review period

McGowan said a formal review period permitting public comment on the strategic alliance will be initiated by the Justice Department in accordance with the Hart-Scott-Rodino law, which requires public participation in mergers and business combinations where market share is affected. He predicted that the merger of SBS into MCI will be accomplished within the next three to four months.

In 1984, SBS generated approximately $400 million in revenue from 200,000 customers, McGowan said. MCI will fold these customers into the company and take over ownership of three Ku-band satellites now in use — SBS 1, SBS 2 and SBS 3 — as well as 21 switching centers, SBS' headquarters and most of its 2,700 employees in McLean, Va.

IBM Vice-Chairman Paul Rizzo, who accompanied McGowan to the press conference here last week to unveil the alliance, said that IBM and its other partner in SBS, Aetna Life & Casualty Co., were absorbing SBS' $100 million annual losses. IBM owned 60% and Aetna 40% of the subsidiary into which $1.8 billion has been sunk. Aetna said it would receive a payment from IBM in the form of MCI stock and cash for a portion of its ownership and would write off a loss in the second quarter.

McGowan predicted that adding SBS' assets to MCI would aid his company and not detract from it, despite an 11-year history of SBS losses. "By acquiring these assets debt free, we can enhance them and enlarge our own system," he said.

IBM's Rizzo commented, "IBM continues to be very interested in telecommunications, and we have taken a minority stake in the most significant independent company in the telephone industry." Rizzo said IBM decided to unload SBS to MCI because "we determined that [SBS] would have required a very considerable investment over the next few years during a period where there is considerable turmoil in the telecommunications market."

Rizzo said IBM did not intend "to be the deep pockets" to fund MCI's expansion. "Unless the economy of this industry makes sense, it will be difficult to attract dollars from anyone, including IBM," he said.

By having in IBM a partner that is established as the dominant presence in the DP departments of corporations and businesses, MCI will find it easier to attract this important segment of telecommunications business, analysts said.

MCI alliance fortifies IBM arsenal for battle with AT&T

Industry analysts generally felt IBM's intended acquisition of a 16% stake in MCI Communications Corp. would benefit both companies, while AT&T reacted to last week's announcement by calling for an end to government regulation of its operations.

Greg Carlsted, an analyst with Dataquest, Inc., said, "MCI understands communications. IBM gains a foothold in the market where they will ultimately be in direct competition with AT&T. MCI needed the capital to expand its network."

Mary Johnson, a senior analyst with the Yankee Group, said, "IBM is bracing for its battle with AT&T. But it did not know much about communications. Now they can turn to MCI and let them do it."

Johnson predicted a very close working relationship between the two companies. "MCI has a packet-switching data network that IBM may be interested in as it begins to include support for IBM products," she added.

The strategic alliance between the two companies prompted AT&T Communications President Randall Tobias to remark, "IBM has now staked out a very big role in the long-distance market. This announcement should put to rest any remaining questions about the strength of competition in the telecommunications business — and whether or not it is here to stay."

Tobias called on the Federal Communications Commission to relax current regulatory barriers that bar AT&T from combining its long-distance service with its computer and office automation product lines, which are presently offered through its AT&T Information Systems subsidiary. That petition is now being considered by the FCC.

GTE Telenet Communications Corp., whose Sprint Communications Corp. subsidiary is the third largest competitor in the long-distance market, said, "The action that IBM and MCI have [taken] shows the severity of the problems in the long-distance market and the need for changes for the transition to effective competition with AT&T."

William McGowan, MCI president and chief executive officer, said MCI's alliance with IBM will not diminish competition in the long-distance industry but rather enhance it by making MCI better able to compete with AT&T. He said that the current 10% market share held by carriers other than AT&T was not relevant in determining if competition was enhanced by the IBM-MCI alliance.

McGowan downplayed the suggestion that IBM would eventually buy a controlling interest in MCI. "There's nothing in the plan which says IBM will obtain the 30% interest. It only says thay can go to that amount without getting board approval. We initiated the discussions. We wanted [Satellite Business Machines] and a relationship with IBM."

IBM Vice-Chairman Paul Rizzo added, "IBM is not interested in exercising a controlling interest." Nevertheless, IBM last year completed a $2.5 billion takeover of private branch exchange and switching system manufacturer Rolm Corp. of Santa Clara, Calif., after initially buying a small stake in the company and then gradually increasing its interest until a complete buy-out was agreed to.

McGowan said IBM had not asked for a seat on MCI's board and added, "I don't think it would be any problem if they wanted to."

— Bryan Wilkins

seen; I've got to be shown," he said.

Similar sentiments were voiced by Wells Fargo Bank's San Francisco manager of telecommunications, Ron Lee. "The only interest in this is in the financial arrangement. There are no benefits I can see that we can derive from this in the short term. Maybe in the long term, they can offer improved service and improved availability," he said. Lee said Wells Fargo dropped SBS as a telecommunications supplier several years ago.

Natural fit

Jerry King, GE's telecommunications manager, said he saw the merger of SBS' digital satellite capacity with MCI's terrestrial microwave and fiber-optic network as a natural fit.

"SBS can put its voice customers on the terrestrial network, getting rid of the space delay problems [associated with satellite voice links], and MCI can put its data communications traffic on the satellites. AT&T has a real contender," he said.

Most SBS users contacted were unanimous in predicting that IBM would eventually want to obtain complete control over MCI, which they saw as a "feisty, independent" company.

The managers of large corporate telecommunications networks said they preferred having a number of competitors from which to choose for their service and voiced some doubts whether in the long run competition would be served by the IBM-MCI alliance.

Joe Brophy, manager of telecommunications for Travelers Insurance Co. of Hartford, Conn., also a user of SBS, said the IBM-MCI alliance probably won't affect his company immediately.

"Business as usual"

"It will be business as usual, most likely. I don't expect anything to come of it for the first year or so," he said.

For the long term, Brophy said, the alliance will aid both IBM and MCI. "I'd expect to see new products, penetration into data communications by IBM, combining its [private branch exchange] technology contained in Rolm," he added.

Travelers' voice needs are currently being supplied by a large investment in a Centrex system as well as heavy reliance on AT&T Communications for long-haul links. MCI is used very little, said Brophy, who added that switching to MCI was not currently in his company's future plans.

Integrating voice and data is one of Travelers' major goals, Brophy said, but "that's really a PBX problem how the architectures will be constructed."

Dick Kaufman, a telecommunications consultant in Rowayton, Conn., said the alliance will make large-scale data file transfers over SBS satellites a viable business if managed by MCI without IBM interference. But Kaufman said that customers of these new sophisticated business services have been left behind, afraid to buy the offerings because they don't know what to do with them once they have them."

"I'm very pessimistic. IBM has failed; AT&T has failed. We need massive customer education to take advantage of all this wonderful stuff. There is very little going on to harness the data capacities of these communication pipes," he said.

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		International Alliances
Equity Interests	Siemens Capital Corp. Shareholders for U.S. corporations Siemens Capital Research & Support, Inc. Siemens-Allis, Inc. (50%) Factory automation and power engineering equipment Siemens Communication, Inc. Telephone and data communications equipment — Databit, Inc. Data network systems Siemens Components, Inc. Semiconductors and electronic components — Crystal Technology, Inc. Optical and acoustical crystals — Microwave Technology Corp. Microwave semiconductors Siemens Medical Systems, Inc. Medical electronic equipment HMC Graphic Systems, Inc. Prepress electronics systems Siecor Corp. (50%) Joint venture with Corning Glass Works Fiber-optic products Advanced Micro Devices, Inc. (20%) Semiconductors	Partnership with N.V. Philips, Dutch and West German governments Development of submicro semiconductors European Computer Industry Research Center Partnership with ICL Ltd. and Groupe Bull Research into artificial intelligence and advanced software
Technology Exchanges	Computer-aided engineering (CAE) cooperative with Daisy Systems Corp.	Signed Unix standardization pact Esprit* participant OEM mainframes from Fujitsu Ltd. OEM Personal Logician (CAE) system from Daisy Systems Corp.

		International Alliances
Equity Interests	Docutel/Olivetti Corp. (46%; seeking to acquire 100%) Microcomputers, office equipment and banking terminal systems Microage Computer Stores, Inc. (46%) Retail microcomputer chain Venture capital investments	Acorn Computer Group PLC (49%) UK microcomputer vendor Acquired European operations of Exxon Office Systems OEM mainframes from Hitachi Ltd. Olivetti of Japan Ltd. (80%) Japanese subsidiary part-owned by Toshiba Corp.
Technology Exchanges	OEM microcomputers to AT&T OEM microcomputers to Xerox Corp.	Signed Unix standardization pact Esprit** participant OEM fault-tolerant systems from Stratus Computer, Inc.

		International Alliances
Equity Interests	Nixdorf Computer Corp. IBM plug-compatible mainframes, office automation equipment, financial systems Nixdorf Computer Software Co. Software development Auragen Systems Corp. (10%) Fault-tolerant systems	
Technology Exchanges	Joint development and OEM Auragen Systems Cooperative agreement with Spartacus Computer, Inc. for Operating system software Wide range of software licensing agreements	Signed Unix standardization pact Esprit* participant

EUROPE from page 1

Each of the six, however, has adopted a strikingly different strategy.

- **Siemens AG of West Germany.** In 1983, this vast electronics conglomerate was second only to IBM in its number of large-scale systems shipments, according to IDC Europa, but that ranking was a far-distant second: Siemens shipped 112 units compared with IBM's 700 units. But Siemens AG does not ship any computer systems to the U.S., preferring instead to nurture functionally independent U.S. subsidiaries engaged in telecommunications equipment, semiconductors, factory automation and fiber optics.

- **Nixdorf Computer AG of West Germany.** Domestically a poor cousin to the older Siemens, this firm — through its Nixdorf Computer Corp. U.S. subsidiary — is the only one of the six major vendors to market a line of general-purpose computer systems in the U.S. and has gained a niche by offering IBM-compatible hardware.

- **International Computers Ltd. (ICL) of the UK.** Despite the aid of the British government's nationalistic buying tendencies, ICL suffered financial problems for a number of years and was acquired last year by Standard Telephone and Cable. The firm's ICL, Inc. U.S. subsidiary has lived a stop-and-go existence and is concentrating on vertical-market applications of small business computer systems.

- **N. V. Philips Gloeilampenfabrieken of the Netherlands.** A multibillion-dollar conglomerate like Siemens, N. V. Philips' claim to fame in the U.S. lies with its majority ownership of North American Philips Corp. and attendant consumer brands such as Magnavox, Norelco and Sylvania. In the U.S computer arena, Philips owns a semiconductor manufacturer and operates a subsidiary to sell office automation products manufactured by a Canadian subsidiary. It has aggressively entered the emerging market for optical storage products in partnership with Control Data Corp.

- **Ing. C. Olivetti & Co. of Italy.** Despite the uneven performance of Docutel/Olivetti Corp. in the financial systems and office equipment markets, Olivetti recently announced it is seeking to increase its ownership of Docutel/Olivetti from 46% to 100%. The No. 1 European manufacturer of small-scale systems is indelibly wedded to the U.S. market through an equity interest held by AT&T and a variety of venture capital investments.

- **Telefonaktiebolaget L. M. Ericsson of Sweden.** This firm is one of the leading telecommunications equipment companies, with revenue of more than $3 billion. Of the domestic small systems installed base, Ericsson claimed only 3% of the total in 1983, and medium systems were only 8% of Sweden's installed base. In the U.S. it operates Ericsson, Inc. in partnership with Atlantic Richfield Co. and has formed and acquired an impressive stable of U.S. operating units.

The lure of the U.S. market to European vendors is obvious. "It is a big, homogeneous market," noted

See EUROPE page 13

Technological lag spurring partnerships

By Peter Bartolik
CW Staff

European vendors may not want to admit publicly that the problem exists, but they are all taking aggressive steps to halt what has been perceived as a serious technological lag.

In his 1984 report to shareholders, W. Decker, chairman of N. V. Philips Gloeilampenfabrieken, said, "There is much talk of a 'technology gap' between Europe and the rest of the world. We are of the opinion that, in our field at least, such a gap does not exist at the present time. There is considerable danger, however, that Europe will indeed fall behind if the available technological knowledge cannot be translated into products required by the market. . . . Accordingly, in the past year we have done everything within our power to help bring about the common and homogeneous market that is so desirable."

Both with government sponsorship and without, European vendors are increasingly banding together with each other and with Japanese and American vendors in an effort to ensure technological progress and to establish viable distribution channels.

'Trying to fight IBM'

According to Chris Wicka, director of research for IDC Europa, Ltd., the London-based office of International Data Corp. (IDC), the impetus behind technological and marketing alliances is simple. "They are trying to keep away from IBM and trying to fight IBM," he said of the European vendors.

IDC Europa's figures (see story page 1) point out the naked truth. Where IBM has yet to grasp the dominant share of the marketplace — such as it holds in the European mainframe market — it has at least established a trend as the fastest growing supplier in small- and medium-scale systems.

So, International Computers Ltd. (ICL) and Siemens AG have turned to Fujitsu Ltd. for mainframe technology, and Ing. C. Olivetti & Co. has turned to Hitachi Ltd. to fill a similar need. While selling micros to AT&T, Olivetti is also reselling AT&T's 3B line of minicomputer products in Europe. N. V. Philips also recently reached an OEM agreement with Harris Corp. to resell Philips' Sopho-Net wide-area network communications products. The communications products are part of a broad Sophomation family of products from micros to large superminicomputers that are designed for a fully integrated office automation environment.

Both N. V. Philips and Siemens are engaging in U.S. semiconductor operations, as well as cooperating in Europe on a venture to develop submicron semiconductor techniques; Philips is taking a leading role, in partnership with Control Data Corp.,

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Equity Interests	Ericsson, Inc. (80%) Joint venture with Atlantic Richfield Co. — Ericsson Communications Telecommunications and OA equipment — Ericsson Information Systems Integrated information processing equipment — Ericsson Network Systems Central office switching systems — Anaconda Wire and Cable Co. Wiring and cable products — Honeywell Ericsson Development Co. (50%) Joint venture with Honeywell, Inc. to develop Ericsson telecommunications equipment for U.S. market Facit, Inc. Office equipment [illegible], Inc. (50%) Retail automation equipment Ericsson Programmatic, Inc. Software development Rifa, Inc. Components design and manufacturing	Thorn Ericsson Telecommunications Ltd. (49%) Joint venture with Thorn EMI PLC to develop and market digital phone-switching systems
Technology Exchanges	OEM digital switching systems to Honeywell OEM printers to Memorex Corp. (Facit) Chip technology exchange with Advanced Micro Devices, Inc. (Rifa) OEM AT&T Unix-based office software from Applix, Inc.	Cooperative marketing agreement with Sperry Corp. for European marketing of Ericsson financial systems

Equity Interests	U.S. Philips Trust (trustees are the shareholders of N.V. Philips) North American Philips Co. (58%) Consumer products, lighting products, electrical and electronic components Signetics Corp. Semiconductors Philips Information Systems, Inc. Office automation sales subsidiary of Canada-based Philips Information Systems Ltd.; absorbed Philips Peripherals, Inc. Optical Storage International — U.S. (51%) Optical storage products venture with Control Data Corp.	Partnership with Siemens AG, Dutch and West German governments Development of submicro semiconductors Optical Storage International — The Netherlands (51%) Optical storage products venture with Control Data Corp. AT&T and Philips Telecommunications BV (50%) Telephone exchange development venture with AT&T ASM Lithography Systems BV Semiconductor equipment partnership with Advanced Semiconductor Materials International NV
Technology Exchanges	OEM Sopho-Net wide-area network products to Harris Corp.	Signed Unix standardization pact Esprit* participant

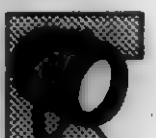
Equity Interests	ICL, Inc. Computer systems for vertical markets	European Computer Industry Research Center Partnership with Siemens AG and Groupe Bull Research into artificial intelligence and advanced software Cooperative pact with AT&T to develop UK value-added network
Technology Exchanges	Joint development with Perq Systems Corp. Scientific workstations	Joint development with Fujitsu Ltd. Very large-scale semiconductors for ICL mainframes Signed Unix standardization pact Esprit** participant OEM Officepower software from Computer Consoles, Inc. OEM systems from Perq Systems Corp. OEM Unix-based superminis from Datamedia Corp.

European vendors cool on entrance to U.S. markets

Strategies focus on pioneer areas

By Peter Bartolik
CW Staff

The U.S. market for general-purpose computer systems seems to hold little allure for the Europeans. With one exception, the strategies for gaining U.S. market share are based on thrusts into areas of technology that either are just getting off the ground or have yet to be dominated by U.S. vendors. That exception is Nixdorf Computer AG, which has circumvented Siemens AG's dominance and closeness to the West German government by developing a range of IBM-compatible products.



A 1½-year-old study by the U.S. Congress' Office of Technology Assessment (OTA), "International Competitiveness in Electronics," characterized Nixdorf as, "perhaps the closest to an entrepreneurial firm in the American style that the European electronics industry has seen."

According to the OTA study, although Siemens has acquired only 20% of the West German computer market and less than 10% of the European computer market, it has received the greater share of West German government funds for research and development in computer technology. In contrast, the study said, "Nixdorf is an aggressive worldwide competitor in its chosen markets. . . . The company has accomplished this with little government assistance."

Yet Siemens has undoubtedly been successful. According to a report last year on international competitiveness by Newton-Evans Research Co., "Siemens AG is West Germany's largest producer of electrical and electronic engineering equipment, and when ranked by sales and numbers of employees, the company ranks as one of the six largest companies in the worldwide electronics and electrical industries."

Siemens' U.S. efforts date back to 1970, and its U.S. employees number about 15,000, Newton-Evans said. A spokesman for Siemens Capital Corp., the holding company for Siemens' U.S. ventures, said the company does not ship CPUs into the U.S., and it has adopted a decentralized structure, with various divisions reporting directly back to European headquarters. The Siemens U.S. strategy targets four areas: semiconductors, telecommunications, medical systems and factory automation. When Allen-Bradley Co., the U.S. factory automation firm, was up for sale earlier this year, Siemens reportedly made a $1.5 billion offer, although Rockwell International Corp. submitted the winning bid.

> ”
>
> *Olivetti has an increasing presence in the U.S. and seems anxious to make its presence felt.*

N. V. Philips Gloeilampenfabrieken, the Dutch conglomerate, is as big as Siemens yet much more diversified. Its U.S. presence is well cemented with 58% control of North American Philips Corp., the lighting and appliance manufacturer that ranks among the 100 largest U.S. corporations. In recent years, N. V. Philips has moved to broaden its U.S. presence with the 1979 acquisition of semiconductor manufacturer Signetics Corp. and its 1984 partnership with Control Data Corp. to develop and market optical mass storage products. Philips also has a thriving Canadian-based office automation company, Philips Information Systems, Ltd., which markets Micom systems. Newton-Evans estimated that the Canadian company generated 20% of Philips' 1983 information-processing-related revenue; that only amounted to $224 million, however.

In the U.S., N. V. Philips' business systems and peripherals subsidiaries were consolidated into Philips Information Systems, Inc., the U.S. sales arm for both its Canadian-built and European-built products. On June 1, according to N. V. Philips, the company combined its information and communications products groups into the Telecommunication and Data Systems division. "This division intends to strengthen its presence within the U.S. market; however, nothing specific can be said on this at this moment," the spokesman said.

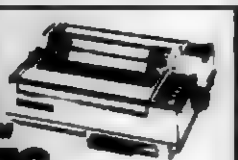
In the Netherlands, N. V. Philips has built a 23% share of the installed base of medium-scale systems, second only to IBM's 24% share, according to IDC Europa, the London-based office of International Data Corp. In small systems, its domestic share at the close of 1983 was only 4% of the installed base, the fifth largest share. Unlike International Computer Ltd., Siemens and Ing. C. Olivetti & Co., Philips has no mainframe systems installed, according to the IDC Europa statistics.

Olivetti has an increasing presence in the U.S. and seems anxious to make its presence felt. The Docutel/Olivetti Corp., formed by the 1982 merger of Docutel Corp. and Olivetti, has had an uneven financial performance and has undergone several reorganizations; its two major components are financial automated teller systems and office equipment.

Olivetti has established a venture capital investment arm that reportedly has invested in some 30 start-up electronics firms and is very involved in California's Silicon Valley. This venture reportedly has acquired a large stake in the Microage retail store chain. The big news came last year when it was announced that AT&T would resell Olivetti's M24 micros as the AT&T Personal Computer 6300 and that AT&T had purchased 25% of the Italian firm, with an option to acquire as much as 40%.

Olivetti's U.S. presence was built on the back of its success with typewriters and other office equipment. According to Bill Cronin, vice-president of Docutel/Olivetti's office products division, sales are made mainly through dealer and other indirect channels, with the exception of federal government sales and a small direct sales force set up to assist dealers with major accounts.

The writing systems line, a series of typewriters and word processing stations, is distributed through 400 dealers, while the M24 micro is sold through 100 dealers.



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The office products division has no role in the AT&T resale agreement, which is handled directly by Olivetti in Italy, according to Cronin.

There is no conflict between AT&T and Docutel/Olivetti selling the M24 machines, Cronin said. "There are plenty of customers for both of us," he said.

L. M. Ericsson Telephone Co. has built a varied base of operations in the U.S. The central company, Ericsson, Inc., is a partnership with Atlantic Richfield Co., with whom L. M. Ericsson cooperated on cable ventures in South America.

U.S. market share

John Meurling, head of Ericsson's corporate and marketing communications and vice-president of U.S investor relations for L. M. Ericsson, said the U.S. market represents 35% to 40% of the worldwide market for information technologies products and about 30% of Ericsson's worldwide revenue.

Despite business press reports of the make-or-break nature of its operations in the U.S., Meurling said, "It's a big slice that we are interested in, but it is not a stand-or-fall situation."

A relative newcomer to the systems equipment market, L. M. Ericsson has developed a broad range of products ranging from workstations to financial systems. However, its strength is clearly in the telecommunications area.

LAG

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to develop optical storage. ICL has linked with Groupe Bull, the other dominant European company that has not yet established a U.S. beachhead, to explore artificial intelligence software techniques.

On the home front, all but L. M. Ericsson Telephone Co. have signed a pact to standardize applications packages around AT&T's Unix System V operating system to enable porting of software among their various systems.

All except L. M. Ericsson are also participating in the European Strategic Program of Research in Information Technology (Esprit), the Common Market-sponsored program of applied technological development.

L. M. Ericsson has gone somewhat alone in its approach, aside from one joint venture in England and a Honeywell, Inc. partnership in the U.S.

"Right now we're not involved," said John Meurling, vice-president of U.S. investor relations for the Ericsson Group and head of Ericsson, Inc.'s corporate and marketing communications. "There are two lines of development [for these alliances]; one is along the lines of the Common Market, to which we do not belong."

The other line, he said, is the transoceanic partnerships such as the one linking AT&T to Olivetti and a recently announced pact linking Olivetti to Toshiba Ltd. in Japan.

Randolph Richmond, president of ICL, Inc. in the U.S., said, "The only way to compete with IBM is to team up; I think we'll see more and more of that, particularly with communications and computers."

But he dismissed the concept of a technological gap, claiming that ICL's design of semiconductors built by Fujitsu are leading-edge products.

Nixdorf AG, although a participant in Esprit and the Unix pact, has a somewhat different story, according to Robert C. Nicewicz, senior vice-president with Nixdorf Computer Corp. in the U.S.

The company has never adopted the approach that it can develop all the best components, but rather has "selected the best and most modern" products from other vendors that can be integrated into a Nixdorf system.

Both Siemens and Ericsson have set goals to capture large shares of the U.S. telecommunications market, spurred by the breakup of the Bell system. Nixdorf also views the U.S. market as one of growth, but as yet has not announced any plans to adopt its European private branch exchange products in the U.S., according to Nicewicz.

European telecommunications products, Nicewicz noted, are designed according to the standards established by the various Postal Telephone and Telegraph (PTT) authorities in each country, and are not immediately transferable to the U.S. market.

Francis McInerney, a vice-president with Northern Business Information, Inc., a New York-based market research company focused on the telecommunications arena, held little hope for European vendors breaking into the U.S. market.

"In Europe, the PTTs set the features packages; they are designed as a matter of policy and expand for a number of years," McInerney said. "Here in the U.S., features are user driven and change very quickly."

The international situation puts the Europeans in a quandary, McInerney said. The leading vendors are conditioned to establish standards via a political process.

But, he said, "If they realize that the future is in networking, they have to be in North America because it is the only large, open market."

> ***'The only way to compete with IBM is to team up; I think we'll see more and more of that.'***
>
> — Randolph Richmond
> ICL, Inc.

EUROPE

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Chris Wicks, director of research with IDC Europa. The European manufacturers may be "too sophisticated for the U.S. market" in that they have evolved and grown by developing products for "the excessive heterogeneous aspects of the European markets," Wicks said. Although the relative mass markets of the U.S. offer the potential for greater sales of uniform products, the European vendors "don't necessarily have the skills and infrastructure to succeed," he said.

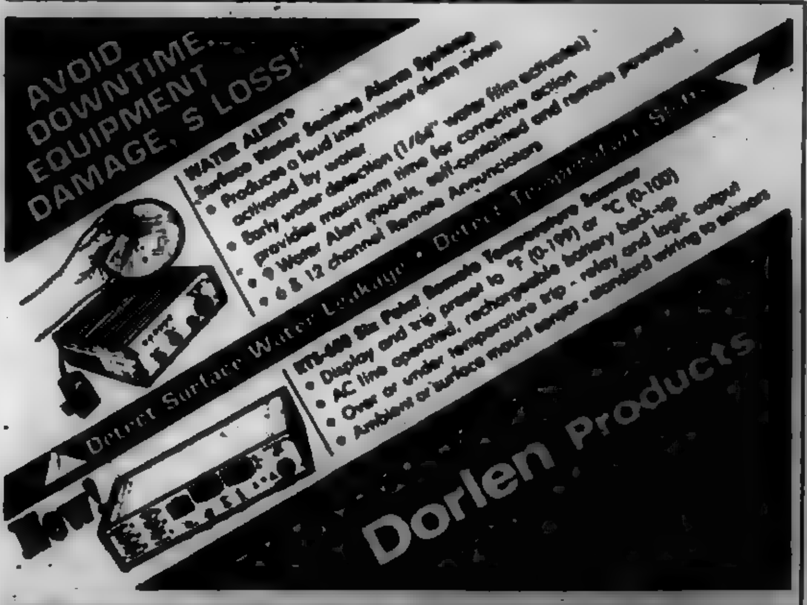
Randolph Richmond, president of ICL, Inc., said ICL's 10-year-old U.S. subsidiary has decided, since he was hired 2½ years ago, that "rather than compete across the board, we have to get very focused — that is the only way to sustain progress."

But ICL also hopes to tap a broader vertical market by targeting multifunction workstations at professional and management personnel.

"The U.S., businesswise, represents a tremendous market," said John Meurling, vice-president of investor relations (U.S.) with Ericsson and Ericsson, Inc.'s director of corporate and marketing communications.

The U.S. product strategy is built around Ericsson's AXE central office switch, its MD110 private branch exchange, fiber-optic cable products and peripherals such as financial and IBM-compatible workstations.

In addition to the potential for increasing market share, Ericsson has other key goals in the U.S. "We are trying to internationalize our ownership; about one-third of [Ericsson] shares are held by U.S. interests," Meurling said.



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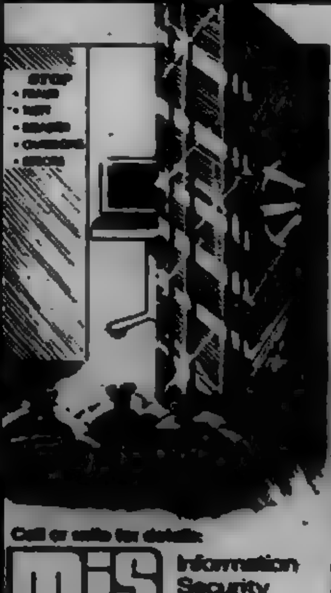

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Charles River Data Systems adds 68020-based system

By Tom [illegible]
CW Staff

FRAMINGHAM, Mass. — Charles River Data Systems, Inc. last week joined the ranks of vendors offering supermicrocomputers based on Motorola, Inc.'s 68020 microprocessor with the high-end addition of Universe 32 to its Universe line of Versabus-based systems.

About 2,000 current users of the firm's Motorola 68000-based processors, the Universe 68 line, can field upgrade to the Universe 32 by swapping processor boards. The upgrades, which cost $8,000 (the vendor is offering a $1,500 trade-in rebate on older CPU boards), will be available in August. The company said users can double their system performance with the upgrade.

The Universe 32 was designed around the 12-MHz version of the 68020, however, Daniel DeLea, vice-president of marketing, said the company will switch to the 16.7-MHz version of the microprocessor when it becomes available this fall.

A basic Universe 32 processor with 1M byte of main memory, an integrated 35M-byte Winchester disk drive, a 1M-byte floppy disk drive and four serial ports costs $23,000 and will also be available in August.

Supports up to 1.6G bytes disk storage

The Universe 32 can be configured with up to 12M bytes of main memory, a 45M-byte streaming tape unit and either a 35M-, 115M- or 400M-byte Winchester disk drive. The system can support up to 1.6G bytes of disk storage and up to 64 serial ports, the vendor said.

In addition to the 68020, the Universe 32 uses a Motorola 68000 microprocessor as an I/O character processor. The 68000 is dedicated to character-oriented devices such as terminals, printers and serial network ports. A socket is also provided on the Universe 32 processor board for an optional Motorola 68881 floating-point coprocessor.

The Universe 32 supports UN/System V, the company's implementation of AT&T's Unix operating system and Unos, Charles River Data Systems' Unix-compatible, real-time operating system kernel. The two operating environments share the same device drivers and object formats. They also support C, Fortran 77, Pascal, RM/Cobol and Basic II programming languages.

Universe 32 users can configure systems into the firm's Universenet local-area network by installing a Versabus network interface module. Universenet conforms with the International Standards Organization's seven-layer Open Systems Interconnect model, General Motors Corp.'s Manufacturing Automation Protocol and Boeing Computer Services Co.'s Technical Office Protocol, the vendor said.

Charles River Data Systems is located at 983 Concord St., Framingham, Mass. 01701.

Net program lets Universe users share Unix capabilities

FRAMINGHAM, Mass. — Charles River Data Systems, Inc. has announced a networking package that permits users of its Universe family of supermicros to share AT&T Unix capabilities in a network that conforms with International Standards Organization (ISO) specifications.

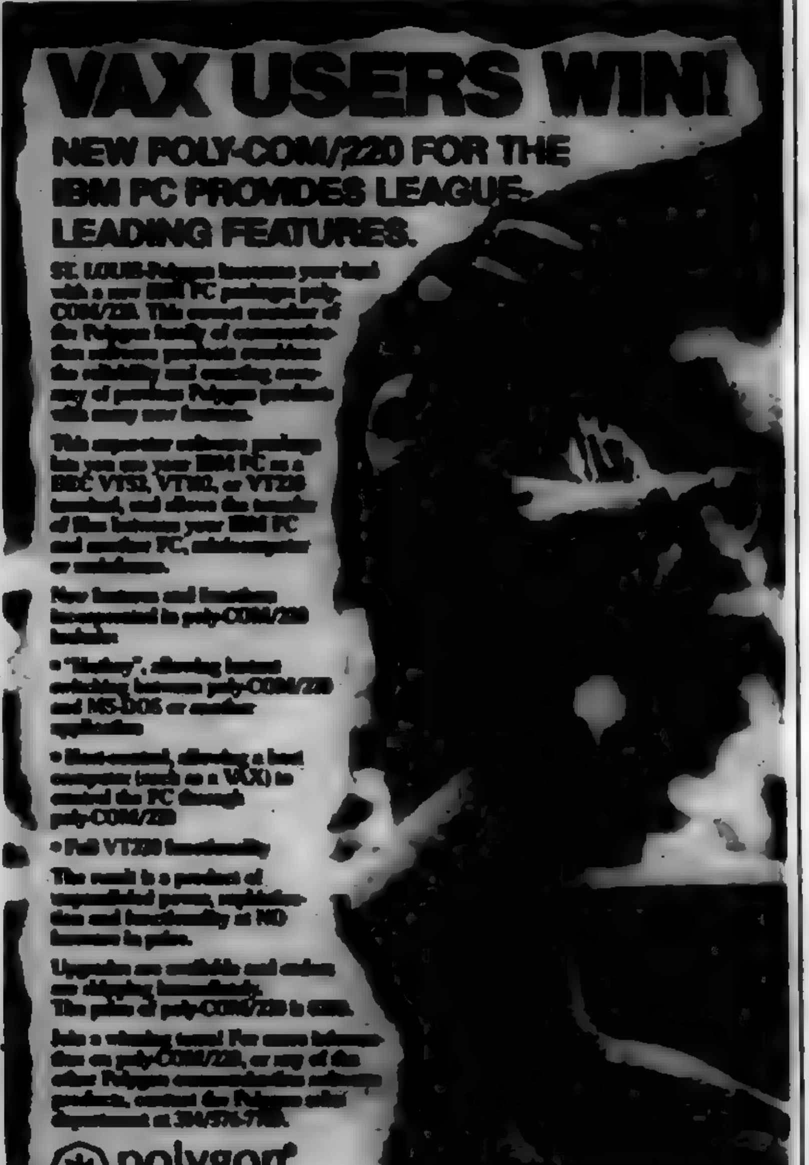
Called Unicluster, the package consists of IEEE 802.3 Ethernet-type local-area network interconnect hardware and General Motors Corp.'s Manufacturing Automation Protocol (MAP) and Boeing Computer Services Co.'s Technical Office Protocol (TOP) software that has been added to Charles River Data Systems' Universenet local-area network. The package costs $2,000 per node and is available immediately.

Unicluster consists of two network capabilities: the Distributed Resource Management System (DRMS) and Network Applications Services (NAS).

DRMS permits a user to access files on any Charles River Data Systems unit in the network and exchange data with all systems, regardless of its manufacturer, using the ISO, MAP and TOP protocols. The user accesses the file by entering a Unix path name that accesses remote files in the same way local files are accessed. This, the vendor said, eliminates the need to add communications codes to applications. Other features of DRMS include remote process execution and virtual terminal connections.

NAS supports three applications: electronic mail, electronic messaging and printer spooling. These applications support request queues, and all requests eventually will execute even if the destination system or intermediate system in the request route is not running. The remote printer spooling feature enables any user on a network to operate any available printer on the network by executing the same command used for a local printer. The printer can queue the messages and print them as time becomes available.

Charles River Data Systems is located at 983 Concord St., Framingham, Mass. 01701.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NCR unveils 32-user supermini

FRAMINGHAM, Mass. — NCR Corp. last week unveiled the most powerful version of its Tower superminicomputer to date, the Tower 32, based on Motorola, Inc.'s 68020 microprocessor and capable of supporting up to 32 interactive users.

Claiming two to three times more power than Tower XP, the previous top-of-the-line Tower system, the Tower 32 was designed to use Release 5.2 of AT&T's Unix System V operating system and an optimized C compiler, according to John Walsh, NCR's assistant vice-president of product marketing.

Software programs developed for existing members of the firm's Tower line — the Minitower, Tower 1632 and Tower XP — will run without modification on the Tower 32, the company said.

Available with 1M to 16M bytes of main memory, the Tower 32 can use 44M to 4.6G bytes of disk storage. Floppy disk storage ranges from 1M to 2M bytes, and the unit can accommodate a ¼-in. 45M-byte streaming tape drive. Up to three reel-to-reel type tape drives can also be attached, NCR said.

Up to 32 CRT terminals can be attached to the Tower 32. The unit can also support a serial printer operating at up to 300 char./sec., a 720 line/min printer and up to four parallel I/O devices connected via Centronics Data Computer Corp.-compatible ports.

The Tower 32, based on a 16.7-MHz 68020 microprocessor, was designed to use Intel Corp.'s Multibus bus architecture and the IEEE' Small' Computer System Interface to control data flow. The unit includes an I/O subsystem based on Motorola's 68010 microprocessor and a Processor Memory controller that offers 8K bytes of cache memory and a 14M-byte virtual address space, the vendor said.

Available in the fourth quarter, a basic configuration for the Tower 32 consisting of 1M byte of main memory, 46M bytes of disk storage, a 45M-byte cartridge tape drive, I/O subsystem, battery backup and the Business Basic Module of the Unix System V operating system costs $21,900.

NCR's corporate headquarters is located at 1700 S. Patterson Blvd., Dayton, Ohio 45479.

Apple axes direct sales channel

By Kathleen Sullivan
CW West Coast Bureau

SAN FRANCISCO — Apple Computer, Inc. President John Sculley last week described his company's plans to dismantle its national accounts program, thereby abandoning the most widely used method of selling micros to large corporations.

Instead, all Apple sales will be handled through its dealer network. Because the vast majority of personal computer sales to the Fortune 1,000 market, by most accounts, are made through direct sales, the decision calls into question Apple's commitment to selling to the corporate market.

Sculley, who once championed the Macintosh as a business machine for corporate America, took a different tack in last week's speech. "We are a company that builds personal computers for individuals," he said.

In his first public appearance since Apple's recent management shake-up and company consolidation, which resulted in the layoff of 1,200 employees, Sculley sought to reassure the audience that Apple will continue to be a major player in the industry.

New framework of openness

Acknowledging that he would have to do "incredible things" to clear up the confusion over his firm's corporate direction, Sculley promised a new framework of openness and pledged his firm's commitment to "an appreciation for accountability."

Sculley also announced plans to strengthen Apple's relationships with third-party software developers and peripherals manufacturers. He declined to discuss specific peripheral products and said, "The ideas themselves must come from entrepreneurs, as they have in the past."

In his speech, Sculley emphasized Apple's desire to build bridges and make it easier for third-party developers to design products for the Macintosh.

"Apple will make a gradual transition to select industry standard protocols and workstation expandability," he said.

Apple's internal product development efforts will continue. The company will begin shipping an external hard disk drive for the Macintosh in October, he said.

Although he did not give a specific date, Sculley said Apple still plans to introduce a file server for its Appletalk network.

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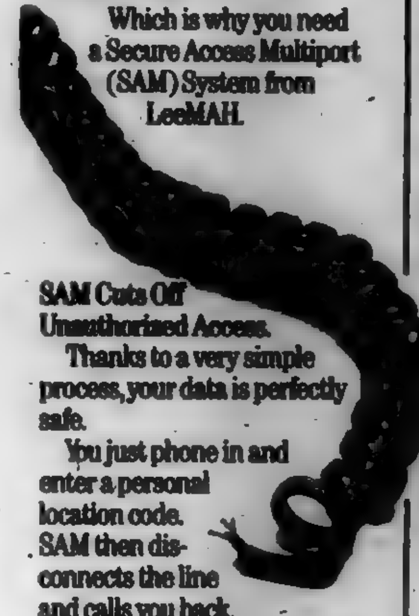

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Informatics General takeover not to cause upheaval

Users think Sterling Software will retain products, services

**By John Gallant
and Peter Bartolik**
CW Staff

Users of Informatics General Corp.'s software expressed little concern last week about the pending acquisition of that company by Sterling Software, Inc., a much smaller, Dallas-based company.

Many users were surprised that the Woodland Hills, Calif.-based Informatics, which had vigorously opposed earlier takeover attempts by Sterling, consented to be acquired. However, they said it was unlikely that Sterling would tamper with Informatics' product line.

"I do not know much about Sterling, but I do not expect much disturbance to the products," said Chappy Holbrook, data base analyst at Chevron Geosciences, Inc. in New Orleans. Holbrook's shop has used Informatics' Mark IV applications development system for nearly 15 years. "Mark IV is a very mature product, and I am sure its sales are not what they once were," he said. "But it still sells, and it is a good product. Since its development costs are probably fully amortized, there would be little reason for Sterling to get rid of it. It would not sell for much anyway.

"There is always the possibility that Sterling would discontinue or sell off products," Holbrook said. "But it would not do that within the next one or two years. That would destroy Sterling's reputation as a software vendor."

Not to affect maintenance

Holbrook said the merger would have little effect on software maintenance and upgrades, which are tied to maintenance agreements already in place.

Even if Sterling was to abandon Mark IV, Holbrook said, Chevron Geosciences' DP center is prepared to migrate completely to a similar product already in use.

Carl Weber, information center manager for Arco Chemical Co. in Philadelphia, said the future looks bright for Informatics' existing products. Arco currently uses Informatics' Mark IV and Inquiry IV-IMS, IBM's IMS query facility, and is considering purchasing Informatics' Answer/DB data retrieval and reporting tool.

> *'There is always the possibility that Sterling would discontinue or sell off [Informatics General's] products, but it would not do that within the next one or two years. That would destroy Sterling's reputation as a software vendor.'*
>
> — **Chappy Holbrook**
> **Chevron Geosciences, Inc.**

'No great concerns about the merger'

"I have no great concerns about the merger," Weber said. "I think the new owners will continue to support and nurture the products. It seems Sterling will be well positioned with the Informatics products, and I do not see any problems ahead."

Informatics accepted a new bid by Sterling of $27 per share, equal to $135 million for the company. Earlier bids of $25 and $26 a share had been rejected, and a proxy battle by Sterling principals to unseat Informatics Chairman Walter Bauer and another director had failed.

Sterling's offer was conditional on its obtaining two-thirds of Informatics stock and on obtaining financing by July 17.

Informatics, Sterling revenues

Informatics reported 1984 revenue of $193 million, while Sterling had 1984 revenue of only $18.7 million.

Sterling spokesman Ray Hannon said that Bauer will remain as chairman of Informatics, which will operate as a subsidiary of Sterling, and Sterling President Sterling Williams will be chief executive officer.

No other management decisions have been made at this time, he said.

Debt financing

Sterling, which has essentially been in operation for 2½ years and has grown by acquiring existing software companies, will raise the cash for the acquisition through debt financing, a move that had prompted much speculation that parts of Informatics' varied product lineup would be sold.

Hannon said there is no current game plan to sell any assets but added that it may be determined in the future that some parts of the two companies are not compatible.

Informatics spokesman Ron Freeman would not comment on any management changes. He did say, however, that the financing being arranged by Sterling would probably not require the disposal of any assets.

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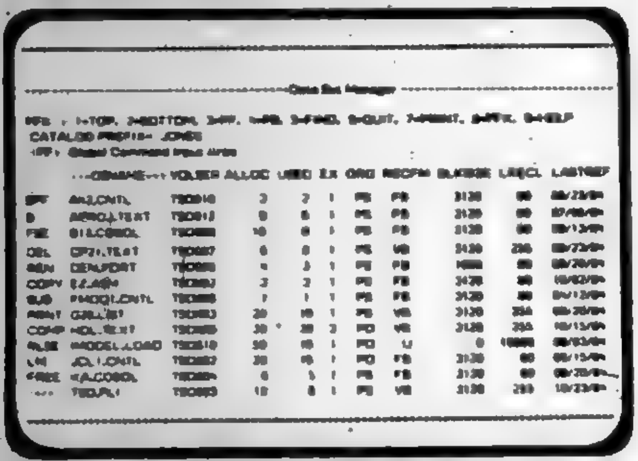

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Intel down for second round; Gould to reduce operations

SANTA CLARA, Calif. — With the semiconductor industry mired in its worst depression in years, Intel Corp. last week announced its second round of layoffs this year.

In another development, Gould, Inc. reported it will reduce the scope of its semiconductor operations, resulting in a second-quarter write-off against earnings of about $150 million. The company said layoffs are anticipated, but it declined to release any specific figures.

As previously reported [CW, June 17], Intel had been considering a number of options to cut costs in light of a continued slump in semiconductor sales. The company announced that it will cut 4% of its work force, or about 950 employees out of a total worldwide labor force of 24,200. The cutbacks will affect all of its domestic integrated circuit operations and support groups, the company said. Earlier this year [CW, Feb. 25], Intel laid off 900 employees, a majority of whom worked at its systems and components division, and phased out a test facility.

Also, Intel said it will phase out its Fab2 facility in Santa Clara, Calif., which it said is the oldest and smallest wafer fabrication plant operated by the company. In other cost-cutting moves, employees will be required to take seven days of unpaid vacation in the third quarter, and merit pay raises will be delayed at least until the first quarter of 1986.

> *'This is the most severe shakeout in our industry in over a decade.'*
>
> — **Gordon E. Moore**
> **Intel Corp.**

"This is the most severe shakeout in our industry in over a decade," said Gordon E. Moore, chairman and chief executive officer of Intel. "We continue to receive a low rate of incoming orders."

At Gould's semiconductor operations, work reportedly will now be focused on custom circuit production, an area that has "remained relatively strong over the past few years and where, because of our expertise, we expect our growth to be in the future," according to William T. Ylvisaker, Gould chairman and chief executive officer.

Gould will write off $150 million to reflect obsolete assets, plant reductions, inventory valuations, offshore facilities and interest in overseas joint ventures.

Excluding the write-off, the company said, second-quarter earnings are expected to be 15% below the first quarter, and it expects fiscal-year profits to be slightly below those of 1984.

CDC unwraps DBMS, DSS, tools for Cyber 180 systems

MINNEAPOLIS — Control Data Corp. has announced the Information Management/Virtual Environment (IM/VE) family of software, including a data base management system, decision support system (DSS) tools and an applications generator.

The IM/VE packages run on CDC's Cyber 180 systems with the firm's NOS/VE operating system.

Initial offerings in the family include Information Management/Data Management (IM/DM), a dictionary-driven DBMS; Information Management/Zero Effort User System (IM/Zeus), a fourth-generation-orientation DSS; and Information Management/Information Processing Family (IM/IPF), an applications development facility.

The company said it would announce a data dictionary and intelligent screen management interface at a later date.

Product features

According to a vendor spokesman, the IM/DM DBMS allows nontechnical users to enter and retrieve information, manipulate data, produce reports and issue queries and commands. Technical users are given a set of tools for modifying applications aimed at improving productivity.

IM/Zeus reportedly is intended to give novice users the ability to format, write and edit sophisticated reports and make on-line queries using function keys.

IM/IPF, a package of eight integrated productivity tools, is said to allow sophisticated users to develop a range of applications and access data on the Cyber 180 system.

Product pricing

IM/VE product pricing is based on CPU size. IM/DM is priced from $23,520 to $184,884; IM/Zeus costs from $5,880 to $46,200; and IM/IPF costs from $19,960 to $89,190.

CDC also offers Micro IPF, said to enable nontechnical users to develop stand-alone and distributed applications on microcomputers in the personnel and departmental data areas.

CDC can be reached through P.O. Box 0, 8100 34th Ave. S., Minneapolis, Minn. 55417.

Computervision launches CAE, CAD/CAM software

Runs on 3000 series, IBM microcomputer

LAS VEGAS — In a number of announcements, Computervision Corp. last week unveiled software products for computer-aided engineering (CAE) and computer-aided design and manufacturing applications. The packages run on either Computervision 3000 series workstations or the IBM Personal Computer AT.

The CAE products were developed by Metheus-CV, Inc., the Hillsboro, Ore., joint venture formed last year by Computervision and Metheus to provide an automation link with Computervision's CAD/CAM software systems.

Products announced at the Design Automation conference here included the following:

- The Personal Engineer, an IBM Personal Computer AT-based schematic capture package, priced at $7,000 and scheduled for fourth-quarter availability.
- Two enhancements for the Logic Design/3000 system, which was designed for logical testing of circuitry for printed circuit boards or integrated circuits. The enhancements include Hilo-3, a simulator from Genrad, Inc., priced at $14,000; and Timver, a timing verifier used to identify critical paths, priced at $2,900. Both are scheduled for third-quarter availability.
- Symbolic Layout/3000, for symbolic layout and compaction, priced at $25,000 per workstation and scheduled for fourth-quarter availability.
- VLSI Advanced Layout Editor (Vale), for use with Metheus-CV's Full Custom Design/3000 system for integrated circuit design, priced at $105,000 and scheduled for fourth-quarter availability.
- Electrocadds/3000, a printed-circuit board design package derived from Computervision's Cadds 4X software and customized for the company's CDS 3721-E 32-bit workstations. The package is priced at $15,000 and is scheduled for fourth-quarter availability.

The company also announced the following interfaces, all scheduled for fourth-quarter availability:

- Cadds Connect Interface for system-to-system interfacing between IBM Personal Computers, Computervision's CDS workstations and Computervision's Cadds resource systems. The interface is priced from $8,000 to $30,000.
- Scicards, Racal-Redac and Cadds 4X interfaces for format-to-format interfacing between Logic Design/3000 and Scicards, Racal-Redac and Computervision's Cadds 4X printed-circuit board systems. All are priced at $4,900.
- Cvpac, a computer-aided design wire harness software that eliminates the need to design wire and cable connections between system components, priced at $12,000 per system.

Computervision is located at 15 Crosby Drive, Bedford, Mass. 01730.

Meet to eye human resources

HOT SPRINGS, Ark. — The 17th annual meeting of the National Association for State Information Systems (Nasis) will be held Aug. 5-8 at the Arlington Hotel here.

The conference theme is "Managing the Human Resource in an Information Systems Environment."

Conference topics will include comparable worth and sexual harassment in the workplace, key areas of change for managers, office automation, end-user computing and stress management.

W. Frank Blount, executive vice-president of networks for AT&T Communications, will deliver the keynote address on "Human Resources Development in a Changing Business Environment: Challenges and Opportunities, 1985-1990."

Cost of the conference is $160 for government representatives and $280 for private-sector employees. An additional $20 fee will be charged for registration after July 15.

More information is available from Nasis, P.O. Box 11910, Lexington, Ky. 40578.

Commercial, OA applications of AI focus of July conference

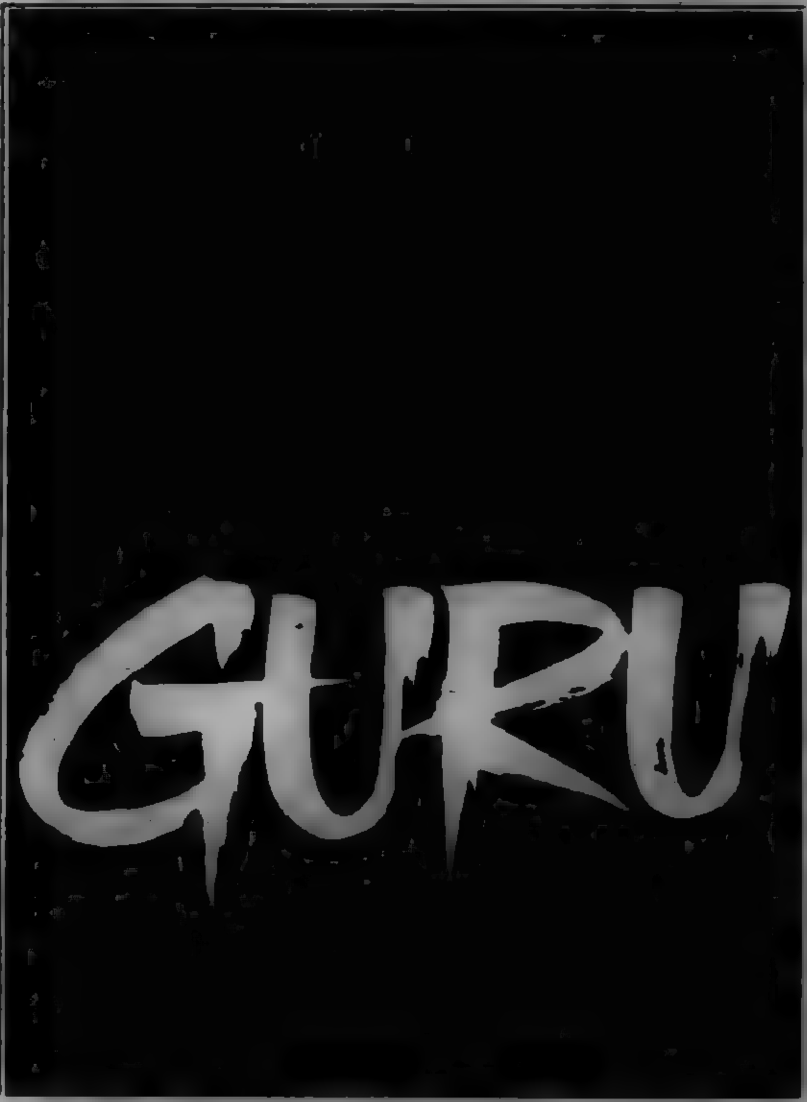
HYANNIS, Mass. — A three-day seminar on artificial intelligence, software and the commercial applications thereof will be held July 10-12 at Dunfey's Hyannis Hotel here.

Sponsored by the Technology and Innovation Council and the Information Industry Association, the seminar will include discussions on AI developments in microcomputing, decision tools, the emergence of commercial applications and AI in office automation.

Among the speakers at the conference will be Larry Harris, president of Artificial Intelligence Corp.; Frederick Hayes-Roth, chief scientist, Teknowledge, Inc.; and Maxine Rockoff, director of OA for Paine Webber, Inc.

Before June 3, the registration fee is $345 for Information Industry Association members and $445 for nonmembers. After June 3, the fees are $395 and $495, respectively.

More information on the conference is available from the Information Industry Association, Suite 400, 316 Pennsylvania Ave. S.E., Washington, D.C. 20003.



Hewlett-Packard unwraps enhanced Portable laptop

PALO ALTO, Calif. — Hewlett-Packard Co. today will introduce the Portable Plus computer, an enhanced version of its Portable laptop that offers a 25-line by 80-char. flip-up LCD display and sells for $2,295.

Designed for "mobile professionals," the new system is built around a Harris Corp. 80C86 Cmos microprocessor, comes with 128K bytes of Cmos random-access memory (RAM), expandable to 896K bytes, measures 13- by 10- by 3-in. and weighs less than 10 lb, according to the vendor. The Portable Plus reportedly will run on batteries for up to two weeks of normal use on a single charge.

The laptop runs under Microsoft Corp.'s MS-DOS 2.11 operating system, and software applications are available either in plug-in read-only memory (ROM) cartridges or in 3½-in. floppy disks for an external disk drive, HP said.

The 192K bytes of built-in ROM-based software includes MS-DOS, the Personal Applications Manager operating environment, HP Link for communicating with the IBM Personal Computer as well as other compatible systems, diagnostics and other utilities.

Optional applications

Optional ROM-based applications include Lotus Development Corp.'s 1-2-3 ($495), Microsoft's Word ($375), HP's Memomaker/Time Management ($195) and HP's PC 2622 ($395), which emulates the HP 2622 and Digital Equipment Corp. VT102 terminals.

Instead of a mechanical disk drive, the Portable Plus reportedly offers an "electronic disk" — a battery-powered RAM circuit for nonvolatile storage of data and programs.

The antiglare LCD supports bit-mapped graphics with a resolution of 200 by 480 pixels, according to HP. The viewing angle is continuously adjustable.

Two expansion drawers can be configured with additional ROM or RAM for a total capacity of more than 3M bytes, HP said. The ROM drawer accepts industry-standard Cmos 32K-byte or 128K-byte plug-in ROM or 32K-byte erasable programmable ROM.

Optional Portable Desktop Link packages provide hardware and software to connect the system with HP Touchscreen microcomputers or IBM Personal Computer-compatible systems. A version for HP micros costs $175, while a package for IBM-compatible personal computers is priced at $150.

A 300/1,200 bit/sec. modem, also optional, costs $495.

The system can link up to a variety of existing HP peripherals, including the battery-powered 3½-in. HP 9114A disk drive, which handles 710K-byte diskettes, and the Thinkjet printer, HP said.

HP will continue to manufacture the earlier Portable system, which offers a 16-line by 80-char. LCD screen, and the Portable's price will remain unchanged, the company said. No upgrade kit will be offered.

More information is available from HP Inquiries Manager, HP, 1020 N. E. Circle Blvd., Corvallis, Ore. 97330.

HP's Portable Plus battery-powered personal computer

FCC rules Accunet unlawful

WASHINGTON, D.C. — The Federal Communications Commission recently ordered AT&T Communications to withdraw its Accunet Packet Service after determining that the offering discriminated in favor of AT&T Information Systems, which made up 95% of its business.

The FCC determined that the service was priced below its cost and was therefore unlawful. It ordered AT&T Communications to withdraw the current Accunet tariffs within 120 days and imposed an accounting order designed to account separately for the service's costs, revenue, investment and net earnings.

The Accunet Packet Service objected to by the FCC was originally called Basic Packet Switch Service. After it was renamed, AT&T Communications reconfigured the service by bundling its packet switches with the transmission component and changed the pricing of transmission to a usage basis rather than a leased-line basis.

The FCC said that a packet-switch service offered by AT&T Communications to the general public, and to AT&T Information Systems, must unbundle the switching portion from the transmission portion.

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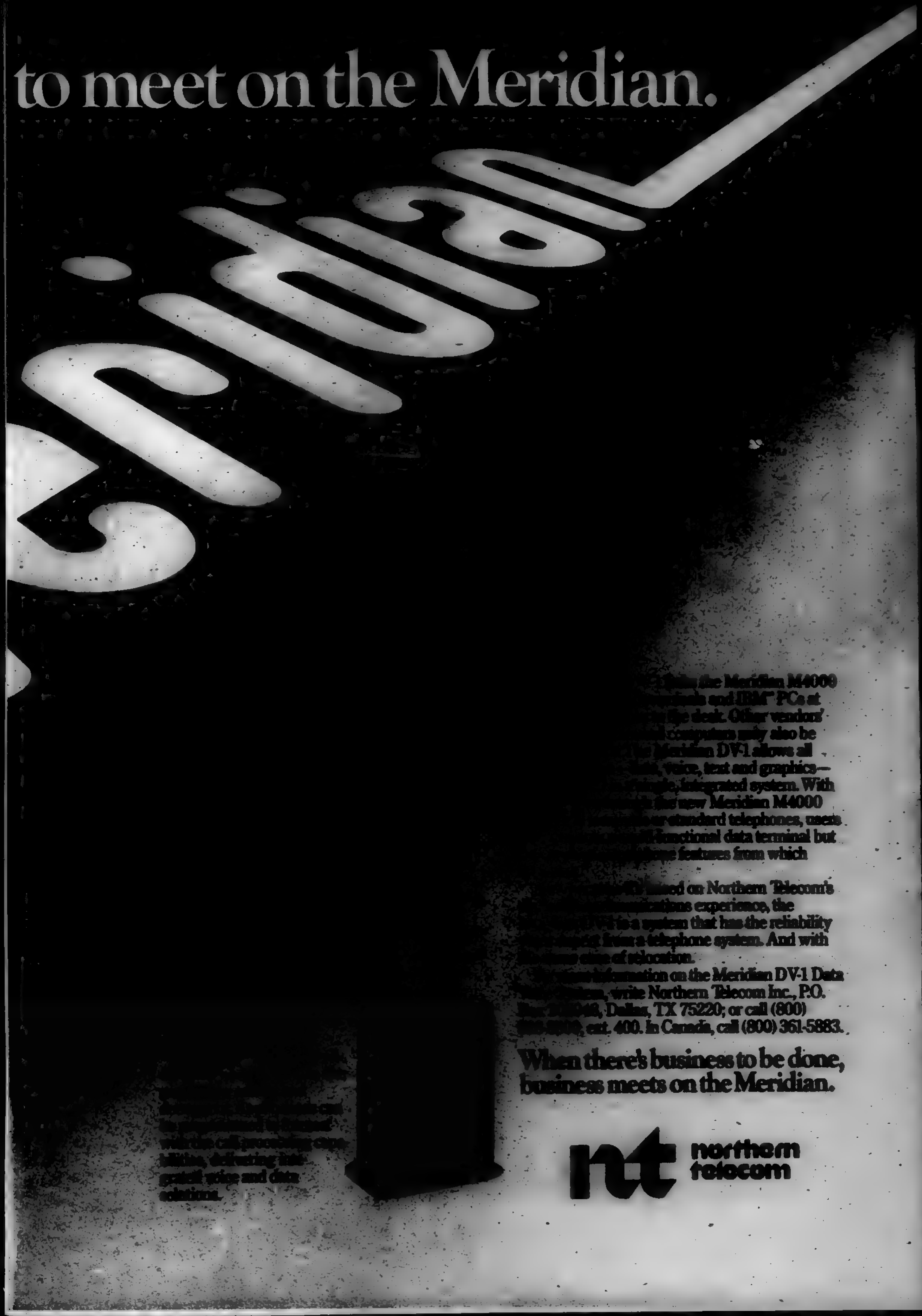

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[illegible] information on the Meridian DV-1 Data [illegible], write Northern Telecom Inc., P.O. Box [illegible], Dallas, TX 75220; or call (800) [illegible], ext. 400. In Canada, call (800) 361-5883.

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U.S. attorneys push to clarify vague '84 DP crime law

By Mitch Betts
CW Washington Bureau

U.S. prosecutors are dissatisfied with the Computer Fraud and Abuse Act of 1984 and have suggested changes in that law as well as pending legislation to make prosecution of computer crimes more successful in court.

At a recent congressional hearing, for example, David Geneson, assistant U.S. attorney for Washington, D.C., said he is working to obtain a grand jury indictment in a computer crime case but is having difficulty using the 1984 law. He declined to provide details.

Cathy Goodwin, an assistant U.S. attorney in Denver who recently obtained a conviction under the law, said in a recent interview that the law needs some refinements or else it will be open to challenges that it is unconstitutionally vague.

Through a plea-bargain agreement, Goodwin obtained the conviction of Philip Gonzales Fadriquela, a Los Angeles man who was charged with trespassing in U.S. government computers in Colorado [CW, June 24].

> ❞
>
> *'We wanted to challenge the constitutionality of the law.'*
>
> — Robert Booms
> defense attorney

Goodwin said she is concerned with a provision in the law that defines criminal trespass as conduct that affects the operation of the government computer, because the term "affect" is not defined and is apparently unnecessary. She noted that Fadriquela's defense attorney filed a motion to dismiss the case on grounds that the law's language is vague.

Robert Booms, Fadriquela's attorney, confirmed, "We wanted to challenge the constitutionality of the law," arguing it is too broadly drawn and "subject to gross misinterpretation."

He said it is not clear what affecting a government computer means. If it covers the act of entering an access code without authorization, Booms said, "It's like being charged with tapping on a door without ever going behind it."

Because the case was settled by plea bargaining, the defense motion was moot and the language in the 1984 law was not tested.

Provisions referring to unauthorized use of a government computer and trespassing in credit bureaus to obtain information also need to be clarified, Goodwin said.

Goodwin said the law, as a deterrent to hackers, should expressly provide that the perpetrator forfeit his computer equipment, a move also supported by the U.S. Department of Justice. Under the terms of the plea bargain reached in the Denver case, according to Goodwin, Fadriquela had to forfeit his equipment.

Prosecutors and computer crime specialists also are studying legislation pending in the U.S. House Subcommittee on Crime, particularly a bill [H.R. 1001] that would prohibit trespassing in private sector computers and permit federal attorneys to prosecute cases involving crimes in which more than $5,000 a year was gained.

Goodwin and other computer crime specialists strongly opposed the $5,000 threshold. "From a prosecutor's point of view, that is going to eliminate so many cases," Goodwin said. "You can't put a dollar value on gaining information."

Federal jurisdiction should be triggered when the trespass crosses state borders, such as in the wire-fraud statute, she said.

The $5,000 threshold was included in the bill, sponsored by Rep. William J. Hughes (D-N.J.), because that is the way the House Judiciary Committee traditionally has defined federal jurisdiction, leaving lesser crimes to state authorities, according to a congressional source.

John T. Vanadia, who follows legislation for the Electronic Data Processing Auditors Association (EDPAA), also opposed the $5,000 threshold. "The problem is that it's hard to put a value on the theft of computer services or information." Vanadia and Jim Fleming, cochairmen of the international government relations committee at EDPAA, said these issues were discussed by Goodwin and others at the recent EDPAA International Conference in Salt Lake City.

After the conference, the EDPAA officials vowed to sponsor an advisory group composed of EDP auditors, attorneys and legislators to discuss the technical aspects of computer crime.

Goodwin predicted that prosecutors will handle an increasing number of computer crimes, including bank fraud and embezzlement cases, and will need to form partnerships with groups such as the EDPAA to better understand computer crimes.

"The computer is the white-collar crime medium of the 1980s and '90s," she said. "We're just going to have lots of cases in the federal system involving computers, and we need a really good statute for it."

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O CONTROL I N K B
E M O A T G EASE
X PLANNED I I T T
P A F PATHWAYS
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Bulletin boards target of crime legislation?

Computer crime experts and prosecutors interviewed recently agreed that future computer crime legislation should address the use of electronic bulletin boards in computer crimes and should modernize courtroom evidence rules.

Cathy Goodwin, assistant U.S. attorney in Denver, said hackers frequently get access codes for trespassing in computer systems and networks from electronic bulletin boards. "To me, it's akin to having a billboard by the street saying: 'Here is the combination to the Colorado National Bank vault, if anyone wants to use it,'" she said.

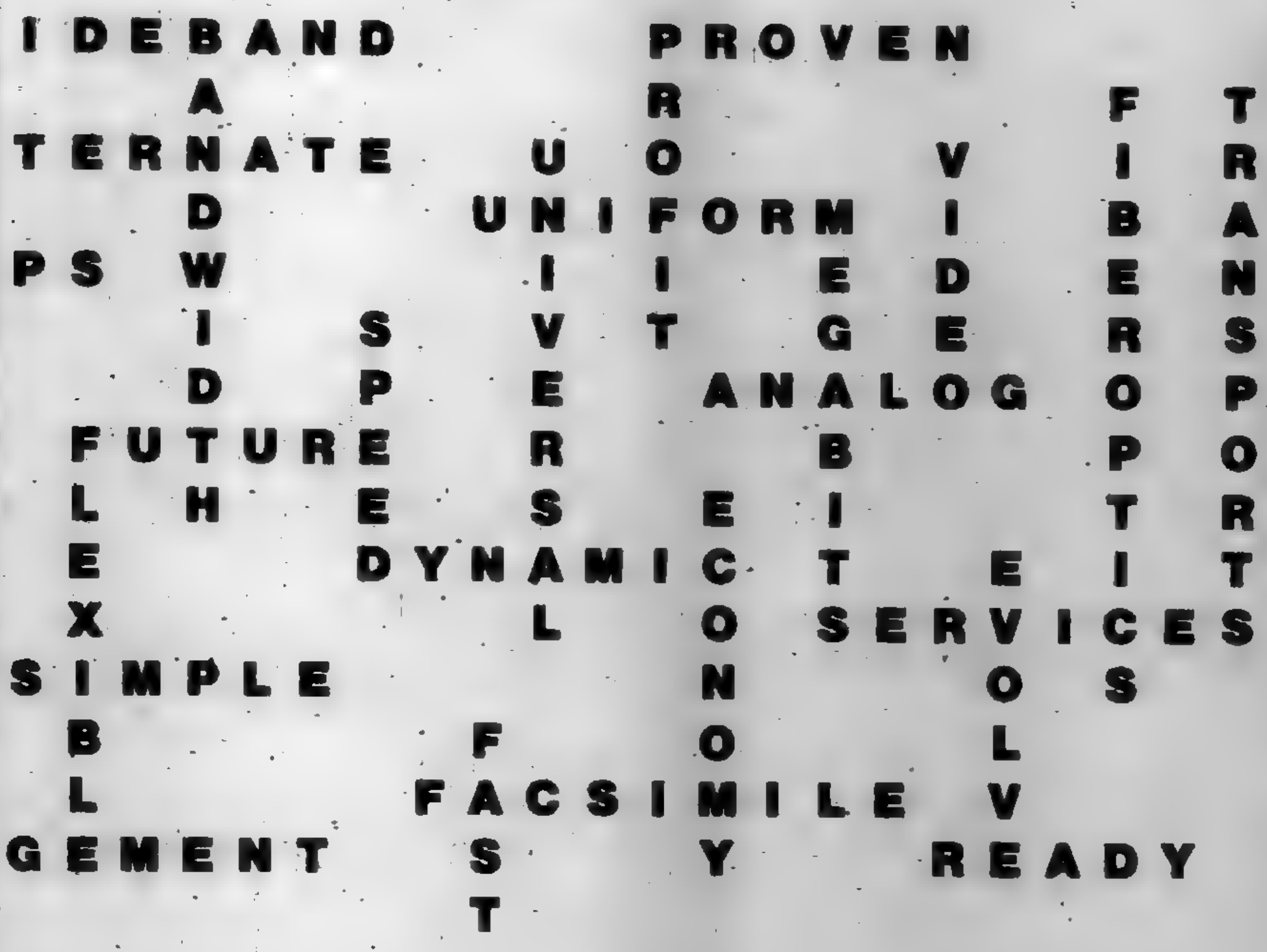
Richard Cashion, chairman of the Data Processing Management Association's computer crime committee and assistant DP director for Tennessee Technological University in Cookeville, Tenn., agreed. He said he is drafting a model computer crime bill that would penalize electronic bulletin boards for aiding and abetting in a crime or solicitation of a computer crime.

The failure to address this issue is a big deficiency in pending computer crime legislation, added John T. Vanadia of the EDP Auditors Association.

Goodwin, Cashion and Vanadia also said that the courtroom rules of evidence should be revised so that computer-generated business records will be admissable in court. Legal experts say computer printouts are not automatically accepted in court [CW, May 20]. Under his draft legislation, Cashion said, computer reports would be admissable if the report is used in the normal operations of the business or organization; it can be verified as accurate and complete; and it can be put in the form of paper or micrographics for the convenience of the court.

The experts said this reform is especially important in computer crime cases because the system's activity log is crucial to the prosecution. "Without that [log]," Goodwin said, "you have almost no way of proving what was done to the system, other than witnesses."

— Mitch Betts



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German survey ranks CDC tops

DELRAN, N.J. — Control Data Corp. ranks first in customer satisfaction among German computer users, according to a recent survey.

With values ranging from 1 to 4, the company received a 4 in the areas of engineering support and technical training for all of its computer system models, according to the survey, which was conducted jointly by *Computerwoche* newspaper — a *Computerworld* sister publication — and Datapro Research Corp. The company received an overall rating of 3.75, with the Siemens AG Model 7800 coming in second overall with a 3.33 rating, according to the study.

The next five overall rankings are as follows:

- BASF (Series 7) — 3.29.
- Burroughs Corp. (all models) — 3.20.
- IBM (Series 4331) — 2.94.
- Siemens AG (Series 7500) — 2.91.
- Honeywell, Inc. (DPS 7 and 8) — 2.88.

Five hundred survey participants evaluated leading computer companies in the areas of computer systems, peripherals, customer engineering support, software and technical training.

Additional information is available from Datapro, which is located at 1805 Underwood Blvd., Delran, N.J. 08075.

Architectures topic of meets

SAN JOSE, Calif. — Communications Solutions, Inc. (CSI) has announced that a seminar titled "IBM's Advanced Communication Architectures" will be held at two locations this summer.

According to CSI, the two-day seminar will examine office communication architectures, including IBM's Systems Network Architecture (SNA) Distribution Services, Advanced Program-to-Program Communications, Document Interchange Architecture and Document Content Architecture.

The seminar will discuss how these products are related to IBM's SNA and how IBM's latest SNA enhancements accommodate IBM's Logical Unit 6.2 and Physical Unit 2.1 capabilities.

The seminar will detail the implementation of IBM's architectures in such products as the IBM 5520 Administrative System and its host-based Distributed Office Support System.

The seminars are scheduled for July 15-16 in Washington, D.C., and Aug. 5-6 in New York. The enrollment fee is $695 per person.

More information on registration is available from CSI at 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

INTERNATIONAL REPORT
CW International
News Network

AUSTRALIA

AVALON — To help reduce manual labor costs, the Australian Government Aircraft Factory (GAF) has installed a National Advanced Systems Corp. (NAS) 8023 mainframe to perform backup and testing. The 16M-byte NAS system contains 5G bytes of disk storage and will run parallel with an IBM 4341 Model 11, according to Bruce Macneil-Brown, GAF data processing manager.

■

QUEENSLAND — Australia's first open-access electronic funds transfer (EFT) switch has been launched here by Datec, Inc., a major Australian software house. The switch will be open to card-issuing companies and will be linked to EFT switches in other Australian states. The program has been endorsed by the Queensland state government and by 11 of the largest banks here, sources said.

■

CANBERRA — The government's legal aid system, produced entirely with Information Builders, Inc.'s fourth-generation language, Focus, is undergoing major hardware upgrades due to system inadequacies. According to sources here, the system so overtaxed the agency's IBM 4331 mainframes that upgrades have been ordered from National Advanced Systems Corp.'s 6630 series and IBM 4341 systems.

FRANCE

PARIS — While Sperry Corp. in the U.S. balked at merger talks with Burroughs Corp., Sperry France underwent a shake-up. The president of the French subsidiary was let go, apparently as a result of the firm's recent financial difficulties.

■

PARIS — Groupe Bull has unveiled a financial version of its workstation based on Convergent Technology, Inc.'s products. The Groupe Bull Questar 400 F is intended for banks and insurance applications.

HONG KONG

HONG KONG — A three-pronged plan to combat software piracy has been launched here. The Anti-Software Piracy Association (Aspa), a coalition of Asian distributors and major personal computer software firms, has been formed to decrease piracy by changing public attitudes toward it. According to Aspa cofounder Jodee Rich, this can be accomplished by publicizing the success users experience with legitimate programs and by launching marketing campaigns throughout the region emphasizing the technological and training support that comes with legal software. The group has also allocated a $100,000 fund for taking pirate dealers to court.

HUNGARY

BUDAPEST — Despite a late start, computerization is thriving here, according to Zsolt Naray, director of Hungary's Institute for Coordination of Computer Technology. Naray said the Hungarian government is firmly committed to educating the population here and has launched a program to integrate computers in most schools and universities. Also, the government has sponsored a television program that features instruction in Basic programming. The TV program has resulted in the formation of users groups that enable viewers to test their lessons and exchange ideas.

WEST GERMANY

HAMBURG — Members of the European Computer Leasing and Trading Association (Eclat) are up in arms against IBM's leasing division, IBM Credit Corp. Eclat plans to file a complaint against IBM Credit Corp. for violating competitive leasing practices. According to Eclat spokesman Horst Gruhlke, the problem lies in IBM's attracting users with low prices initially and later inflating the price when a system needs upgrading. Also contributing to Eclats' outrage is a recent statement by IBM GmbH general manager, Bernhard Dorn, who reportedly threatened to cut off leasing representatives if they worked with any other leasing company besides IBM Credit.

■

MUNICH — Why are women less likely to choose high-tech careers? The Federal Ministry for Education and Science here recently conducted a survey on this question and discovered that women tended to avoid high technology because they are less interested in computers and are not as comfortable around them as their male counterparts. In the study, women revealed that after some exposure to computers, their initial reluctance faded. After this occurred, women were found to be just as adept in dealing with the computers as their male colleagues.

■

BOBLINGEN — Hewlett-Packard GmbH has boosted revenues by 30% during the first half of this business year, an HP GmbH spokesman said. Meanwhile, the U.S. parent company experienced a more modest revenue growth of 16%. Last year HP GmbH experienced a 42% increase in revenue, to $706 million, as well as a 35% increase in net profit after taxes, to $43 million. During that period HP GmbH increased its staff by 21% and now employs 4,167 workers in West Germany, the spokesman said.

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CALENDAR

WEEK OF JULY 28

JULY 28-AUG. 1, OTTAWA — **The Urban and Regional Information Systems Associations' (Urisa) 23rd Annual Conference.** Contact: Urisa Secretariat, Suite 300, 1340 Old Chain Bridge Road, McLean, Va. 22101.

JULY 29-30, ST. LOUIS — **Southwestern Bell.** Contact: Telestrategies, Inc., P.O. Box 811, McLean, Va. 22101.

JULY 29-30, NEW YORK — **Integrating Voice and Data in the Private Branch Exchange.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 29-30, BOSTON — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 5-6 in Atlanta.

JULY 29-31, BOSTON — **Standard Network Protocols: International and National Packet-Switching Networks.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

JULY 29-AUG. 1, FORT LEE, N.J. — **CICS/VS MRO/ISC.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JULY 29-AUG. 1, CHICAGO — **CICS/VS Application Design.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 29-Aug. 1 in Los Angeles.

JULY 29-AUG. 1, NEW YORK — **IMS/DB (DL/1) Application Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JULY 29-AUG. 2, ATLANTA — **CICS/VS Internals.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 29-Aug. 2 in Denver and Aug. 5-12 in New York.

JULY 29-AUG. 2, FORT LEE, N.J. — **CICS/VS Application Programming — Command Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held July 29-Aug. 2 in Los Angeles and Washington, D.C.

JULY 29-AUG. 2, PARSIPPANY, N.J. — **CICS Command-Level.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 30-AUG. 1, — **SAS Basics.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

JULY 30-AUG. 1, CARY, N.C. — **SAS Programming for New Computer Users.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511. Also being held Aug. 12-13 in Toronto; Aug. 19-20 in Portland, Ore.; Aug. 22-23 in Calgary, Alta.; and Sept. 9-10 in Atlanta.

JULY 31-AUG. 1, BOSTON — **Recovery/Restart.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JULY 31-AUG. 2, BOSTON — **The IBM Personal Computer.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015. Also being held Aug. 5-7 in Washington, D.C.; Aug. 7-9 in Los Angeles; Aug. 12-14 in Seattle; Aug. 21-23 in Chicago; and Aug. 26-28 in New York.

JULY 31-AUG. 2, HOUSTON — **Data Analysis and Logical Design Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2900 N. Loop W., Houston, Texas 77092.

AUGUST 1-2, TORONTO — **Networking the IBM Personal Computer.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 15-16 in San Jose, Calif.; Aug. 20-21 in Chicago; Aug. 22-23 in Houston; Aug. 26-27 in Arlington, Va.; and Aug. 28-29 in Hasbrouck Heights, N.J.

WEEK OF AUGUST 4

AUGUST 4-9, DALLAS — **Systems Development: Analysis Phase.** Contact: Arthur Young & Co., Education Center, 1950 Roland Clarke Place, Reston, Va. 22091.

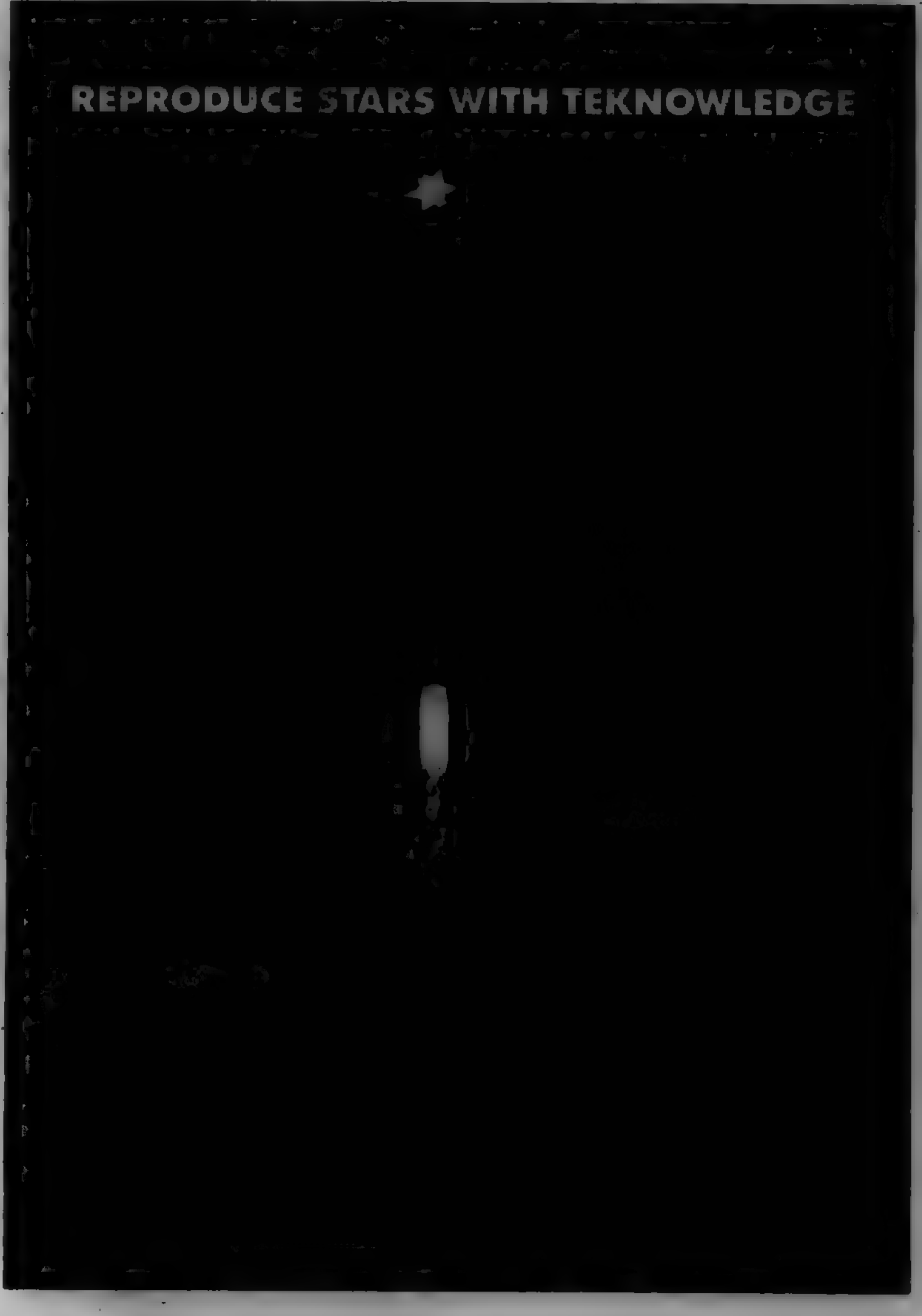
AUGUST 5-6, MINNEAPOLIS — **Unix/Xenix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 7-8 in Columbus, Ohio; Aug. 19-20 in Hasbrouck Heights, N.J.; Aug. 21-22 in Hartford, Conn.; Aug. 26-27 in St. Louis; and Aug. 28-29 in Philadelphia.

AUGUST 5-7, PARSIPPANY, N.J. — **TSO/ISPF.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

AUGUST 5-7, JACKSON HOLE, WYO. — **EDP Audit Managers Roundup.** Contact: Beth Evans, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

AUGUST 5-7, BOSTON — **1985 American Society of Mechanical Engineers (ASME) International Computers in Engineering Conference and Exhibition.** Contact: ASME, 345 E. 47th St., New York, N.Y. 10017.

AUGUST 5-7, WHITE PLAINS, N.Y. — **The IBM Personal Computer.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 7-9 in Detroit and Las Vegas; Aug. 12-14 in Milwaukee; Aug. 14-16 in Baltimore and Seattle; Aug. 19-21 in Baton Rouge, La., and St. Louis; Aug. 26-28 in Cherry Hill, N.J., and San Diego.



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EDITORIAL

The potential for a potent trio

Turnabout is fair play.

Two weeks ago, IBM launched a fleet of products with a string of specifications 237 pages long trailing behind it . Early last week, AT&T let loose its own product barrage, a roster of 70-plus products, featuring emulation ties into IBM systems.

Now IBM, the world's largest computer systems vendor, is about to become a part owner of a communications company second only to AT&T.

Apparently gratified with the results of its acquisition of Rolm Corp., a major player in the business communications market, IBM has adjusted its sights to accommodate a nationwide, retail scale.

Trading most of its stake in money-losing Satellite Business Systems for a minority position in profit-making MCI Communications Corp., IBM now has a significant piece of what is touted as the world's largest digital communciations network.

At worst, IBM has consolidated its losses from SBS and invested money in MCI, the biggest challenger to AT&T in the common carrier business. At best, IBM-Rolm-MCI makes a potent combination — the leader in information processing systems, a leader in communications equipment and a firm with a nationwide consumer-based network in place.

A greater concentration on communications and network offerings should be forthcoming from IBM, at the very least. More attention to consumer products, such as home videotex services — IBM currently owns one-third of Trintex — and a second wave of home computing offerings, should follow.

The phrase "integrated solution" could take on a whole new meaning. IBM will be able to make aggressive moves bundling communications capabilities with systems. If IBM takes this initiative, AT&T will only be able to watch, its hands tied by the divestiture edict from the Federal Communications Commission.

AT&T may have assumed that with its communications advantage, it had a sizable window in which it could develop a competitive position in the data processing market. That window may have just slammed shut. Instead of growing its DP products at home, AT&T may be forced to enter into the acquisition market.

As things stand now, IBM has a lot of options open to it, options that are closed off to AT&T and that add to the mounting pressure on the erstwhile telephone company. But there are some voices that have not yet been heard — the Department of Justice and the FCC, regulators who have been know more than once to spoke corporate wheels, or at least slow them down.

I-R-M — IBM hardware, Rolm interfaces, MCI transmission services — for many people will spell "trust." There are sure to be congressional hearings on antitrust issues if IBM moves to acquire all of MCI, as it did last year with Rolm Corp. Demands from AT&T that the FCC release its stronghold are certain to come in amplified volume.

Users can be certain that as the demand increases for information communications, the options will also burgeon in the short term.

DATA PAST

Five years ago

CAMBRIDGE, Mass. — Threatened by computerization, a significant number of hospital workers — including doctors, nurses and data-entry personnel — were deliberately interfering with the operation of computer-based medical information systems.

PENNSAUKEN, N.J. — The cost of service and the quality of preventive maintenance were found to be relatively unimportant to managers when compared with keeping a system available for production work and a fast response time to repair.

ARMONK, N.Y. — IBM raised lease, rental and maintenance charges on virtually all of its major hardware.

Ten years ago

NEW YORK — In regard to the U.S. government's antitrust case against IBM, one of Big Blue's attorneys had contended, "The stockholders of IBM stand on a different footing . . . than a general citizen of the country." The attorney argued that IBM had a right to inform its stockholders of its side of the case, even though both parties had been barred from discussing the case with the press and the general public.

SAN FRANCISCO — Itel Corp. had bolstered the movement of IBM 370 users back to IBM 360s with the announcement that it would supply its simulated DOS/VS environment to any IBM 360 shop that bought Itel disks, tapes or add-on memory units.

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VIEWPOINT

Realizing or rationalizing a career move

THE DATA CENTER
John P. Murray

Sooner or later, a change in environment is not only in our best interests but also in the best interests of our organizations. When that time comes, we do a disservice to ourselves and to the organization if we stay.

Some people may never encounter such a circumstance. Others do but ignore it and find themselves unable to leave the organization. This is a pity. Still, others accept that they need to change and move on to the next situation.

I am not talking about the malcontents or prima donnas of our profession or those people who are prone to move every year for a few additional dollars. We all know those people — the ones who have four to six different jobs in five years. I am talking about those employees who have done well, who have made solid contributions, but who know that the time to move on has arrived.

It is usually a combination of factors, rather than a single issue, that encourages the move. Even though it may be clear that leaving is the appropri ate course, it is not always easy. Fear of the unknown is always a factor. Complacency or simple inertia are also factors. The accumulation of various "golden handcuffs" can also impede the decision to go. Such considerations should not be allowed to obscure realization that the time to move on has arrived.

The rationalization of staying, of waiting, is based upon the hope that someone up the line will retire or move on, producing an opportunity for advancement. This is usually more of a wish than a reality. It does happen, after years of waiting, that the job opens up and is given to someone outside the organization.

> *In assessing the move, reason should always prevail over emotion. It is time to go if your talents are not being used, if your contribution is not appreciated or, worse yet, if you suffer from persistent boredom.*

The appropriate time to leave should be based on sound reason and careful assessment of the circumstances associated with the decision. It should not be a reaction to some emotional issue or crisis which, upon calm reflection, will be viewed as a momentary issue or an aberration.

That does not mean that some specific incident may not be the final straw. Such an incident may be the catalyst that will finalize the decision but should not be the overriding factor. In assessing the move, reason should always prevail over emotion.

Every day brings its portion of irritation. We all have to deal with dissatisfied clients, unhappy managers and critics of one type or another. All that simply goes with the territory. Those situations will be waiting for us wherever we go. Although these day-to-day situations can be distracting and sometimes frustrating, they certainly should not be allowed to cloud reason or long-range thinking about what we want to do with our lives.

The factors that indicate that it is time to move will differ for everyone. Individual needs and personalities have a great deal to do with the decision, but there are general guidelines that can be used to begin the process of objectively thinking the issue through.

Reasons to stay

With a job that offers challenge, where your supervisors understand, appreciate and support your efforts, you have reason to remain. When you know you have given it your best, you have reason to remain.

Conversely, it is time to go if your talents are not being used, if your contribution is not appreciated or, worse yet, if you suffer from persistent boredom.

In the information processing environment, people either grow or fall behind. If you are falling behind and do nothing about it, you have no one to blame but yourself.

It may be that job opportunities are too plentiful. It may be that some of us are too willing to move on too quickly. The opportunity to do something more exciting, more challenging and more rewarding, can make *not* moving a career mistake.

Heeding his own advice, Murray has moved on. He is now director of management and information services for American Breeders Service, a DeForest, Wis., division of W. R. Grace & Co. He is also the author of Management Information Systems as a Corporate Resource.

Tracking T&M costs: Too much of a good thing

MANAGEMENT MATRIX
Walter F. Cuirle

A friend recently moved to a new job in a custom DP house. I asked the obvious question, "How do you like it so far?"

"The work is interesting, but the environment's a problem. For example, there's the copying machine just outside my office. It's not the noise from the machine [that bothers me], it's the noise from the people using it. They have this code gadget on it — you have to punch in your personal ID and a job control number to get copies.

"Twelve digits, and a different code for each project. So all day long it's 'beep . . . beep . . . beep, Arrgh!' Then people come into my office and waste my time complaining about the system before they cool off, give up and go away."

Estimating costs

Ah, technology. It's wonderful. Somewhere, still alive no doubt, is the person who invented that particular electronic thumbscrew. The alleged idea behind it is to track costs. But the real cause of these extreme measures is inefficiency.

It starts innocently enough. Estimating time and materials (T&M) is the obvious way to determine the cost of a project. But at some point along the way, somebody wants a firm accounting of how much money was actually spent on the project in terms of T&M.

Suddenly, an experienced manager's educated guesses, spot checks and estimates aren't good enough anymore. Justified figures and itemized lists for everything become the rule. Demands like this cause management to get obsessed with billing everything to some kind of control number other than "general overhead."

Soon, everybody is running around tracking time by the minute and counting photocopies. In the above case, the control number was used three to four hours per week just to fill out the required tracking forms — that's roughly 10% of the available time — and costs were billed to the clients as "administrative expenses."

Sure, you can justify every penny this way, but what happened to common sense? This method is too much of a good thing.

How did that company get into such a situation? How did all this get started? It sounds harsh, but the odds are that the end user probably demanded those itemized lists because too many projects came in past their deadlines and over their budgets, and by then there was no other supplier left.

> *DP is labor-intensive. The raw material is time. But selling a system in terms of time alone is equivalent to selling a car in kit form by the pound. It's this attitude that emphasizes cost-justification of the parts at the expense of the whole product. It leads to high overhead and $650 ashtrays.*

Had there been a reliable product at a fair price, the demands probably would not have been made; instead, two organizations got enmeshed in picking endless nits, and the whole external billing practice moved over to T&M.

Sometimes it makes sense to bill by the hour. For example, surveys, consultations and occasional training courses are all situations where the value of the product sold is clearly proportional to the time spent. But in many cases, end users don't buy time; they buy a product: a finished system, a modification, a report or analysis. In this case, the value of the product is not proportional to the time spent. Only the costs are.

Internal cost controls

DP is labor-intensive. The raw material is time. It's elusive stuff and measures like T&M are necessary internal cost controls. But selling a system in terms of time alone is equivalent to selling a car in kit form by the pound.

It's this attitude that emphasizes cost-justification of the parts at the expense of the whole product. It leads to high overhead and $650 ashtrays.

Cars and systems have this in common: it doesn't matter how you slice up the costs, the products aren't worth a thing until they run. Seeing a system as a product changes the focus from how much time is spent on it to how well that time was spent. Rather than having individual employees feeling accountable for every minute of their time, teams are challenged to meet a deadline and create a product that works. The emphasis changes to high quality and accuracy. And that is something of which you cannot have too much.

Cuirle is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

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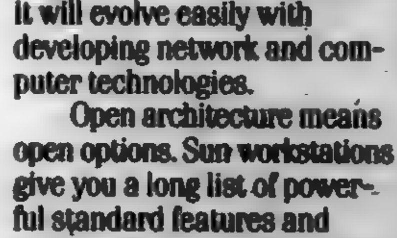

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COMPUTER ASSOCIATES

SOFTWARE & SERVICES

IBM enhances QMF, tools

RYE BROOK, N.Y. — In addition to the plethora of software IBM recently introduced that merges its System/38 with its Office Systems network [CW, June 24], Big Blue announced a variety of other software products, including Release 2 of its Query Management Facility (QMF) for the DB2 data base management system under MVS.

QMF, which also operates with IBM's SQL/Data System data in VM/SP environments, reportedly features report-writing enhancements, batch invocation of QMF procedures and improvements in error-handling capabilities. QMF Release 2, available now, has a one-time charge of $6,420 or a monthly charge of $1,070.

IBM also announced Release 2 of Network Services, which supports the attachment of a customer's Systems Network Architecture (SNA) network with IBM's Information Network's remote computer services and other attached networks. Release 2 allows users to interconnect with one or more existing customer networks as well as with the Information Network's remote computing facilities. The service includes multiple parallel links and alternate paths. Applications in attached networks can communicate with applications in other attached networks or in Information Network host processors. Release 2 will be available at the end of the month, and pricing will be based on usage.

IBM also announced the following:

- DFSort Release 7.1 for sorting fixed-length records in MVS/XA environments. The release also supports OS/VS1 and MVS/370 environments and includes enhanced capabilities for processing multivolume Sort Out data sets during a Block Set sort or merge function. The product also allows users to preserve the original order of collating records during a Block Set merge. The product includes link-editing capabilities of user exit routines. The monthly license charge is $247.
- Enhancements to the System/38 Interactive Data Base Utilities. Release 7 includes predefined joined logical files that are supported by the software's Query functions. A predefined join logical file will appear to the Query user as a single-record format in a file, a spokesman said. The product also allows Data File Utility (DFU) users to display, add, delete or change records without exiting an application. Users may also enter the verify mode from any other DFU mode. The product will be available in September at a one-time charge of $3,000 or a $250 monthly charge.

See IBM page 37

Will hardware chart course for data base management?

SOFTALK
John Gallant
CW Senior Editor

Whither thou goest DBMS? Does the future of data base management lie in hardware or in software? The vendors (currently two) of data base machines — a blend of relational DBMS software and specialized hardware — are betting that the future of data management lies in hardware. But it isn't clear that users agree with them, at least not yet.

It seems certain that future generations of hardware will be better equipped to handle data management functions. Hardware's evolution may involve anything from the microcoding of key DBMS processes to the development of a data base machine architecture that is radically different from current data base machine designs.

For today, the path to success for data base machines is strewn with provisos. Data base machine technology will be embraced *provided* the following:

- Users want to move to a relational DBMS and are willing to invest the effort necessary to migrate existing production — not just ad hoc or information center-type — applications to such a system.
- Users in mainstream commercial shops are facing the storage constraints data base machines are intended to relieve. The data base machine vendors admit their current users have application-specific needs, such as compiling and manipulating massive amounts of seismic data. But they point to the fact that users are now spending more for storage systems than they are for computing power.
- Users are convinced that specialized data base hardware is the answer to the performance problems associated with relational DBMS technology.
- Users are looking to tie together heterogeneous processors through a central data base machine — a capability data base machine vendors

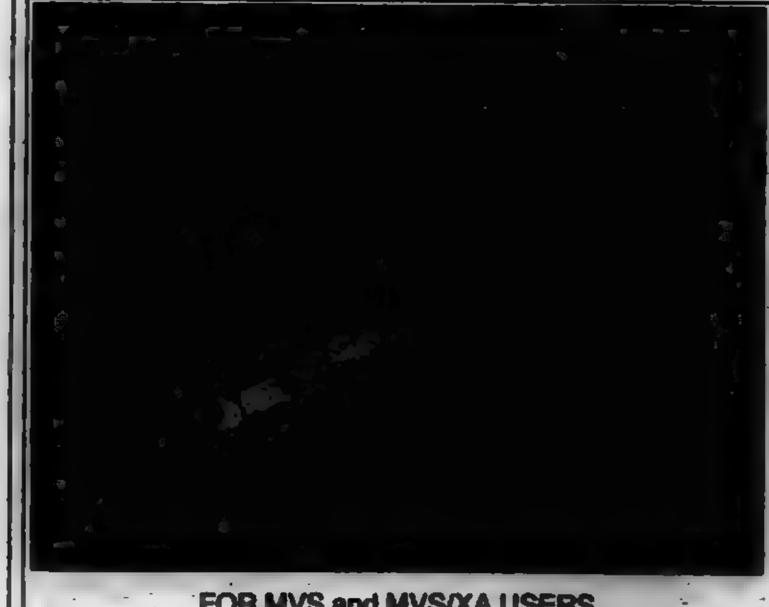
See DBMS page 39

- To reach projections of $50 billion in revenue by 1990, the software industry will offer more services, major vendors agree/34
- IBM unveiled software that allows its mainframes to act as videotex hosts and a product that enables the IBM Personal Computer to generate videotex graphics/38

INSIDE

Systems Software/36

International Data Corp. (IDC), the Framingham, Mass.-based market research firm, predicts that the fastest growing segment of the software and services industry for the remainder of this decade will be microcomputer software. That market is expected to grow at a compound annual rate of more than 50% until at least 1990. In contrast, IDC said, the remote computing services market is expected to decrease at a compound annual rate of 5% for the same period, due in large measure to "plummeting hardware costs."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Software gaining momentum in DP battle of the budget

By Randall Litchfield
Special to CW

ANALYSIS

If the computer industry had a junior partner, it was traditionally software. From the perspectives of both revenue and status, software took a backseat to the might of mainframes, the glamour of minis and the sheer sex appeal of microcomputers.

By all accounts, that is quickly changing. A decade ago, $1 out of every $10 spent on data processing went to software. The split is now 50-50 and is predicted to swing wildly in software's favor — to a ratio of about 4-1 — by 1990. By then, software in North America is expected to be a $50 billion industry.

To a much greater degree than hardware, software is revolutionizing the concept of the corporation itself. In a recent James Martin seminar, the reputed wizard of information processing claimed that developments in software are nothing less than a management revolution in the making that is bent on flattening the corporate pyramid.

These issues were the setting for the latest Computer World Round Table discussion between senior managers of 11 prominent software companies. Since the companies represented ranged from large mainframe-oriented multinationals such as Management Science America, Inc. (MSA) to smaller micro-based companies such as Basic Software Group of Vancouver, B.C., a wide spectrum of viewpoints was presented. But basic to every argument was the dire need to move swiftly in an industry that is absolutely merciless to stragglers.

One thing the participants agreed on was that software companies are starting to look like service bureaus. Mike Walczak, general manager at MSA Canada Ltd., said, "In the old days, software was a simple 64K bytes that the user could load. But with 70% to 80% of our time being spent on customer hand-holding and education, we are quickly moving from a software industry to a service industry."

Much of the hand-holding stems from the fact that software companies are penetrating departments other than traditional MIS stomping grounds. There have been several inroads, including such end-user-oriented software as fourth-generation languages and decision support systems.

Vehicle to carry software into '90s

Viewed as the vehicle that will carry software into the 1990s, fourth-generation languages are expected to move into fairly broad use by the end of the decade. Michael Potter, president of Cognos, said that 12% to 14% of IBM installations have fourth-generation language products today and most will be using them by the end of the decade.

But even defining a fourth-generation language in an industry as lacking in definition as the software industry has been is a problem. "The only consistent definition of [a fourth-generation language] seems to be that it isn't Cobol, or that it improves user productivity in the eyes of the vendor," said Harvey Gordon, vice-president of marketing for Mathematics Products Group Canada Ltd.

Whether fourth-generation languages could actually replace Cobol, however, is as hotly debated among vendors as it is among MIS professionals. Avery Burdett, director of operations for Systemhouse Ltd., saw them only as supplements to Cobol, adding that there are simply some things that can't be done with fourth-generation languages.

Walczak, on the other hand, made the blunt statement that there is probably some genius program developer in a garage banging the last nail into Cobol's coffin.

The micro has had perhaps the greatest impact on end-user computing and in creating the political struggle going on within many MIS departments. "We've been conditioned to address the MIS guy, but since the [personal computer] has entered the workplace, we are now making inroads into other departments," said Larry Lloyd, general manager at Infobuild, Inc.

Not so many years ago, software vendors wouldn't dare approach the end user for fear of MIS wrath. But with predictions that as many as two million people will be using decision support tools by next year, selling to the end user is practically unavoidable.

"Our approach is that when we know that we are going to sell a major piece of software, a committee is formed of MIS and end users," said Comshare, Inc.'s president, Derek Price. "You can't afford to collect a lot of 'no's' in the selling cycle, so you have to sell all the levels making sure that the package satisfies all the needs."

The other factor is that MIS often doesn't have the signing authority for some of the larger software pur-

See SHIFT page 30

Litchfield is the editor of Computer World Canada, *a sister publication of* Computerworld *based in Mississauga, Ontario.*

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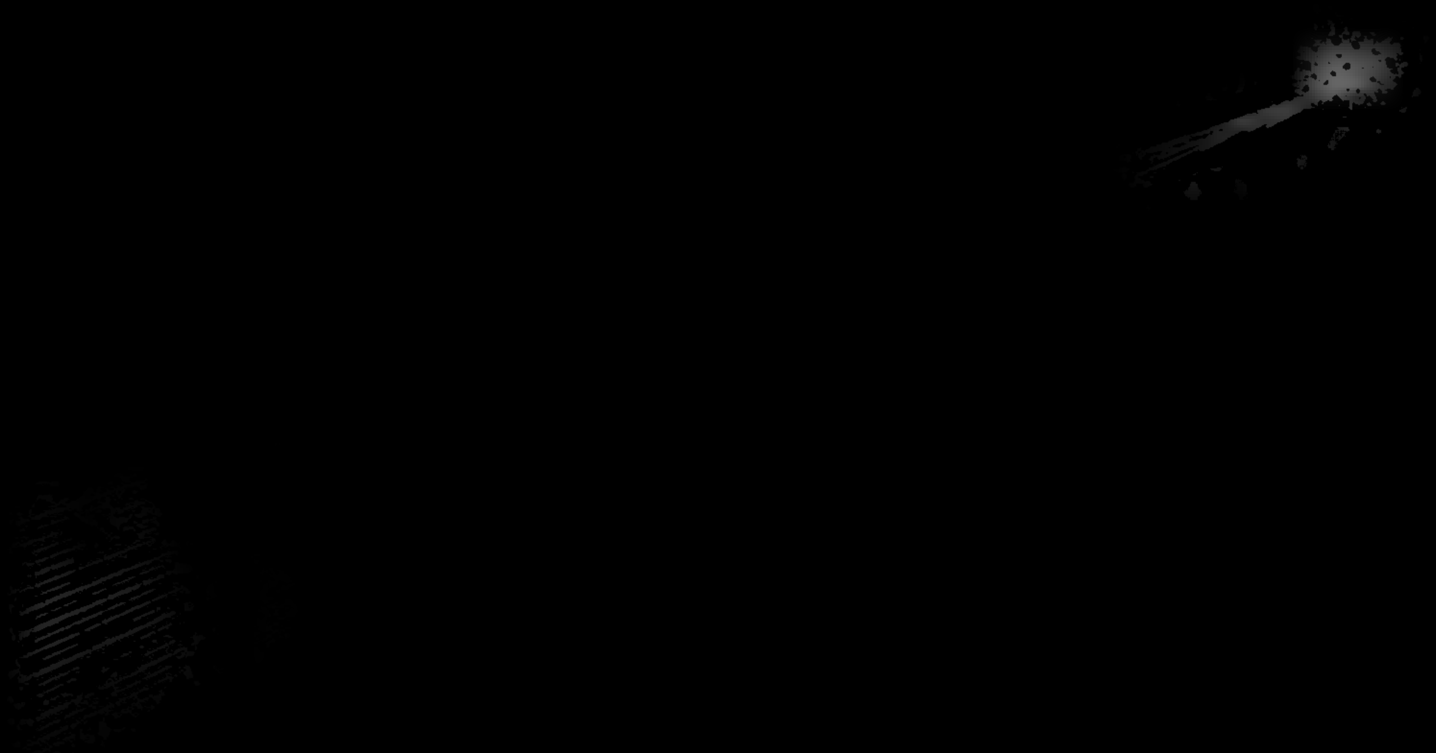

SHIFT

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chases that can range to $500,000 or more. As Sandy McNair, vice-president of marketing for Minicom Data Corp., said, "We find that the best decisions come from the bottom up, where the president waits for his people to say what the best route is."

But if the president is to make an intelligent final decision, it increasingly involves getting his hands dirty in something top management has so far avoided like the plague. "Senior executives are getting left behind by computers and need to get their own [personal computers] in order to understand what the revolution is all about," Lloyd said.

Another issue is portability. Software vendors are observing that the most obvious trend is that customers are not scratching their heads over what kind of machine to use for a specific function, as long as it networks.

Though AT&T's Unix operating system has been touted as a solution, there are the obstacles of a lack of applications software and customers to be overcome. It's a catch-22 situation — vendors won't develop the applications without a solid customer base to sell to, and customers won't switch to Unix hardware until they see a good crop of software to harvest.

Conversion may be answer

The answer may be conversion. According to Dennis Kukulsky, president of Human Computing Resources Corp., "A criticism of Unix has been the lack of application software, but there is a lot out there to be converted. The problem is that to code in C is very difficult and expensive. This is a prime case [in which] we need those fourth-generation productivity tools to get Unix applications on the market."

Still, there was the general notion that Unix would steam ahead and eventually prevail as an operating system, since heavy hitters such as Sperry Corp. and NCR Corp. were standardizing their high-end hardware around it. But that still leaves the question of which variation of Unix will prevail.

Artificial intelligence is another issue with which practically every software firm is trying to come to grips. Though not firmly entrenched in the commercial arena yet, most predictions tout AI as the future direction of the software industry itself.

Ian MacLachlan, vice-president of Logicware, Inc., predicts that AI will gradually integrate into the traditional software worlds of tools and applications. A major component will be expert systems — the practice of embodying human expertise in software.

Ted Comfoltey, president of Basic Software Group, Inc., said his company has been taking a hard look at expert systems, expecting that they could have a strong impact on the perpetual problem of user interface.

"We don't expect generic expert systems to be of much use. Solutions become user dependent, and systems will have to be custom-made to provide them," he said.

But lest software developers comfort themselves with the idea that AI will be the last hurdle for a while, Paul Bassett, vice-president of research for Netron, Inc., shared a sobering observation: "With parallel processing just around the corner, we could all be living in a fool's paradise. Software vendors haven't been thinking about this and the profound changes it could bring about."

SYSTEMS SOFTWARE

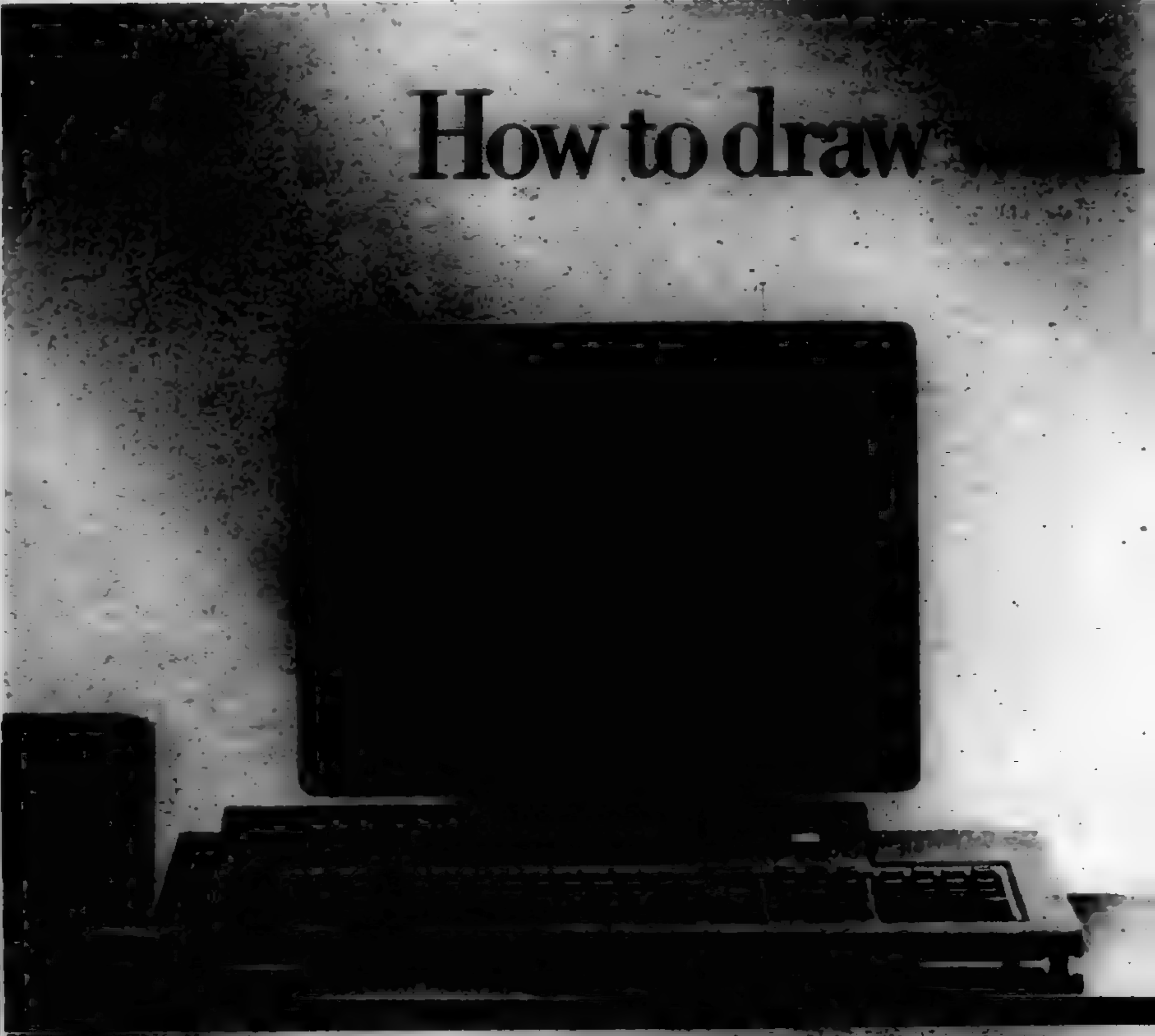
■ **Optimation, Inc. has announced a Tektronix, Inc. 4010 emulator for Hewlett-Packard Co. HP 200 series microcomputers running Pascal 2.1 or 3.0.**

The emulator permits either full screen display or windowing onto the full T4010 screen size, a spokesman said. The package provides output capability to any HP-supported printer or plotter for hard-copy display.

The T4010 is offered as an add-on feature to the company's HP 2623 emulator running under its compatibility mode. This allows files and HP text and graphics to be transferred between the HP 300 and the HP 1000, HP 3000 and HP 9000 processors.

The T4010 costs $550.

Optimation, 81 Faxon Road, Atherton, Calif. 94025.



How to draw

IBM 3270 PC/G

If your department gets repeated requests for presentation graphics, IBM has [illegible] answer.

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The 3270 PC/G or GX gives you easy access to host-based graphics and data. And, with IBM's new Graphics Editor and Picture Plotting software, you can work offline locally to draw your own high-resolution charts, diagrams and free-form sketches.

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If you want to create foils for a business meeting, just zoom and scroll to position the graphics you want to reproduce. Then use IBM's Picture Plotting to plot the results. You also get a handy graphics index, so you can file and retrieve pictures for future presentations.

But there's more to the 3270 PC/G or GX than just pretty pictures. Each system can display up to four host graphics

SOFTWARE & SERVICES

IBM from page 33

■ Enhancements to the Subsystem Data Analyzer menu design.

■ Availability of the Cross System Product/Application Development Version 1 and Cross System Product/Application Execution Version 1 under IBM's VSE/AF Version 2. The Cross System Products also now support CICS/VS, MVS/TSO, SSX/VSE and VM/SP CMS. The former product carries a one-time charge of $5,300 or a $198 monthly charge. The latter has a $4,000 one-time charge or a $150 monthly charge.

■ Data Facility Data Set Services Version 2.1 for XA/370 or IBM 370 mode. Version 2.1 now includes a function to support Dasd conversion, Dasd space management, logical data set processing and expanded data set selection criteria. The monthly charge for the product is $215.

■ The System/36 Cryptographic Facility. The product is compatible with the IBM 4700 Finance Communications Subsystem and includes capabilities for encryption and decryption of data allowing the user to create, protect and organize cryptographic keys used by a system.

Other encryption operations include capabilities for generating personal identification numbers for financial institutions and message authentication codes to determine if data has been tampered with. The product is available immediately for a one-time charge of $5,000 or a $250 monthly charge.

■ Teleprocessing Network Simulator Version 2.3 for MVS, MVS/XA and VM/SP. The product was designed to test on-line applications programs, control programs and networks.

Enhancements include an Advanced Communications Function/Vtam application program, said to eliminate the need for a communications controller in some testing environments.

Version 2.3 will automatically be sent to current users. The product is available immediately.

■ Release 8 of Device Support Facilities for MVS and MVS/XA. It also supports IBM 3380 models running VSE/AF and runs as a stand-alone version.

Functions for the program are necessary for initialization, surface maintenance and error recovery of supported fixed-block architectures and count-key data Dasds. The product also includes the ability to default the I/O devices to the console. Release 8 will be available this month.

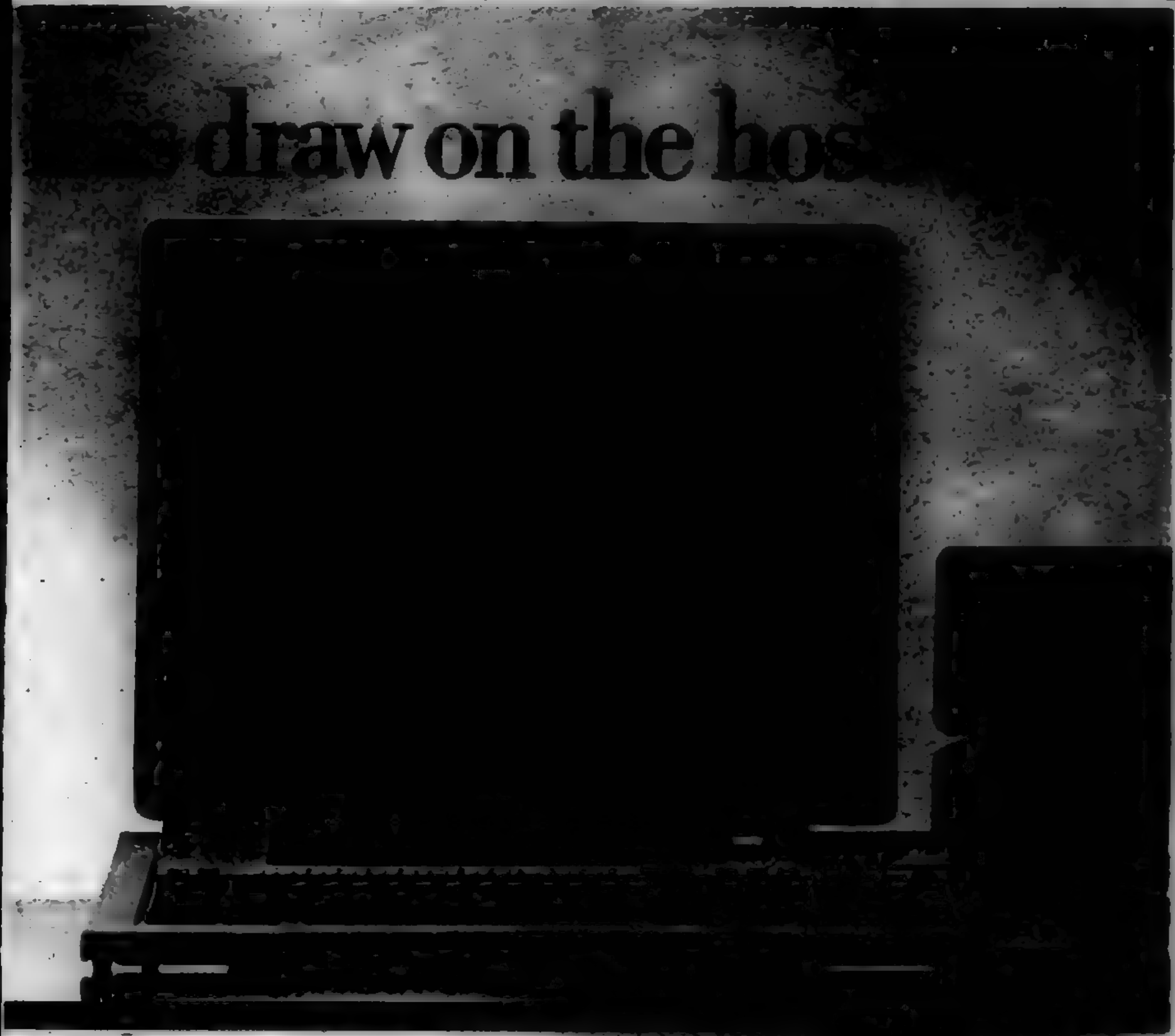
■ Version 2 of the System/36-to-System/38 Conversion Aid that now supports functions added to the System/36 System Support Program Release 3. The product will be available this month and carries a one-time charge of $600.

> ”
>
> *Other encryption operations include generating personal identification numbers.*

■ Non-SNA Interconnection Licensed Program Releases 2 and 3 for the IBM 3725 communications controller. The product is an enhancement to IBM's networking program and allows the 3725 to select RJE devices and network job-entry subsystems.

The facilities can transport bisynchronous communications data through the SNA network and share the use of the Synchronous Data Link Control network links. The product now includes support for the IBM Displaywriter in the IBM 2780 mode, as well as support of VM/Pass-Through-to-VM/Pass-Through connections.

Release 2, which will be available in October, operates under MVS/XA, MVS, OS/VS1 and VSE/AF with ACF/NCP Version 2. Release 3 will be available in December and operates under MVS/XA and MVS with ACF/NCP Version 3. The versions have a one-time charge of $1,606 or a $465 monthly charge.



IBM 3270 PC/GX

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DBMS

from page 33

tout as one of the most important assets of the technology.

- Users are willing to purchase a data base machine from one of today's relatively unknown vendors, rather than simply wait for their current hardware supplier to offer a similar machine. That may take some time. Computer manufacturers are more than happy to push software DBMS that chew up more and more hardware resources.
- Users are convinced that data base machines can solve their productivity problems. Productivity is seen as a primary concern and one that outweighs such concerns as data storage constraints and the linkage of disparate processors.

Those are weighty conditions. Thus, it is no surprise that pundits parry over the fate of data base machines. Scott Smith, vice-president of Gartner Group, Inc., said he believes the data base machine market is in a nascent stage and could grow rapidly. Michael Geran, vice-president in research with E. F. Hutton & Co., said he thinks there is no significant interest in data base machines.

Los Gatos, Calif.-based Britton-Lee, Inc. seems to be doing fairly well in the mini arena. The company has installed about 500 of its Intelligent Database Machines (IDM) and predicts roughly a 65% revenue growth for the upcoming fiscal year.

But the mini world is light-years away from the IBM-dominated mainframe world, where only Los Angeles-based Teradata Corp. has thus far ventured. The company has installed about a dozen of its DBC/1012 data base machines and it hopes to ship at least twice that many in its upcoming fiscal year.

In addition to the provisos mentioned above, however, Teradata faces what may prove to be an insurmountable obstacle. The fledgling company is going against IBM in what William Inmon, a director at Coopers & Lybrand in Denver, called the heart of Big Blue's operations.

"The problem facing Teradata is not the technical aspects of its product, not the fact that it is a data base machine," Inmon said. "The real problem is the marketplace it is trying to penetrate. It is trying to compete against the IBM [30 series] processors."

Ronald Ross, editor of the "Data Base Newsletter" published by Boston-based Data Base Research Group, emphasized Inmon's point. "There is a lot of skepticism, and it isn't about the machine's capabilities," Ross said. "Most users in the IBM world are not accustomed to a multiple hardware vendor configuration. That is not so true in the mini world. But the data base machine could, conceivably, obsolete the mainframe. It could act as a data management node with midsize processors and micros attached. IBM has demonstrated the capacity to blow out any competitor like that."

For the time being, the attitude toward data base machines appears to be one of "wait and see." Will the conditions impeding the adoption of data base machines be met? Time will tell. It will be interesting to see how the data base machine vendors, each with its own target audience, philosophy and architecture, fare in a market that remains skeptical.

Teradata Corp.'s DBC/1012 data base machine

IBM announces videotex tools

NEW YORK — IBM has announced Videotex/370, which allows an IBM mainframe to serve as a videotex host, and PC/Videotex-Graphic Artist Facility (VTXGraf), for enabling an IBM Personal Computer to create color graphics for the host system.

Videotex/370 can run with other applications in MVS/CICS environments. The Videotex/370 product was developed by Videodial, Inc., in conjunction with IBM, and is being sold under a nonexclusive licensing agreement. VTXGraf was developed by IBM and incorporates a program from Cableshare, Inc. under an exclusive licensing agreement.

The PC/Videotex program enables an IBM Personal Computer to create pages of videotex information combining color graphics and text.

Videotex/370 is priced at $75,000 and is scheduled for early 1986 availability. VTXGraf is priced at $2,500 and will be available in September.

IBM also announced two videotex services from the IBM Information Network. Videotex/370 Application Development Service enables subscribers to develop videotex applications on the network. Users are billed for on-line time. Videotex/370 Host Attach Service allows subscribers to use the Information Network to deliver their videotex service to end users. It has a fixed monthly charge.

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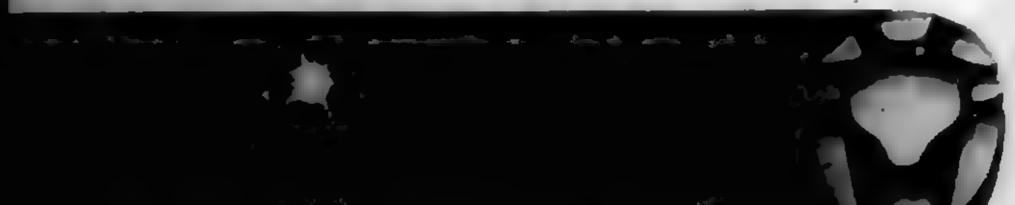

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MICROCOMPUTERS

Hyperdrive boosts speed of Mac business software

By Kathleen Sullivan
CW West Coast Bureau

LAKE TAHOE, Calif. — Homestar, a property management firm based in this resort community, depends on its Apple Computer, Inc. Macintosh computer to provide services to its clients. Until a couple of months ago, however, Homestar president Steve Kubby was disappointed in the computer's performance.

"It was not the serious business machine I thought it was," said Kubby, who described the Macintosh as a slow, cumbersome system that could not keep up with his secretary's rapid-fire typing.

But the situation has changed dramatically since Homestar bought Hyperdrive, an internal 10M-byte hard disk drive for the Macintosh, designed by Cambridge, Mass.-based General Computer Co. Although the transition was not a smooth one — it took three installations to get a trouble-free unit — Kubby is an enthusiastic user.

"I now have a business machine that makes no apologies to anyone," he said. The Hyperdrive, now running "like a well-tuned clock," has transformed the Macintosh, he said. "It's such a treat to zoom down a list with data popping up and not have to wait for the computer to catch up with you."

Kubby's remarks were echoed by other users, who praised the Hyperdrive's speed and ease of use. "It's a very impressive product," said Joe Garappolo, manager of Macintosh software development for New York-based Peat, Marwick, Mitchell & Co. "Its speed is not approached by any other hard disk drive."

Garappolo said the accounting firm, a beta test site, discovered problems in an earlier release. But a second unit has performed without a hitch. Garappolo said the firm had done an excellent job designing the Hyperdrive's system software, which allows users to partition the drive into 22 drawers.

Rick Richardson, national director of microcomputer technology for Arthur Young & Co., agreed, saying that the Hy-

See DRIVE page 51

IBM micro, videodisk aid in training

By Edward Warner
CW Staff

WARREN, Mich. — When a company newsletter comes out, most employees are likely to flip through its gray pages and give it a quick heave-ho. A pioneering program scheduled to get under way last month at General Motors Corp.'s Technical Center here, however, hopes to use laser disk-based video displays to present company news more colorfully.

The GM program, being developed by its Electronic Data Systems Corp. (EDS) subsidiary, relies on Natick, Mass.-based Visage, Inc.'s marriage of the IBM Personal Computer and a laser videodisk player.

Twenty of the Visage machines, called V:Stations, will be placed at various locations around the headquarters of GM's Chevrolet/Pontiac Canada division. They will be used to "publish" a video company newsletter with which employees can interact.

See VISAGE page 50

- A 1,200 bit/sec. modem card for IBM Personal Computers, priced at $198, debuted from Cermetek Microelectronics/42
- IBM upgraded its Personal Computer Basic Compiler/43
- AST Research introduced a 2M-byte expanded memory board for the IBM Personal Computer/43

INSIDE
Software/46

IBM the buyer's choice as micros go blue collar

SMALL TALK
Edward Warner
CW Senior Writer

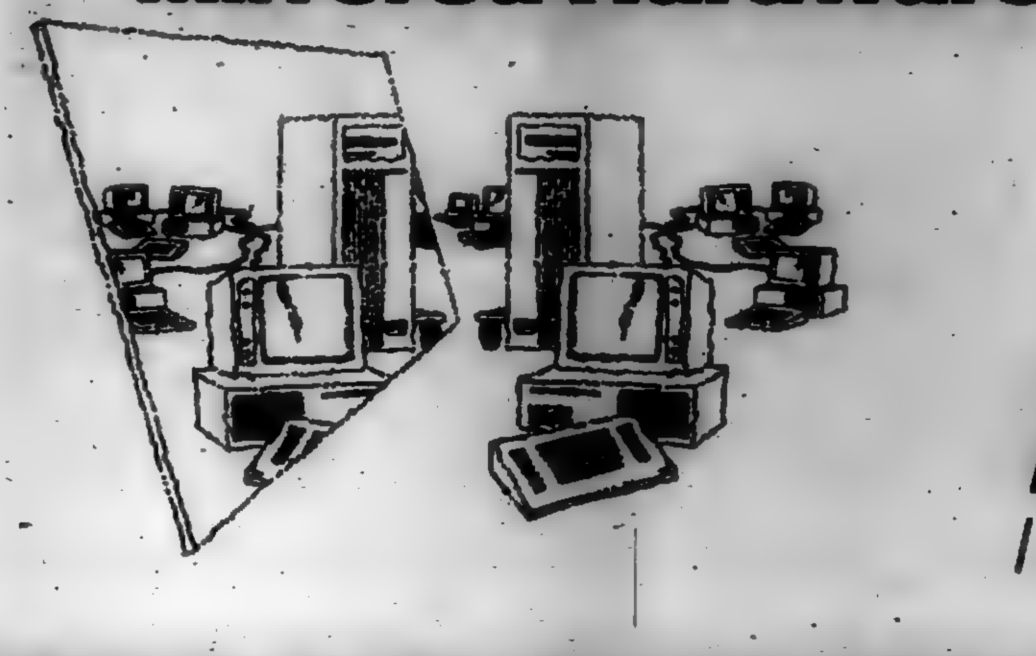
With the office already awash in personal computers, micros will next work their magic on the factory floor. The year 1985 could mark the start of a revolution in automation similar to that wrought in offices in 1981 when IBM first introduced its 16-bit wunderkind.

Consider the evidence:

- IBM's year-old 5531, a Personal Computer in a hardened case for factories, outsells IBM's Personal Computer AT, according to Peter Cohen, a factory automation analyst with International Data Corp. He added that a large number of nonhardened Personal Computers also find their way into the factory, a place no longer usually filled with flying sparks and smoky haze.
- At the recent Robots 9 show in Detroit, one of the hottest items was not an advance in robotics but an enhancement of the old standby of factory automation, the programmable controller. The enhancement was the incorporation of a personal computer into a programmable controller — truly a PC within a PC.
- The use of computer-aided design software for personal computers is spreading. Though not a new idea — Autodesk, Inc. pioneered the market with its Autodesk software — personal computer CAD products are proliferating. The boom is being spurred by advances in personal computer technology in general and the Personal Computer AT in particular. A 63% growth rate is predicted for the personal computer CAD industry, which will hit the $1 billion mark in software and systems revenue by 1990, according to a recent market research report from Technology and Business Communications, Inc.
- The adaptation — by users — of Lotus Development Corp.'s 1-2-3 spreadsheet for on-the-spot analysis of factory

See FACTORY page 51

Mirrored Hardware



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Local Area Networks For Large Organizations

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HP unwraps IBM micro-compatible disk, tape products

By Jeffry Beeler
CW West Coast Bureau

CUPERTINO, Calif. — Hewlett-Packard Co. today entered the IBM Personal Computer-compatible storage business with the introduction of two hard-disk units and a ¼-in. streaming tape module.

To its existing 10M-byte 9154A and 20M-byte 9134H Winchester disk models HP has added the necessary interface cards, cable and software utilities to enable the two products to support the Personal Computer, Personal Computer XT and AT and Compaq Computer Corp. Portable Computer, the company said.

For the first time, HP is also now offering a 60M-byte tape backup system that reportedly works with either the company's Touchscreen family of micros or with its IBM and IBM-compatible equivalents. Unlike the 9154A and 9134H hard-disk units, which were available with the Touchscreen before they were adapted to provide IBM compatibility, the 9142A streaming tape module is new.

Product strategy revived

In functionally enhancing and reintroducing its Winchester offerings, HP is reviving a product strategy that reportedly was used to good advantage on the output side of its micro peripheral line.

Although its low-end plotters and printers were originally intended to be sold primarily to its own customers, HP later broadened the output devices' target audience to include users of IBM Personal Computers as well. Now, the company is again diversifying the intended market for its microcomputer peripherals — but this time at the mass storage end, according to John Boose, a marketing manager with HP's Greeley, Colo., division.

All three of the IBM-compatible additions to HP's disk and tape product line cost about $200 less than the comparable units previously sold with the Touchscreen family.

The 20M-byte 9134H provides twice the capacity and 20% greater throughput than a Personal Computer XT mass storage upgrade for $100 less, Boose said.

Backup for the 9134H and its 10M-byte sister product is supplied by the 9142A streaming tape unit, which copies hard-disk files at 2M byte/min, Boose said.

The 10M-byte 9154A, meanwhile, is aimed at users who have exhausted the capacity of their floppy disk-based IBM Personal Computers and need to upgrade to a Winchester disk system.

Available immediately for customer delivery, the 9154A, 9134H and 9142A cost $1,698, $2,390 and $1,690, respectively.

HP is headquartered at 3000 Hanover St., Palo Alto, Calif. 94304.

Kodak announces plain-paper printing: the lowest-cost retrieval you can buy.

Presenting the Kodak IMT-350 microimage terminal and the Kodak Starvue II reader-printer, the first image-management work stations from Kodak with the plus of plain-paper printing. And unmatched retrieval savings.

Both units offer high-speed front delivery of positive prints from either positive or negative film. Under-2¢-a-print economy. Improved work flow. Labor and materials savings. And the means to increase your productivity up to *50%*.

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New KODAK STARVUE II
Reader-Printer
with Plain-Paper Printing

New KODAK IMT-350
Microimage Terminal
with Plain-Paper Printing

IBM micros get modem

SUNNYVALE, Calif. — Cermetek Microelectronics, Inc. has introduced a 300/1,200 bit/sec. modem card for the IBM Personal Computer, Personal Computer XT and Personal Computer AT that sells for $199.

The Info-Mate 1200TPC modem reportedly permits the microcomputer to autodial voice or data calls either directly from the keyboard or from a 200-name disk-based phone directory, Cermetek said. Autologon strings for data base services also may be stored. QC-Modem, a windowing communications software package, is included with the modem, the vendor said.

The product is compatible with Hayes Microcomputer Products, Inc. modems and will operate with most popular communications software packages, such as Microstuf, Inc.'s Crosstalk, Highland Press' PC-Talk II and Lotus Development Corp.'s Symphony, according to the vendor. It supports Xon-Xoff, Paced, Xmodem and Xmodem CRC file transfer protocols. Other features include autoanswer and automatic selection of speed and parity.

More information is available from Cermetek at 1308 Borregas Ave., Sunnyvale, Calif. 94089.

Lotus to offer Spotlight tool

CAMBRIDGE, Mass. — Lotus Development Corp. has announced that it will market Spotlight, a desktop manager for the IBM Personal Computer, at a price of $75.

Spotlight, which Lotus acquired through the purchase of Software Arts, Inc., reportedly includes a notepad, on-screen calculator, phone book, appointment book, index card file and a DOS filer.

The accessories are said to appear as windows, which can be called up while an application is running or by themselves.

Lotus is headquartered at 55 Cambridge Pkwy., Cambridge, Mass. 02142.

AST Research introduces memory board for IBM micro

IRVINE, Calif. — An IBM Personal Computer memory board that provides up to 2M bytes of expanded memory, and reportedly supports and improves upon the Lotus/Intel Expanded Memory Specification (EMS), has been introduced by AST Research, Inc.

According to the vendor, the Rampage! board requires less software overhead and offers a more flexible paging scheme than does the EMS specification, developed by Lotus Development Corp. and Intel Corp. AST said the board was created from a superset of the EMS specification.

Rather than allocate a single 64K-byte window in high memory (the area from 640K bytes to 1M byte) for paging, as does the standard EMS, the AST board reportedly permits applications software to exchange data into all of the available 16K-byte blocks in high memory. This feature doubles the potential paging area, the vendor said.

Rampage! also is said to offer split memory addressing, under which the board's memory is added to the Personal Computer's existing random-access memory (RAM) until the 640K-byte level is reached. As many as four Rampage! boards reportedly can be installed to bring a Personal Computer's memory up to 8M bytes beyond the 640K-byte threshold.

A Rampage! software driver, included with the board, is said to operate transparently to the user.

Rampage! is bundled with AST's Superpak utility software, which includes Superdrive, a RAM disk simulator. The board will be available in July for $595 with 256K bytes of memory.

For more information, AST Research is located at 2121 Alton Ave., Irvine, Calif. 92714.

IBM unveils enhanced micro Basic Compiler

WHITE PLAINS, N.Y. — IBM has announced an enhanced version of its Basic Compiler for its Personal Computer.

Personal Computer Basic Compiler 2.0 reportedly supports IBM's Topview operating environment and PC Network. It includes such program control structures as named subroutines, user-defined multiline functions, separately compiled Basic subprograms and the ability to branch to alphanumeric labels.

The enhanced version also permits larger programs to be compiled, with instruction space separated from data space. It supports large numeric dynamic arrays, with the maximum index for any dimension of a numeric array now at 32,767, IBM said.

Other features are said to include expanded access to IBM's PC-DOS, support for redirection of standard I/O, addition of an input editor and new metacommands.

The product costs $395. Users of the IBM Personal Computer Basic Compiler may upgrade for $195.

IBM Information Systems Group's National Accounts Division is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

Micro-MRP introduces two modules

FOSTER CITY, Calif. — Micro-MRP, Inc. has introduced two modules for use with its MAX, The Production Manager material requirements planning (MRP) software for the IBM Personal Computer.

One of the modules, Just-in-Time (JIT), reportedly supports the just-in-time style of MRP pioneered by Japanese firms. JIT permits a manufacturer to reduce the amount of raw materials that must be stored on site, cutting inventory costs.

The Micro-MRP JIT module features a system of prioritization that gives production priority to those orders that are needed and available, according to the vendor.

It also provides load and queue detail and summary reporting to concentrate attention at the work center level and displays exceptions (orders that are needed and not available or available but not needed). Also included is a manual override feature that allows managers to permit exceptions.

The Data Collection Module reportedly prints automatic audit trails and tracks shop floor completions, scraps and order splits. According to the vendor, it also interfaces with most data collection devices for personal computers.

The JIT module sells for $4,000. The Data Collection Module costs $2,000.

Micro-MRP is located at 1065 E. Hillsdale Blvd., Foster City, Calif. 94404.

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Terminal emulation tools announced for IBM micro

ST. LOUIS — Polygon Associates, Inc. has introduced its Poly-Com/220 terminal emulation and file transfer software, an addition to the company's family of terminal emulation and file transfer programs.

The Poly-Com/220 package reportedly allows the IBM Personal Computer to be used as a Digital Equipment Corp. VT52, VT102 or VT220 terminal and allows file transfers between the IBM Personal Computer and another IBM Personal Computer or a DEC minicomputer.

Poly-Com/220 resides in the microcomputer's memory and can be accessed by a hot key.

All VT100 and VT200 keys are implemented, as are DEC's international 8-bit character set and the Compose key, according to Polygon Associates.

The system is backward compatible with previous Poly-Com packages. Users of previous versions can upgrade to the Poly-Com/220 version for $52.

The package costs $200, the vendor said.

Polygon Associates is located at 1024 Executive Pkwy., St. Louis, Mo. 63141.

SOFTWARE

■ **Software Services of Tampa, Inc. has introduced its Lease Vs. Purchase Analyzer software for the IBM Personal Computer.**

The software is said to be a menu-driven program that performs an analysis of the cheapest method of equipment acquisition. The analysis can be performed on a present value, after-tax basis. Before-tax and raw dollar amounts can also be shown.

The software reportedly also performs purchase conversion and lease buy-out analyses of an existing lease. This would permit users to determine whether it would be less costly to exercise a purchase option than it would be to remain on a lease, the vendor said.

The software is priced at $196 and requires at least 128K bytes of memory and one diskette drive.

Software Services of Tampa, Suite 1001, 4410 Ranchwood Lane, Tampa, Fla. 33624.

■ **National Information Systems, Inc. has announced that its VUE project management system is available for the IBM Personal Computer XT and AT and compatibles under Microsoft Corp.'s MS-DOS operating system.**

VUE uses the critical-path method to track up to 3,000 activities per project. Ninety-nine related projects can be scheduled and tracked, the vendor said.

Fourteen reports are said to be standard, including printer graphics output of bar charts and network diagrams.

The package costs $895.

National Information Systems, Suite 130, 20370 Town Center Lane, Cupertino, Calif. 95014.

■ **Breakthrough Software Corp. has announced enhancement of its Time Line project management software for the IBM Personal Computer line.**

Time Line 2.0 reportedly includes support for an unlimited number of resources and costs for each project. A resource may be defined as either a person or a resource pool, and managers may allocate all or part of the resource to a particular task. Time Line is said to monitor resource allocation continually and to advise the user of overscheduling.

Time Line 2.0 also is said to define fixed, unit or variable costs for each cost category. The number of digits for an individual cost has now risen to eight, allowing a single cost up to $100 million.

Also added are reporting features, including an earned value analysis report and two table reports that summarize either task or resource information. Cost reports can tally either total dollar amounts or man hours, the vendor said.

Time Line 2.0 is priced at $495. Registered users may upgrade for $75.

Breakthrough Software, 505 San Marino Drive, Novato, Calif. 94947.

■ **Control Data Corp. has released its Cybernet-Express Project Manager software system for the IBM Personal Computer XT and compatibles that is said to help engineers plan, control and track projects with as many as 10,000 separate activities.**

The system provides critical-path scheduling, resource leveling, management reporting and graphics capabilities, the vendor said. It integrates Primavera Systems, Inc.'s Project Planner and its Primavision plotter interface with the Cybernet-Express series of engineering applications systems.

The Project Manager costs $4,450.

Control Data, 8100 34th Ave. S., Minneapolis, Minn. 55440.

■ **Taxcalc Software, Inc. has introduced a tax planning template for use with software such as Lotus Development Corp.'s 1-2-3 on the IBM Personal Computer.**

The software, Corporate Tax Plan-

Continued on page 50

Come talk to us at NCC '85

IBM, Hewlett-Packard, Control Data, Digital, AVX and companies like them—including 49 of the top 50 U.S. electronics companies—have subsidiaries in Britain. Indeed, Britain is by far the preferred location for U.S. business in Europe.

The Invest in Britain Bureau and Peat, Marwick, Mitchell & Co. are holding a BRIEFING ON BRITAIN in Chicago on July 16, 1985, during the National Computer Conference. The Briefing is specifically designed for executives whose companies are considering expanding in Europe. It will be given by David Trippier MP, British industry minister; John Alvey of British Telecom; and Mark Arvin of Peat Marwick. There will be ample opportunity for questions and private discussion.

To register, contact Edith Jaffe, British Consulate-General, 845 Third Avenue, New York, N.Y. 10022. Telephone (212) 593-2258. Or come talk to us during NCC at the Invest in Britain Bureau and Scottish Development Agency booth, number 1231/1232/1233.

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VISAGE

from page 41

More than 6,000 employees will be able to use the system's color touch-screen monitor to call up short video segments on GM's latest corporate news or to add their vote to a weekly opinion poll. Their responses to that poll will be stored on each V:Station's hard disk, combined with those of all respondents and displayed in a graph on the system during the next week.

GM is one of the first to use the V:Station, introduced last November. Its use is also unique; most other early users have put the machines to work providing interactive employee training.

A user of the more traditional stripe is Gould, Inc.'s Programmable Controller Division in Andover, Mass., which is using V:Stations to develop training for users of Gould's Numeric Controllers (NC), one of the simpler forms of factory automation equipment.

Gould is using 10 V:S 2006 machines — each of which comes with 512K bytes of memory, a 5¼-in. diskette drive, 10M-byte hard disk and touch-screen monitor — to write instructional software for three training courses that it plans to market this fall to buyers of its Gould 584 programmable controller. The courses, each on three videodisks, will include one for factory electricians on programmable controller maintenance, one for plant supervisors, offering an overview of the 584, and one for OEM customers.

Rely on interaction

Like any application for the V:Station series, the Gould courses will rely on the interaction of the videodisk player and instructional software running on the system's Personal Computer. That interaction is brought about by the videodisk controller board, inserted into the Personal Computer, and the instructional software, or courseware, authored by the user.

To author its courseware, Gould is using Troy, Mich.-based Sandy Corp.'s System for Authoring Microtraining (SAM), a package that, according to Richard Michaels, Sandy account director, is entirely menu driven and requires no programming skills. Michaels explained that the courseware for the V:Stations begins life as a flow chart, or storyboard, which maps out the structure the course is to follow.

The storyboard is made up of segments, each combining video in the form of a still picture or a film clip with an overlay of text. Each segment is produced separately, but when they are combined, "it turns into a runtime package," Michaels said. Depending on the student's answers to the course's occasional quizzes, the courseware will skip ahead one or several events or jump back several events for a review.

'Satisfies everything we need'

Richard Bell, director of training and development for the Gould NC division, said SAM "satisfies everything we need to use it for," but added that authoring the courseware was only part of the job. The six who worked on the course for Gould 584 training, he noted, will have spent nearly six months on the course when it premiers Sept. 1.

The best feature of the Visage machines, according to Bell, is that they are based on the Personal Computer, a machine that can be used for other office automation tasks. As he put it, "a customer doesn't have to go out and plop down $12,000 to buy a lot of equipment that is just for training."

Though the V:Stations include a Personal Computer, they do not include a videodisk player. Visage said that almost any videodisk player, including those of Hitachi America, Ltd. and Pioneer Electronics, will interface with it.

Bell said there have been no hardware or software problems with the V:Stations and that Gould has received "incredible on-site support," from Visage. "Anything we've asked them to do," he said, "they've been willing to do."

At GM, the V:Stations cum newsletters are being programmed to run a series of eight 4- to 5-min. GM "featurettes," which users can choose via a touch-screen monitor, according to Mike Allie, an EDS account manager handling the GM project.

Allie said the feature of the V:Stations he liked most was that "their learning curve [was] very small." This ease of use, he explained, "insulated the developer from getting involved in the little details." It also sped development time. The machines were acquired in March and the first prototype of the electronic newsletter was ready in one month, he pointed out.

Continued from page 48

ner, reportedly offers users the ability to compare the minimum tax, the alternative tax on capital gains and credits and special deductions.

The software is said to interface with other applications including Lotus' Visicalc IV and Microsoft's Multiplan.

Corporate Tax Planner costs $150.

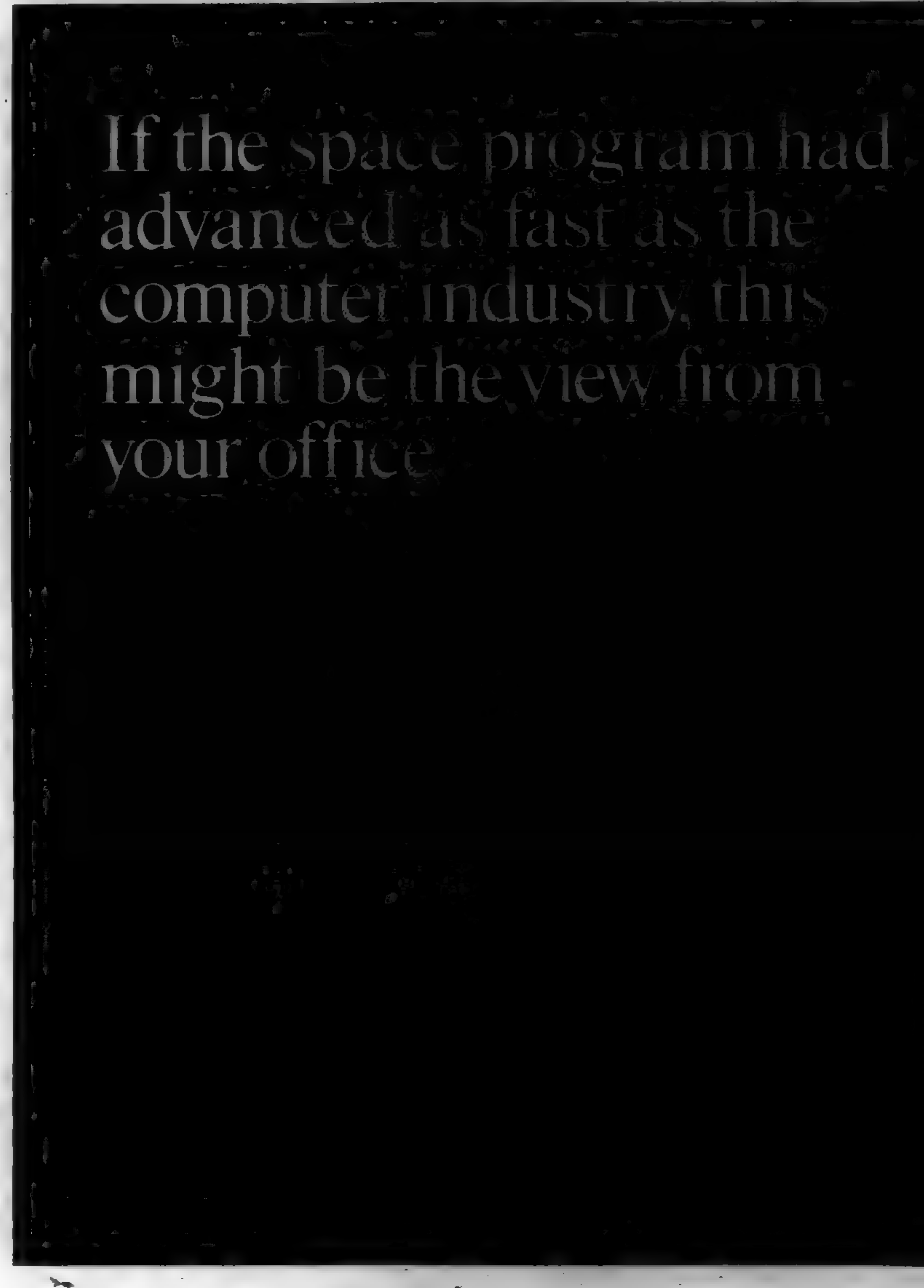
Taxcalc Software, 4210 W. Vickery Blvd., Fort Worth, Texas 76107.

■ **Software Studios, Inc. has announced enhancement of its PC-Desk desktop manager software for the IBM Personal Computer.**

PC-Desk II reportedly offers memory partitioning, which permits two programs to be active at the same time. With a single command, users may switch between programs. Also included is a cut-and-paste command.

The package is available free, but a $49 registration fee reportedly entitles the user to telephone support and free updates of the software.

Software Studios, 8516 Sugarbush, Annandale, Va. 22003.


If the space program had advanced as fast as the computer industry, this might be the view from your office.

FACTORY

from page 41

floor data is increasing. Shop floor managers are using 1-2-3 because they want to make corrections as needed, noted Sandra Gunn, vice-president and general manager of Lotus' Engineering and Scientific Products division. "By the time they get the information back from their mainframe or from their MRP [material requirements planning] system, it's too late," she said.

Ultimately, that is what drives the factory floor boom in personal computing — a need for quick response. Ironically, at a time when talk runs high about getting factory floor devices to communicate with the corporate mainframe, the micro is coming to be seen as the solution to the mainframe's weak points, such as high cost, slow response time, and data center tyranny.

For those who believe the factory should be completely tied to the corporate mainframe, William Rankin, a Deere & Co. manager for computer-aided manufacturing, argued that this is an outdated concern. "One of the problems we've had in the past," he said, "is that data didn't stay in the plant."

Like the personal computer revolution in the office, the onslaught of the blue-collar personal computer will be fueled by software. In the short run, new applications will include such products as the integration of graphics with MRP packages. In fact, Micro-MRP, Inc. promises such a package by the year's end.

Also on the horizon, according to Micro-MRP President David Meyer, is software that integrates MRP with CAD, allowing the mainframe to download a robot's operation program, for example, to the shop floor personal computer.

With the spread of personal computing to the factory come concerns much like those presented when a horde of micros reared their screens in the office. There is one difference: Most factory users are buying only one brand of computer — IBM.

Another positive sign is the imminent arrival of full specifications for General Motors Corp.'s Manufacturing Automation Protocol (MAP), which would permit a factorywide local-area network that handles products from diverse manufacturers. With IBM supporting MAP and factory users demanding more and more Personal Computers, the final irony may be that the boom in factory personal computing is in truly blue-collar computers.

DRIVE

from page 41

perdrive was easier to use than other hard disk drives. Its software, which conforms to the Macintosh user interface, is said to allow users to create and name a file drawer, add a password or encrypt a file by using pull-down menus, dialog boxes and a mouse.

The Hyperdrive reportedly allocates memory dynamically. Since the software partitions the 10M bytes of storage as files and drawers are created or deleted, users do not have to decide ahead of time how to divide up the memory, Richardson said.

Partitioning also speeds up the performance of the Macintosh operating system's Finder software, users said. Users can mount the file drawers to be used in a work session on the Macintosh desktop, while other drawers are hidden.

"The advantage of partitioning is that the Finder doesn't have to look through a vast reservoir of 10M bytes of memory," said Jay Friedland, vice-president of operations for Turning Point Software, Inc., a Watertown, Mass., software firm. On a 10M-byte hard disk drive, he said, users would wait a long time for the Finder to come back, he said.

Garappolo and Richardson, who are evaluating a backup utility for Hyperdrive, gave the program high marks. The utility allows users to back up individual files or drawers, or perform "incremental backups," which back up the files in a selected drawer that have been created or modified since the last backup.

Turns Mac into 'a real computer'

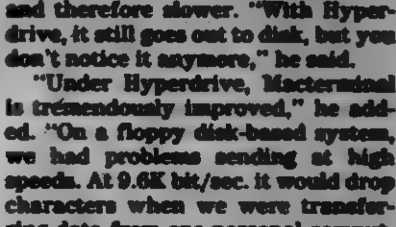
According to Friedland, Hyperdrive "turns the Macintosh into a real computer." It improves the performance of Macintosh applications software, most of which is disk based and therefore slower. "With Hyperdrive, it still goes out to disk, but you don't notice it anymore," he said.

"Under Hyperdrive, Macterminal is tremendously improved," he added. "On a floppy disk-based system, we had problems sending at high speeds. At 9.6K bit/sec. it would drop characters when we were transferring data from one personal computer to another. We don't have problems like that anymore."

Garappolo voiced a concern about the long-term effects of the drive on the Macintosh, noting that the installation added a second power supply, a fan and a piggyback circuit board.

"I wish Apple would come out and say, 'It's a great product, and it won't harm the internals of the Macintosh' or say, 'Stay away from Hyperdrive, it hurts the Mac's internals,' " he said.

Garappolo also worried about the effect of future Apple upgrades to the Macintosh, pointing out that there was no assurance Hyperdrive would be able to interface with an enhanced Macintosh. Nevertheless, he is sold on the drive. "I have real concerns," he said. "But at the same time I love using Hyperdrive."



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A Call For MAINFRAME SOFTWARE STANDARDS

When mainframe software vendors conform to standards of design, development and support, users benefit. A modular design and intelligent architecture shorten learning time and lower the cost inherent in adopting hardware and applications changes.

By Robert Healy

Despite its general success, the applications software industry is not as effective or efficient as it could be in building new products or supporting existing ones. The reason is because the industry lacks standards for designing and supporting mainframe applications software.

Today's software offerings are typically updated by patching — adding layer upon layer of corrective or enhancement code to application logic built years ago. Perhaps that is the only way to change old monolithic programs. But the resulting code is convoluted and nearly impossible to maintain. Patching leaves the user burdened with an outdated product.

In many cases, the term "standards" is confused with an exhaustive list of product features. Often vendors operate on the assumption that what is best for them is best for their users.

Setting standards will enhance productivity industrywide. Here are 15 possible industry standards. Ten deal with product design and five with support and service.

Product design standards

Standard 1: Applications software product design must utilize an intelligent architecture, one that isolates key system components in a modular fashion to accommodate changes in operating environments and technologies.

The major building block of a software product is its architecture. An intelligent architecture is completely modular in nature. Its intelligence is characterized by its ability to adapt to change.

What constitutes an intelligent architecture? Consider the following components:

- Applications interface to data bases controlled by a service module external to the application logic that translates or reconverts logical data views.

- Applications interface to data bases controlled by a service module external to the application logic that translates or reconverts logical data views.

- Applications interface to teleprocessing monitors handled by a service module,
- Dictionaries containing screen literals, error messages, Help text, definitions of data base elements and editing rules to permit easy maintenance, user modification and multilingual formats.
- An open architecture permitting easy access to other applications and utilities. As a result, applications products can be integrated with other proprietary applications.

To date, most applications software is partially modular in structure and has an unintelligent architecture. The major benefit of an intelligent architecture is that it insulates the user against dislocations caused by change. For example, a company can change its software environment or respond to new hardware technology by replacing one module in the applications software product rather than having to replace it entirely.

A user can move to a new data base management system or teleprocessing environment without impacting applications and without a major conversion effort. Additionally, generic functionality reduces the user's learning hurdle by creating an environment of similar products. Users can tailor applications without modifying code because of flexible data and editing rules. Productivity is enhanced by individually tailored screens, messages and Help text.

Using an intelligent architecture allows software suppliers to support and enhance the product more easily. The savings can be passed on to the user in the form of better service and support.

Standard 2: Applications software must be flexible so that it appears to be designed for each user's individual needs.

Some vendors offer applications software that might be described as "what you see is what you get." Although these hard-coded packages may meet a buyer's basic needs, they are highly inflexible. Advances in both fourth-generation languages and applications development tools have led to flexible systems that can be tailored to meet users' specific needs. These types of systems are becoming more popular and more affordable.

Software capabilities are required that allow for system tailoring, such as the ability to generate specific reports, to change and build new input and inquiry screens, to define new systems functions and to tailor error messages and Help text.

Software systems must incorporate the latest technological improvements — for example, ergonomically designed screens featuring color and visuals, cursor movement and simplified navigation between systems.

Benefits of flexibility

Increased flexibility and custom-tailored applications software give the user individualized solutions. Product lifetime is greatly increased because the applications software can respond to change. Productivity is increased because the software can better meet each user's needs.

Flexibility allows for customization, which reduces the burden on the DP department by helping to make users more self-sufficient. In effect, increased flexibility and tailoring applications software gives the user a customized solution at an affordable price.

Standard 3: Applications software must provide the ability for users to combine or chain-process events to reflect their business practices. This is event-oriented software.

When examining how business is transacted, it is immediately apparent that current applications software is structured for DP methodologies rather than day-to-day business practices. Event-oriented software takes traditional business activities and performs information processing for these activities in a logical, sequenced fashion.

With event-oriented applications software, information created by paying a bill or making a sale is transparently utilized. Appropriate software tools update data stored in accounts payable and general ledger systems simultaneously.

By incorporating advances in data handling alternatives, data dictionaries can be expanded to include information about the data stored along with the relationship between one piece of information and another.

The logical relationships that comprise event-oriented systems reduce the number of steps required to automate a business. Thus, productivity is increased and the potential for manual errors decreased. The relationship between users and software is transformed from software-driven to user-driven.

Not long ago, *PC* Magazine called MDBS III "The most complete and flexible data base management system available for microcomputers." That's a powerful statement. But then, MDBS III is an amazingly powerful software package. So powerful, in fact, that it lets you build mainframe-quality application systems on your micro or mini. MDBS III is not for beginners. It's for application developers with large data bases or complex data interrelationships who want to define data base structures in the most natural way—without resorting to redundancy or artificial constructs. It's for professionals who can appreciate its extensive data security and integrity features, transaction logging, ad hoc query and report writing capability and its ability to serve multiple simultaneous users. And if you want the power and the glory that only the world's most advanced data management system can provide, MDBS III is for you. For information on MDBS III and our professional consulting services, write or call Micro Data Base Systems, Inc., MDBS/Application Development Products, 85 West Algonquin Road, Suite 400, Arlington Heights, IL 60005. (800) 323-3629, or (312) 981-9200. **MDBS III. ABSOLUTE POWER.**

WE'LL GIVE YOU THE POWER.

YOU TAKE THE GLORY.

Standard 4: Applications software must be a working partner in the information center. The system's architecture must allow for easy interface and integration with other products and inquiry tools.

As information needs increase in size and complexity, so does the trend for companies to establish information centers that act as clearinghouses for information processing. Activities handled by an information center include recommending software applications products for usefulness, training new users in information technology and coordinating key data processing activities.

Applications software products will no longer be directed to an individual audience. Rather, they will be required to run in an information center environment.

Critical factors in information center compatibility include the following:

- Use of file access and DBMS facilities in their native mode. Query and report generation tools used by an information center must have direct access to applications data.
- Integrated and sound applications data base structures.
- Real-time update of applications data bases where possible.

Software as partner

Offering hooks to tie in other information center software products will make applications software more usable. Less custom coding will be necessary. The applications software will be implemented more easily and quickly.

These factors will help to alleviate today's near-universal backlog of applications development projects.

Applications software as a partner in the information center will increase the quality of information available to users. It will stop being an obstacle to new technology, as it has been in the past.

Standard 5: Applications software must be designed in such a manner that common functions or tasks can be provided through a single, shared software module.

There are many functions common to most applications. For example, navigation, Help text, security and inquiry tools all could and should be shared.

Users would benefit most from sharing these functions because they would eliminate the frustration of having to perform repetitious tasks. Needlessly struggling for information that exists in another application also would be eliminated.

The ability to share these common functions has come to be known as generic functionality.

Eliminating the segregation of these functions and the boundaries that their division creates greatly increases productivity. Shared generic functionality in applications products provides several advantages. Access to multiple applications is made easier. Training and learning cycles are shortened. The complexity of the system is reduced. Finally, there is less redundancy in systems development.

Standard 6: Applications software must support the continuing trend toward expansion of functionality to networked personal computers.

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> ***The ultimate goal is to bring applications closer to the user and transfer some of the processing responsibility from the MIS group to the actual user.***

The personal computer has revolutionized the concepts of software development, systems design and the relationship between terminals and mainframes.

The partnership between mainframes and personal computers is now represented primarily in micro-to-mainframe links. These links serve principally as vehicles for data transfer. Data analysis is usually handled on the personal computer. Micro-to-mainframe links signal the beginning of an important change. The way in which large and small computers interrelate and relate to the user is evolving.

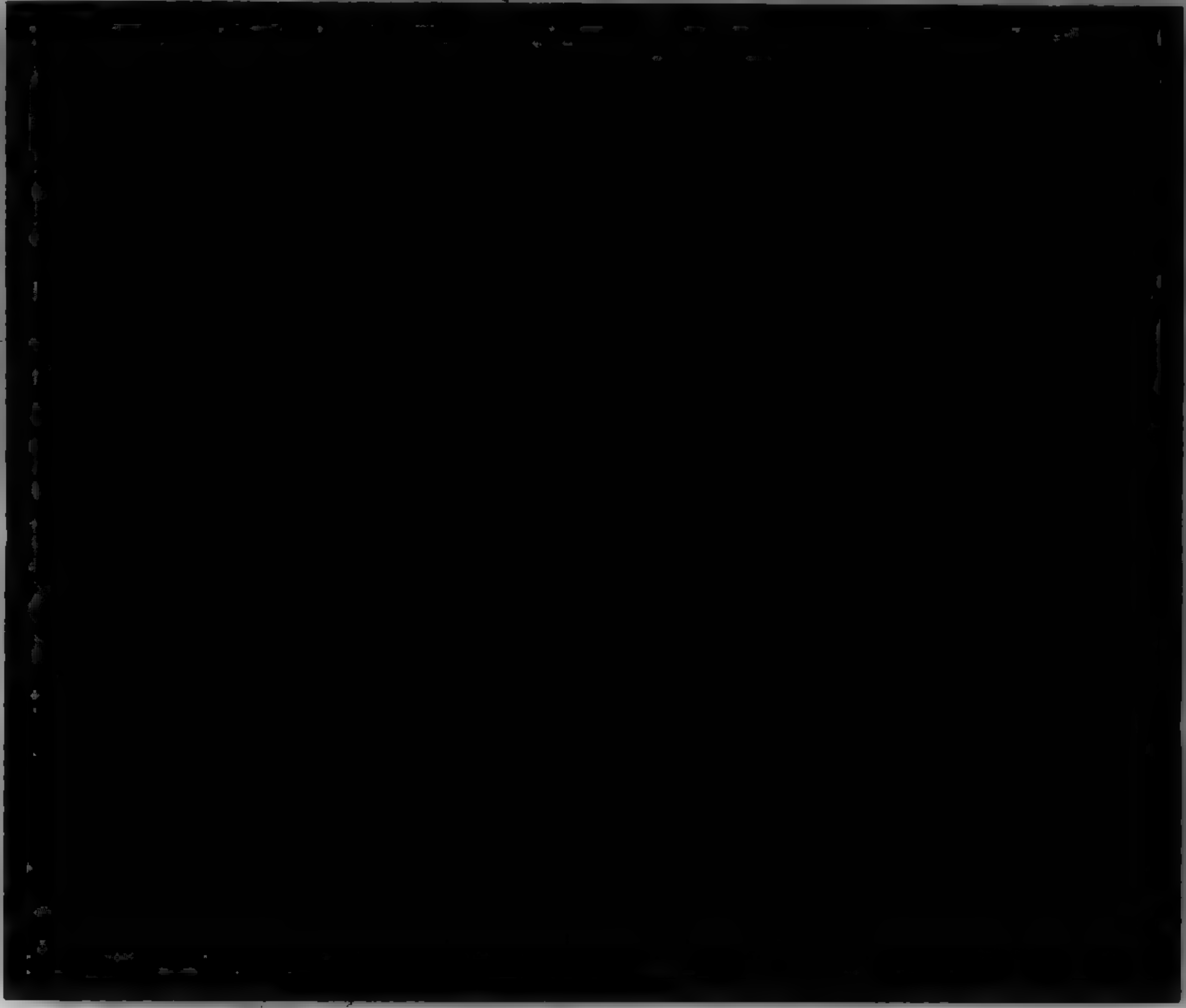
In the future, this relatively new technology will serve as more than a medium for data download and upload. The microcomputer will become an integral part of the application itself, especially as mainframe applications software is designed with the personal computer in mind.

Processing that is handled primarily by the host will be distributed to the personal computer. These developments are being driven by the increasing power of the personal computer. The industry's continuing trend toward user orientation has enhanced usability and friendliness.

The ultimate goal is to bring applications closer to the user and transfer some of the processing responsibility from the MIS group to the actual user. The result will be greater departmental productivity and better use of new technology.

In addition, personal computers will be tied together via local-area networks to provide multiple-user access to information. Distributed data bases will be served through personal computers as well. Enhanced communications between these computers will be considered the norm.

The use of personal computers has distinct benefits. These benefits include the promotion of more efficient



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computer use, which means more processing per dollar spent; strengthened information access capabilities, because barriers are removed between users and the information they wish to access; and the ability to take full advantage of available resources.

Standard 7: Application logic must be independent from other key components of the applications software product.

The goal is to have applications software universally adaptable to the user's environment. Universal adaptability serves as the user's insurance policy against technological change.

Successfully designing applications software with applications logic independent of all other software system components means that the software architecture must be intelligent, modular in nature and open. An intelligent architecture allows for independent application logic because the code required to interface with a given operating environment is independent of all the applications programs.

In addition to acting as an insurance policy for change, such an architecture supports the use of tools specific to individual environments.

Independent systems

The savings for the applications software user are twofold. The manpower needed for modifying the applications to meet changes in technology, whether software or hardware changes, are immense. Also, the time that would have been expended relearning the modified system can be spent more productively.

Applications developed with an intelligent architecture allow for portability to new environments if a change is made. As a result, it is not necessary to change the application to run in a new environment. This significantly reduces system maintenance. Software suppliers can provide enhancements much faster. The result is a greater return on the maintenance dollar invested.

Currently, software suppliers determine the importance of specific hardware and operating systems to their product line and then release application enhancements in the order of the hardware environment's relative importance to the vendor. It can be a matter of months before key features of a product enhancement are brought to additional hardware environments.

Software designed with an intelligent architecture allows the application code to be segregated from code related to a hardware environment. When code that allows an application to work in a particular hardware environment is designed with an intelligent architecture, changes in the application code can be made and distributed immediately.

By structuring the software system with an intelligent architecture, product enhancements are more quickly available to users. Additionally, customer support is more effective because problems with the product are solely application-oriented and are not embedded in the environment code.

Standard 8: Applications software code must be delivered in a generally accepted programming language and not require use of nonstandard or proprietary languages.

When software suppliers provide product features or development tools that increase product flexibility, yet deliver the capability via proprietary software code, a potential problem is created.

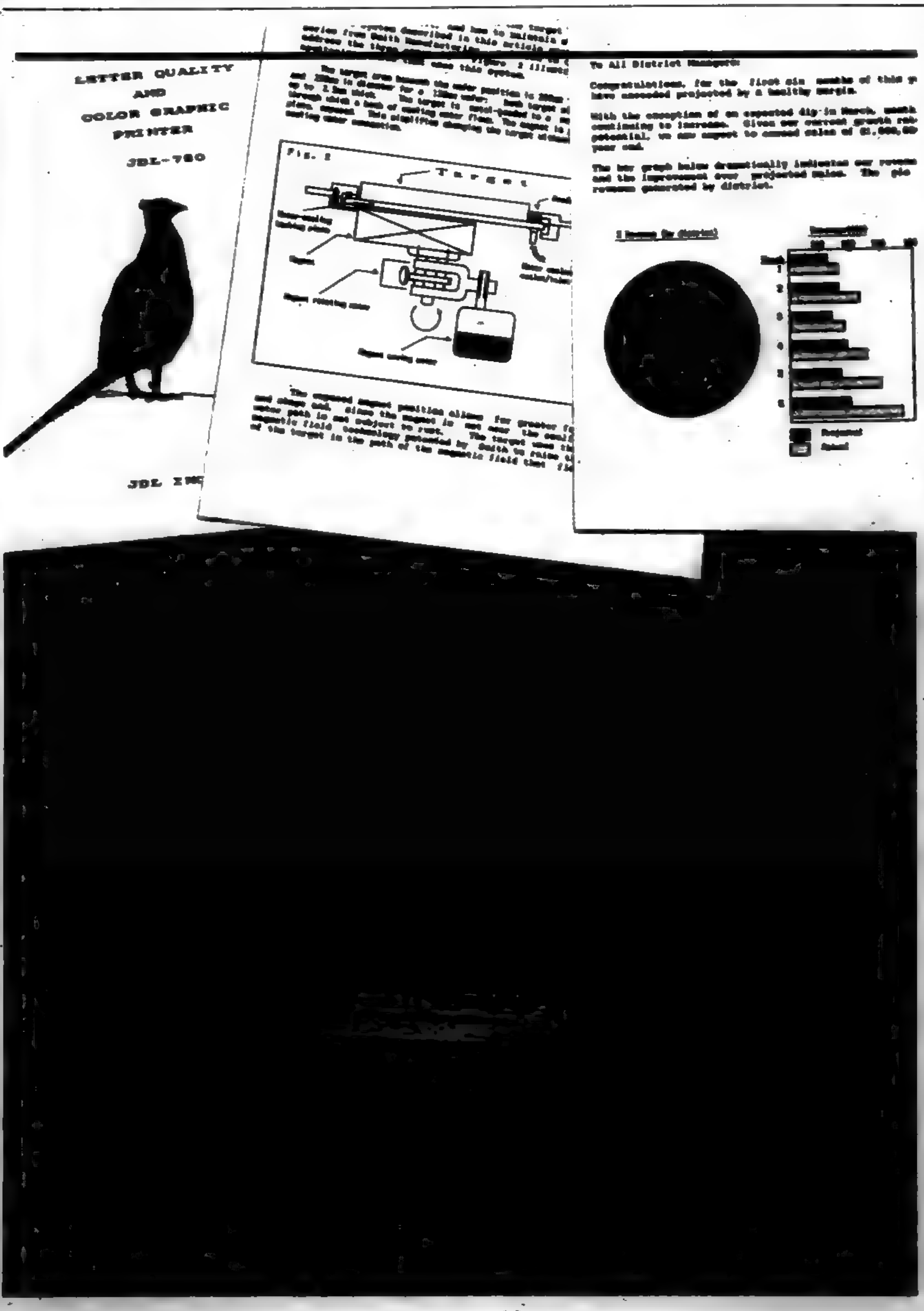
Complications are bound to arise because the software code cannot be maintained by the user. If it is to be updated by the user, a new programming language must be learned. Developing an application with proprietary languages increases the likelihood that the program will someday become obsolete because of programmer attrition. Support and training also are hampered by proprietary languages. Recruiting new employees fluent in the proprietary languages becomes an additional complication. As would be expected, maintenance of such a system, because of its complex setup, is more expensive and time-consuming.

IBM sets the standards for mainframe programming languages. If IBM is using a particular language, it is safe to assume that this language will become a standard in the software industry.

The situation is complicated further by constant alterations and improvements to hardware. Applications development tools must be capable of generating source code that can be compiled on the user's computer. The cost of replacing applications development tools is immense. In some cases, these costs are prohibitive, and the user is limited by the operating environment and the applications software.

Universal product

Applications software delivered in a generally accepted programming language gives the user a universal product. It can be maintained more



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easily because the pool from which to select technical talent is larger. Furthermore, salary costs are kept within reason because the constraints of hiring specialists in the proprietary language are eliminated.

Another factor that reinforces this standard is that a wider array of compatible products will be available to the user. Not only are the risks of choosing an incompatible applications product eliminated, but so are the frustrations caused by limited product compatibility.

Standard 9: Applications software must utilize standardized reporting and inquiry tools so that users can retrieve information easily and not be required to learn and understand MIS concepts.

Users should be able to use any reporting or query product they wish to access an applications data base. Reporting information will continue to be a critical function of applications software in the future. However, a reporting mechanism can no longer require users to understand complex MIS concepts or the ins and outs of data structures. Reporting must be easy to do and understand.

All levels of an organization need to have access to information that will assist in making management decisions. In the past, this process was accomplished by using the DP department to retrieve information or by learning DP-oriented tools.

More often than not, when information is retrieved it is not up to date. This is because maintaining current information is almost impossible. When crucial decisions or analyses need to be made, day-old information is not good enough. Once again, time is lost.

Advances in fourth-generation languages have eliminated the need for having to know DP-specific information in order to have access to data. Reporting tools must be easier to use, especially because of the increasing popularity of the personal computer.

Reporting tools are important to users because they often represent the end result of many information processing activities. A lack of standardization has hindered productivity and limited their usefulness.

With seamless on-line query and cross-application report writers, users will have to learn only one set of reporting tools. As with generic functionality, time and money is saved in training people to retrieve information from a family of applications products. With this facility, the user need only purchase and install one query and reporting product.

Standard 10: Applications software must be developed in an automated fashion to provide users with high-quality products expeditiously.

Ironically, the principal tools of office automation have been developed in a nonautomated, piecemeal fashion. Future software development will, in many ways, mirror today's manufacturing assembly plants. Fourth- and fifth-generation language tools will be used to develop and test applications software code.

Imagine how the system would work: Component software pieces would be developed in different parts of the applications software factory. When needed, universally accepted software components would be taken off the shelf and used to build the applications product.

These products would be modular in nature. Following final assembly, their last stop would be testing and quality assurance — as is the case for any factory.

Software development

Incorporating reusable code in new products allows for the product to be developed faster and at a higher quality because the code has already been extensively tested. Product releases can occur faster because development cycles are shortened. Reusable code also reduces the number of bugs in a system. This leads to a product that is easier to install and maintain.

Using development tools will increase programmer productivity. For example, designing an input screen with old coding methods could take as long as eight hours. Using tools, this effort can be reduced to a matter of minutes.

The ultimate value of an automated software development environment is higher quality software. An average application consists of 350,000 lines of code. Even a small reduction in the percentage of errors translates to a significant improvement in quality.

Automated tools make sense because they allow software developers to make optimum use of their employees. Repetitive tasks will be reduced. Tools also promote product design that is universal in nature and has highly structured code. The time required to build, enhance and correct a problem is reduced.

Industry standards

The following five standards set goals that a responsive, professional software company should meet to support its user base:

Standard 11: Applications software must be serviced and supported by a dedicated organization.

A full-time, dedicated service organization is critical to the success of

> ***The cost of replacing applications development tools is immense. In some cases, these costs are prohibitive, and the user is limited by the operating environment and the applications software.***

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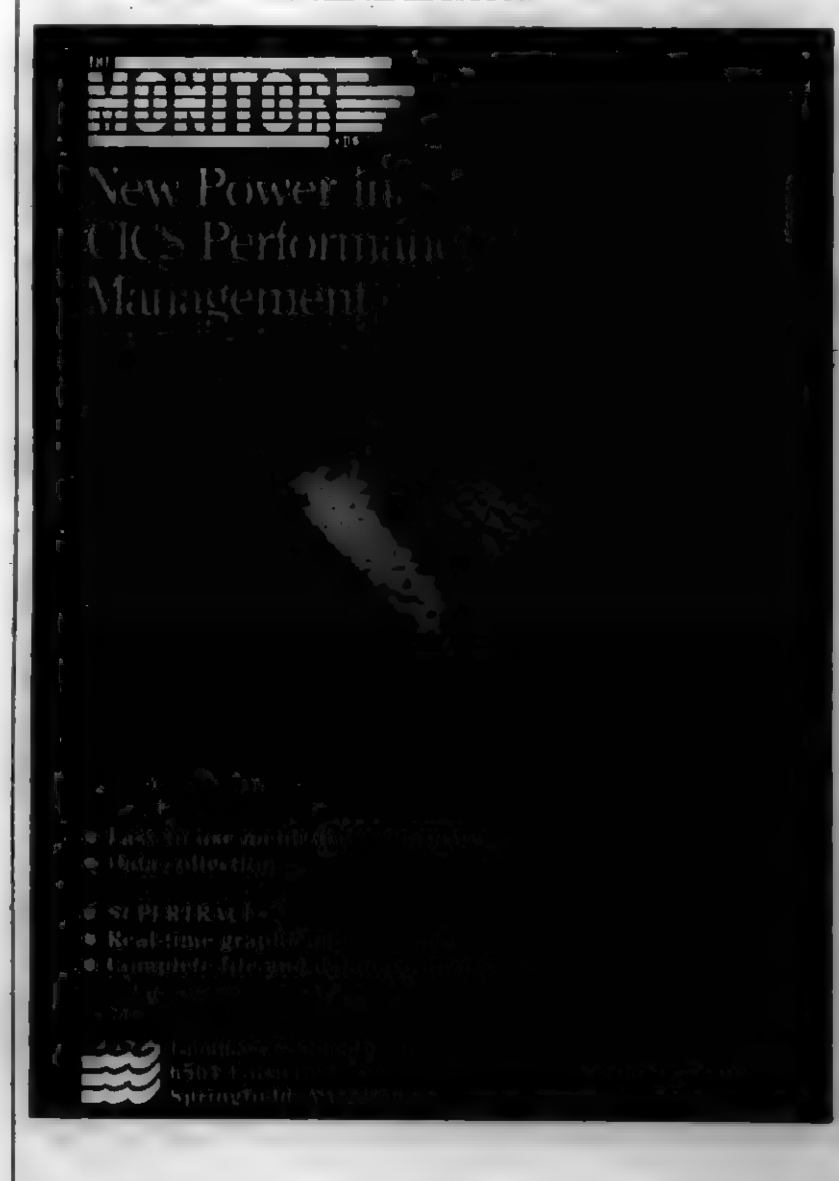

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> *Comprehensive installation assistance reduces the uncertainty that accompanies an applications conversion and protects the user's software investment.*

any applications software product. Establishing and maintaining such an organization is costly but essential.

Support organizations must focus on a comprehensive array of support activities, including education and training, product installation, customer support, continuing education and specialized consulting.

The support group should be separate from the product development team. This separation ensures faster product enhancements and a team of dedicated support specialists. The support team should not be isolated from the development process. By actively tracking a product's development, the team will be able to provide the best support.

With a dedicated service and support organization, users can get direct attention and immediate response to questions. It also guarantees that users will have a full range of services to assist them with product implementation, use and enhancement. These factors contribute to a longer product life cycle.

Standard 12: The applications software vendor must supply multitiered education and support.

Today's applications software products are sophisticated and complex. The user needs product education and training to receive maximum benefits from them.

Centralized training is a crucial component of multitiered training. Systems users from different organizations should be brought together in a classroom setting for instruction. The classes should be limited to 20 people.

During the sessions, hands-on training should be given with no more than two people per terminal.

In the case of training tailored to an individual company, on-site sessions should be cost-effective. A self-paced, self-teaching alternative should also be available.

No matter where the education and training is to take place, the instructors should be certified educators. They should be supplied with professionally prepared educational materials.

Initial product training is important, but it should be followed up with continuing education opportunities. Through such opportunities, a mechanism will be in place for users to learn about new product features and to share experiences.

A multitiered education program allows tailored training programs. Personnel receive individual attention, learn faster and increase comprehension. Continuing education guarantees the maximum value from a software investment.

Standard 13: Applications software must be installed in a quick, clear and effective manner.

Installing a product is often more difficult than expected. The degree of difficulty is directly related to the amount of time and attention a vendor has given to preparing for the installation.

An installation guide is only the first of many features that should be supplied. Conversion programs and job control language are necessities. A trained installation assistant should be on-site to assist with the process. The assistant should run tests and fine-tune the system before it goes on-line.

Effective installation sets the tone for a long-term partnership between vendor and user. Comprehensive installation assistance reduces the uncertainty that accompanies an applications conversion and protects the user's software investment.

Standard 14: The applications software vendor must provide support when the user needs it.

Users often struggle to solve problems common to a broad range of companies. Instead of receiving timely advice, they often are asked to call back in a few hours. Not only should trained, dedicated specialists be available, but there should be an easy way to contact them. A toll-free, 24-hour hot line is one solution. An automated client services system that logs calls and responses would provide a useful inventory of solutions to common problems.

Standard 15: Applications software vendors must limit new product announcements to 90 days before commercial delivery.

Preannouncing products leads to confusion in the marketplace. Limiting announcements to 90 days prior to commercial shipping establishes realistic expectations. This action would eradicate vaporware and lower the number of unmet promises. The 90-day period allows ample time for users to plan for new products.

Standardized lead times for new product announcements will benefit everyone. Rather than failing to answer current needs because of anticipation of a product that never arrives, users can develop realistic solutions to problems.

About the author

Robert Healy is senior vice-president of marketing and planning for Software International Corp., a wholly owned subsidiary of General Electric Software Products Corp., which has been developing and marketing software since 1968.

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COMMUNICATIONS

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Sampling: The smaller view

All people, whether they realize it or not, are aware of the outstanding results achievable with applied sampling theory, a branch of statistics. It is used in political polls and presidential elections, making it possible to predict who will win an election eight to four hours prior to the closing of the West Coast polls.

Sampling theory can be applied to data communications to achieve substantial monetary savings in certain situations. Sampling, however, does not mean voice digitation rates or techniques; these procedures are an example of the general theory.

Sampling is a way to choose and study a small subset of cases from a large population and to generalize the results, taking into account the entire situation. The generalization can be carried out with high statistical confidence.

The theoretical results are fully developed and are generally understood fairly easily. The classic reference is *Sampling Techniques* by W. Cochran (John Wiley & Sons, Inc., New York). As indicated, sampling theory states that to obtain results about a large population, one need only do the following:

- Determine the population homogeneity.
- Use the theory to obtain the necessary sample size.
- Obtain the scientifically specified sample for which appropriate measurements will be made.
- Adjust the results to fit the whole population using the formula.

See POLL page 70

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

IBM debuts include modems

Offers high-speed duo, short-haul model

RYE BROOK, N.Y. — IBM announced two high-speed modems and a short-haul modem in its mid-June product barrage.

The IBM 5866 and IBM 5865 are synchronous modems reportedly designed for point-to-point or multipoint, four-wire, unconditioned leased lines. The 5866 works with trellis-coded modulation and transmits data at up to 14.4K bit/sec. with a fallback speed of 12K bit/sec. The 5865 operates at 9.6K bit/sec. and falls back to 7.2K bit/sec. when lines degrade, the vendor said.

The modems are said to include a keypad and a display panel that can be used to configure the modem or illustrate line parameter statistics. The products are available in stand-alone or rack-mount versions, IBM said.

The short-haul modem, the IBM 5811, transmits data at distances up to 15 miles. It supports half- and full-duplex synchronous data transmission at 2,400, 4.8K, 9.6K and 19.2K bit/sec. The four-wire IBM 5811 can be used in point-to-point applications or with four tributary modems in a multipoint application.

The product is available in stand-alone or rack-mount versions. The product's diagnostic capabilities include local self-test, local loop-back test, loop transmit test and remote loop-back test.

The stand-alone IBM 5866 costs $6,000, and a rack-mount version sells for $5,300. The IBM 5865 sells for $4,000, and its rack-mount version costs $3,300. The IBM 5811 costs $595, and its rack-mount version costs $550.

For additional information, IBM is located at 900 King St., Rye Brook, N.Y. 10573.

Bell Atlantic IVDM to be sold as CPE

WASHINGTON, D.C. — Bell Atlantic Corp. has unveiled a $200 integrated voice/data multiplexer (IVDM) that will permit a customer's telephone and a computer terminal to share a copper-wire local telephone line.

The IVDM, manufactured by Teltone Corp. in Kirkland, Wash., permits data communications at speeds up to 19.2K bit/sec. Bell Atlantic said it plans to market the IVDM, classified as customer premises equipment (CPE), in conjunction with its regulated Centrex service, provided that it obtains permission from the Federal Communications Commission.

Currently, Bell Atlantic has two sites testing the Centrex-IVDM configuration, which the telephone company is calling a central office local-area network. The two sites are West Chester University in West Chester, Pa., and Virginia Polytechnic Institute (VPI) in Blacksburg, Va.

Fifty of West Chester University's Centrex lines now support simultaneous 9.6K bit/sec. voice/data communications in an asynchronous mode, connecting on-campus terminals with two mainframes.

At VPI, Bell Atlantic said it set up a Centrex 19.2K bit/sec. local-area network to connect 60 on- and off-campus terminals to the university's mainframes, while using the same lines for voice communications.

According to Bell Atlantic, the Centrex service is an important part of its campaign to fight the erosion of the Centrex market to office-based private branch exchanges.

The company revealed that 300,000 federal government Centrex lines will soon come up for contract bid as existing leases expire. According to Bell Atlantic Vice-President of Marketing A. C. Tedesco, obtaining FCC permission to combine the provision of Centrex service with the IVDM CPE is critical to the viability of Bell Atlantic's Centrex service.

"We're asking the FCC for a waiver of FCC rules requiring separation of basic

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- The Distributed Systems Research Group has developed a network that links 29 Canadian institutions and that conforms to the CCITT X.400 standard/62
- Paradyne enhanced its Analysis 5500 series of network management systems and added two modems to its product line/62

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Digilog net management out for DEC Microvax

MONTGOMERYVILLE, Pa. — Digilog, Inc. has introduced a network analysis and management system that runs on Digital Equipment Corp.'s Microvax supermicrocomputer.

The Digilog Network Analysis and Management System is said to provide alarm notification, local and remote diagnostics and critical network path control.

The product's data base reportedly supplies performance history, vendor references, device information, network link data and interconnection specifications. The system features automatic processing and notification of alarm conditions from any point on the network, according to the vendor.

The package is said to supply user-selectable alarms, automatic circuit identification, alarm descriptions and date-time stamp to a console and printer. The network analysis tool reportedly supports up to three local or remote color consoles.

The package's management and analysis reports include activity summary log, trouble tickets, trouble history summary reports and an inventory management facility, the vendor said.

The Digilog Network Analysis and Management System costs $48,000.

For more information, Digilog is located at 1370 Welsh Road, Montgomeryville, Pa. 18936.

Timeplex offers two-task multiplexer for data links

WOODCLIFF LAKE, N.J. — Timeplex, Inc. has announced a combination statistical and time-division multiplexer for wideband links operating at up to 64K bit/sec.

Microplexer DTM48 reportedly supports up to 48 ports over point-to-point data links. As a statistical multiplexer, the device supports asynchronous and half-duplex synchronous transmission at up to 9.6K bit/sec.

The time-division multiplexing capability reportedly provides transparent handling of synchronous protocols through 44 ports at up to 38.4K bit/sec.

The bandwidth can be dynamically allocated or permanently assigned on a per-port basis, according to Timeplex.

Network manager

A network manager can reportedly mix time-division multiplexer ports and statistical ports. The network manager can be programmed to sound an alarm whenever data link synchronization is lost, according to the vendor.

The product costs $6,800 for a unit with four time-division multiplexer ports, four statistical ports and a standby data link.

For additional information, Timeplex can be reached at 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675.

Canadian message net connects 29 institutions

Conforms to CCITT X.400 standard

VANCOUVER, B.C. — CDNet has linked 29 Canadian institutions from Newfoundland to British Columbia on a message network that conforms to the CCITT X.400 message standard.

The network was established by the Distributed Systems Research Group at the University of British Columbia and Consortel, which was responsible for developing the software for the network.

The research group reportedly has tested linking CDNet with a KDD, a Japanese message network also based on the X.400 standard.

Consortel was created by the Interprovincial Association for Telidon and Telematics and funded by the Canadian Federal Department of Communications.

Consortel's goal is to create an information network to link Canadian institutions.

Consortel will now manage continued research and development of CDNet.

Paradyne enhances network management system series

LARGO, Fla. — Paradyne Corp. has enhanced its Analysis 6500 series of network management systems and has added two modems to its product line.

Paradyne's Analysis network restoral facilities have been expanded to include an intelligent Multidrop Automatic Call Unit (MCAU) and a Dual Call Auto Answer (DCAA) card.

The MCAU is said to restore service over dial-up lines automatically in the event of a failure in a point-to-point or multipoint leased line.

The device's switching logic enables multiple lines and remote drops to be supported from a single unit, reducing the number of standby dial backup lines required, the vendor said.

The DCAA reportedly can be used whenever a primary leased line connection degrades or is disconnected.

New modems announced include the HDX 9600, a synchronous 9.6K bit/sec. modem that is said to have fallback rates of 4.8K bit/sec. The half-duplex product was designed for point-to-point applications and uses quadrature amplitude modulation. The product includes automatic dialing and answering capabilities.

The FDX 1200 is a full-duplex, 1,200 bit/sec., asynchronous/synchronous modem that uses phase shift keying modulation. The product features reverse calling modes, automatic rate speed detection, tandem and alternate dialing with tone and busy recognition and call progress monitoring.

Prices for network management packages range from $12,600 for a 10-line system to approximately $200,000 for a 900-line system. HDX 9600 costs $1,995, and FDX 1200 costs $365.

Paradyne can be reached through P.O. Box 1347, 8550 Ulmerton Road, Largo, Fla. 33450.

PROTOCOL CONVERTERS

■ GSD Systems, Inc. has announced two single-channel protocol converters that enable asynchronous printers or terminals to access IBM System/34, 36 and 38 computers.

GSD One attaches a serial asynchronous printer to one of the systems and enables it to mimic an IBM 5224, 5225 or 5256 printer, the vendor said. GSD Two is said to connect an asynchronous terminal or microcomputer to a System/34, 36 or 38 and enables the device to emulate an IBM 5251 Model 11 terminal.

The products can be daisy chained off a host CPU or a 5251 Model 12, 5294 or 5295 controller.

GSD One costs $1,495, and GSD Two sells for $1,595.

GSD Systems, Suite 505, 600 S. Dearborn St., Chicago, Ill. 60605.

SOFTWARE

■ Account-A-Call Corp. has announced a software package that reportedly helps determine a company's voice network needs.

The Interactive Traffic Analysis System calculates the number of trunks needed to meet a required grade of service at minimal cost, the vendor said. It determines customer needs for a number of services including Wats, foreign exchange lines and long-distance services.

There are two versions of the product: One runs on IBM Personal Computers; the second works with IBM mainframes. The micro version of the package costs $5,000, and the mainframe version costs $12,000.

Account-A-Call, 4450 Lakeside Drive, Burbank, Calif. 91505.

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TEST EQUIPMENT

■ Hanson Data, Inc. has announced a board-level product for IBM Personal Computers that enables a user to monitor an RS-232 line.

Hanson Serial Line Monitor can be used with half- or full-duplex data transmissions of up to 19.2K bit/sec. User-selected data in Ascii, Ebcdic or hexadecimal formats can be displayed on 21 lines.

Signals that can be displayed are Request to Send, Clear to Send, Data Terminal Ready, Data Set Ready, Carrier Detect and Ring Indicator. The board works in monitor data on keyboard command, monitor when triggered by data or signal change and simulate/transmit pattern to peripherals.

Data can be displayed on a screen or stored in a buffer or on a disk. Framing, parity and overrun errors are indicated by blinking characters.

The board costs $1,495.

Hanson Data, 18732 142nd Ave. N.E., Woodinville, Wash. 98072

AUXILIARY EQUIPMENT

■ Hall-Comsec, Inc. has announced the Gatekeeper Security System, a call-back verification system said to support up to 16 RS-232 ports.

The product reportedly can be programmed to call back users at a fixed location or direct password checking for traveling users. The direct-dial passwords are generated randomly through an automatic password generator that is said to supply more than 60 million passwords.

Through a call-routing feature, only one automatic dialing modem is said to be needed with the product. The Gatekeeper Security System enables an operator to reverse phone charges to call-back or direct-access users, the vendor said. The product logs any illegal access attempts to any serial port.

The average cost of a 16-port system is $185/port.

Hall-Comsec, 1024 Wakerobin Lane, Fort Collins, Colo. 80526.

■ Votan, Inc. has announced the VTR 6050 Voice Terminal, a voice recognition and synthesizer for use with personal computers and other Ascii devices. The product has a 150-word vocabulary.

The VTR 6050 includes a 3½-in. floppy disk with 320K bytes of storage for saving messages or voice files. The 6050 responds to conversational English, according to the vendor.

Votan's Voice Key Software is said to let users incorporate voice capabilities into existing software applications packages without any modifications to the software itself. The VTR 6050 is a stand-alone voice I/O subsystem that includes chassis, power supply, microphone and speaker.

The VTR 6050 costs $4,950.

Votan, 4487 Technology Drive, Fremont, Calif. 94538.

IVDM

from page 61

telephone service from provision of telephone equipment] on the basis that the customer, the U.S. government, wants it," Tedesco said. He added that opposition from other CPE vendors to the Bell Atlantic waiver petition is without foundation because Bell Atlantic said it will obtain the equipment from unaffiliated vendors.

"We feel that we've fixed the application called Centrex and are now looking at what other applications we can do. We think local-area networks are the next thing. We've put the [data communications capability] in the central office. The key thing is using the existing copper wire. That is the strategic advantage with customers who are concerned about costs," Tedesco added.

Bell Atlantic's waiver appeal from the FCC on joint provision of Centrex with CPE cites the commission's permission to allow AT&T Information Systems, AT&T's equipment arm, to resell basic telephone service with its telehone equipment.

On its current agenda, the FCC is also considering dropping the requirement that AT&T must maintain the subsidiary to market CPE. Bell Atlantic said it will support the competitive market that exists for PBX office-based equipment by offering equipment with its own Centrex service.

If you buy a TI 855 printer now, you won't have to upgrade to one later.

Don't tack just any printer on your new PC for now, thinking that you'll get what you really need later. Start with the best, a TI 855 or TI 865 printer. That way you can put the money you'd have spent on a needless upgrade on some other smart investment.

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What's more, since our printers are among the easiest to use, you can utilize all the capabilities built into your PC and software right from the start. Instead of sometime later. You even have a choice of over 30 different plug-in type fonts, any three of which can be printed on the same page without ever stopping the printer! Just touch the control panel and it happens. Simple. So every document looks just the way you want it to. Professional.

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So don't downgrade your PC's performance with a printer you'll outgrow in a month. Get yourself a TI 855 or TI 865 printer now. It's easy. Just call 1-800-527-3500, ext. 801, for the TI Dealer near you.

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HOW TO AVOID IT, FROM THE LEADER
IN ON-LINE TRANSACTION PROCESSING.

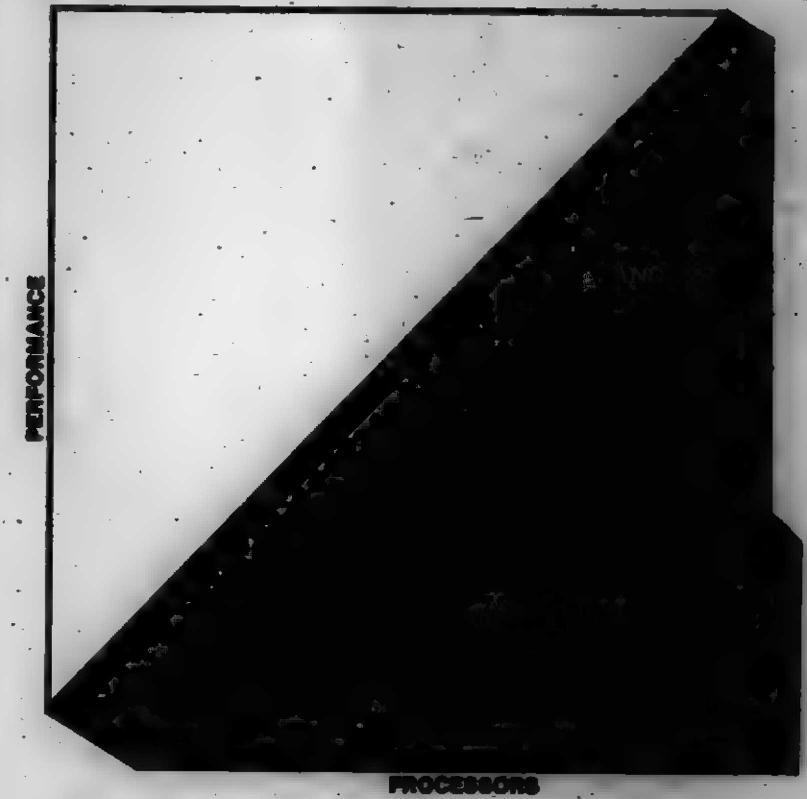
WHAT COMPUTER FAT IS.

Computer fat is created when you buy more computer than you need. With conventional computer architecture, you have no other choice. You buy the closest fit available and "grow into it."

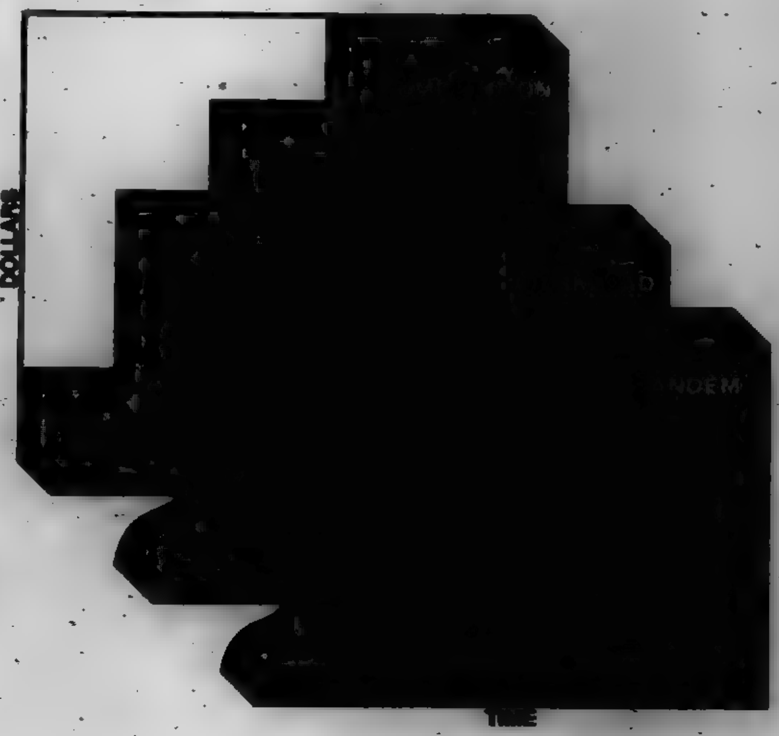
So there is always waste and inefficiency. And you pay dearly for it.

WHAT IT COSTS.

The performance cost. With conventional computer architecture, doubling your processors does not double your performance. With Tandem, each incremental increase in processing power provides matching performance.



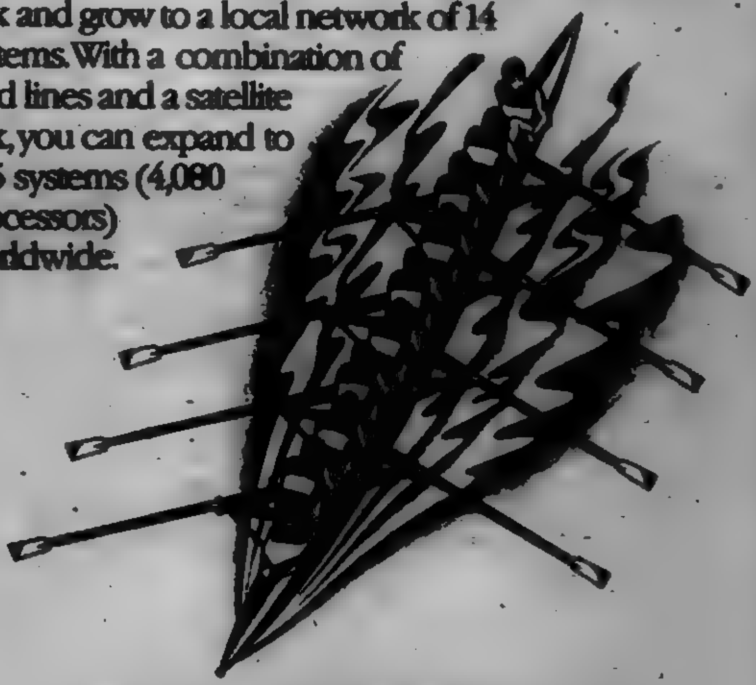
The dollar cost. With conventional computer architecture, growth is convulsive. You must continually over-invest to assure sufficient processing power. With Tandem, growth matches need. You never invest more than you have to.



TANDEM'S NON-FAT ARCHITECTURE.

Tandem Computers has developed the ultimate system for on-line transaction processing. It is the fault-tolerant system that can grow as your needs grow, expanding at any increment you choose.

You can start with two processors and grow to 16 processors in a system. You can put in a fiber-optic link and grow to a local network of 14 systems. With a combination of land lines and a satellite link, you can expand to 255 systems (4,080 processors) worldwide.



In a Tandem system, there are no idle backup components. They all share the workload.

With Tandem, your software expands, too. All systems work like one system, and you'll never have to rewrite a line of applications code.

The Tandem NonStop™ system is also enhanced by a high-performance, relational data base that can be geographically distributed to wherever it's needed. And no single component failure can shut you down.

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TANDEMCOMPUTERS

POLL

from page 61

Homogeneity tests the uniformity of a given population. If all objects, people or situations are likely to be similar in principle, then there is homogeneity, and an "unstratified sample" would be used. If the objects or entities can be classified into areas likely to have some intrinsic difference, then a "stratified sample" would be used. This means that a sample must be taken from each of the classes defined.

For example, if one wishes to determine the characteristics of traffic habits of asynchronous users throughout the U.S., one may want to define an "urban population" and a "rural population." On the other hand, it may not be necessary to stratify the population by male and female users, as both categories can be assumed to have the same characteristics.

Sample size is determined by a set of formulas and depends on the degree of accuracy demanded. If the accuracy must be 100%, then the entire population must be consulted; this could be very expensive. If one can live with 95% accuracy, then only a small subset of the population needs to be consulted. This subset varies from 1%, for very large situations where the universe is in the one-million-population range, to 5% for a 10,000-population range to 20% in a 500-population range.

Once the size of the sample is determined accurately, the sample must actually be picked, namely, the individual representatives to be examined. One is not free to pick just any representatives, otherwise the results would be biased. Generally, one must choose a random subset; in a stratified environment, a random subset from each population is required. With the example above, one would not, despite the convenience, be able to select the "urban users" from New York only; one would have to pick some from New York, some from Los Angeles, some from San Francisco and some from other cities.

Data communications uses

The bottom line is to save money. The following three concrete examples — among others that easily come to mind — will suggest how DP managers can use sampling techniques to save money. In addition, one should bear in mind that voice digitization is an example of sampling: It was shown that to reconstruct a continuous telephone voice signal made up of billions of continuum levels, one need only take 6,000 samples per second.

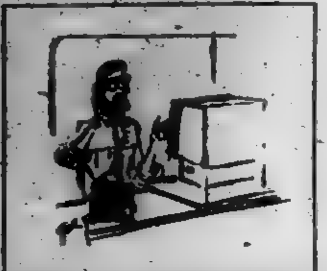
■ An international record carrier wanted to classify the 800,000 calls a day its switch carried into national destination percentages and to calculate the blocking factor to each nation.

To achieve this goal, the company executed a daily batch job requiring eight hours every night and several disk drives — an inefficient program that parsed every one of the 800,000 transactions. Clearly, the firm could have applied sampling techniques and sampled 8,000 transactions with a program running for only 0.05 of one minute. The sampling techniques would have saved in millions of instructions per second and disk storage capacity.

■ A company wishing to determine the feasibility of receiving a one-way broadcast satellite signal in 550 business office locations sent out a battery of technicians to visit each of the 550 locations to survey line-of-sight conditions to a satellite. The firm could have surveyed fewer offices and reached the same statistically valid conclusions, while saving manpower and travel expenses.

■ An operations manager wanted to determine firsthand the type of problems experienced by his approximately 200 major network users.

A project was undertaken to contact each of the 200 users at considerable manpower expense. Again, a sample of approximately 50 users would have been statistically sufficient.



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	R:base 5000	dBASE III
Keystrokes	434	6588
Command Lines	47	244
Automated steps	37	0
Time*	9 minutes	2 hours

*Actual time may vary depending on skill level

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Since the Application Express automatically generates programming code, it can give you the tremendous advantage we've documented in the attached chart. For people who've never programmed before, these automated steps can make all the difference between getting the job done and giving up completely. And for your experienced programmers, the Application Express can give you ten to one productivity gains. Of course, R:base 5000 also has the powerful procedural language and report writer it takes to create highly customized applications.

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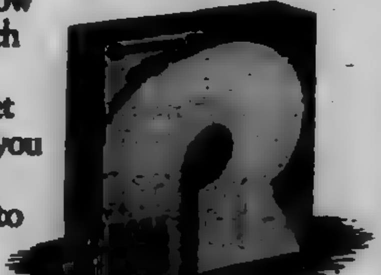

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SYSTEMS & PERIPHERALS

Sony adds unit to Sios disk system

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Sony Communications Products Co., a division of Sony Corp. of America, officially unveiled the IOS-1050 workstation processor for use with its newly announced optical disk system, intended for very large-scale document storage and filing applications, in-house publishing and computer-aided design.

At a briefing at the National Archives here, Sony officials said the intelligent workstation is part of the Sony Integrated Office System (Sios), which includes optical disk storage, document scanners and laser printers.

The Sios workstation engine incorporates a 16- or 32-bit microprocessor linked to five other 16-bit processors by a multiplexed bus system. The operating system is AT&T Bell Laboratories' Unix V.

The five subsystems control the display, a file-transfer network, compression/decompression of digital image data, printers and scanners and storage on a standard 75M-byte hard disk drive, expandable to 300M bytes, or optical disk unit, Sony officials said.

The workstation permits processing of text, graphics and visual images using the IDM-1715, a full-page high-resolution VDT. The display has a resolution of 150 dot/in., but information is stored in a 200 dot/in. format. According to the vendor, this allows images to be magnified up to four times without visible loss of resolution.

The Sios workstation provides windowing for multiple functions, a mouse interface and communications via an Ethernet local-area network, the vendor said.

Sony's 12-in., write-once optical disk, the WDM-3DL0, stores 1.64G bytes per side and costs $300, the vendor said. The archival-quality disk will last for 30 years, Sony officials said, citing company tests.

Other products for the integrated Sios line include the WDA-3000 optical disk autochanger for up to 50 disks, the WDC-3000 writable disk controller, the WDD-3000 writable disk drive and the IRD-1330 image scanner, which now operates at 5 page/sec.

The company said the workstation and

See SONY page 83

DEC offers workstation for engineering market

MAYNARD, Mass. — Digital Equipment Corp. has unwrapped a color workstation for engineering and manufacturing markets that is based on the floating-point processor recently introduced with DEC's Microvax II.

The Vaxstation 520 — said to have the power of a VAX-11/780 — costs $42,780 and includes 2M bytes of main memory, DEC's Q-bus network adapter Ethernet interface, the MicroVMS operating system, a 32M-byte Winchester disk and dual 400K-byte floppy disks.

The unit features a Tektronix, Inc. 4125 graphics subsystem said to offer segment editing, zoom and pan capabilities and arc drawing.

The graphics subsystem includes a 19-in. Tektronix 4125 monitor with 1280- by 1280-pixel resolution, convergence accuracy of 0.3mm over the display area, the capability to display 256 colors from a palette of 16 million, pick operations, pop-up menus, two-dimensional transforms and windows that allow a user up to 64 viewports.

The workstation can be linked to other VAX and PDP-11 computers as a node in an Ethernet local-area network, the vendor said. The Vaxstation 520 can also be used as a terminal within a multiterminal environment.

Options include up to 6M bytes of additional memory, a four-line asynchronous line controller and an external 31M-byte disk.

Graphics options include a three-dimensional wire-frame upgrade, 3-D solid shading upgrade and additional planes of video display memory.

The unit will be available midsummer of this year.

More information is available from DEC, Maynard, Mass. 01754.

Analyst calls IBM mid-range plans unclear

By John Desmond
CW Staff

NEW YORK — Convincing users that its System/36 small-systems processor is of long-term strategic importance is what the IBM announcements of June 18 were all about, analyst Laura Stuart of the Boston-based Yankee Group said at a seminar here recently.

IBM, however, is putting the cart before the horse by releasing mid-range systems before its entire networking plan is in place, Stuart asserted in a talk on IBM's office automation strategy. She described the IBM Cabling System announced in June 1984 as the "Great Cabling System Bust" and pointed to the absence of an IBM local-area network. "IBM is in the iron business still," said Stuart, Yankee Group's director of small-systems planning.

With the System/36 focus, IBM's strate-

See STUART page 83

IBM enhances 4361 series processors

RYE BROOK, N.Y. — IBM has announced extended capabilities for its 4361 series processors.

Enhancements were made to the Workstation Adapter for the 4361. They include a distributed function terminal mode of operation that provides up to four concurrent host sessions, eight colors, extended highlighting and programmed symbols on the IBM 3270 Personal Computer and support of the Models 24 and 26 with the IBM 3295 Plasma Monitor.

Additional enhancements to the Workstation Adapter are said to include attachment of the 3270 PC/G and 3270 PC/GX with full graphics functions, support of user-selectable printer assignment and support of the IBM 3262 printer Models 3 and 13.

No charges apply except for customers who install the communications adapter enhancement on other than new production machines.

- Gould unveiled the Sci-Clone/32, a nodal processing system based on the firm's Concept/32 superminicomputers/79
- A cable-through tape drive for IBM System/36 and 34 users was anounced by Interface Data/79
- Hewlett-Packard cut the price on its HP 7580 line of graphics plotters by 25%/82
- Beehive International introduced a DEC VT220-type terminal/82

INSIDE

Terminals/82
Printers/Plotters/82
Graphics Systems/82

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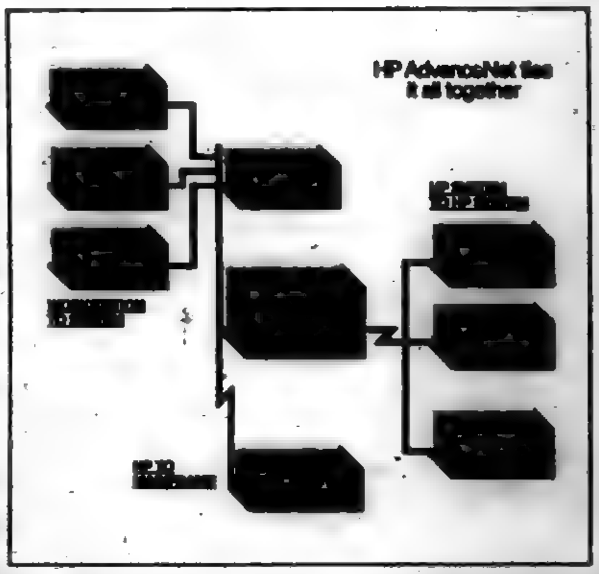
The HP 3000 compu

However much you change, you're going to need both office automation *and* distributed data processing. Fortunately, one company gives you both in a single system.



Hewlett-Packard's HP 3000 is a fully compatible family of computers, ranging from a new system that handles as few as two users to a distributed mainframe that connects up to 400. You can run the same software right up the line.

And our systems can change and grow as you do. When you're ready for upgrades and additions, you simply plug your existing programs into the new systems. No recompiling. No time and money wasted on conversion.

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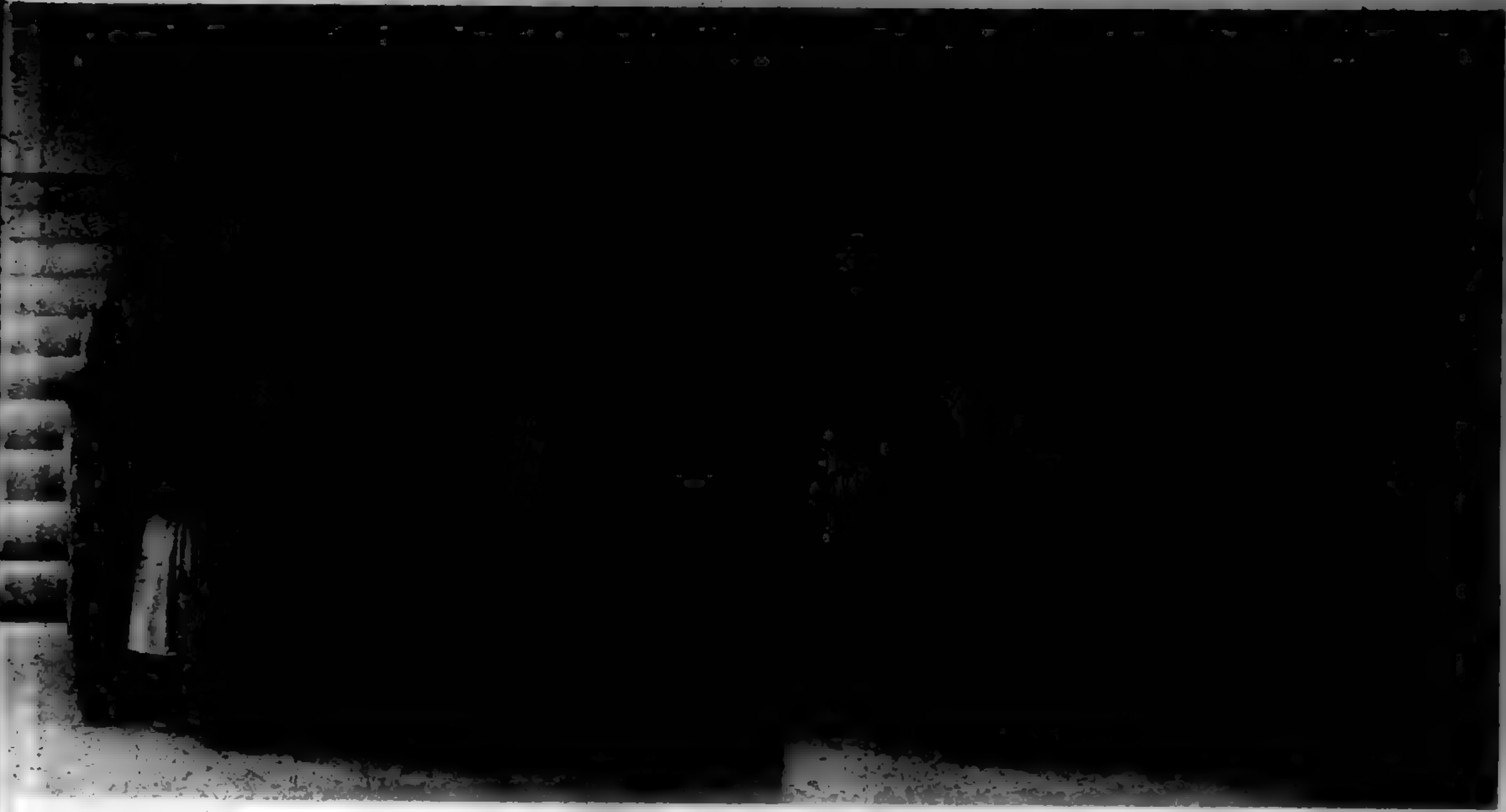
It provides an interface for a wide range of workstations, peripherals and personal computers, including our Touchscreen Personal Computer and The Portable, as well as IBM PCs. And it allows them to interact directly with



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You'll communicate better with HP AdvanceNet.

Our communications go well beyond this office network. With HP AdvanceNet, they extend to links with other HP 3000s, in the same building or on the other side of the world. And to your mainframe computers, ours or IBM's.

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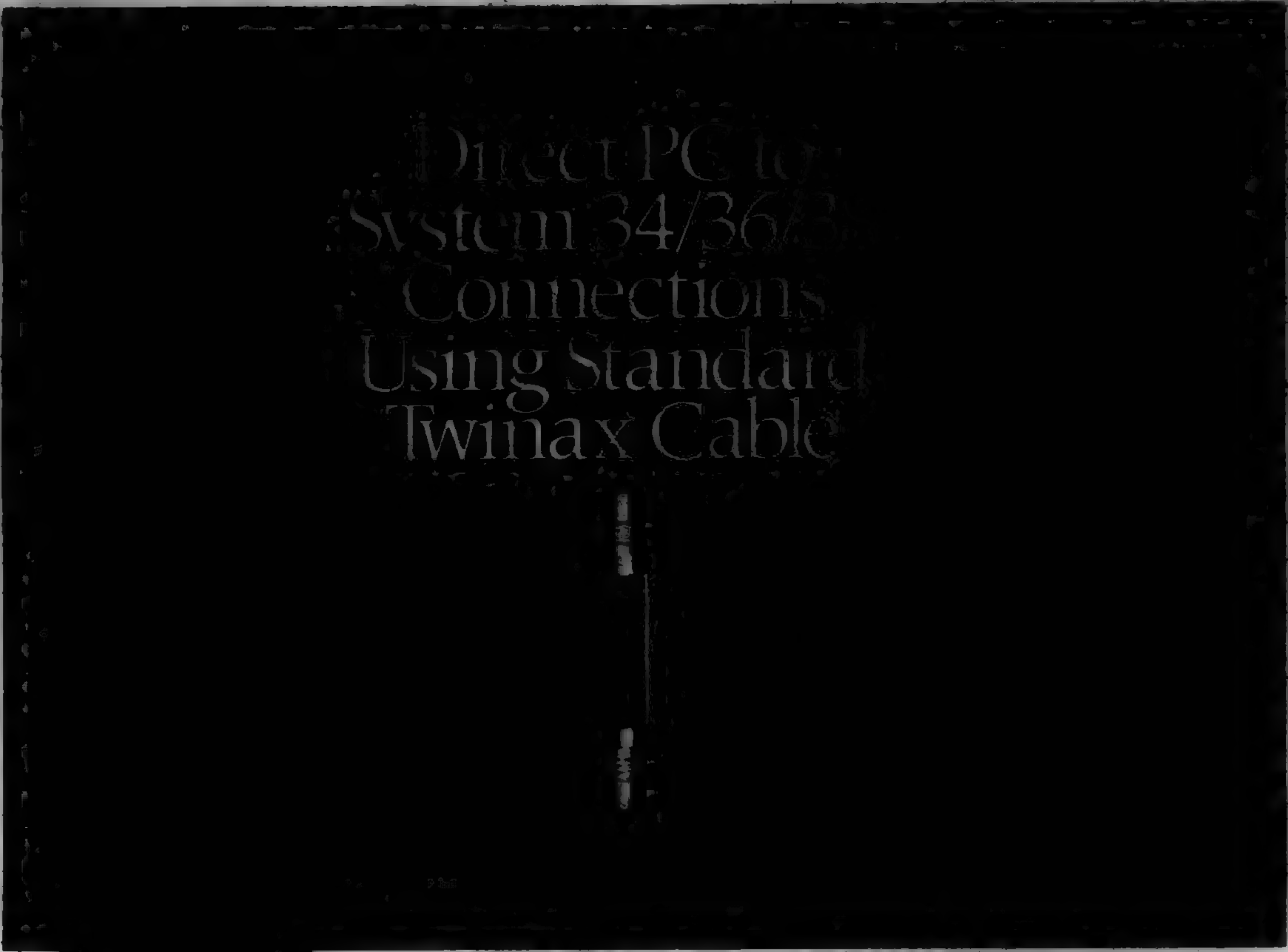

It's Easy With AST-5251/11:™ Fast Hookup, File Transfer And Extra Capabilities

Standard Twinax Cable Support Makes Installation A Snap. Now you can offer your customers an easy, cost effective direct cable attachment from PC to the IBM® System 34/36/38—no expensive communications adapter necessary. And it's as easy as plugging our AST-5251/11 emulation board into a PC/AT/XT, portable or compatible and connecting the twinax cable. With this complete solution that's all it takes to use a PC just like a standard IBM 5251/11 terminal.

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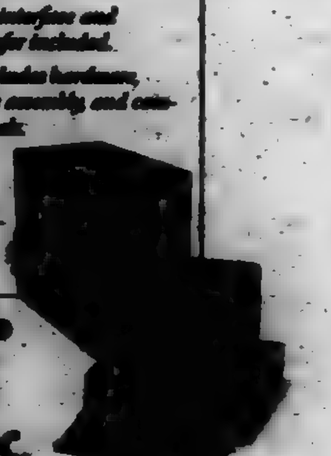
- *Provides host-addressable 5256 printer support (background mode) on PC-attached printer.*
- *Selectable DMA and I/O interrupt channels.*
- *Application program interface and bidirectional file transfer included.*
- *Complete package includes hardware, software, twinax cable assembly and comprehensive user manuals.*
- *Supports fixed or hard disk.*
- *Hot-Key assist for concurrent host and PC sessions.*



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Gould offers Sci-Clone/32

FORT LAUDERDALE, Fla. — Gould, Inc.'s Computer Systems Division has announced its Sci-Clone/32, a multiple-node processor system that uses the company's Concept/32 parallel processing minicomputers as nodes in a system linked by dual-ported integrated memory modules. The system runs under Gould's MPX/32 operating system.

The system was designed for applications such as flight simulation, signal processing, power plant simulation and energy management.

The basic configuration is a host-Concept/32 SC27, the Reflective Memory System memory module and a node unit cabinet that will allow for expansion up to four single-card SC27 nodes with one SC27 node processor for $277,200.

The top-of-the-line system costs $1,377,000 and includes a Concept 32/9780 host computer, the Reflective Memory System and two node units fully loaded to handle 16 Concept 32/SC27 minis with parallel processing units. All configurations include two 9-in. 340M-byte Winchester disk drives and one 100 in./sec., 1,600 bit/in. streaming tape drive.

More information can be obtained from Gould through P. O. Box 9148, 6901 W. Sunrise Blvd., Fort Lauderdale, Fla. 33310.

Sun announces workstation, price cuts

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. has announced its Sun-2/130 Sunstation workstation, a mass storage subsystem for its Sun-2/50 Desktop Sunstation, across-the-board price cuts on its systems and memory and upgrades to its VME bus-based products.

The AT&T Unix-based Sun-2/130 Sunstation is a VME bus-based monochrome workstation with a 19-in. display, a library of graphics utilities and a display manager. Mass storage options for the Sun-2/130 range from 71M-byte disks that cost $4,900 to 760M-byte disks that cost $36,600. Both ¼-in. streaming cartridge drives costing $3,000 with disk or $4,000 if bought separately and ½-in. tape drives costing $9,500 each are available for backup.

List price for a 2M-byte Sun-2/130 Sunstation is $16,900, and it is available in configurations of up to 8M bytes, with memory available in increments of 2M bytes at $1,500 per 1M byte. The optional mass storage subsystem for the Sun-2/50 Desktop Sunstation consists of a 71M-byte disk along with a 45M-byte ¼-in. cartridge backup tape. It costs $8,500.

Sun also announced that it is doubling the maximum memory available on its products to 8M bytes. The cost of 1M byte of memory has been cut from $4,100 to $1,500, the vendor said. The cost of the 2M-byte diskless Sun-2/50 was cut to $8,900 from $13,400; the cost of the Sun-2/160 Color Sunstation with 2M bytes of memory was reduced to $27,900, down from $36,400; and the price of 71M-byte drive with a 45M-byte ¼-in. streaming cartridge tape option available for the Sun-2/120, Sun-2/130 and Sun-2/160 pedestals was reduced from $10,900 to $7,900.

In addition, the company unwrapped upgrades from the Motorola, Inc. 68010 processor to the 32-bit Motorola 68020 processor for its VME bus-based products, the Sun-2/130 and Sun-2/160. The cost of the upgrade is $4,000.

More information can be obtained from Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043.

Interface Data unwraps tape drives for IBM CPUs

BOSTON — Interface Data, Inc. has announced cable-through tape drives for the IBM System/36 Model 5362 and the System/36 and 34 computers.

The controller was designed for use with the company's Series 5 tape drives and supports a ½-in. tape format. The cable-through feature is said to allow the tape drive to bypass the communications port and be configured so that the System/34 or 36 thinks it is communicating with a local workstation. The package includes tape control software that facilitates data exchange with both IBM computers and non-IBM equipment, the vendor said. The Tape Librarian software has a timer that is said to allow operations to be scheduled in advance.

The Series 5 Model 98 tape drive is a self-threading, front-loading desktop unit that accepts 7-in. reels. It costs $5,995. The Series 5 Model 89 is a reel-to-reel unit in a self-supporting cabinet that supports both 800 bit/in. and 1,600 bit/in. recording densities and accepts 7- to 10½-in. reels. It costs $13,995. The Series 5 Model 99 self-threading front-loading unit accepts 10½-, 8-, and 7-in. reels. It is available with either 1,600 bit/in. or 3,200 bit/in. data densities and costs $10,795.

More information can be obtained from Interface Data at 18 Assembly Square Drive, Somerville, Mass. 02154.

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Three more firsts from the people who invented the wheel.

From day one, Xerox and Diablo have been known as the two best names in daisywheel printers. And now there are three more in the Xerox line to choose from.

The Xerox Advantage D-25 Diablo printer turns out letter quality documents quickly and quietly. And it does all that for the price of a dot matrix printer.

At 80 c.p.s., the D-80IF is the fastest daisywheel printer ever made by Xerox. It has a built-in double bin sheet feeder. As well as the capacity to handle up to 16 computers at once.

And the D-36 spells reliability. It averages 4,000 hours of printing between maintenance calls.

But Xerox didn't stop there. Each of these new machines is compatible with most computers on the market, including the IBM-PC. And they're all easy to use. They're also a part of Team Xerox, so they can be serviced by the national Xerox service force and authorized service locations across the country.

So if you're looking for the latest in daisywheel printing technology, go with the people who've been in the business the longest. Call 1-800-833-2323, ext. 25, your local Xerox office, an authorized Diablo or Xerox dealer or send your business card to Xerox Corporation, Dept. 25083, P.O. Box 24, Rochester, NY 14692.

SYSTEMS & PERIPHERALS

TERMINALS

■ Motorola/Four-Phase Systems, Inc. has announced its FT45 intelligent terminal that works with the Motorola, Inc. Series 6000 minicomputers.

The FT45 has a 14-in. screen with a choice of amber or green characters. Three styles of adjustable keyboards are available, the vendor said. Features are said to include a security keylock, a high/low intensity control and tile/swivel capability.

The terminal is priced at $2,100.

Motorola/Four-Phase Systems, 10700 N. De Anza Blvd., Cupertino, Calif. 95014.

■ Beehive International, Inc. has released its ATL-220 terminal, said to be equivalent to Digital Equipment Corp.'s VT220 terminals.

The ATL-220 is a low-end model of the company's ATL-220E, formerly designated as the ATL-220. The ATL-220 is said to offer a 14-in. screen and five operating modes, including DEC VT200 seven- and eight-bit control modes and a VT100-compatible mode.

The user may modify communications protocols, interfaces, tab settings, printer controls, function key definition and keyboard parameters through menu-driven terminal operating features, the vendor said.

The unit costs $895.

Beehive International, 4910 Amelia Earhart Drive, Salt Lake City, Utah 84116.

PRINTERS/PLOTTERS

■ BDS Corp. has announced the BDS Laser 630/8, which is compatible with Diablo Systems, Inc. 630 daisywheel printer protocols and is said to be capable of accepting data through parallel IBM Personal Computer-compatible and serial RS-232C interfaces.

The Laser 630/8 has nine type fonts in the basic configuration and can accept a maximum of 16 fonts. Optional font cartridges include one that reportedly allows a host processor to download user-defined fonts.

Printer features include combined underlining and boldfacing or italic and boldfacing, the vendor said.

The BDS Laser 630/8 costs $3,495.

BDS, 800 Maude Ave., Mountain View, Calif. 94043.

■ Southern Systems, Inc. has announced its ST series of printers, which are compatible with IBM's System/34, 36 and 38 and Series/1 systems; Texas Instruments, Inc.'s 990 family and Business Systems computers; and Digital Equipment Corp. PDP-11 and LSI machines.

The models ST 450 and ST 900 printers come with either a Data Products Corp. parallel interface or a Centronics Data Computer Corp. parallel interface. An RS-232 interface is optional.

The ST 450, said to be a 450 line/min band printer, costs $6,795. The ST 900, reportedly a 900 line/min band printer, costs $7,995.

Southern Systems, 100 N. Belcher Road, Clearwater, Fla. 33575.

■ Southern Systems, Inc. has unveiled the Mercurion 7450, a low-end version of its Mercurion 1 page printer.

The 7450 reportedly operates at 45 page/min, when using 8½- by 11-in. paper. It has a duty cycle of 50,000 to 300,000 page/mo and is field upgradable to the 60 page/min Mercurion 1, the vendor said. It comes with an IBM mainframe interface.

The Mercurion 7450 costs $49,950.

Southern Systems, 100 N. Belcher Road, Clearwater, Fla. 33575.

■ Hewlett-Packard Co. has announced that it has lowered the prices of its HP 7580 family of drafting plotters by an average of 25%, effective immediately.

The HP 7580B has been reduced from $13,900 to $9,900, the company said.

Also reduced is the HP 7585B, from $16,900 to $12,900, and the HP 7586B, from $21,900 to $16,900.

HP, Inquiries Manager, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

■ Test & Measurement Systems, Inc. has released its TP-35 video printer for use with Tektronix, Inc. Logic Analyzer models 1240, DAS 9100 and 318/338.

The thermal printer gives a hard copy on white thermal paper from a CRT display. It prints any CRT image generated by the measuring instruments in 16.7 sec., the vendor said.

The TP-35 is priced at $1,295.

Test & Measurement Systems, Suite 301, 349 Cobalt Way, Sunnyvale, Calif. 94086.

■ Facit, Inc. has released a four-color printer, which can handle text and graphics, for use with micros and minicomputers.

The C7500 is said to print dual-resolution graphics at speeds of 2,400 dot/sec., draft-quality text at 400 char./sec. and near-letter-quality text at 100 char./sec. A fanfold or cut-sheet tractor feed are standard.

The unit costs $2,495.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

GRAPHICS SYSTEMS

■ Chromatics, Inc. has announced its CX 1280 Colorgraphic Display System, which supports Digital Equipment Corp.'s VMS and AT&T's Unix operating systems.

The CX 1280 base system includes four single-buffered image planes, CX 1280 resident firmware, a 1,280- by 1,024-pixel resolution monitor and an engine that processes 500,000 fully transformed vectors per second.

The basic unit costs $24,995.

Chromatics, 2558 Mountain Industrial Blvd., Tucker, Ga. 30084.

STUART from page 75

gy is "install today and rationalize tomorrow," Stuart said.

Although System/36 is inexpensive and easy to use, she noted that it has a 16-bit architecture with a limited processing range. "Right now five or six System/36 users using Displaywrite will bring a high-end system down," she said. With the improvements announced June 18, "nine to 11 users will take the system down. That's not a very significant improvement," she said.

The System/36 Personal Computer, priced at approximately $7,000, that IBM announced on June 18 offers 75% of the performance of the former low-end System/36, she noted. Disk speed is a constraining factor, she added. The System/36 Personal Computer can run PC-DOS with the System Support Program (SSP), but the PC-DOS application must be suspended for the machine to get into SSP, she said. She called that co-resident feature more significant for IBM than for users.

"We predict a real extension of the System/36 product line later this year," Stuart said. The product will support an SQL front end to the System/36 file system, a feature Stuart said will round out System/36 by offering data base management system access.

"Can IBM improve System/36 performance to run a [data base management system] in a multivendor environment?" Stuart asked rhetorically. "That remains to be seen. Until users see a workable OA package or a workable extension to the product line upward, some skepticism is deserved." She noted that the IBM 8100 distributed processor was IBM's former strategic OA product.

'Merging the successful with the endangered'

With the announcement of the 3270 Personal Computer AT, IBM is "merging the successful IBM Personal Computer and the endangered 3270 environment. IBM does not want to lose its 3270 terminal end users," Stuart said, noting that several million such terminals are installed. "A hybrid 3270 and Personal Computer product will result," she predicted.

Generalizing about the announcements, Stuart said, "IBM continued on a slow path of bringing its disparate systems into compatibility with its architecture." In the Yankee Group's view, IBM will exploit the installed base of System/36 in corporate OA environments.

Thus, IBM will eventually offer System/36 support for Distributed Office Support System (Disoss), its documents interchange package, Stuart said. IBM is working in its Rochester, Minn., plant on a long-range plan to combine System/38's object-oriented architecture and integrated data base features into a System/36-like processor, Stuart maintained.

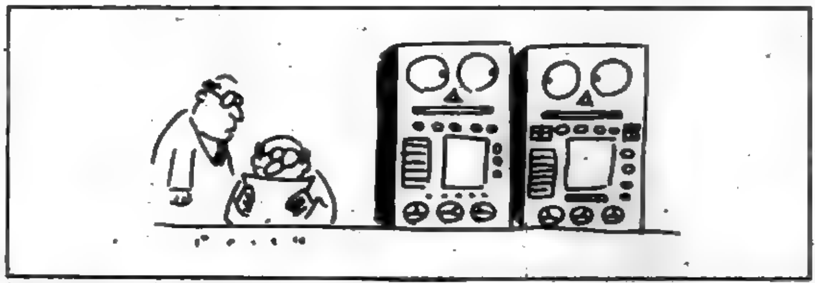
Although System/38 has certain advanced features, its shipments have been stable at approximately 3,000 per year, Stuart said. "We see [the] System/38 as relegated to niche accounts," such as small businesses and small manufacturers. "It will continue to be enhanced but not brought into the mainstream strategy." Instead, she said, "IBM will give the System/36 base a path to an alternative architecture, a non-370 architecture," she said.

Stuart predicted that IBM will eventually announce a token-ring local-area network. "System/36 will eventually have a [local-area network] connection so it can act as a file server," she said.

In viewing IBM's OA strategy, Yankee Group divided IBM's strategic office products into the following three areas:

- Applications such as Displaywrite and Professional Office System.
- Logical connection products such as Disoss, Document Interchange Architecture, Document Content Architecture and Topview.
- Physical connection products such as the Cabling System and the various hardware products.

"Where physical compatibility fails, construct logical compatibility; until then, a little applications compatibility will do," Stuart said, describing IBM's OA strategy.



"Ever get the feeling they're just using us?"

SONY from page 75

the model IPL-1345 laser printer will be available in the fourth quarter, and other parts of the Sios line will be available in the first quarter of 1986, the vendor said.

Sony said the basic workstation hardware, including the microprocessor, keyboard, mouse and display, costs about $60,000. Hardware for the integrated system, including the workstation, printer, image scanner and optical disk system, will cost about $80,000, Sony said.

The hardware will be sold to software and systems developers that will provide software and configure the system for users with mass storage needs, the vendor said. Applications software for the system is not available yet, officials added.

Sony is located at Sony Drive, Park Ridge, N.J. 07656.

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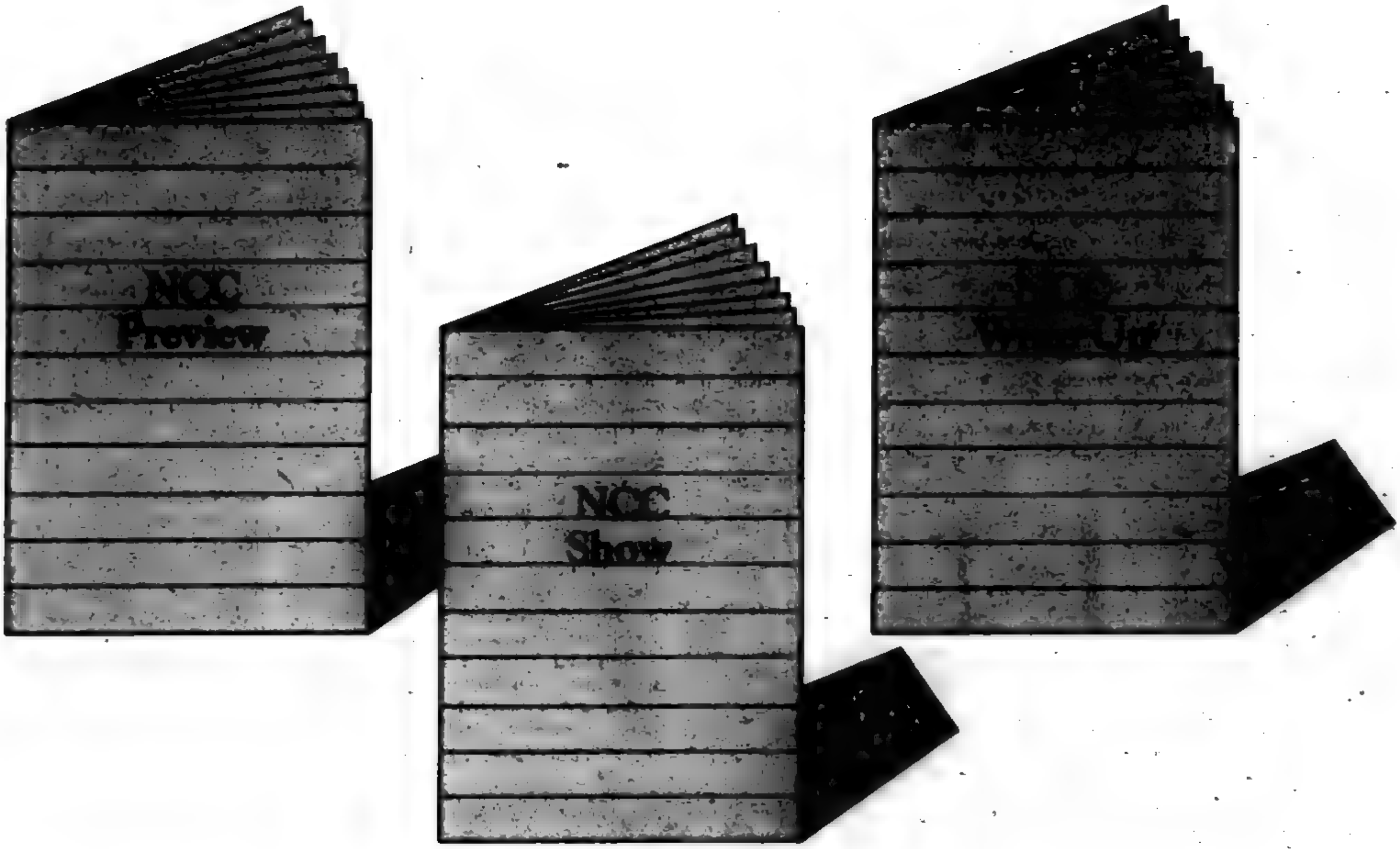

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COMPUTER INDUSTRY

Dataquest: Generalist amid specialists

FOURTH OF A FIVE-PART SERIES

By Kathleen Burton
CW West Coast Bureau

SAN JOSE, Calif. — At a time when its competition is increasingly coming from specialists, Dataquest, Inc. remains one of the market research field's most confirmed generalists.

With operations in three continents and a staff of 130 analysts and researchers, Dataquest boasts a range of products and industry coverage that few of its competitors can match, according to company President E. David Crockett.

Breadth provides Dataquest with an effective hedge against the industry's periodic downturns and recessions. "If one research area is in a slump, Dataquest can cut back and lay off staff with hardly a ripple in the rest of the operation," according to Michael Killen, president of Strategic, Inc., another market research firm here.

Breadth is also the key weapon with which Dataquest hopes to combat a growing host of niche-seeking competitors.

How well Dataquest copes with these rivals will determine, to a large degree, whether the firm meets its current goal of 30% revenue growth during 1985.

Dataquest's competitors span a broad range of geographical areas and products: Phoenix-based Instat Corp. focuses on semiconductors; Dallas-based Future Computing, Inc. covers the personal computer market; Software Access International in Mountain View, Calif., specializes in software; and the Boston-based Yankee Group targets telecommunications.

But Dataquest's most significant competitor, Crockett said, is Cupertino, Calif.-based Infocorp, founded in 1982 by three former Dataquest employees.

Infocorp, which now has 250 clients and a revenue of $4 million that company officials say will double this year, competes head-to-head with Dataquest in the small systems and microcomputer areas, said Skip Bushee, Infocorp's executive vice-president.

Bushee said Dataquest failed to do extensive basic research in the small systems and microcomputer markets. "Dataquest presents its results to clients in attractive packages and talks a good story, but they don't back their numbers with sufficient primary research, which requires talking to large numbers of end users, dealers and distributors," Bushee said.

Dataquest — a subsidiary of A. C. Nielsen Co., a Chicago-based media ratings conglomerate — was founded in 1971 and has since become the largest syndicated market research firm in the U.S., with an annual revenue estimated at $35 million to $40 million, company officials said.

David Norman, William Coggshall, and Ronald Miller became involved in market research in the late 1960s as employees of Creative Strategies, Inc. in San Jose. The three left to begin Dataquest, envisioning the firm as a "one-stop, automated information boutique," and that philosophy

See RESEARCH page 86

■ The often-overlooked international software market has greater growth potential for vendors than does the domestic market, a Software AG executive told Adapso members/87

■ RCA and Sharp bucked the trend of the U.S.-Japanese semiconductor trade war by announcing a joint venture to produce Cmos chips in the U.S./91

Software services mart to grow 20%

By Charles Babcock
CW New York Bureau

NEW YORK — The computer software and services industry will continue to grow by 20% to 21% annually through the end of the decade, despite the current slowdown of hardware sales, said Peter A. Cunningham, president of Input.

Figures collected by Cunningham's Mountain View, Calif., market research firm, which were presented to the Association for Data Processing Service Organizations, Inc. here recently, indicated that software and services firms' revenues grew quickly in late 1983 and early 1984 but have slackened some since then.

"The industry grew at its fastest rate in 1984, 24%," with actual growth rates of 24% to 28% in the first half, Cunningham said. He called it genuine growth — few price increases

See GROWTH page 94

Financial software maturing

Signifies broader trend in mainframe packages

By Charles Babcock
CW New York Bureau

NEW YORK — The market for mainframe software is maturing, and the companies that produce it are going to have to grow more sophisticated if they plan to survive, said Gerald C. Chichester, president of Focus Research Systems, Inc., a Dun & Bradstreet Corp. company in West Hartford, Conn.

Chichester made his remarks before 200 people attending the Association of Data Processing Service Organizations, Inc.'s (Adapso) 12th annual software and services financial forum here recently. His comments were directed at vendors of financial applications software packages such as payroll, general ledger and accounts receivable, but what is happening to financial packages signifies broader changes in the industry, he said.

"The older, more substantial solutions have been provided. The challenge now is for vendors to find new applications areas that they heretofore have ignored," he said.

Chichester's organization analyzed its data base of 10,000 IBM System 370 mainframe users — including 3080 series, 4300 series and the 3033 — and found that their purchases of financial applications packages peaked during the first quarter of 1984 and have gradually declined since.

The number of users of general ledger has increased for many years, but that trend leveled out in 1984, the survey indicated.

"I infer that all those who want it,

See ADAPSO page 94

Synapse execs withhold public comment on firm's demise

By Kathleen Burton
CW West Coast Bureau

MILPITAS, Calif. — Synapse Computer Corp. quietly closed its doors last month, but company officials have refused to confirm its demise.

At first, officials at Synapse, a privately held on-line transaction processing systems manufacturer backed by $35 million in venture capital, said they would release a statement about the company's closure. Later, Mark Wilson, Synapse's vice-president of administration and finance, said, "We're a privately held company, and other than talking to our customers, we do not plan to make a public announcement about recent activities or about our future plans."

A Synapse employee, who asked not to be identified, confirmed that the company had locked its doors at the close of business June 14, and the remaining employees "are just Xeroxing resumes and packing personal belongings. The parking lot is empty, and the doors are locked," he said.

According to the employee, the closing came as a shock to the company's 98 workers, who had been led to believe that a merger with aerospace giant McDonnell Douglas Corp. was imminent. "We didn't know a thing until Friday [June 14] at 2 p.m. when [Synapse Chief Executive Officer James Bochnowsky] called us all into a room and told us the McDonnell Douglas deal had fallen through the night before, and the company was closing," he said.

"We feel ripped off"

The employee said that Synapse's workers were angry that a severance and vacation pay package that had been promised in the event of a shutdown was not forthcoming. "They paid us only through Friday, our last day," he said. "We feel ripped off."

McDonnell Douglas had been considering a merger with Synapse until late last week, said Glenn Marquist, McDonnell Douglas' director of marketing and product planning in Irvine, Calif. McDonnell Douglas decided against the merger because it was seeking an entry-level system priced well below Synapse's $350,000 entry-level systems, Marquist said.

According to insiders and analysts, a series of management and technical problems plagued the company during its five years of operation.

Synapse became mired in several problems that included shipping delays and a market crowded with competitors, said Gwen Peterson, an analyst with Dataquest, Inc., a market-research firm in San Jose, Calif. "When the company started in 1980, only [Tandem Computer Corp.] was there, but now there are half a dozen competitors in the same niche," Peterson said.

Synapse shipped nine systems during 1983 and 1984 and had two active users — General Motors Corp. in Pontiac, Mich., and the police department in Nashville — according to Omri Serlin, president of Itom International, a market research firm in Los Altos, Calif. The other seven systems the company shipped were bug-ridden prototypes, Serlin said.

RESEARCH from page 85

still guides the company today, said David G. Jorgensen, Dataquest's current chairman.

The three gradually moved on. In 1982, Norman left Dataquest to found the San Jose-based Businessland chain of computer stores. Coggshall, who left the company in 1983, is now chief executive officer at Software Access International. Miller is vice-president of Boyden Associates, a high-technology recruiting firm in Menlo Park, Calif.

Dataquest has a roster of 900 blue-chip clients that includes IBM, Prudential-Bache Securities, Inc., 60 venture capital firms and the Big Eight accounting firms. Dataquest's first research forays tracked copiers, semiconductors, mobile homes and recreational vehicles. The first two divisions provided a launching pad for the company's expansion into the more lucrative areas of electronic printers and computer storage.

Dataquest subscribers pay between $9,000 and $35,000 annually for single subscriptions, which include industry-specific analyses and specialized studies aimed at Fortune 1,000 CEOs.

The firm's clients receive binders with information charting market size, order and shipment rates and pricing strategies. Clients also receive newsletters on subjects germane to their subscriptions, have telephone and in-person inquiry privileges and can attend one or more of Dataquest's 25 industry-specific annual conferences.

'Only game in town'

According to Curt Francis, vice-president for strategic planning at Advanced Micro Devices, Inc. (AMD) a Santa Clara, Calif.-based semiconductor manufacturer, "Dataquest is the only game in town for semiconductor data."

A Dataquest client for five years, AMD bases crucial marketing and strategy decisions on Dataquest's numbers, Francis said. Semiconductor firms like AMD need to understand and interpret the international market, from the shipping rate of graphics controllers to how fast companies will switch to digital telephony, Francis said.

Perq Systems Corp., a graphics workstation manufacturer in Pittsburgh, spends $24,000 annually to subscribe to Dataquest's computer-aided design and manufacturing and small computer services, which it uses to evaluate competitors and construct a marketing plan, said Linda Richardson, Perq's marketing specialist. "Dataquest's numbers about our competition are very accurate," she said.

Though each Dataquest division is run separately and is responsible for its own profits and losses, the research activities of each group overlap, said Robert Sanekoff, vice-president of Dataquest's graphics and display terminals division.

"It's not hierarchical here. The company is run like a law firm with everybody working on several 'cases' simultaneously," Sanekoff said. Dataquest's semiconductor group, for example, would be "flying blind" if it could not cross-check information with the telecommunications, laser printer and terminals groups, according to Sanekoff.

According to Crockett, Dataquest's philosophy is based on the premise that the price/performance ratios and growth rates of computer-related industries have predictable life cycles.

He claimed success in predicting IBM's 20% per year price reductions, based on the equivalent functions of products. "Our projections on IBM may vary two months based on parts availability," Crockett said, "but we understand IBM's product cycles, and, as IBM goes, so goes the rest."

During its 14-year history, Dataquest has had successes and failures. "Market research is not an exact science," Crockett conceded. Because of this, Dataquest has miscalculated trends and technology breakthroughs, including the mercurial growth of under-$5,000 laser printers and the sluggish expansion of robotics and office automation.

But the company claims significant successes. It predicted the last five downturns in the semiconductor industry and Xerox Corp.'s 1972 loss of market share in the copier industry, according to Crockett.

Dataquest's success formula is based on aggressively filling niches that no one else has targeted, according to Jorgensen.

New services launched this year include a London-based Western European printer group that set a sales record during its first months of operation by signing up a record number of clients. In the U.S., newly established groups include software, semiconductor materials and electronic publishing divisions, he said.

In spite of Dataquest's successes, however, problems cloud the horizon. "It's difficult being No. 1," Jorgensen said. "Though we try harder, the bar goes up all the time. Clients

See RESEARCH page 94

AT A GLANCE

Nielsen Dataquest

1290 Ridder Park Drive
San Jose, Calif. 95131

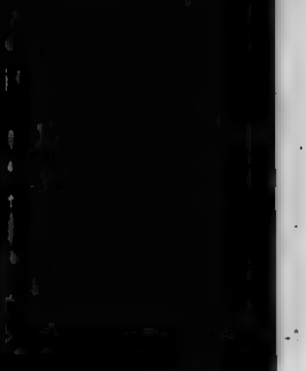
Founded - 1971

Employees - 330

1984 Revenue - $35 million

1984 Profits - Not available

Specialization - Semiconductor technology



Nielsen Dataquest

[illegible]	[illegible]	[illegible]	[illegible]
Semiconductor Industry	Semiconductor market and trends with company-by-company analysis	Vendor	$13,800
[illegible]	[illegible]	[illegible]	[illegible]
Japanese Semiconductor Industry	Pacific Rim semiconductor market and vendors	Vendor	$12,000
[illegible]	[illegible]	[illegible]	[illegible]
Semiconductor Equipment and Materials	Worldwide semiconductor equipment and materials production trends	Vendor	$12,600
[illegible]	[illegible]	[illegible]	[illegible]
Computer Storage Industry	Computer storage industry and markets	Vendor	$14,000
[illegible]	[illegible]	[illegible]	[illegible]
Robotics Industry	Companies and trends in several areas of factory automation	Both	$13,800
[illegible]	[illegible]	[illegible]	[illegible]
Software Industry	Trends, markets and competitors in the software industry	Both	$9,000
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Business Computer Systems Industry	Trends, markets and competitors in small business and mainframe manufacturing	Both	$12,000
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Telecommunications Industry	Focus on public transmission equipment, customer premise equipment and North American telecommunications industry	Both	$16,000
[illegible]	[illegible]	[illegible]	[illegible]
Terminal Industry	Technological reviews and forecasts for graphics and display terminals (two services)	Both	$10,500 each
[illegible]	[illegible]	[illegible]	[illegible]
Financial Services	Investment issues newsletter for venture capital and investment banking communities	Not applicable	$34,500

* Per year

Source: Dataquest, Inc.

International software mart showing high sales potential

By Charles Babcock
CW New York Bureau

NEW YORK — Many software manufacturers are missing the fact that the international market for software "is larger than [that of] the U.S. and growing at a faster rate," according to a Software AG officer.

Michael Jakes, senior international vice-president of Software AG in San Diego, told the Association for Data Processing Service Organizations, Inc. (Adapso) here that foreign languages, laws and other barriers presented difficulties for U.S. software companies selling overseas. But the biggest obstacle is their conception that the U.S. outstrips every other market for their products.

Jakes cited IBM's international software sales vs. those in the U.S. In 1982, IBM's international sales trailed domestic sales, $758 million to $935 million. In 1983, when reported in 1982 dollars, they had drawn closer together, at $1.13 billion to $1.29 billion. And in 1984, for the first time international sales exceeded U.S. sales when reported in 1982 dollars, $1.97 billion to $1.71 billion.

In reality, the increase in the value of the dollar shortchanged IBM part of the return on its international sales, since it deals in the currency of each country rather than in dollars, Jakes said. The same figures as reported by IBM in its 1984 annual report are as follows: $758 million international to $935 million U.S. in 1982; $1.01 billion compared with $1.29 billion in 1983; and $1.49 billion vs. $1.71 billion in 1984.

The five countries in which IBM does the bulk of its international business are Canada, the UK, West Germany, France and Italy. As software markets, these countries "are far less saturated than the U.S.," Jakes said.

Some rapidly developing third-world countries "are incredibly viable markets," he added.

Proven software packages in the U.S. cannot automatically transfer their success overseas. Accounting laws differ from country to country, and legal systems, office automation packages and educational software all tend to follow local conventions rather than international standards.

"Hardware tends to be global, but software is local; it reflects local culture," Jakes said.

Nevertheless, international markets represent "a great untapped reservoir" for those with the drive to take advantage of them, he said.

Wang creates telecom group

LOWELL, Mass. — Wang Laboratories, Inc. recently announced the creation of a service arm focusing on the communications market that its founder and chairman predicted "will become a second major business" for the office automation company.

Wang Information Services Corp. (Wisc) will be a wholly owned subsidiary that will offer voice mail, telecommunications switching, data base and other services to users of Wang products.

Wang Chairman and Chief Executive Officer An Wang said he has set a revenue goal of $100 million for the subsidiary by next year.

Wisc is scheduled initially to offer Wang customers monthly rentals of nationwide electronic voice mail services.

Future services

The other networking and distributed data processing services will be offered in the near future.

"Technology has become very complex for many users," Wang said. "Wisc has been organized to provide advanced but easy-to-use services without forcing the user to deal with the technology directly or make heavy investments."

Senior Vice-President Robert M. Boseman Sr. will head the Wisc subsidiary, reporting directly to Wang's CEO.

AEA offers guide to Japan

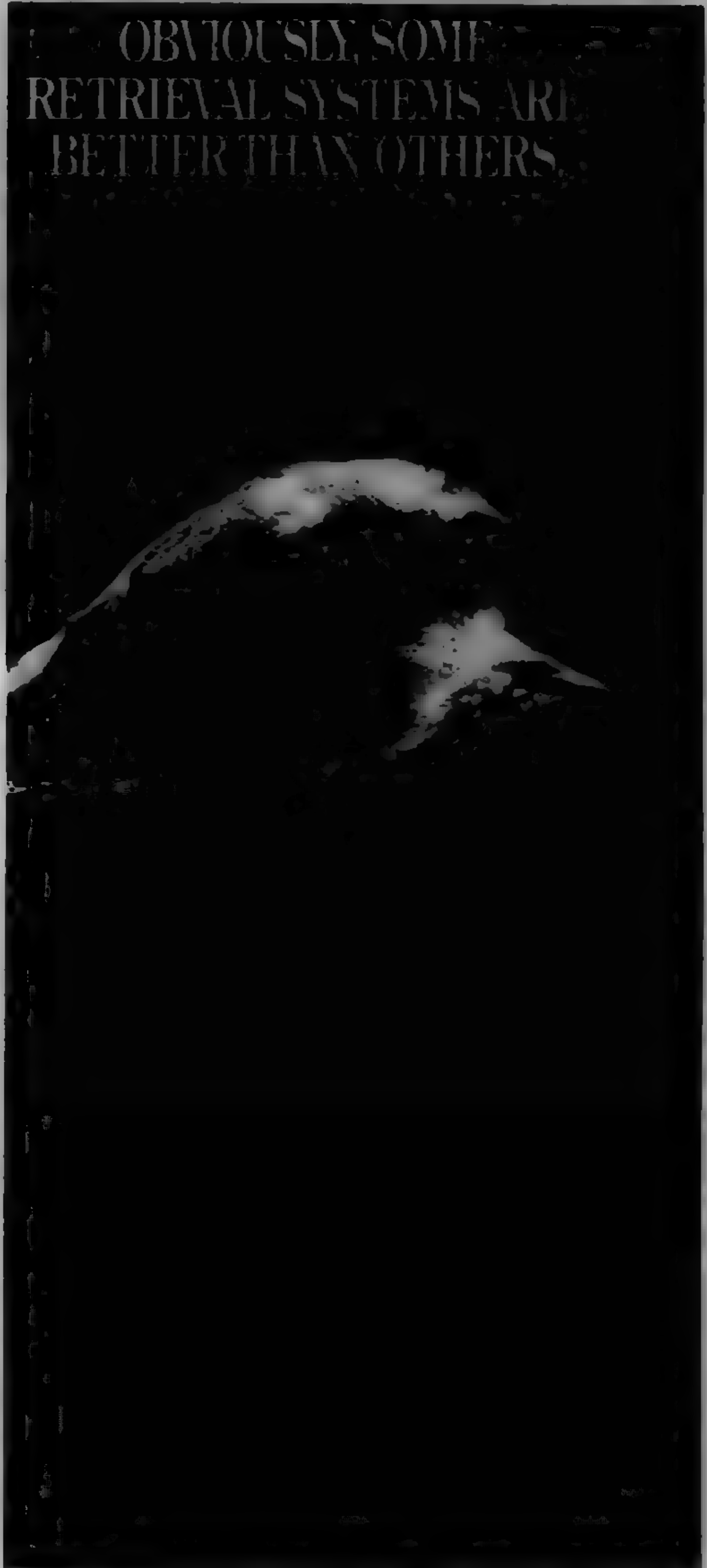
PALO ALTO, Calif. — The American Electronics Association (AEA) recently published a 72-page guide titled "Sources of Electronics Information in Japan."

The booklet provides information on Japanese electronics trade organizations; government, industry and academic publications; research laboratories; technical libraries; computer data base sources; consulting firms; and trade fairs and exhibitions.

Information for the publication was collected by the AEA's Japan Office in Tokyo, opened last spring. The AEA said one of the purposes of the office is to improve the quality and volume of information about the Japanese electronics market available to U.S. electronics industries.

The report costs $45.

AEA can be reached through P.O. Box 10045, 2670 Hanover St., Palo Alto, Calif. 94303.



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That's fast and smart.

IXR not only provides the S213 intercept, but also intercepts for VSAM Open and Dynamic Allocation.

As mentioned, we design intelligent software.

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For further information on the ASM2 subsystem, IXR, please write or telephone Mr. Shawn McLaren direct; (415) 941-4558.

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E-A

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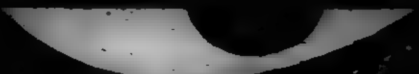

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The results are in! Datapro Research Corporation asked systems software users to rate their data base management systems. And, Software AG users rated ADABAS "Excellent!"

Exactly the same thing happened in an earlier survey when Data Decisions asked users what they thought. For the third year in a row, ADABAS went right to the top of the list as the highest ranked DBMS for the IBM mainframe. And NATURAL was a top contender for best fourth-generation language.

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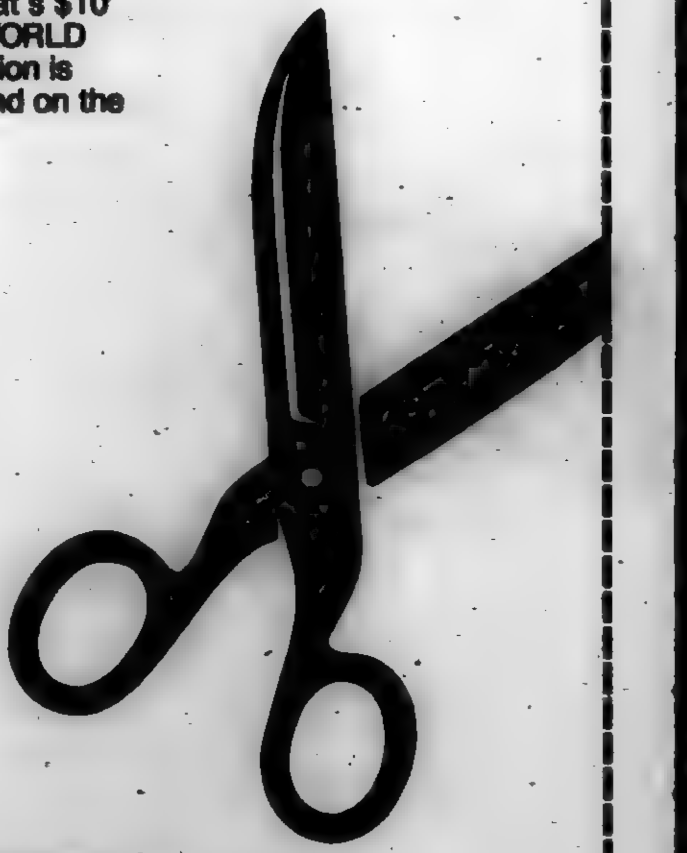

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   13. Treasurer/Controller/Financial Officer
   21. Director/Manager/Supervisor DP/MIS Services
   22. Director/Manager of Operations/Planning/Admin. Serv.
   23. Systems Manager/Systems Analyst
   31. Manager/Supervisor Programming
   32. Programmer/Methods Analyst
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COMPUTERWORLD
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8A13-91

RCA, Sharp plan joint chip manufacturing venture

NEW YORK — In the midst of an increasingly bitter U.S.-Japan trade war in the semiconductor industry, RCA Corp. and Sharp Corp. recently announced the first major U.S.-based joint venture between U.S. and Japanese integrated circuit vendors.

The companies will combine to build a $200 million production facility for Cmos and very large-scale integration (VLSI) chips in Camas, Wash., a suburb of Portland, Ore. RCA will hold the controlling interest in the joint venture, called RCA/Sharp Microelectronics, Inc., with 51% of equity and five of nine seats on the board of directors of the new company.

The 270,000-sq-ft plant is expected to open late this year and employ 650 people by 1989. The facility will include a design center and wafer fabrication center for the production of standard, custom and semicustom chips.

RCA President and Chief Executive Officer Robert R. Frederick said that despite the current semiconductor slump, the market for Cmos chips will grow dramatically through the end of the decade. Frederick predicted that the total annual worldwide sales of Cmos chips will grow 35% to 40% annually from its current level of $3.5 billion to $28 billion by 1990.

"There is no question of the cyclical nature of the industry," Frederick said. "But . . . we believe that electronics, and particularly Cmos, will grow through the years and that we will grow with the industry. We are in it for the long haul."

"Separately, Sharp and RCA each have tremendous capabilities in Cmos LSI," said Atsushi Asada, senior executive director and group general manager of Sharp's Integrated Circuit Group. "We feel that combining our forces will be synergistic, resulting in considerably faster progress than could be attained without such a combination," Asada added.

The companies named RCA's Jon A. Shroyer president and CEO of RCA/Sharp Microelectronics. Shroyer had been division vice-president of LSI products and technology development for the RCA Solid State Division.

Downturn prompts layoffs at four Silicon Valley firms

By [illegible] Burton
CW West Coast Bureau

The computer industry slump claimed more casualties in California's Silicon Valley recently as four more companies announced staff cutbacks.

■ Raychem Corp., a materials manufacturer in Menlo Park, Calif., will eliminate 300 jobs, effective immediately, as part of a cost-cutting move. Approximately 100 of the jobs are local; the remainder are overseas where Raychem does approximately 60% of its business, according to a spokesman.

Raychem, which manufactures a broad array of products for the electronics, telecommunications and defense industries, employs 9,600 people worldwide.

For the third quarter ended March 31, Raychem posted profits of $4.4 million on sales of $164 million, compared with profits of $8.6 million on sales of $156 million during the same period a year ago.

■ Verbatim Corp., a floppy-disk manufacturer in Sunnyvale, Calif., will cut 200 workers from its staff through attrition and layoffs by August.

A spokesman for the company said the cutbacks are the result of a slowdown in orders and are not related to Verbatim's recent acquisition by Eastman Kodak Co. of Rochester, N.Y. Approximately 1,100 employees will remain after the cutbacks.

Verbatim reported a before-tax loss for the third quarter of $6.2 million on sales of $41.6 million, compared with a loss of $4.5 million on sales of $42.1 million for the same period in 1984.

■ Scientific Micro Systems, Inc., a microcomputer manufacturer in Mountain View, Calif., will cut 15% of its staff following the recent consolidation of its manufacturing operations. Scientific Micro Systems posted a $175,000 loss during the first quarter on sales of $8.7 million, compared with a profit of $960,000 on sales of $9.6 million for the same period a year ago.

■ Burroughs Corp., based in Detroit, will trim 300 jobs from its Santa Clara, Calif.-based media products group, formerly a division of Memorex Corp. A Burroughs spokesman said the company will attempt to move the displaced workers to other Burroughs divisions. Burroughs will relocate its 5¼-in. manufacturing operation overseas and its 3½-in. operation to an existing facility in Santa Clara.

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"The Invitational Computer Conferences bring to you the latest high-tech information you need to hear, and the major OEM products you need to see. We'll be there!"

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Celebrating its 15th year, the "OEM Only" ICCs bring you, the volume buying decision makers, together with the key suppliers of computer and peripheral products. The ICCs also bring you a full day of high-tech seminars, explaining the latest in computer product technologies and what they mean to you, the systems design engineer. As an invited guest, there is no charge to attend the seminars or product displays.

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IBM Software Notes
News for the DP professional

Rail car leasing is just one of the financial services supported by the GE Credit Corp. network. IBM's Information/Management helps GECC identify network problems fast.

Information/Management Helps GE Credit Keep Network On Track

"We have happier customers," says Tom Dixon, manager of computing and telecommunication services for General Electric Credit Corporation (GECC) in Stamford, Conn. He is describing the use at GECC of IBM's Information/Management, Version 2—a licensed program that helps manage large data networks.

With assets of $17 billion, GECC is one of the country's largest commercial lenders—active in retail credit, commercial leasing and mortgage banking.

And GECC operates a very large network: one with more than 2,000 terminals. The users, Mr. Dixon's customers, are in GECC field offices, retail stores and GECC client offices. They operate workstations, point-of-sale terminals and credit authorization terminals.

IBM's Information/Management program helps Mr. Dixon's staff use its computer to provide better service to customers. It enables the staff to record and retrieve all the data relevant to any network operating problems: the list of equipment at each site, the details of every communication link, a complete record of every problem occurrence at each site, complete data on every type of equipment used in the network, and a detailed file on each vendor.

These data files can be searched to learn, for example, the history of a particular incident or of all previous occurrences of similar problems.

"We know our customer's environment," Mr. Dixon says. "Over the telephone from GECC's customer support center, we can provide procedures to identify or correct the problem. We can see every change made to the telephone circuit serving that site. We can see all problems on that circuit, year to date. And we can talk to the telephone vendor in specific, geographic terms.

"We're automating ourselves so that our present staff can handle a much larger network and a much greater rate of network change," Mr. Dixon continues. "We're already handling about ten times more devices than two years ago. And we're eliminating paperwork and becoming more responsive.

"Our next step will be to automate the management of network change with Information/Management." ▪

Pacific Northwest Bell Creates Online System Fast

"This is a very large and complex system," says John Osterfeld of Pacific Northwest Bell Telephone Company. "Yet we were able to implement it with 12 programmers—half of them brand-new to programming—in a total of 13 months from preliminary design to an online production system.

"It would have taken at least twice as long without ADF."

Mr. Osterfeld, a system analyst for Pacific Northwest Bell, is referring to IBM's Application Development Facility (ADF). Designed for users of the IMS/VS data base/data communication system, ADF greatly reduces the amount of programming required to create an application.

The programmers, under the technical guidance of Mr. Osterfeld, worked with ADF to develop a new version of the Customer Account Retrieval System (CARS) used by Pacific Northwest Bell representatives to call up account histories while answering customer telephone inquiries.

"We were up against a hard deadline. The application had to replace an older version within 13 months," he continues.

"Fortunately, ADF simplified the IMS programming to the point where we could meet the deadline using some people with no programming experience at all.

"CARS now has several thousand users," Mr. Osterfeld points out, "and a very large data base. In our largest center, CARS handles 350,000 transactions a day—12 per second at peak times. So it is an application with a lot of demand on it. Execution has to be very efficient.

"And this version handles 28 I/O calls per transaction, compared to 20 or less in our previous system.

"In other words, the system as written with ADF is actually more efficient in execution than the conventionally programmed system it replaces." ▪

IBM Software Experts Answer the Call to Keep Systems Running Smoothly

It's 2:00 a.m. You're testing a new application on a tight deadline. Suddenly, something—you don't yet know what—triggers an "abend."

With software, that happens. Each new hardware configuration, new application, or different combination of software releases is a unique environment that may cause a previously hidden problem to surface.

So, to keep IBM intermediate and large system customers up and running, the skills of more than 1,500 software service professionals are always on tap. Part of the IBM National Service Division, these professionals have the full power of special data bases at their fingertips.

You just call a special 800 number. At any time, 24 hours a day, seven days a week, you reach an IBM support center in Chicago, Boulder or Tampa. These locations service IBM's MVS, MVS/XA, DOS/VSE, VM and VS1 system products and the licensed products associated with them. The centers also service licensed products for the Series/1 and the 8100.

Often the IBM Program Support Representative (PSR) taking the call recognizes the problem and gives the customer a remedy. To help the PSR, IBM maintains a data base of symptoms and solutions for known problems. If the problem requires a revision to the code, the PSR has a Program Temporary Fix (PTF) sent to the customer by the fastest possible method—in some cases, by a telephone link.

Over 50 percent of problems are solved by the PSR. But when a problem is a new one, the customer is put in touch with a program specialist, who often is located near the actual developers of the software product.

On the most severe problems—those which have halted processing—the first goal is to find some remedy, such as a bypass, that allows work to resume. The objective is to complete this within 24 hours.

The second goal for the program specialist is a permanent solution. When this requires a new PTF, the objective is to develop and test it within 14 days. The specialist re-creates the problem, functionally tests the new PTF, and then runs "regression tests" to be sure the fix is reliable.

To close the loop, IBM periodically makes available service updates which combine all recent program changes. ▪

To consult a data base of software symptoms and solutions, IBM representatives at customer sites talk by phone to these specialists at the IBM support center in Chicago.

Cross System Product Set–Version 2 Recently Announced

With the recent announcement of Version 2, the IBM Cross System Product Set becomes a strategic productivity tool for large systems, as well as for intermediate and distributed systems. This application generator includes three licensed programs: one for creating applications, one for executing them and a third that permits end users to query the VSAM or CMS files.

The Cross System Product Set runs under all operating systems for 30XX and 4300 systems and under DPPX/SP in the 8100. With this version, support is added for IMS/VS/DB and DL/I as data bases for CICS/VS. In addition, it has been enhanced to run in systems with large networks of terminals.

Simplify MVS Installations

The IBM Custom-Built Installation Process Offering (CBIPO) is a simplified packaging of MVS. A CBIPO can cut the time to install an MVS system or subsystem from weeks to days.

Conventionally, a major system change involves a separate tape, documents and installation procedure for each program product.

With CBIPO, you first select the program products you intend to use with MVS. Then, with an automated process, IBM custom-builds an MVS system consisting of the ordered products in the form of distribution data sets.

The CBIPO also includes customized documentation that provides a step-by-step single installation path.

If you're interested in the growing information needs of business professionals, you'll be interested in *IBM Software Notes for the Business Professional and Manager,* an advertisement in recent business publications that featured these products:

- IBM's Query Management Facility (QMF). QMF is part of Dow Corning's end-user computing program. QMF lets employees do ad hoc queries on relational data bases.
- The Information Facility (TIF). Pratt & Whitney manufacturing experts create computer applications quickly, easily and in plain English.
- Info Center/1 is a new functionally integrated decision support product, combining and enhancing three popular IBM products: ADRS, APL/DI, and FPS.
- The IBM Personal Decision Series (PDS) lets PC users perform a variety of tasks on corporate, departmental or personal data bases.

For literature on these products, check "Business Professional Software" in the coupon at the right.

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Sun Microsystems divides

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. recently announced a major reorganization that will split the company into four divisions. Former Vice-President of Engineering Bernard Lacroute has been promoted to executive vice-president and is responsible for all four divisions.

The Workstation division will continue to concentrate on the engineering, manufacturing and marketing of the existing Sun Microsystems product line of workstations for technical and scientific users.

The reorganized Software Products division will be responsible for the continuing development of Sun Microsystems software products, according to the firm.

The East Coast Engineering division was formed with the purpose of establishing and running a Sun Microsystems technology center on the Eastern seaboard.

The Federal division, housed in a new facility in Milpitas, Calif., will address the special manufacturing and marketing needs of Sun Microsystems products to government organizations through both direct sales and OEM channels.

The Software Products division will be headed by former Director of Software Engineering Eric E. Schmidt and the Federal division by former Vice-President of Operations Russell Bik.

GROWTH

from page 85

inflated the revenue figures. The growth rate slowed to the 19% level by the end of the year; throughout 1984 user expenditures rose to $39.9 billion from $32.2 billion the year before.

Not all segments of the industry have shared equally in the expansion. Software products companies, whose revenues grew 30% in 1984 compared with 41% in 1983, benefited the most. Software product revenues amounted to $10.4 billion in 1984.

Processing services companies, which include facilities management, remote and batch processing, distributed data processing, time-sharing and network services, grew 18% in 1984 compared with 17% in 1983. Professional services companies grew at comparable rates in both 1983 and 1984. They include systems design, programming, consulting, education and training and installation services.

Processing services amounted to $15 billion in revenues in 1984, and professional services amounted to $8.6 billion.

Turnkey systems, where a firm offers a combined hardware and software solution to a business problem, grew 32%, compared with 21% in 1983. Turnkey system revenues amounted to $5.9 billion last year.

Vendors have engaged in "too much hype," creating disbelief among potential buyers of new products. Cunningham cited microcomputers and AT&T's Unix operating system as examples.

Manufacturers, believing the good times were rolling, overstocked their inventories. "[Intel Corp.] representatives visited several customers and were distraught at the amount of inventory people were sitting on," Cunningham said.

The need to resolve questions of communications and integration before buying more technology has led to many more people getting involved in purchasing decisions. And more people means slower decision-making, he said.

The skepticism in the marketplace has been joined by doubt over what the economy will do next.

"When you have a lot of uncertainty, people don't like to make decisions," he added.

ADAPSO

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have it," Chichester said.

Users are also more frequently purchasing multiple applications from the same vendor. In 1981, according to the Focus Research survey, Management Science America, Inc. (MSA) had sold 1.5 packages per user for the five financial packages surveyed. In 1983, MSA's sales of packages rose to 2 per user, and in 1985, to 2.4.

McCormack & Dodge Corp. had sold a similar 1.2 packages per user in 1981, 1.4 in 1983 and 1.9 in 1985. Cullinet Software, Inc., which only recently started offering financial applications, sold 1.9 per user in 1985, Chichester said.

The number of unit purchases has peaked, but the purchase size is growing as users buy multiple applications packages, he said.

To succeed in the face of these trends, Chichester said, software houses will have to integrate families of applications to make them more attractive to users, publish special editions of packages for particular industries, use speedier development techniques to get packages to market more quickly and provide easy-to-access, "borderless" information for users.

RESEARCH

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have higher expectations today. They ask more technically sophisticated questions." And, even with 25 divisions, there are still holes in Dataquest's information, according to Jorgensen.

Dataquest's growth plans include refining industry demographics and launching new business and telecommunications systems divisions during 1986, Jorgensen said.

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RAND SYSTEMS CORPORATION
7071 Orchard Lake Road, Suite 305
West Bloomfield, MI 48033
(313) 855-6877

All replies held in strict confidence

NATIONAL UNIVERSITY OF SINGAPORE

DEPARTMENT OF INFORMATION SYSTEMS & COMPUTER SCIENCE

THE POSITIONS AND THE REMUNERATION

Applications are invited for teaching appointments in the Department of Information Systems and Computer Science. Candidates should have at least a Master's degree with either teaching experience in a tertiary institution or relevant industry experience. The commencing annual salary will depend on the appointee's qualifications and experience and the level of his appointment:

Lecturer	S$50,470 - 88,010 p.a.
Senior Lecturer	S$59,800 - 105,850 p.a.
Associate Professor	S$92,730 - 127,720 p.a.

(US$1 = S$2.21 approximately)

Benefits that will be provided include:

*Subsidised housing
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*Leave and medical benefits
*Contribution by the University to a pension fund at the current rate of 25% of gross monthly emoluments, subject to a maximum of S$1750/-per month.
Amount standing in appointee's credit may be withdrawn on leaving the University's service.

The contract is normally for a period of three years and renewable.

Successful candidates will be required to lecture on courses in information systems which include the following:

*Information Analysis
*Structured Analysis and Design
*Software Engineering
*Data Base Management Systems
*Decision Support Systems
*Design of On-Line Systems
*Office Automation
*Information Systems Planning

They will also be required to supervise student projects and assist in on-going curriculum development.

The positions provide opportunities to engage in research activities to be undertaken jointly by the Department and industry, and/or approved industrial consultancy.

SINGAPORE

Singapore is the commercial, financial and industrial hub of South East Asia. With a per capita income second to Japan in Asia, Singapore has all the facilities of a modern city inclusive of foreign schools, hospitals, communication and air transportation.

It is striving to evolve into a high-technology centre for software research and development.

THE UNIVERSITY

The University which is highly regarded as one of the best centres for learning in Asia admits about 20% of its students from the surrounding countries to give it a cosmopolitan environment. With a student body of over 13,000 and a staff strength of 1300, it is one of the best staffed universities in Asia.

The campus occupies approximately 150 hectares of one of the most scenic areas in Singapore.

THE DEPARTMENT

The Department, which has an annual output of 200 graduates, offers courses leading to a BSc degree, a BSc (Honours) degree and an MSc degree. Since 1978, it has produced 626 graduates in Computer Science. Based on the curriculum recommendations of ACM, IEEE and BCS, and substantial input from the local computer industry, the undergraduate curriculum provides for two major streams of study: Information Systems and Computer Science.

Computing facilities include the Department's own VAX 11/780 and business mini-computer system. In addition, the Department is a major user of the 12-MIPS, 16 megabyte IBM 3081GX mainframe computer system of the University's Computer Centre. The Department is in the process of acquiring facilities which will at least quadruple the present computing power. These additional facilities, which will be installed in the next two to six months, are part and parcel of the Department's plans to continually upgrade its facilities. The office of each academic staff is equipped with an IBM PC-based workstation which is connected to both the IBM 3081GX and the VAX 11/780 systems.

There are four teaching laboratories in the Department: Logic Lab, Micro Lab, Information Systems Lab and Data Communication/Computer Networks Lab. A million-dollar teaching/research laboratory in expert systems is currently being set up. Current research interests include: artificial intelligence, local area networks, software engineering, database management, microcomputer applications, office automation and theoretical computer science. Other areas are being developed. Research grants for fundamentals as well as applied research are available.

The present academic staff strength of 47 will be increased to 64 by 1986.

Application forms and further information on terms and conditions of service may be obtained from:

The Director
Personnel Department
National University of Singapore
Kent Ridge
Singapore 0511

Mr. Peter Lim
Director, North America Office
National University of Singapore
780 Third Avenue, Suite 2403
New York, NY 10017, U.S.A.
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NEW ENGLAND

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111 Pearl St., Hartford, CT 06103
(203) 278-7170
930 Turks Head Bldg., Providence, RI 02903
(401) 274-8700

Client Companies Assume All Fees.

Data Processing

DIRECTOR OF INFORMATION SERVICES

Saint Xavier College invites applications and nominations for an immediate opening for a key management position melding information and computer resources services. Reporting to the President, the Director serves on the central Administrative Council.

Principle responsibility consists of formulating and implementing plans to cover both administrative and academic computing hardware and software. Included would be the development and utilization of information processing technology in management, planning, and research systems, and the establishment of local and area communications networking.

Qualifications: proven organizational, communications and interpersonal skills; an awareness of current trends in information and computer technology; an ability to serve the needs of administrative, faculty and student users; and experience with DEC VAX 11/750 (VMS). Desired: experience with COMPASS or other administrative data base system and with integrating micro-processors into central computing resources; an advanced degree; and five or more years in a supervisory position.

Saint Xavier College currently operates a VAX/750 (VMS 4.1), with twelve academic and sixteen administrative terminals; seven DECmate word processors in both stand-a-lone and interactive mode; thirteen Apple and four IBM personal computers; and communications to off-campus sites.

Application: send letter of application, resume, and three names of references to: Office of Personnel Services, SAINT XAVIER COLLEGE, 3700 W. 103rd St., Chicago, IL 60655

Resumes will be accepted until the position is filled. Affirmative Action, Equal Opportunity Employer

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HOTSITE®, a fully-equipped IBM 4300 facility dedicated to disaster recovery, is seeking an aggressive, sales-oriented individual with two years of field marketing experience as well as good communication and presentation skills. Must have technical knowledge of IBM 4300 computer and related hardware. Some travel involved. Bachelor's Degree required. Prior experience with disaster recovery planning in the financial and manufacturing industries will be a plus. For more information, contact John D. Butch at 216/652-6624, or send resume to:

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1000 Warren Ave.
Niles, OH 44446

PROGRAMMERS/ SYSTEMS ANALYSTS

John [illegible] & Associates, a national search firm representing Fortune 500 clients, is seeking D.P. Professionals who are moving up.

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IMS and/or CICS, COBOL and 3 or more years of experience in an IBM OS environment with good financial applications experience are necessary. Small city environment — excellent benefits, rapid advancement.

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These positions require Assembler/CICS or COBOL/CICS in an IBM OS environment. 2+ years of experience are also necessary for this new insurance project. Mostly development.

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Requirements include 2+ years of IMS DB/DC applications in an IBM OS environment. 50% development and analysis.

Send your resume/salary requirements in confidence to: JOHN [illegible] & ASSOCIATES, [illegible] Road, Ste. 300, Arvada, CO [illegible], or call collect (303) [illegible]-4472. Company pays our fee and full relocation.

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This position requires substantial VM/SP systems experience; good programming skills and CP internals knowledge is essential. Beyond that, however, what you can do is more important than what you have done—we want ability and the willingness to work hard rather than a great resume. If you think you'd fit, please write to:

VM Systems Group Incorporated
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Arlington, VA 22204

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Major midwest financial services firm has 2 key openings in technical services due to expansion of sites, one in data base administration, the other in performance/capacity planning mgmt. Requires management experience in either IBM data base (ADABAS a plus) or MVS internal areas. Call Mark David or Tim Smith at (612) 339-9001.

ROBERT HALF
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3535 IDS Center
Minneapolis, MN 55402

Data Processing

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Two or more years in the design or development of business systems in COBOL or PL/I could open the door to a challenging, fast-track career with a leader in the data processing services industry.

Opportunities exist for talented analysts and programmers who want to be part of a winning team. We offer performance based growth opportunities; a large scale network of IBM mainframes; and an organization dedicated to the integration of "leading edge" technologies including LANs, local/personal computing, voice and data integration and fourth generation languages.

Salary commensurate with experience. Excellent benefits package including stock purchase plan. Send resume in confidence to:

P.O. Box 84315
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Troy, MI 48084

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Person needed to evaluate, modify, implement and develop software for IBM-PC-XT. Requires M.S. in Computer Science or closely related area and two (2) years applied Computer Science experience. Location: Columbia, Missouri. Salary commensurate with experience.

An excellent fringe benefit program includes life and medical insurance, liberal holidays, vacation and retirement plan.

Contact Missouri Department of Conservation, Personnel Section, P. O. Box 180, Jefferson City, Missouri 65102 (314/751-4115) by July 19, 1985.

Equal Opportunity Employer M/F

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To design advanced architectures for microprocessor boards, communication systems to link computers, and file servers to increase the speed of secondary storage devices, and other products to build intercommunicating work stations. Must have M.S. in Electrical Engineering. Forty hours per week, 8 a.m. to 5 p.m., Monday through Friday. Annual salary $28,000. Send resume to Mildred McGill, Ohio Bureau of Employment Services, 3135 Euclid Avenue, Cleveland, Ohio 44115. Job order number 0302[illegible].

State University of NY College at Plattsburgh is seeking a Technical Specialist in the office of Instructional Engineering & Maintenance. Primary Duty: To maintain and repair computer equipment - including micro-computers, terminals, modems, printers and other peripherals. Additional duties include maintenance and repair of TV and audiovisual equipment. Qualifications: Associate Degree in Digital Technology or equivalent. Send resume and three reference letters to:

[illegible], Director,
Instructional Engineering & Maintenance
c/o Ms. [illegible] Miller,
Director of Personnel
and Affirmative Action
Box 700, SUNY Plattsburgh
Plattsburgh, NY 12901

Applications will be accepted until qualified candidate is found. An Equal Opportunity/Affirmative Action Employer.

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A leading Southeastern firm is seeking an individual knowledgeable in "BASIC" software, in [illegible]. Project leadership abilities desired.

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Atlanta, GA [illegible]
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BOEING

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Data Processing

I D M S

CTG is a twenty year old software Consulting Company with branch offices in 41 cities and annual revenues approaching $100 million.

The rapid expansion of our list of IDMS clients in the Southeast has created challenging assignments for software professionals with experience in the Cullinet IDMS Family Of Software Products.

We currently have positions for Programmers, Analysts, or DBAs with a minimum of one year of IDMS experience. Candidates with at least six months of ADS/O experience are of particular interest. We are also interested in talking to growth-minded professionals with any IBM DBMS experience who would be interested in learning IDMS, at our in-house educational facility. Positions are available in: Atlanta, Baltimore, Charlotte, Ft. Lauderdale, Greenville, S.C., Miami, Nashville, Orlando, Raleigh, Tampa, Washington, D.C., Winston-Salem.

To find out for yourself about the unique career options, technical training lifestyles and attractive compensation and benefits package that await you at CTG in the Southeast, write or call immediately: COMPUTER TASK GROUP, INC., S.E. Regional Headquarters, 100 Colony Square, Suite 2010, Atlanta, GA 30361, (404) 881-6152 (COLLECT).

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CTG

BANK SYSTEMS ANALYST

The Chittenden Bank has an immediate opportunity for an experienced professional to coordinate and support the implementation of data processing projects. This will involve working directly with all levels of management to develop technical specifications, interface with the programming department and monitor testing efforts during implementation.

Candidates must possess experience in systems analysis within a banking environment combined with two to three years of programming experience and project management skills. In addition, exposure to microcomputers helpful. Degree preferred. Qualified applicants please respond, in confidence, with resume and salary requirements to:

The Chittenden Bank
Attn: [illegible]
Employment Manager
2 Burlington Square
Burlington, VT [illegible]

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Chittenden
BANK

ALASKA

Providence Hospital is a [illegible]-bed hospital serving patients throughout Alaska. Current [illegible] and expansion to a [illegible]-bed facility has [illegible] our [illegible] for the positions of Information Systems Manager and Systems Analyst. Applicants should be familiar with the DEC VAX Operating System, [illegible] VS Operating System, [illegible], COBOL, [illegible], communications protocols, graphics, statistics and fourth generation languages with proven experience in project management.

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Must have a Bachelors degree in Computer Science or related field and a minimum of 3-4 years managerial experience, 2 years of which must be in a hospital. Responsibilities include management of data processing, systems analysis, and data entry in a [illegible], [illegible] communications and [illegible] center environment.

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Must have a Bachelors degree in Computer Science or related field and 3-4 years experience as a Systems Analyst, 2 years of which must be hospital financial experience. Must be capable of analyzing user needs in the health care environment, creating manual and computer based solutions, writing and testing software, training users, and maintaining the system.

Providence Hospital is located in Anchorage, which enjoys a moderate climate and [illegible] recreational opportunities. Excellent salary and benefits package, relocation assistance provided. Submit resume and salary history to Cathy Allen, Personnel Assistant, Providence Hospital, [illegible] Providence Drive, Anchorage, AK [illegible], (907) [illegible]. An Equal Opportunity Employer.

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[illegible]

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[illegible] Forsyth Blvd.
St. Louis, MO [illegible]
(314) 727-[illegible]

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Bachelor's degree in Computer Science, Math, Business or related field. Minimum 3 years experience in Computer Programming and Systems Analysis with at least 1 year experience in Data Base design and analysis. $2,[illegible] - $3,[illegible].

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Bachelor's degree in Computer Science, Math or Business and/or 2 years experience in Programming with some analyst duties. $2,[illegible] - $2,[illegible].

SYSTEMS PROGRAMMER

Bachelor's degree in Computer Science, Math, Engineering or related field. Minimum 3 years experience in Computer Programming and systems analysis with at least 1 year experience in Systems Programming. $2,[illegible] - $3,[illegible].

Apply by July 11, 1985 at San Joaquin Delta College, Personnel Office, Administration Building, Room [illegible], 5151 Pacific Ave., Stockton, CA [illegible]. AA/EOE.

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Call Maggie Lipton, 212-[illegible] or
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DATA PROCESSING

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Northrop provides our employees a competitive, comprehensive benefits package. Please send your resume to: Bill Hargan, Northrop Advanced Systems Division, Employment Office, Dept. CW 674, P.O. Box 1138, Pico Rivera, CA 90660-0677.

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A minimum of five years' audit experience in EDP Operations, preferably IBM, plus knowledge of computing and data communications hardware and software is required.

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Lockheed-Georgia Company
Professional Employment
Dept. 90-31-432
Marietta, Georgia [illegible]

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POSITION ANNOUNCEMENTS

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Qualified candidate shall have a Computer Science degree or equivalent experience, plus five years of systems analysis/programming. ANSI COBOL experience required. CDC 6400 and Scope 3.4/NOS Operating System experience desired but not essential.

Kwajalein offers an opportunity to enjoy sailing, fishing, scuba diving, golf and many other amenities. We offer annual paid vacation with transportation to point-of-hire and an opportunity for overseas U.S. Tax Exclusion. Bachelor and/or family housing are provided at no cost. The Kwajalein schools are fully accredited, K-12. U.S. Citizenship is required. Interested candidates should forward resume and salary requirements to:

Kathy Ringwood
Global Associates, Dept. [illegible]
P.O. Box 12185
Oakland, CA 94604-2185

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Global Associates

PROGRAMMER/ ANALYST

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Duties will involve the design and implementation of business systems in a multi-plant environment. Candidates should possess an Accounting/Business degree or equivalent with three or more years experience on a system 38 using RPG III. Prior working experience with RPG II on systems 34 or 36 would be a plus.

We offer a competitive salary, excellent fringe benefits and the opportunity to develop your professional skills. For confidential consideration, please send your resume including salary requirements to:

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BROCKWAY STANDARD, INC.
[illegible] Roswell Road
Building 2 — Suite 100
Atlanta, GA 3033[illegible]

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Personnel Director
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COMPUTER CONSULTING GROUP
3700 Forest Drive Suite 405
Columbia, SC 29204
[illegible]-1273 or [illegible]-1994
ATTN: Diane Williams

PROGRAMMING MGR.

Hi tech mfr. in Western NY seeks dynamic prog. mgr. for growing DOS/VSE MIS Dept. Req. min. 2 yrs. mgmt. exp. + BA/BS degree. Must be a team player & be effective at developing young prog. staff. Great co. - superb suburban location. To $55,000.

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OF BUFFALO, INC.
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1310 Liberty Building
Buffalo, NY 14202
(716) 842-0801
Personnel Agency

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COBOL/INFOS AOS (/VS) experience required. Project leadership preferred. Commercial/manufacturing DG MV series applications helpful.

Furniture manufacturer located in the Blue Ridge mountains of southwestern Virginia. Excellent living environment. Competitive salary and benefits.

Qualified applicants only. Send resume to:

The Vaughan Furniture Company, Inc.
Sr. V.P., Administration CW824
P.O. Box 1489
Galax, Virginia 24333-1489

SENIOR SYSTEMS PROGRAMMER

WVNET is the computer network of seventeen colleges and universities of West Virginia. The computers located at the central site are a VAX Cluster of four 11/785's, a PDP-11/44, an IBM 3081/D, an AMDAHL V7/A, and a UNIVAC 1100/80. PDP-11/44's and VAX's are located at the schools. WVNET is seeking a Senior Systems Programmer to assist in supporting the VAX Cluster and RSTS/E on the PDP's. The position requires a Bachelor's degree and two years of DEC operating systems programming experience preferably with VAX/VMS and RSTS/E. Experience with DEC-to-IBM networking and DECnet is desirable. Salary: low 30's plus excellent benefits. Apply by July 19, 1985 to: [illegible], Personnel Manager, WVNET, 837 Chestnut Ridge Road, Morgantown, WV 26505. Phone (304) [illegible]. An Equal Opportunity Employer.

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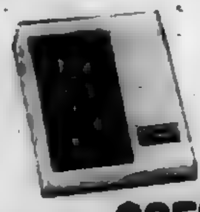

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4331-11	0.38	1 to 2	[illegible]	4.3	4 to 16
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4361-5	1.45	2 to 12	3081D	10.0	16 to 32
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4341-12	1.65	2 to 16	3081GX	11.9	16 to 64
3031AP	2.0	2 to 8	3081K	14.0	16 to 48
4381-1	2.1	4 to 16	3081KX	15.5	16 to 64
3032	2.5	2 to 8	3084Q	25.6	32 to 96
4381-2	2.7	4 to 32	3084QX	28.7	32 to 128
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3083CX	3.3	8 to 32	†3090-400	52.0	128 to 384

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5850	11.8	16 to 64
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AS 9070	15.2	16 to 64
AS 9080	20	16 to 64
†AS XL-60	20	32 to 256
†AS XL-80	30	64 to 256

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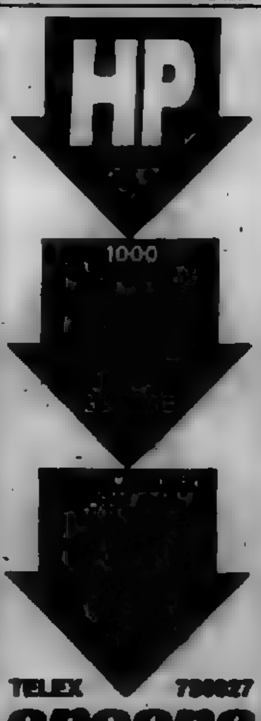

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The bid package will be available o/a August 2, 1985. A pre-bid conference will be held on August [illegible], 1985 at 10 a.m. at the Chester County Courthouse, Fifth Floor, High and Market Streets, West Chester, PA [illegible]. Proposals are due August [illegible], 1985, and the contract is scheduled for award by September 17, 1985.

A bidders list is now being prepared. Please address bid-package requests and questions regarding this procurement to [illegible], Purchasing Coordinator, Office of Commissioners, County of Chester, at the above address, or call him or [illegible] at (215) 431-[illegible]. Also, see Chester County ads for related procurements in June 24 issue of Computerworld.

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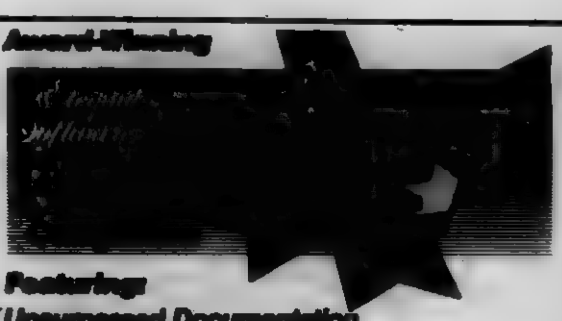

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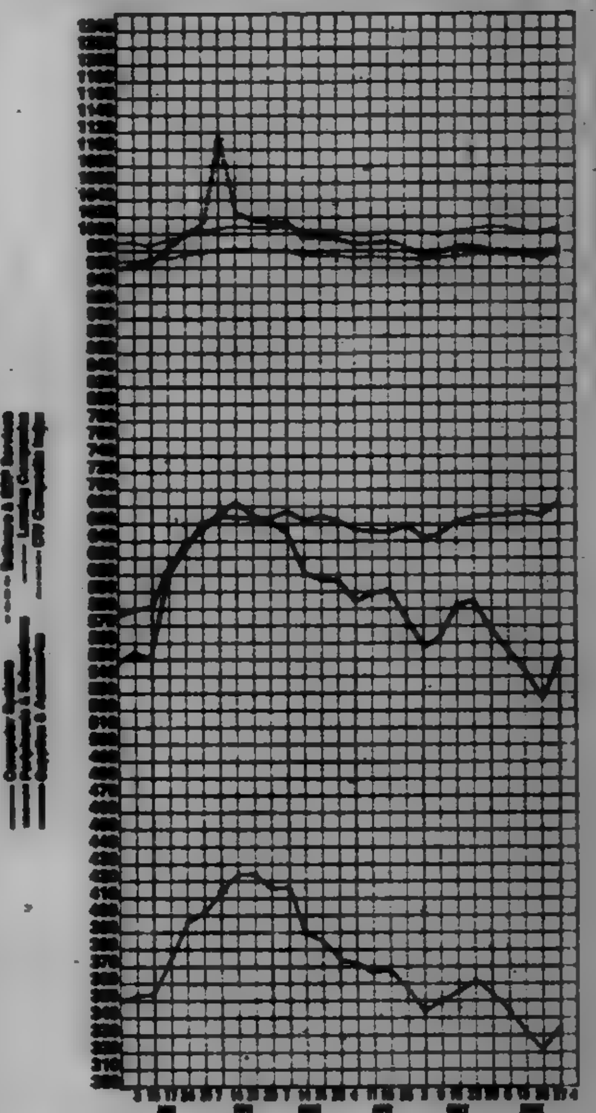

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CLOSING PRICES WEDNESDAY, JUNE 26, 1985

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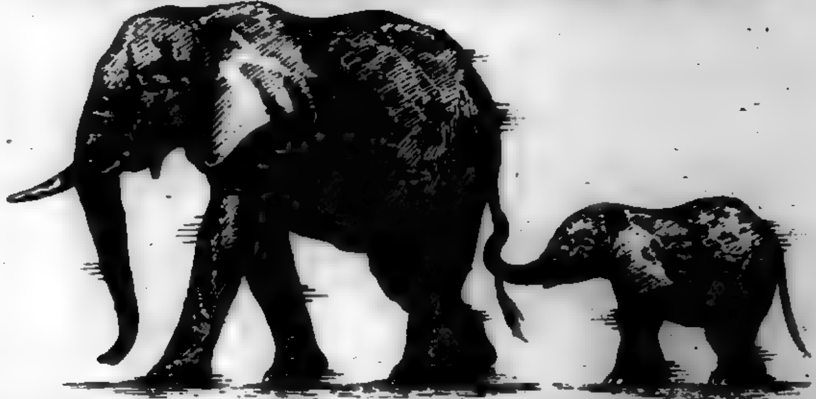

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Users divided on System/38 bug complaint

By John Desmond
CW Staff

KNOXVILLE, Tenn. — A power failure hit the Dataman, Inc. real-time service bureau here recently just after an IBM System/38 user had invoked the transfer control command, a feature that can improve CPU efficiency.

When the power returned, the user's terminal came back with a different screen. With a little fiddling, a technician learned the terminal had defaulted to a command-entry screen, which appeared to bypass the System/38's security systems and give the user more than his allowed authority. Dataman President Glen McCown said he believed his shop had accidently uncovered a bug in the System/38's CPF operating system.

"When you get on this command-entry screen, which is tragic enough, it has some bizarre authority," McCown said. "You can get into any user's source modules, change them and recompile them." McCown wants IBM to change its operating system to prevent this default to a higher authority. He maintained that IBM's documentation does not clearly state that a power fluctuation can bypass system security.

But the issue is a divisive one in the System/38 community. Members of two IBM users groups and IBM itself acknowledge that the system can default to a command-entry screen and bypass certain security measures. But the parties disagree on who should be responsible for preventing the default.

See S/38 page 4

Reagan systems security directive under attack

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — U.S. Congress members and others warn that a little-noticed presidential directive on computer security may give U.S. military and intelligence officials too much control over computer security at civilian agencies and in the private sector.

The controversy concerns National Security Decision Directive 145, which President Reagan signed last September but which is only now getting congressional and public scrutiny.

"My concern is whether this directive concentrates too much power in the National Security Agency over civilian areas," Rep. Dan Glickman (D-Kan.) said recently as he opened the first congressional hearing on the directive.

NSA and U.S. Department of Defense officials said the security directive is needed to curb the flow of sensitive information — including U.S. business and economic data — from highly vulnerable U.S. computers to adversaries. They said the NSA's role is appropriate because of the agency's technical expertise in information security.

But critics, such as Rep. Jack Brooks (D-Texas), the Institute of Electrical and Electronics Engineers, Inc. and the American Civil Liberties Union, questioned the broad scope of the directive and the leading role given to the military and intelligence communities.

The stated objective of NSDD 145 is to ensure the security of telecommunications and computer systems that process classified and sensitive government information and to provide security assis-

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TOP OF THE NEWS

Big brother is coming. A survey of IBM 3080 sites revealed extensive plans to dump some of the older mainframes once Sierra rolls off the line. **Page 2.**

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Running the micro-mainframe gauntlet. Micro-mainframe links must survive rigorous testing to make the grade in a GM laboratory. **Page 8.**

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AT&T will work harder than ever to free itself from regulatory constraints in the wake of IBM's plan to acquire 16% of MCI. **Page 9.**

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ADR strengthened its micro offerings with an enhanced version of its micro-mainframe link and integrated personal computer software. **Page 11.**

■

Thanks to a $3 million grant from IBM, the University of Texas will offer an MIS concentration to MBA candidates starting next fall. **Page 12.**

FYI

Users, vendors facing up to break-ins

Agencies' hacker troubles blamed on bulletin board

By Paul Korzeniowski
CW Staff

Adolf Cecula's worst fears were realized one night last August when a hacker brought down a computer at the U.S. Geological Survey in Reston, Va.

Cecula, information security administrator at the agency, reported that a hacker accessed the computer through the agency's connection to the Arpanet network, a packet-switching network operated by the U.S. Department of Defense. "The hacker probably learned of the telephone number and an entry-level password from a bulletin board," Cecula said.

The USGS has experienced four such incidents in the last year. Those incidents — and a growing number of others in the private and public sectors — indicate that hackers and bulletin boards are a common problem for government and commercial security administrators.

What made the most recent USGS case distinctive was that the hacker disrupted a system. Once in the network, the hacker located and found a default account. A default account is set up

See HACKER page 15

Product features reflect effort to enhance security

By Paul Korzeniowski
CW Staff

In reaction to threats from hackers or as part of evolving product lines, vendors have filled some security holes in their products.

"In our latest release of VMS, we incorporated a number of security features in response to hackers," said Peter Damon, VMS systems software marketer for Digital Equipment Corp. "After reading of cases from the newspaper or hearing from customers, we traced some cases and designed features to solve some problems."

One VMS item is an audit trail that tracks the number of times someone unsuccessfully tries to access a system. Most audit trails track only those resources users work with after they gain access to the system. The new trail serves as a red flag to security administrators. "A security administrator will notice a lot of activity at one account," Damon said. "It could be a hacker trying a random password method of cracking an account."

Another feature helps a security administrator confuse a

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NEWSPAPER

Users planning to dump 3080s

Will make room for Sierras soon to roll off IBM lines

By Tom Henkel
CW Staff

FRAMINGHAM, Mass. — Despite IBM's insistence that its 3080 series is not a dying line of mainframes, users do not appear to be buying either the notion or the processors.

A recent survey of 860 3080 mainframe sites by International Data Corp. (IDC), a market research firm here, revealed that the users planning to get rid of their 3080s strongly outnumber those planning to buy new ones. Most who said they will dispose of a 3080 seemed to be eyeing IBM's newer 3090 line as a replacement.

More than 40% of the users polled said they have already placed 3090 Model 200 orders for delivery in the next 20 months. However, IDC noted that, traditionally, not all users who place an order for IBM mainframes actually accept delivery of the machines.

The firm also pointed out that its survey did not take into consideration current users of IBM 4300 and 3030 series systems, who might influence overall 3080 sales. Furthermore, the survey did not explicitly ask 3080 users about their field-upgrade plans.

Users of 3081s most interested in 3090s

The group most interested in the 3090 are users of 3081 CPUs. Of the 365 3081 users polled, 110 said they have either ordered or plan to order a 3090. In terms of actual orders, IDC said 3081 users have placed 163 orders for 3090 Model 200s and 32 orders for Model 400s. The 3081 users polled said they plan on removing a total of 100 3081 CPUs to make way for 3090s. Some 3081 users, however, still intend to install additional 3080 processors. Of the group polled, 21 3081 orders have been placed, and 12 orders for the 3084 processors are planned.

There are a number of 3084 users who said they have placed orders for the 3090 Model 200. IBM, in its February introduction of the 3090 series, stated that the Model 200 offers roughly the same internal performance of the 3084 Model QX. But of the 135 3084 users polled by IDC, 71 said they have placed or plan to place a 3090 order. The survey said the 3084 users have placed 158 orders for 3090 Model 200 processors and 41 orders for the larger Model 400 processors.

Far fewer users of the smaller 3083 CPUs said they are planning to buy a 3090. Of the 293 3083 users polled, only 12 have either placed 3090 orders or indicated they were giving the idea serious thought.

In terms of orders, 3083 users accounted for a total of 16 3090 Model 200 processors, and none have placed orders for the Model 400. But 3083 users did not appear to want to buy larger 3080 series processors, either. Of the 3083 sites polled, only 15 3081 orders had been placed, and only one user will add a 3084. Orders have been placed for eight 3083s, according to the survey.

Market ripe for uniprocessor 3090

The sluggish demand for larger 3080 machines by 3083 users makes the market ripe for the introduction of a uniprocessor version of the 3090, a machine IDC assumes will be called the 3090 Model 100.

"But history suggests that deliveries [of the Model 100] won't begin until mid-year 1986 at the very earliest," IDC said, noting that 1987 will probably be the peak year for 3090 Model 100 shipments.

Aside from the increased deliveries of 3090 Model 200 processors planned for the fourth quarter, 1985 appears to be a wash for IBM in terms of mainframe sales, but 1986, especially the first half, will be much better, IDC predicted.

History repeating itself

The upshot of the survey, IDC said, is that history is repeating itself. IBM traditionally experiences slumps in current-model mainframe sales every time it introduces a new line. IDC said similar slumps have occurred in 1965, in 1970, from 1976 to 1977 and in 1981.

Furthermore, the firm said, the current slump does not appear any worse than those of the past but has been exacerbated because this time IBM does not have the huge base of users leasing hardware to help soften the blow.

Potentially bad news for IBM is the high number of used 3080 CPUs that are being dumped on the market. This imbalance, IDC said, could lead to a strong downward pressure on 3080 residual values.

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The IBM-MCI alliance may put pressure on the FCC to loosen the regulatory separation between customer premises equipment and basic telephone service/9

A first user of the Wang Laboratories' Wang Office system finds that executives can use it right from the start/10

Applied Data Research strengthened its micro software offerings with an enhanced version of its micro-mainframe link and integrated micro software/11

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After IBM announced its Cabling System last May, Standard Oil of Ohio evaluated it but decided to stick with a plan to use twisted-pair cable in a private branch exchange network for its new 45-story headquarters in Cleveland/13

Bill Landreth, claiming that he and others accessed more than 800 computer systems in a four-year period, told how it was done/14

Multimate will offer its word processing software on IBM's System/36, mainframes and various minis/16

Users in Fortune 1,000 firms will reap cost benefits as long-distance carriers provide enhancements to their services/18

A survey of large companies found that salaries for top computer executives rose 20% from last year, while the decentralization of data centers expanded the number of DP management positions/19

A firm's manufacturing division cut its lead times in half and its inventory levels by one-third with a manufacturing software system/22

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WHODUNIT

Sortland Yard warns against "Raffles-type sort programs."

Call (201) 568-9700.

Ask for Inspector SyncSort!

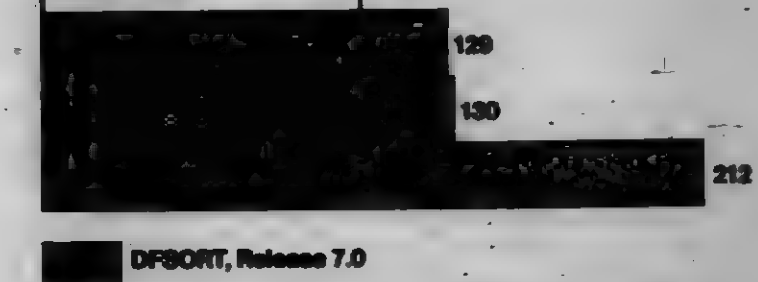
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied. "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

syncsort INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

BUG

from page 1

The founder of the Northeastern System Thirty-Eight Users, Inc. (Nesta) said certain additional coding can prevent an ordinary user from obtaining higher level authority. The System/38 hot-line coordinator for Common, the IBM users group, believed that the user has discovered a fault in his own security and not in IBM's code. An IBM spokesman said, "The System/38 does not have a data security problem."

McCown said that while the authority of the command-entry screen was considerable, it was not equal to that of the security officer, who has the highest level of access on the system. McCown said he was not able to execute a command that displays all users' passwords, which the security officer is allowed to do. But McCown said he was able to recompile and delete a program from the command-entry screen. The user profile he accessed should not have been capable of such a deletion, he said.

"Clearly this is not what IBM intended. There is no way in the world that all the System/38 users around the world have spent the money and time to build security systems to have them mean absolutely nothing," McCown said.

IBM's customer service representatives here have told McCown to avoid the problem by not using the transfer control command. According to McCown, they said the problem was not unexpected after a power fluctuation and thus is not a bug. "That is patently absurd," McCown responded. "They're obviously avoiding the situation." McCown said IBM previously encouraged use of transfer control, both in the command language manual and in the programmer's guide.

Serious implications

The implications of the security breach are significant, in McCown's view. "We all know the capabilities of the so-called hackers all across the country and what they can pull off not knowing anything. This baby puts you halfway into the heart at first blush," he said.

The existence of the default to a command-entry screen was verified by Gary Keith, vice-president of Magnatron, Inc., a software firm based here specializing in System/34, 36 and 38. For the security breach to occur, Keith said, a user would have to time a fluctuation of the terminal's power just right.

Keith said System/38 programmers are not generally aware of the default procedure. For IBM to make systems programmers responsible for avoiding the potential breach is outside the philosophy of the System/38's CPF operating system, he said. "That type of responsibility is typically not put on us. In my opinion, the problem is a security breach of the command-entry screen. [IBM] has chosen to lay the responsibility on us as programmers to solve the problem. That's a typical response, but I don't think it's appropriate," Keith said.

The System/38 hot line coordinator for Common, Gene Gellman, director of information services for Cyro Industries of Sanford, Maine, said he finds the existence of the security breach hard to believe. "I maintain that what this person has found is a breach of his own security and not a problem with IBM's code. I see no reason why going to a command-entry screen is a problem from a security point of view."

William Petrone, founder of Nesta and director of technical services for Computer Software and Services, Inc. of Spencer, Mass., said it is possible for a user to obtain higher authority on a command-entry screen, but he does not consider that a bug. "I don't consider that a flaw, because transfer control is basically [there] to help the user. IBM is probably reluctant to change that, because no one has complained about it."

Error-handling program recommended

The IBM spokesman said the System/38's operating system, as delivered, will sign off a user after a power fluctuation. The system interprets the power fluctuation as an error. IBM recommends that users write an initial program to handle errors. But by doing so, the user can inadvertently revert to a command-entry screen after a power fluctuation, the spokesman said.

Nevertheless, IBM is reluctant to change the recommendation to write an initial program. "We don't want to preclude any of the user's options. But the user needs to be aware of what can happen if certain options are chosen," the spokesman said.

Gellman said he would not want the default sequence reported to IBM as a bug. "I don't want IBM to deal with it, because they take away your flexibility when they do," he said.

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Sale of Harvard Software set

MOUNTAIN VIEW, Calif. — Software Publishing Corp., the publisher of the PFS line of microcomputer software products, announced last week an agreement in principle to acquire Harvard Software, Inc. of Littleton, Mass. No price had been disclosed at press time.

The acquisition is subject to the approval of a definitive agreement by both boards of directors. Harvard Software developed and markets Harvard Project Manager and Harvard Total Project Manager.

Fred Gibbons, president of Software Publishing, which had revenue of $23 million and profits of $3.2 million in 1984, said the Harvard Software name is a leading brand in project management software.

Shakeel Mozaffar, vice-president of marketing for privately held Harvard Software, said the formal details under which the company will be acquired have not yet been finalized. He said Harvard Software had about 50,000 packages installed by the end of 1984.

According to Mozaffar, Harvard Software had captured about 50% of the market for project management software among Fortune 1,000 companies and needed "fundamental access to the low end of the market."

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Reagan DP security mandate raises congressional ire

Measure said to usurp legislators' authority

WASHINGTON, D.C. — President Reagan's controversial directive on computer security created an elaborate policy-making organization to provide governmentwide direction on telecommunications and computer security.

National Security Decision Directive 145 (NSDD 145) established a four-part organization as follows:

- T Systems Security Steering Group, chaired by the president's national security adviser, to provide overall direction.
- The National Telecommunications and Information Systems Security Committee (Ntissc), a panel of 22 agency heads that considers technical questions and sets policy.
- The Executive Agent, who is the secretary of defense.
- The National Manager, who is the director of the National Security Agency (NSA) and who implements the Ntissc's policies.

Warren G. Reed, director of the information management and technology division of the U.S. General Accounting Office (GAO), said a positive feature of the organization is that it provides the central leadership on computer security previously lacking in the federal government.

On the other hand, Reed said, the directive may also create confusion over who has responsibility for information security in the federal government.

The Office of Management and Budget, the General Services Administration and the National Bureau of Standards (NBS) now have statutory authority to set policy and standards for government information systems.

Usurped congressional authority

Rep. Jack Brooks (D-Texas), chairman of the House Government Operations Committee, said the Reagan administration usurped congressional authority by issuing the directive, which he said conflicts with existing statutes.

Brooks said the directive should be withdrawn. "The corridors of the Pentagon and the offices of the East Wing of the White House are not places in which national policy should be established," Brooks said. "The importance of this issue demands public hearings and a full debate in the Congress before the national policy is set."

Brooks also suggested that implementation of the directive could be thwarted by the congressional appropriations committees, if they deny funds for its implementation.

Rep. Dan Glickman (D-Kan.) said he is troubled by the lack of public and congressional input in the formulation of the directive as well as by the apparent dominance of the organization by national security officials.

Glickman and Brooks recently sponsored legislation to enhance the computer security efforts of the NBS, suggesting that the NBS would be the more appropriate agency for government standards.

The bill, H.R. 2889, would provide the bureau with $1 million a year for research on computer security and would require federal agencies to provide training in computer security techniques for federal managers.

Jerry Berman, legislative counsel to the American Civil Liberties Union, said NSDD 145 raises important information and privacy policy issues that should receive more congressional oversight.

Consequently, Berman urged Congress to create a Select Committee on Information.

"Only the direct involvement of Congress can ensure that openness and personal privacy considerations are given their full due in the development of [telecommunications and computer] security policy," Berman said.

Critics also questioned the composition of the Ntissc, calling it a "military-dominated" committee. Ten of the 22 members of the Ntissc are from national security offices in the government, according to the GAO.

But Ntissc officials denied that the committee is dominated by the military, pointing out that civilian agency officials are quite vocal in committee meetings.

Furthermore, they said that the NSA is a service agency — providing both intelligence reports and security services — not a military one.

— Mitch Betts

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DIRECTIVE

from page 1

tance to the private sector.

To accomplish this, it established an elaborate organization, including a 22-member National Telecommunications and Information Systems Security Committee (Ntissc) chaired by an assistant secretary of defense and a National Manager, who is also director of the NSA.

U.S. 'being bled to death'

Donald C. Latham, chairman of the Ntissc, defended the president's directive on the grounds that U.S. computer systems are extremely vulnerable to security breaches, and consequently, the U.S. is "being bled to death" by losses of technical information.

Walter G. Deeley, deputy director of NSA for communications security, said foreign countries such as the Soviet Union use on-line commercial data bases in the U.S. to obtain technical data and also to intercept the industrial communications of Fortune 1,000 companies, thus hurting the U.S. economy.

The directive also created a category of information below the traditional classifications and referred to it as "sensitive but unclassified government or government-derived information" whose loss could harm national security.

Big Brother really here

"It means that Big Brother is really here," Rep. Brooks said at the hearing. "I seriously question the wisdom of the president's decision to give [the] DOD the power to classify, hence control, information located in civilian agencies and even the private sector, which, in [the] DOD's opinion, may affect national security," he testified.

The U.S. General Accounting Office said the scope of the new computer security organization will depend on how broadly the Ntissc defines the new category of sensitive information, a category which could include government information on hazardous materials, flight safety and the Federal Reserve Board's monetary policy.

Asked how the Ntissc will define this sensitive, unclassified data, Latham responded that the committee is "heatedly debating that right now." He suggested the data might include banking transactions, medical records and Social Security records.

Mid-range security classes

These information systems would require a lower level of security than military computers, he said. For example, they might be assigned a security level of C-1 or C-2, which are mid-range security classes defined by the NSA [CW, Sept. 17].

John M. Richardson, testifying for the IEEE, said the society is concerned about the extent to which NSDD 145 "seems to reach into the operation of private sector activities and systems."

Richardson urged the government to exercise "extreme restraint" in this area and to limit its role simply to alerting the private sector to security problems and to encouraging remedies.

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Denver	Jul 18, Aug 13, Sept 19
Detroit	Jul 23, Aug 20, Sept 24
Greensboro	Aug 1
Houston	Jul 30, Aug 28, Sept 24
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Omaha	Aug 7
Orlando	Jul 17
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GM technical unit test-drives links in laboratory trials

By John Desmond
CW Staff

WARREN, Mich. — Before a micro-mainframe link is accepted by General Motors Corp.'s technical group here, the link must survive a communications gauntlet of emulation boards, data switches and multiple types of hardware.

In a laboratory setting at the GM Technical Center here, the Advanced Product and Manufacturing Engineering Staff (Apmes) subjects micro-mainframe link products to a rigorous series of tests. Most available micro-mainframe links fail to meet the company's need to send data along some labyrinthian paths. "The more diverse you are and the larger environment you have to work in, the more difficult it is to find one product to meet all your requirements," said John Crombe, Apmes personal computer liaison and technical engineer.

In the micro-mainframe arena, Apmes' goal is to allow its 341 current IBM Personal Computer XT and AT users to communicate with each other's personal computer and with processors from IBM and Digital Equipment Corp., according to Crombe. In an ambitious program, Apmes plans to add another 200 personal computer users by year's end, Crombe said.

Apmes, which receives computer services from GM's DP subsidiary, Electronic Data Systems Corp., is a technical staff of hundreds that develops and plans engineering systems for future use at GM.

Data follows many paths to and from Apmes end users. Over dial-up lines from the personal computers, the asynchronous data is routed to the mainframes through a Gandalf Data, Inc. data switch and an IBM Series/1 minicomputer used as a protocol converter. The Series/1 is the gateway through which all microcomputer data destined for mainframes must pass. Once the Series/1 performs the necessary protocol conversion, the data is passed on to an IBM 4381 or 4341 mainframe or to a Digital Equipment Corp. VAX-11/780 or an 11/750 supermini. The IBM mainframes work in both MVS/TSO and VM/CMS environments.

Data is also channeled from personal computers equipped with terminal emulation boards through coaxial cable into IBM controllers and then into the mainframes.

'Most links aren't smart enough'

Most available links support connections between one type of micro and a single manufacturer's processor — and do not support the code, protocol, file format and other conversions needed for a micro to access multiple types of hosts. Crombe said, for example, "Most asynchronous file-transfer micro-mainframe links do not allow you to link through a Series/1 protocol converter. You might say they aren't smart enough. There are a lot of characters that get translated and stripped out on the way through. It has to be a pretty smart protocol to get binary files transferred through there."

A key requirement is that the link provides for transmission of text and binary files. "It's pretty simple to send text only," Crombe said. Text requires Ascii characters representing uppercase and lowercase letters A to Z and punctuation marks. "That leaves a lot of Ascii characters to use as control code," such as the code needed to signal the end of a transmission, he said.

With binary data transfer, he said, "No characters are illegal. If you have a character that signals end of transmission, and your binary file uses that same character, it means you have to transform that character into something else, and the end program transforms it back to original state," he said. The encoding and decoding further complicates communication. "The more things you have to encode into a different format and decode on the other end, the more you have a delay in speed. Plus you have more data to be sent down the line. Those are factors to consider," Crombe added.

To meet these conversion demands, Crombe investigated some two dozen link products. The first-stage requirement was that the link had to support data transmitted through the Gandalf data switch and through various IBM 3270 emulation boards, including Forte Data Systems, Inc.'s Forte; CXI, Inc.'s Pcox/CXI; Digital Communications Associates, Inc.'s Irma; and IBM's 3270 board. "When you say you want to talk through Forte, Irma, Pcox and a modem at 9.6K [bit/sec.] directly to an IBM mainframe, that knocks half the list out. Then when you say you want to talk to Series/1, that knocks just about everyone else out. Then when you say you want to talk to a VAX and send for text and binary files, everybody's gone," Crombe said.

Slim micro-mainframe pickings

While the micro-mainframe pickings are slim from Apmes' point of view, the group is impressed with Linkware Information Service from Linkware Corp. of Waltham, Mass. "Linkware's product was the only one that fit the criteria," Crombe said. "There are individual products that may provide individual links superior to any one particular link that Linkware might give you, but none of them give you the whole picture."

Using Linkware, he said, "We personally did binary and text file transfers from the micros to the VAX and IBM mainframes through the Series/1. We did the coaxial connect file transfers up and down through the 3270 cards. We also evaluated the security access control, [which determines] who is allowed to read and write certain files in the central library." A list of 500 files was created by Apmes to test delays caused by making a large directory available to personal computer users.

To evaluate whether a transmission was successful with Linkware, Crombe performed a loop test. He sent data from the host to the personal computer, then back up to the host under a new file name. He then compared the two files on the host, bit for bit. He did the same loop test going from the personal computer to the mainframe, then back to the personal computer. He also examined text files from the personal computer to the mainframe, where Ascii code was converted to Ebcdic and vice versa. And he checked binary data from the personal computer to the mainframe for accuracy.

AT&T joins forces with Japanese consortium in net venture

NEW YORK — AT&T announced last week that it has formed a joint venture with a consortium of Japanese companies, including two mainframe vendors, to build a data communications network in Japan.

Announced in Tokyo, the agreement established Japan ENS Corp. for the purpose of developing a value-added network based on AT&T's Enhanced Network Services technology.

James S. Hubley, formerly director of international and network product management with AT&T Information Systems, will be the senior AT&T executive involved in the venture. AT&T's partner is Japan ENS, Inc., a consortium established in 1984 to investigate enhanced network services. Hajime Hirota, president of Japan ENS, Inc. and former managing director of the Industrial Bank of Japan, will also play a leading role in the venture, an AT&T spokesman said.

The spokesman said the equity holdings for AT&T and the 17 Japanese firms involved in the venture have not been finalized, and the details will be worked out during the summer. AT&T will provide the network technology and the resources to design, engineer and operate the network, along with management for network operations and product planning and development.

'Venture will compete with NTT'

The opportunity to develop value-added data nets in Japan is a result of the Japanese government's decision in April to allow competition in its domestic communications marts. Previously, Nippon Telegraph & Telephone Corp. (NTT) enjoyed a regulated monopoly over communications.

"In that prior to April NTT was the only company doing anything in this area, the venture will certainly compete with NTT," said AT&T's Barry Campbell.

Other companies, Campbell noted, are also seeking to establish data networks in Japan. According to the Framingham, Mass.-based market research firm, International Data Corp., IBM previously established two joint ventures to pursue value-added network opportunities. The two ventures, Advanced Systems Technology Development, Inc. and Advanced Systems Technology, Inc., were formed in partnership with Mitsubishi Corp., an electronics conglomerate that has previously worked on projects with IBM, and Cosmo Eighty Corp., a software development firm.

The members of the Japanese consortium in partnership with AT&T represent a wide range of Japan's leading industrial, financial and service companies. Included in the consortium are mainframe vendors Hitachi Ltd. and Fujitsu Ltd., along with Industrial Bank of Japan, the Asahi Shinbun press organization, Sony Corp., Mitsui & Co., Nissan Motor Co. Ltd. and Nippon Life Insurance Co.

AT&T said the planned network will enable Japanese industries to let dissimilar terminals and computers communicate over a shared intelligent public network.

Later this year, AT&T said, a wide-area packet network service will be implemented with network access provided through packet assemblers/disassemblers in nine cities. Early next year, the venture is expected to provide full value-added network services, with Net 1000 storage and processing technology available.

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IBM-MCI alliance to aid AT&T's deregulation quest

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The proposed IBM-MCI Communications Corp. business alliance [CW, July 1] is adding fuel to AT&T's campaign to have regulations relaxed or dropped which bar AT&T's joint marketing of telecommunications with office equipment and computers.

Specifically, AT&T is using the alliance as proof that a highly competitive market exists, as it presses the Federal Communications Commission to slacken existing restrictions that bar AT&T from combining sales of its new minicomputer and microcomputer lines, local-area networks and enhanced data communications services with the regulated long-distance telephone service.

IBM and other large computer manufacturers, such as Digital Equipment Corp., have said they do not oppose the removal of the rules barring AT&T from joint marketing of regulated telephone service and nonregulated computers and equipment embodied in the Second Computer Inquiry decision as long as separate accounting is maintained to prevent cross-subsidy.

Forced to spend extra

AT&T is arguing that the restrictions are unnecessary in a highly competitive equipment market and are causing the company to spend an extra $10 billion to duplicate functions that are performed by AT&T Information Systems, the nonregulated equipment subsidiary, and by the regulated AT&T Communications.

The FCC will decide shortly on removing the Computer Decision II ban on AT&T's joint marketing as part of its overall shift away from the regulatory regime it had built around AT&T before divestiture. Earlier this year the commission granted permission to AT&T to shift $1.9 billion worth of plant and equipment from AT&T Technologies to AT&T Information Systems [CW, April 22].

Last week, a former architect of the separation policy and a former member of the Justice department's antitrust division, Phil Verveer, said, "The most interesting aspect of the IBM-MCI deal is what impact it will have on the FCC. I expect it will push them toward a more rapid deregulation of AT&T."

An FCC official working on the pending ruling to drop the Computer Decision II restrictions said last week, "To the extent that the IBM-MCI deal affects the market share for the equipment industry, I think it will affect the decision. The commission has said market share will be a factor in its decision."

While IBM and DEC are not opposing the joint marketing, they are asking the FCC to require information disclosure by AT&T as far as technical changes it makes to the network, especially as the network moves toward an Integrated Services Digital Network mode of transmission.

The companies point out in comments to the FCC that equipment interfaces to the network will be highly dependent on the protocols and standards adopted by AT&T. They assert that AT&T's network interconnect standards for equipment do not match those established by the International Standards Organization.

Other safeguards being pushed on the FCC by IBM and DEC would have AT&T continue to keep separate the revenue from the regulated basic transmission service from the nonregulated computer and equipment side and would require that AT&T pay the tariffed transmission rates for a joint service offering as others are currently forced to do. Additionally, they would require that an outside independent accounting review of the integrated services be conducted annually.

Verveer, commenting on the pressure the IBM-MCI deal is putting on the FCC as it considers its regulatory treatment of AT&T, added, "I expect the FCC will move toward more rapid deregulation. They are strongly inclined to relax the equipment separation rules, deregulate AT&T's long-distance business as well as the [divested] Bell operating companies and find any means of doing so. To that extent, the IBM-MCI deal will probably be cited as a factor."

Last week there were other evidences of the building pressure:

■ Recent comments emanating from the FCC have thrown the competitive long-distance industry into an uproar. Common Carrier Bureau Chief Bert Halprin remarked that the FCC is not disposed to continue preferential terms and conditions for hookups by AT&T's competitors to the local telephone exchanges.

■ GTE Sprint Communications Corp., Allnet Communications and other long-distance competitors have filed an emergency petition with the FCC citing the difficult business conditions they are faced with from added costs and pleaded for easier regulatory treatment while equal access is being implemented by the local-exchange telephone companies.

■ The FCC last week floated a trial balloon idea, according to telecommunications industry lawyers representing these principal long-distance competitors, about letting the regional holding companies into the interstate long-distance business, from which they are specifically barred by the terms of the AT&T divestiture.

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This NEW book is for programmers who want to expand their CICS skills. It covers the advanced CICS features you'll use regularly, though you won't need all of them for every program.

That means you'll learn how to:

- use browse commands—STARTBR, READNEXT, READPREV, ENDBR, and RESETBR—to process a file sequentially
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- use transient data queues (transient data exists only from the time it's written to the time it's read)
- use interval control commands to start a task
- produce multi-page output using BMS page building
- use the ROUTE command to direct output to one or more terminals
- apply DL/I data base processing to CICS programming
- create an abend exit to keep your task from abending when an error occurs
- use 2 terminal control commands—SEND and RECEIVE—that let you communicate directly with a terminal, bypassing BMS
- write programs for terminals that support color and extended highlighting features, like blinking, underscoring, and reverse video

Plus, you'll learn how to use a variety of other CICS commands:

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- SYNCPOINT—to control the recovery processing that occurs if your task abends
- LOAD—to load and establish addressability to a constant table
- JOURNAL and WAIT JOURNAL—to create journal records
- GETMAIN and FREEMAIN—to acquire and release main storage
- ABEND—to force your task to end abnormally

At the end of this book, then, you'll know a wide variety of advanced CICS features. You'll also know which features do similar things and when you should use each one.

140 examples for learning and reference

To make it easier for you to understand the advanced CICS features, this book is chock-full of examples. You'll find drawings that show how the CICS elements work and syntax for the CICS commands.

More important, you'll find complete documentation for 11 CICS programs. That includes screen layouts, mapset listing, symbolic map, design, and code for each program. What's more, all of the programs are designed and written in a way that makes them easier to read and understand. I think you'll find they make time-saving models for you to use for your own CICS programs.

Who this book is for

Although this book is *Part 2* in a series, you don't have to read *Part 1* first. But you do need to know the basics of writing CICS programs. Specifically, you should be able to do the following before you start *Part 2*:

1. Design, code, and test simple interactive programs using pseudo-conversational programming.
2. Define mapsets, use the SEND MAP, SEND TEXT, and RECEIVE MAP commands, position the cursor on the screen, and detect the use of PF keys, PA keys, and the clear key.
3. Use the following file control commands: READ, WRITE, REWRITE, DELETE, and UNLOCK.
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OA system keeps firm's execs on top of business

By Donna Raimondi
CW Staff

BEDFORD, Mass. — The chief executive officer of a company here decreed that there was no better way for his corporation's executives to learn about technology than with hands-on experience. So he went out and bought them a Wang Laboratories, Inc. Wang Office system.

GCA Corp. became one of the first users of the Wang Office, said Glenn Fund, GCA's manager of end-user computing. The company manufactures automated production systems used for making integrated circuits for semiconductor makers. It also supplies integrated factory automation hardware and software systems for automotive, aerospace and electronics companies.

Fund credits the office automation system with speeding the work flow and giving GCA's executives the ability to react quickly to business situations, he said. When Milton Greenberg, GCA's CEO, gave Fund's group responsibility for finding an office system for the executives, the choices were somewhat limited. GCA already had IBM and Wang equipment and was committed to staying with those two vendors, and IBM had no OA system available at the time, Fund said. By the beginning of May, GCA had installed the Wang Office system for its executives and their secretaries, he said.

The company bought several standard Wang Office software modules and customized other functions that it wanted, Fund said. Standard modules that GCA purchased included Wang's word processing; the Reminder File; the Local Mail facility for sending and receiving memos and phone messages; the Personal Phone Directory; the daily, weekly and monthly Calendar module; and the List Management data base package.

Custom-developed functions include an on-line company telephone directory, which is downloaded from GCA's IBM 3083 mainframe, and a tie-in to Western Union Corp.'s Easylink electronic mail service, which provides access to information such as treasury, stock market, weather and news, Fund said. Telecommunications options such as the TTY asynchronous and 2780/3780/WPS bisynchronous Wang-to-Wang connection protocols were also developed. The customized portions were created by the GCA staff with Wang software specialists, he added.

User's needs surveyed

GCA arrived at its choices of features and functions by surveying the executives and secretaries who would be using the system to find out what they needed and wanted, Fund said. Fund discovered that personal information, including reminder files, message services and telephone information, and corporate information such as sales, bookings and financial data, were the two basic types of data that people wanted. Up to now, he has concentrated on developing the personal features of the system. The corporate information will come later as he brings mainframe applications to the Office system.

The company bought tutorial books from Ad Verbum in Acton, Mass., for teaching word processing and for creating glossaries, said Marge Snowdon, GCA's executive VS office system administrator. The glossaries allow the cataloging of documents that can then be called up and inserted in other documents, she said.

GCA acquired a 1M-byte Wang VS85 with two 75M-byte disk drives for the initial system, which is a pilot currently serving 26 users. Users of Wang Office Information Systems 50 and 60 word processing machines that the company already owned were linked to the VS so they could access the new functions.

Wang should have provided much more assistance and start-up help, Fund said. The system is more complex than many OA products and requires a sophisticated group of people to put it in, he added. "We know more than Wang knows about the system now," he said.

The initial 26 users do not all have the same functions available to them, Fund said. Security levels are set by the system administrator, and as soon as users enter their identification numbers, the system knows which menus the users are allowed to access and which peripherals they have access to.

Training users for the system was a challenge, Fund said. His staff pulled together a manual for the system in four to five weeks' time, he said. "Wang had terrible documentation," Fund said, and even the terrible documentation was not available when he bought the system. The staff wrote their own manual using pictures, examples and features such as program function keys and menus. They could not work on the manual until they had the system developed and ready to install, he said.

Because of GCA executives' busy schedules, no training sessions could be planned for them, Fund said. Secretaries were trained first so that they could help their bosses learn when they had time, he said.

Secretaries took two-hour training courses, Snowdon said. A few of the secretaries had prior experience with

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ADR tightens micro line with link boost, integrated tool

By John Gallant
CW Staff

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) last week bolstered its microcomputer software offerings with introductions of an enhanced release of its micro-mainframe link and a multifunction productivity package for IBM Personal Computers.

Unveiled here were PC Datacom 2.0 and PC Peer. PC Datacom 2.0 is an upgraded version of PC Datacom, which gives IBM Personal Computer users access to data residing in ADR's Datacom/DB relational data base management system for IBM mainframes.

The enhanced PC Datacom link now supports widely used micro software data formats, including comma-separated values, Data Interchange Format, Symbolic Link Format and ADR's own format for data reporting.

In addition, PC Datacom 2.0 now supports data exchange with Lotus Development Corp.'s 1-2-3 and Symphony and Ashton-Tate's Dbase II, Dbase III and Framework.

A spokesman said the link allows users to download mainframe data and invoke a menu option that automatically reformats the data for the supported micro formats and packages. Users can also update Datacom/DB from the micro through PC Datacom.

The spokesman said the enhanced release also features a report writing facility that is said to allow micro users to create standard and custom reports using mainframe- or micro-generated data.

All PC Datacom procedures are menu driven, and queries can be created on the micro through the menu or ADR's mainframe Dataquery language.

ADR's PC Peer is an integrated micro software package that combines spreadsheet, graphics, data and forms management and telecommunications capabilities. It can share data with mainframe Datacom/DB through PC Datacom 2.0. PC Peer offers split-screen capability that allows data and graphs to be displayed simultaneously.

The spokesman said the product's forms manager allows users to create invoices, mailing labels and form letters. Documents produced with the word processor can contain text, data tables or graphs copied from other PC Peer facilities.

PC Peer's telecommunications facility supports asynchronous communications using a serial port and a Hayes Microcomputer Products, Inc. Smartmodem or a Digital Communications Associates, Inc. Irma board for IBM 3270 communications.

The package runs under IBM's PC-DOS and requires 512K bytes of random-access memory on an IBM Personal Computer, Personal Computer XT or AT. It is available now at $595 per copy.

PC Datacom 2.0 costs $495 per copy and will be available in the third quarter.

ADR is located at CN-8, Rt. 206 and Orchard Road, Princeton, N.J. 08540.

WANG

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Wang word processing machines, but most of the secretaries and all of the executives were using computers for the first time, she said.

The staff is working with Wang to improve some of the system's features, Fund said. Wang recommends that the shared printers, for instance, be dedicated to either word processing or to office functions or else documents will appear to be hung up, which causes system administration problems.

The system is expensive, Fund said, so it may be a while before everyone in the organization has access to it. "If we are able to sign a multimillion-dollar contract because we could react quickly, it will pay for itself," he said. The benefits are in the ease and speed of automatically doing jobs that were previously done manually, he said.

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IBM grant launches MIS program for University of Texas

By Clinton Wilder
CW Staff

> *'We believe there has been a void between the academic and business worlds.'*
>
> — Darwin Klingman
> University of Texas

AUSTIN, Texas — The Graduate School of Business building was not the most pleasing sight on the scenic campus of the University of Texas here this spring. Where other buildings were flanked by the green, well-trimmed lawns one expects at a large Sunbelt university, the business school was surrounded by freshly dug dark earth and stacks of cast-iron pipe. Inside, too, the ravages of renovation dominated the academic setting. It was apparent there was a transition going on.

By next fall, the university will open its "Classroom 2000" — an ultramodern, multitiered room decked out with what university officials say will be the world's largest IBM Personal Computer AT/370 collection in one room. The 64 AT workstations were purchased with part of a $2 million grant from IBM, funds that will allow the school, along with 12 other universities nationwide, to offer an MIS concentration in its MBA program for the first time.

"We believe there has been a void between the academic and business worlds," said Darwin Klingman, the management science and computer science professor who will direct the MIS concentration. "In the history of computers, the early machines were designed totally in universities, but now it's the vendors who are at the leading edge. The universities can't afford multibillion-dollar computer research, but the educational function can come back into it because business needs management expertise to manage those systems."

University of Texas professors will begin training an estimated 75 MIS concentration candidates next fall to fill what they said they believe is a corporate management gap between the computer science-trained DP manager and the corporate vice-president with an MBA. Their goal is to integrate all of the standard MBA topics — marketing, finance, accounting, management and general business — into a curriculum designed for the MIS environment.

"The 'of' in management of information systems is very important," said Associate Professor of Management Robert Sullivan. "We've identified a vacuum between top management and DP, and we hope to fill the void between managers and number crunchers with these people. They should have the ability to interact with vice-presidents, cost-out systems, be sensitive to user interfaces and behavioral aspects and be able to facilitate getting terminals on the desks of decision makers."

According to graduate school officials, ideal MIS candidates will enter the program with most of the required computer technology courses, such as Pascal programming and data structures, behind them. "The majority will be able to waive one or two courses by having backgrounds in data base management and several programming languages," Sullivan said. "The admissions standards for this concentration are distinctly separate from those for the regular MBA program."

The IBM grants, announced in April, were earmarked at 50% for hardware and 50% for faculty and curriculum development. The university claims to be the only grant recipient to spend the hardware component completely on end-user workstations rather than on a host processor. Thanks to a previous IBM grant to its engineering school, the University of Texas already had an IBM 4341 mainframe as well as an IBM 3081 Model D.

"We wanted to keep up with the latest technology on the micro-mainframe link and local-area networking," Klingman said. "We think that's a critical part of information system management today."

Want city's business sector involved

Business school officials also hope to see the MIS concentration grow along with Austin's high-technology private sector, which includes a move to a new University of Texas building next year by a corporate research consortium, Microelectronics and Computer Technology Corp. Committees of advisors from the business community will be established to maintain close contact between the new university program and business.

"We want to make sure we're not running behind industry's needs in terms of our training," Klingman said. "And we would like to get top business leaders to lecture or teach."

The business school's transition to

See TEXAS page 13

Every programmer should have one...

...a programming workbench on a PC

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Oil firm opts for limited use of IBM Cabling System

By John Desmond
CW Staff

NEW YORK — When IBM announced its Cabling System last year [CW, May 14, 1984], a major oil company in Ohio put a hold on twisted-pair cable orders for its new 45-story headquarters building, evaluated the IBM cable and decided to stick closely to its original plan.

Some twisted-pair cable, to be used in a private branch exchange (PBX) network, had already been shipped to Standard Oil Co. of Ohio (Sohio), and other orders were on loading docks when IBM made its announcement.

Les Duncan, manager of corporate telecommunications for Sohio, said that after the evaluation, his firm decided to make only a small investment in the IBM Cabling System for its headquarters, which he said will be the largest office building in Ohio.

"We question how universal the cable will really be for non-IBM products," Duncan said, addressing an office automation conference sponsored by the Boston-based Yankee Group here recently. Sohio decided on a limited role for IBM cable after company engineers inspected the product and talked to IBM engineers and beta users, he said.

"IBM type II cable [multiwire general type] would have cost 2¼ times more than standard telephone wiring," Duncan said. Moreover, standard IBM cable wire racks would not fit into the wiring closets in Sohio's building design. "And the cable is a space hog," requiring one-third of the horizontal distribution space allocated for wire in the building's design, Duncan said.

Finally, the large bend radius — related to the cable's flexibility — of IBM's type II cable makes its installation difficult, he said.

Notwithstanding these drawbacks, Sohio did decide to install the IBM Cabling System to supplement twisted-pair cable in those departments committed to IBM as a vendor. For example, the IBM cable is being used to connect IBM Personal Computers to IBM System/36 minicomputers.

Sohio required support for point-to-point asynchronous terminal-to-host communication, IBM 3270 and high-speed printer connection, departmental systems and video and other broadband services.

Three years ago, Sohio decided to meet its requirements with various devices. The company decided to use a digital PBX to connect terminals to 16 minicomputers with more than 600 ports. Sohio's equipment includes processors from Hewlett-Packard Co., Prime Computer, Inc., Digital Equipment Corp. and IBM.

The PBX provides three twisted-pair wires for every desk; one is for voice/data, and two are multipurpose. The cable connection summary of Sohio's headquarters is as follows: 3,000 twisted-pair connections, 300 IBM type I connections, 150 coaxial cable connections, 50 shielded twisted-pair connections and 32 fiber-optic connections.

A separate IBM 3270 network is used for departmental systems and special applications, Duncan said. A fiber-optic channel extender connects Sohio's headquarters to a nearby building housing host processors. For various video applications, the company uses a broadband local-area network backbone extending from the top to the bottom of the building, with limited horizontal distribution.

Duncan recommended adopting a cabling policy to manage resources. Sohio's cabling policy states that the digital PBX should be the primary data communications system for the building, that twisted-pair wiring is the primary data communications cabling and that departmental local-area networks should be installed where speed or connectivity dictate.

Duncan also stressed the importance of incorporating flexibility into a building's design. Sohio installed a cellular floor system, which Duncan described as having much of the flexibility of a raised floor but at a lower cost. The cellular floor paid off when Sohio acquired part of Gulf Oil Co. halfway through construction of its headquarters.

"We had a major reshuffling on 12 floors," Duncan said. "If we had installed conduit, we would have had significant rework. As it was, with the cellular floor, we rolled with the punches."

> ”
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> *'We question how universal the cable will really be for non-IBM products.'*
>
> — **Les Duncan**
> **Standard Oil Co. of Ohio**

TEXAS

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the MIS concentration is also reflected in the direction of undergraduate computer science education at the university. While not specifically gearing up to train candidates for the MIS program, the undergraduate program now stresses a much broader range of organizational skills on which future DP employees can base their careers.

Data processing/analysis and computer science majors, for example, are now required to take more writing and communications courses than they were previously.

"A much larger percentage of recruiters are looking for broad problem-solving skills, not just Cobol programmers," said Associate Professor of Information Systems Eleanor Jordan, an associate director of the MIS concentration. "They want the person who can handle business and organizational issues and can still deal with technical problems. I think they've seen enough people who can read assembly but can't communicate with people. We've had some graduates who have been asked to evaluate micro purchases for their businesses just one year out of college."

In this environment of changing corporate needs for DP management, the university hopes to supply valuable personnel resources. "The MIS program was actually proposed without the IBM grant," Klingman said. "It's a direction [in which] we've been heading for some time because we knew it was needed."

Wang exhibit scheduled for October

BOSTON — Access '85, the first exhibition of Wang Laboratories, Inc. and Wang-compatible products, will be held Oct. 1-3 at the Bayside Exposition Center here.

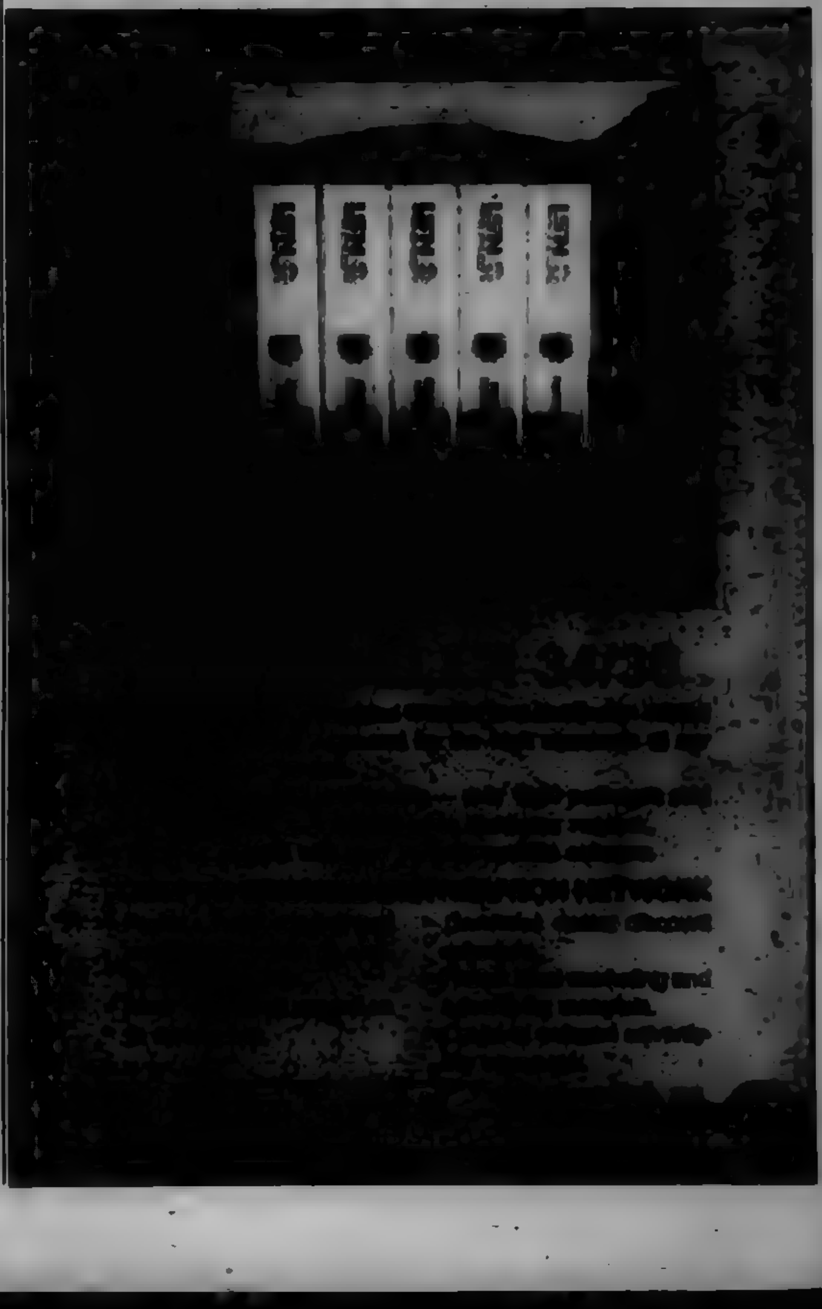
Exhibitors are expected to include vendors of applications and services that are available in the Wang marketplace.

Attendees will have the opportunity to compare and evaluate a variety of products from leading suppliers and manufacturers.

The exhibition is scheduled to run concurrently with the International Society of Wang Users Boston Conference.

Cost of the exhibition is $25.

More information on Access '85 is available from Data Base Publications, 11754 Jollyville Road, Austin, Texas 78759.



All-star teen hacker's team beat hundreds of systems

By Paul Korzeniowski
CW Staff

At 14, Bill Landreth was a major league hacker.

During a four-year career that began in 1979, he cracked between 90 and 100 corporate systems and was a member of a team that accessed approximately 800 computer systems. The team beat university, banking, insurance, newspaper and telephone company security systems. Landreth's exploits are the subject of *Out of the Inner Circle*, published by Microsoft Press, a division of Microsoft Corp. in Bellevue, Wash.

The career of Landreth, who became known as the "Cracker," began in the minor leagues. When he was a teenager, he and his parents split the cost of a $1,000 Tandy Corp. TRS-80 Model I Level II microcomputer. Once he had the machine, learning about computer systems became an adolescent obsession. First, he taught himself how to program in Basic; next he became fluent in Zilog, Inc. Z-80 microprocessor assembler language.

Landreth

To spur their son's interest, Landreth's parents purchased him an Apple Computer, Inc. Apple II. When Landreth borrowed a dumb terminal and a modem from a friend, his hacking moved out of his home and into computer networks.

With the new tools, he began to access a number of bulletin boards. Bulletin boards act as road maps for hackers. They include programming tips, public domain software and games. They also often include telephone numbers, account names and passwords to large computer systems. Such systems fascinated the Cracker, and he spent many nights and early mornings exploring them. "I was spending between $450 and $650 a month on telephone bills," he said. His parents sometimes questioned him, shook their heads and paid the bills.

Whenever the Cracker entered a large system, he tried and often succeeded in gaining operator-like authorization, information other hackers could use. Landreth started trading his information with other hackers.

Through such trading, he became a member of a team of elite hackers known as the "Inner Circle." Members of the group used a number of techniques to access a system and work their way up to the level of a system operator. Their techniques included entering random passwords, emulating a logon screen, manipulating computer memory, changing commands stored in a memory buffer, mimicking a system operator's terminal, locating programs to bypass security procedures and writing a program that a legitimate user might run, thereby unknowingly testing system security procedures.

Through these ruses, the Inner Circle gained access to approximately 800 systems. Landreth claimed the group did not damage any data. When it was learned that one member had altered data, he was blacklisted.

AT&T Unix easiest to access

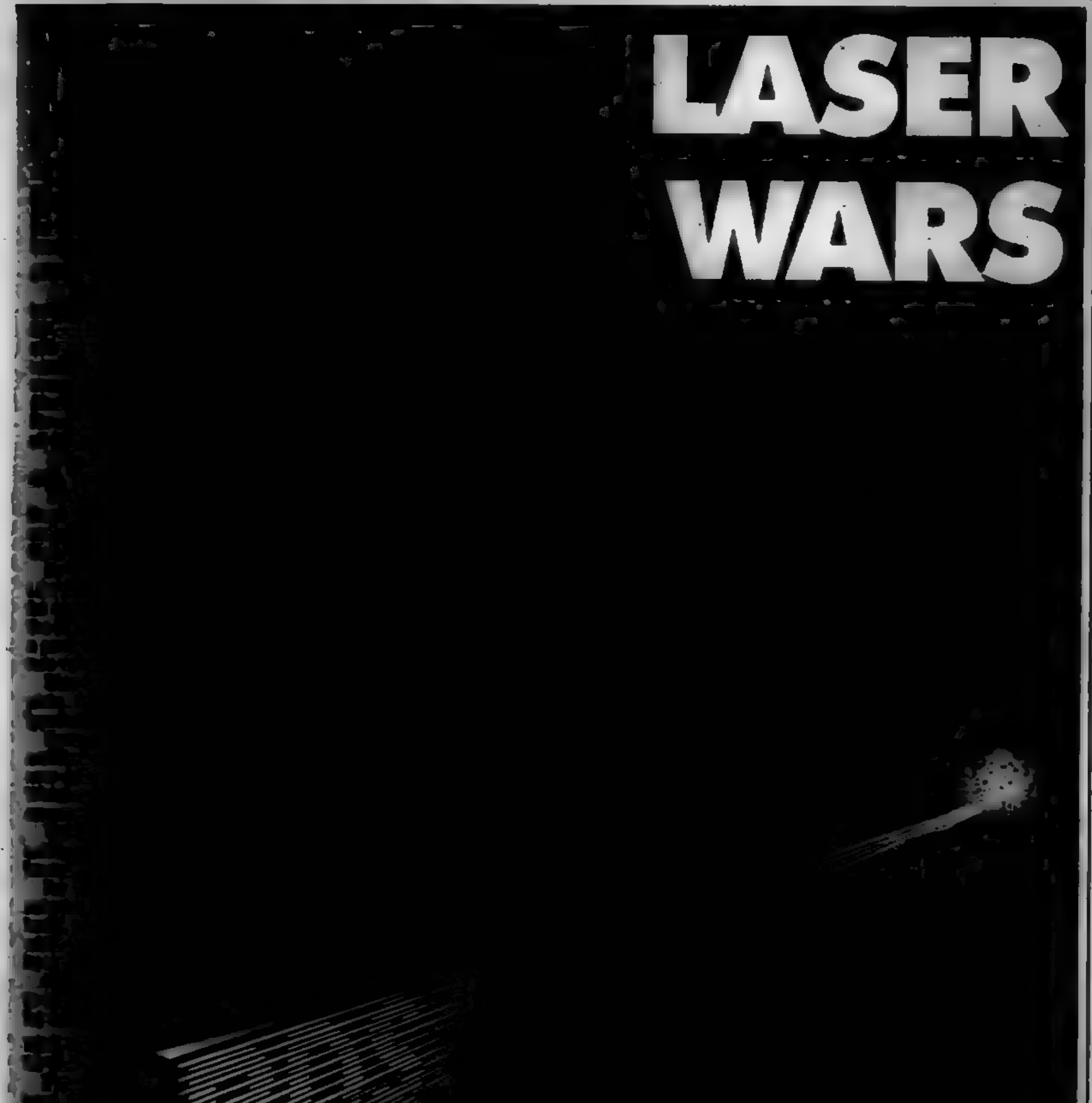
Some operating systems were easier to crack than others. The Cracker listed AT&T's Unix as the easiest operating system to access. Other operating systems that provided minimal security features, according to Landreth, were Digital Equipment Corp.'s Tops, RSTS and VMS. IBM's VM was one of the more difficult systems to crack. Prime Computer, Inc.'s Primos was once a hacker's dream, but the vendor strengthened its security features (see story page 1). Because hackers search for the easiest system to access, the group lost interest in Primos.

Universities are likely to have lax security, while banks tend to supply the most secure systems, according to the Cracker. Other than those two extremes, systems tend to defy classification. "There were some newspapers that had lax security and others that were quite secure," Landreth noted.

In the end, the Inner Circle became a victim of its own lack of security. The group accessed GTE Telenet Communications Corp.'s Telenet packet-switching network and set up a bulletin board. Inner Circle members thought they were not being observed and left a trail of clues that led to their arrests. One hacker member left his name and telephone number on the system; a second wrote GTE Telenet a letter and offered to solve the company's security problems.

In May 1984, the Cracker was indicted and charged with three counts of wire fraud. Through plea bargaining, Landreth was found guilty of one charge, fined $100 and given a sentence of 100 hours of community service.

Thus, the Cracker's career came to an end. "The judge realized that I may have a future in the computer field, so he let me keep an IBM [Personal Computer] and a modem," Landreth said.



Ex-hacker offers supplemental security checklist

In theory, every system is secure. In fact, every system has flaws. Flaws often are not apparent to an MIS manager and can be as simple as a user telling a friend a password.

Bill Landreth, a one-time hacker, estimated in his book *Out of the Inner Circle* that each month, up to 100 hackers attempt to crack a system with one dial-up line.

To prevent unauthorized access, Landreth recommended that companies supplement security measures.

He suggested that an encryption system works well with a good password system.

Landreth targeted three areas vulnerable to security breaches: telephone lines and modems, logon sequences and passwords.

TELEPHONE LINES AND MODEMS

- Companies should try to eliminate telephone line access or at least try to limit incoming calls to only those from a local area code.
- If a company must allow users to call in to a system, the company should move the main system off-line and let users access only a smaller front-end system.
- Do not publish modem numbers.
- From time to time, change modem numbers.
- If possible, keep modem numbers on a three-number exchange that is different from the company's main number.
- Have a modem ring two times before answering.
- Have a telephone operator answer the line, and require that a user ask for the computer.
- Change data lines to voice lines. Hackers have been known to search telephone company trash cans in search of data line lists.
- Be certain the system disconnects users who hang up the phone without properly logging off.

LOGGING ON

- Remove character storage memory buffers that store keystrokes from a logon phase.
- Have the system disconnect a user who makes more than two unsuccessful attempts to access a system.
- Have your modems disconnected if a user unsuccessfully attempts to access a system five to 10 times. A system operator can later reconnect the lines.
- Flash a warning message such as "Invalid Account — Notifying System Operator" whenever someone is unable to access the system.
- Limit the number of users for each account.
- Have a user verify the last time he used his account.
- Do not provide any information or power before a user is logged on. Help screens often provide a hacker with access to a system.

PASSWORDS

- Do not support default passwords — a password given to all first-time users. Users are supposed to change the password the first time they use the system, but often they do not.
- Use a random pattern when assigning passwords.
- Do not assign long random passwords, since users will change them to something they can remember.
- Have a system ask for a new password when a user logs on to a system for the first time.
- Make sure that users know how to change their passwords, but do not allow them to change them to one-letter passwords.

HACKER

from page 1

on a computer when it is first installed. The account is supposed to be deleted, but often it is not. Rather than being deleted, the account had been set to a privileged password.

"He changed information in a job queue and brought down the minicomputer," the security administrator noted.

The computer was running batch programs for a number of models used by geologists at the agency. Since the agency had backup tapes, no data was lost. However, the agency spent considerable time and money determining how the system was brought down. The culprit was never found.

Three other times the agency caught the hackers before they could damage the system. In one case, a college student accessed the network through a toll-free number.

In another, an adolescent tried to access the system through random dialing and random password techniques shown in the movie *War Games*. A second adolescent was given the system's modem number by a fellow hacker.

Response varied

The agency's response to its security problem has varied. One response has been to threaten the hackers with lawsuits. "Federal agents have informed the hackers that they could be prosecuted," Cecula said. "In some cases, the hackers did not know that they had accessed a mainframe."

The agency also has eliminated the toll-free number. "The hackers no longer are able to access the system at our expense," Cecula said. In addition, passwords have been reset or reassigned.

Because of the problems, Cecula's group wrote its own security package. "The package tracks the number of times someone tries to access a system," the security administrator noted. "Previously, there were no logs kept for the number of times access was attempted. Most packages track attempts made after someone has entered a system."

Forest Service incident

Last February, another government agency, the U.S. Department of Agriculture's Forest Service, caught a hacker accessing its Data General Corp. MV/4000 superminicomputer.

Lynn Vancil, assistant director of information systems at the Lake Wood, Colo., office of the Forest Service, reported that a Los Angeles system operator learned the company's identification and password to GTE Telenet Communications Corp.'s Telenet service from a bulletin board service.

"The hacker was familiar with our computer's operating system since he used the same type at work," Vancil said. "He built himself a user profile."

The hacker's access triggered GTE's security system, which noted the unusual 3 a.m. hour of access. The vendor notified the government agency of a possible problem. For a month, GTE, the Federal Bureau of Investigation and the Forest Service monitored the activity, tracing it to the hacker's home.

In March, Philip Gonzalez Fadriquela was arrested and charged with six crimes.

Fadriquela had not damaged any data. "He seemed more interested in experimenting with the system than in destroying any data," Vancil noted.

Following plea bargaining, the hacker pleaded guilty to three misdemeanors for wire fraud, and in return, the government dropped three felony charges. Fadriquela was sentenced to three years of probation, fined $1,000 for each misdemeanor and sentenced to 200 hours of community work, according to Cathy Goodwin, assistant to the U.S. attorney.

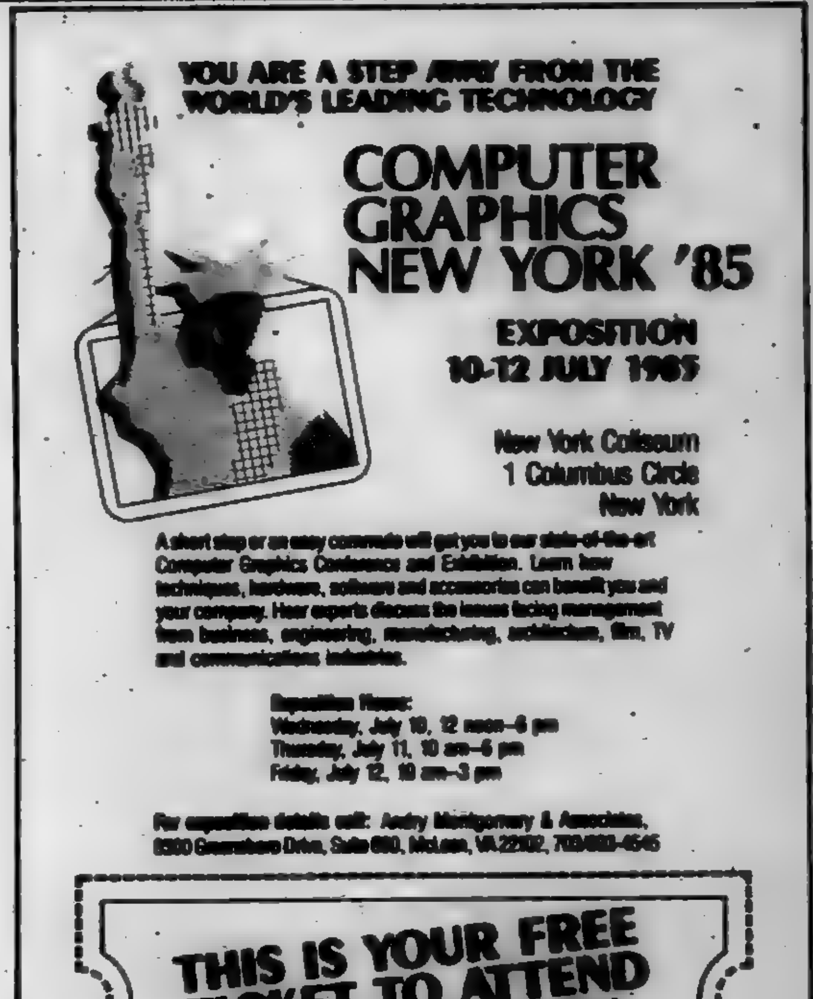
"The fine would have been higher — it carries a maximum of $5,000 — but the judge did not think that the defendent would be able to pay more," she said.

Goodwin estimated that tracking the unauthorized access cost the Forest Service at least $50,000, but the actual figure is probably closer to $100,000. "Since it cost the agency so much money, the judge wanted to make sure that he sent a message to other hackers," she said.

The Forest Service has taken a few preliminary steps to strengthen its security. "We changed all of our passwords to a random series of numbers and letters," Vancil said.

"The break-in has turned out to be a learning experience for us," he added.

Computerworld senior writer John Desmond contributed to this report.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Multimate to extend software to larger IBM systems

System/36 tool expected in '86

By Eric Bender
CW Staff

EAST HARTFORD, Conn. — Moving to meet the challenge posed by IBM's Displaywrite word processing software, Multimate International Corp. will port its Multimate personal computer software to larger IBM machines, aiming to ship versions for the System/36 and various mainframes running under IBM's VM/CMS and MVS/TSO by first-quarter 1986.

Multimate, which industry "hot lists" show as the best-selling word processing package for the IBM Personal Computer and which has made a particularly strong showing in Fortune 1,000 firms, received increased competition after IBM announced plans for Displaywrite/36 and Displaywrite/370 packages last October, company President Wilton Jones said.

Among corporate customers, "we began losing ground a bit when IBM came in and said [Displaywrite] will work on everything," Jones explained, emphasizing that corporations do not want to be forced to retrain employees for word processing on different machines.

One reason Multimate became the first major player in the microcomputer applications software arena to broaden its offerings to larger IBM systems is that among applications software, "word processing is the first generic product that IBM has taken seriously," he claimed.

Cost of the System/36 Multimate software will range from $1,800 to $2,200 per CPU, depending on how many add-on capabilities are supplied, Jones said. Mainframe package prices will be based on the number of terminals, ranging from $15,000 for an IBM 4331 to $30,000 for systems such as the 3083.

Wang-like style

Running on the larger IBM systems, the software packages, based on Multimate's new high-end Advantage micro software, will preserve the micro version's Wang Laboratories, Inc.-like style and conform to IBM standards such as Document Content Architecture, Jones said.

"In a Profs [IBM Professional Office System] VM environment, a user would see Multimate as one of the main menu items under Profs," he noted. "It would not replace Profs utilities or functions; it would add one editor."

Some functions, such as text centering, would be modified to conform more closely to standard IBM functions, he added.

The System/36 software, which will resemble current personal computer software more closely than will the mainframe packages, will run on all System/36 models. Like the mainframe versions, it will work with IBM's Personal Services software, Jones said.

Additionally, Multimate reportedly plans to guard its flanks in small to medium-size businesses by offering packages for several popular minicomputers. Based on the Multimate Just Write software, the packages will be available for $2,000 or less in first-quarter 1986.

While industry analysts generally approved of the company's plan, some noted that many Multimate customers bought the software to complement their existing Wang word processing equipment and do not plan to install significant numbers of System/36 machines.

Expansion a challenge

The rapid expansion of its product line represents a large challenge for Multimate, which posted sales of $22 million in the fiscal year ended in March and expects to see $30 million to $36 million in sales this fiscal year, Jones noted. In a well-publicized vote late last month, company employees approved the overall plan.

Multimate currently employs about 210 people. The word processing development staff numbers about 65, and the company expects to boost this quickly to approximately 110, Jones said.

This kind of sudden expansion in personnel brings "tremendous culture shock," Jones acknowledged, but he maintained that the shock is less than in the case of continual growth.

Multimate is located at 52 Oakland Ave. N., East Hartford, Conn. 06108.

SECURITY

from page 1

hacker. "Whenever someone can't access a system after three tries, the operating system will disengage the user," Damon said. The system operator has the option to design a system so that it disconnects a user or makes it appear like the hacker is getting into the system even though he is not, he explained. "A security administrator can monitor the line and trace the phone call," he added.

Security easy to crack

Passwords and account numbers are designed to provide a wall of security. That wall has proven to be easy to crack.

A few years ago, customers of GTE Telenet Communications Corp.'s Telenet network were able to set up universal accounts for first-time users. There were cases where customers set the accounts with a simple password, often only one letter. Experienced hackers can easily crack such a system.

"We changed the system so that it would require passwords of at least six alphanumeric characters," said Claudia Houston, a spokesman for GTE.

Other changes that vendors are making include additional lines of security. Rather than requiring one account and a password for everything, some operating systems require that a user first log on to the operating system. Only after that is completed can one access a specific application.

When a hacker cracks an account, he can use various programming tricks to search for accounts and passwords that will provide him with more ability to manipulate the system. He can write a routine that looks into main memory and checks lists of other accounts and passwords.

"We have a feature that partitions memory so that a user can look only at the portion where his application lies," noted David Habermehl, product marketing manager for Primos, Prime Computer, Inc.'s operating system.

Passwords stored in encrypted data

AT&T has enhanced its Unix operating systems so that passwords are stored in encrypted data. Even if the hacker could look at the data, it would not make any sense to him, AT&T claimed.

In Release 7 of the CPF operating system that runs on IBM's System/38, a security feature that prevents passwords from being intercepted over communications lines was included, a spokesman said. The software will not accept a password that is sent alone over a line; a password must be paired with code authorizing the user on the system.

Despite all the enhancements, system security is only as good as each company makes it. "We found that some companies had security measures that did not take full advantage of our system's security features," Prime's Habermehl said.

Niceco to hold September strategy meet

STONE MOUNTAIN, Ga. — The National Information Center and End-User Computing Organization (Niceco) will hold its Strategy Conference Sept. 17-19 at the Atlanta Hyatt Regency Hotel.

Shaku Atre, a consultant specializing in information center strategies, will give the keynote address. Other topics will include data control, micro-mainframe links, security and information center policy guidelines. The conference is sponsored by D&B Computing Services in conjunction with the Data Processing Application Consultants group.

Registration costs $375 before July 31, $475 thereafter. Niceco is located at 785 Martin Road, Stone Mountain, Ga. 30088.

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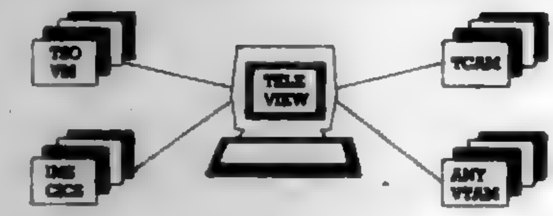

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Long-distance cost savings key to Fortune 1,000 market

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — Users in Fortune 1,000 firms will reap cost benefits as long-distance carriers increasingly offer enhancements to their services.

So said Dixon R. Doll, president of the DMW Group, Inc., a telecommunications consulting firm based in Ann Arbor, Mich.

Addressing a seminar at the Competitive Telecommunications Association (Comtel) conference in San Francisco recently, Doll told the carriers that cost savings are the key to penetrating the untapped Fortune 1,000 market.

"If you let the corporate client know more about his long-distance usage patterns than he already knows and give him ways to save money, you've got a foot in the corporate door," Doll said. "In the Fortune 1,000, information equals power," he said.

Doll suggested a variety of ways carriers could help corporate users reduce their bills:

- Optimizing network services. Most Fortune 1,000 companies are not using effectively their long-distance networks, Doll said. However, recently developed software lets users project their future network usage needs and allows carriers to reallocate their excess networking capacity. This can result in a 5% to 7% cost savings, Doll said.
- Using emerging technologies. Speech compression, for example, will double the number of channels available to users without increasing their monthly circuit costs, Doll said.
- Offering long-distance services bundled with related data communications services to the shared-tenant market.
- Packaging private branch exchange rentals with long-distance service.

As carriers attempt to differentiate their long-distance services, they will offer other product enhancements during the next several years, Doll said.

These will include electronic document distribution services, which let users move pages through a network; nationwide paging services; and voice mail service bureaus, Doll said.

Doll warned the group that the recent trend in the Fortune 1,000 to install high-speed T1 networks and equipment is a double-edged sword.

On the positive side, Doll said, the use of this high-speed equipment creates more usable capacity. On the negative side, however, corporations will increasingly resell this excess capacity and compete directly with the carriers themselves, Doll said.

Eastman Kodak Co. in Rochester, N.Y., and Sears Roebuck & Co. in Chicago have already begun doing this, he said.

Irug conference set for July 17

CHICAGO — The Irmx User Group (Irug) is scheduled to hold its international users conference at the Palmer House Hotel here July 17.

Irmx is a real-time operating system that was developed by Intel Corp. in 1980. The theme of this year's conference is "The Future Direction of Real-Time Software Applications."

At the conference, Intel's Irmx 286 and Opennet, its Ethernet local-area network, will be discussed.

A demonstration room will enable attendees to test Irmx products from Intel and independent software vendors.

There is no charge for attending the conference.

Additional information can be obtained from Catherine Moon, Irug Coordinator, Mail Stop HF2-57, 5200 N.E. Elam Young Pkwy., Hillsboro, Ore. 97123.

Software/Expo speaker chosen

DALLAS — Thomas M. Nies, chief executive officer of Cincom Systems, Inc., will deliver the keynote address at the 1985 Software/Expo to be held here Sept. 17-19.

Nies, whose firm has a reported 6,000 customers worldwide, will speak on "The 'Musts' for Modern Systems Implementation." Other presentations set for the conference include a panel discussion on software systems for business graphics and an examination of the problems posed by artificial intelligence to MIS professionals.

The conference is sponsored by *Infosystems* magazine. Registration for the show only is free when accompanied by a form obtained in advance from the conference organizers, Software/Expo. Otherwise, show-only registration is $10. Registration for the conference and the show costs $325 for the entire event and $110 for one-day attendance.

Software/Expo's offices are located in Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

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Study: N.Y.-area computer execs' salaries rose 20% in '84

By Clinton Wilder
CW Staff

NEW YORK — The salaries of top computer executives jumped by 20% in 1984, and the decentralization of data centers created many more software management jobs in large corporations, according to a recent survey of information management and data processing executive jobs in 28 large companies in the New York area.

The survey was the third annual salary study conducted by New York-based Edward Perlin Associates, Inc. The results showed only a 5% to 6% increase in the average total compensation (including stock options and deferred salary) of systems software department heads and software managers — a fact that research firm President Edward Perlin attributed to staff growth.

According to Perlin, the addition of many new management positions in decentralized data processing operations diluted the average salary figures when compared with the prior year. "What struck me most about the survey was that salaries didn't move more," he said.

"But we found that if a manager earning $60,000 [a year] got a raise to $70,000 but was joined in management by a $50,000 [a year] employee, the average salary in the department remained the same. There are a lot more people moving up the ranks into quasi-executive positions," he said.

Perlin's survey tracked 23 top computer executive positions, with area head — which refers to the company's top computer executive — the highest paid position and head of systems architecture and resource management the lowest paid positions.

Most of the firms surveyed were leading New York-based service companies — 11 were in banking, nine were in financial services, and two were in insurance.

Average salary increased

The average area head salary jumped from $183,500 a year in January 1984 to $221,600 one year later. An area head position is typically at the level of vice-president, executive vice-president or senior vice-president.

Perlin said the top job produces some of the survey's most accurate statistics because the turnover rate in those positions is so low. "With area heads, we're basically surveying the same guy year to year," he said.

The annual salaries for 19 area head positions surveyed this year ranged from $99,300 to $550,000, with the top salary showing a dramatic increase from $357,000, the highest salary reported among 27 area heads in 1984.

The decentralization of data centers among the surveyed firms shows up dramatically in the job classification of data center head. With 27 companies reporting in each year, the number of data center heads jumped 56% from 48 in 1984 to 75. But the average salary dropped from $73,500 to $73,000.

"We know that there are a number of facilities out there for many of the major companies," Perlin said. "Citicorp has 12 different DP centers, and we see the same trend with Chase Manhattan Bank and [Manufacturers Hanover Trust Co.]; what used to be centralized facilities now are spread out among half a dozen. In the three years of the survey, I can't think of one company that's gone the other way [to a more centralized DP operation]."

Figures evidencing staff growth

Other figures that evidence staff expansion include 20 companies reporting 63 salaries for manager of network operations jobs in 1985, compared with 16 firms reporting just 19 such positions in 1984. Systems design and development also showed marked growth in positions. The number of group heads reported for that department rose 25% from 60 in 1984 to 75 positions, with one fewer company reporting in 1985. Twenty-five companies reported 241 heads of systems design and development in 1985 — a 20.5% increase from 200 the previous year.

Among positions with comparable numbers of jobs reported in each year, the Perlin study found the following salary increases:

- Group head, computer services: Up 6% from $103,200 to $109,500.
- Telecommunications services head: Up 6% from $77,900 to $82,700.
- Manager, domestic communications networks: Up 15% from $56,600 to $65,000.
- Head, office automation: Up 9.5% from $64,000 to $70,100.

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MRP pipeline helps firm cut lead time, inventory

BRADFORD, Pa. — In less than one year after it installed a software system, a Fortune 200 company's manufacturing division here cut its lead times in half and its inventory levels by a third and gained a number of other substantial benefits.

The manufacturing division of Dallas-based Dresser Industries, Inc. employs about 250 workers who manufacture products for the energy industry that include pipe couplings, pipe valves and pipe fittings.

When the division began considering automation in 1979, its methods were out of date and inaccurate. The firm used predominantly manual systems; only 20% of its products in inventory had part numbers, and its on-time delivery rate was only 30%.

Inventory up, accuracy down

Dresser set up a task force to make an assessment of the division's operations and pull it out of its rut. "Inventory was way up, and accuracy was terrible," said Rene Al, Dresser's vice-president of operations and head of the task force. "On-time delivery was worse. And we discovered the existence of 13 different bills of material for the same product. You can imagine the confusion that caused."

Without a common bill of materials that reflected the most current and accurate design information from Dresser's engineers, the firm had no way to guarantee that the materials production needed were the same ones the division's purchasing department was ordering.

The task force decided Dresser needed to implement a material requirements planning (MRP) software system. Under the direction of a new task force, the firm bought three modules of Management Science America, Inc.'s Manufacturing System — manufacturing standards, inventory record control and product costing — and installed them on a 24M-byte Amdahl Corp. 5860 in Dallas.

Dresser started bringing up the software in July 1982. "At the time, we were in an economy that was heading in the wrong direction," said James Yerdon, manager of materials management. "But management said, 'We'll endure the expense in the short term for gains over the long haul.' "

From the beginning, the software project helped Dresser hone its operations. During the installation, for example, the firm instituted an alphanumeric indentification system for inventory parts and reviewed its old parts list. After the review, 30,000 inactive parts numbers were eliminated.

Within a year after the installation, the division's productivity rose by 25%, and its on-time delivery improved by 65%. On-time delivery is now at 70%, and the division expects to reach on-time percentages in the high 90s within the next year.

According to Thomas Wilson, the second task force's team leader, the software module that provided the basis for many of the benefits was MSA's standards module, which ties together costing and scheduling functions. The module contains Dresser's bill of materials, standard routing, work center definitions, engineering change notices and an item master. The item master, which pegs each part of each manufactured product from raw material to finished product, was particularly beneficial, Yerdon said.

Another improvement the system brought was in operations engineering, the department responsible for developing routings between work centers. According to Lynn Allen, a product processor who designs routings, the software cut development time in half.

Allen said that with the system taking care of development tasks, product processors can be dedicated to more important work. "Instead of spending most of our time as clerks we can get more involved in solving problems on the shop floor [and] investigating better methods for doing things," he said.

Another important trend that emerged was a shift in Dresser's make-to-stock:make-to-order ratio. With increased control over inventory and production, Al said, Dresser has seen a slight but important reduction in its volume of make-to-stock work in favor of an increase in make-to-order business.

Continuing trend

By being able to process orders quickly, Dresser expects to continue this trend, which will reduce the level of finished goods inventory and therefore reduce the amount of capital tied up in material. Wilson said the manufacturing division has already shaved about $13 million from its inventory and within a month will have only 35% of its capital devoted to material.

He said the software has also improved Dresser's customer relations, both by improving delivery times and by allowing sales staff members to make immediate inquiries about when customers request information. As a result, Dresser has booked orders that it once lost to its competitors.

With the old system, customers sometimes had to wait days or weeks for information such as production and shipping schedules. As a rough gauge of the system's success, however, Wilson said customers have complimented Dresser on its ability to respond quickly to their requests.

On average, users make 6,000 inquiries to the system each day. Wilson said the inquiries come from every division in the manufacturing division.

In the next few months, Dresser plans to bring up two additional MSA software modules — master production scheduling and manufacturing resources planning.

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WANG

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WORLD DIGEST

CW International News Network

TOKYO — Fujitsu Ltd. here has introduced a third line of disk drives to rival IBM's 3380 disk drives. Fujitsu reportedly announced two models of large-capacity magnetic disk storage — one with 5.04G bytes of storage capacity and one with an expandable 2.52G-byte capacity.

Fujitsu follows Hitachi Ltd. and the financially troubled Storage Technology Corp. to this market.

The devices are available for monthly lease prices ranging from $1,720 to $3,580, according to the vendor.

BLACKBURN, Australia — Employees of Hewlett-Packard Australia Ltd. here will be asked to follow their U.S. counterparts and take a three-day holiday this month to use up accumulated vacation time by August. A spokesman said HP was not considering layoffs because it expects an economic recovery to begin in the fourth quarter.

BRUSSELS — What is being called the contract of the century has been awarded to ITT subsidiary Bell Telephone in Antwerp, Belgium, and Acec of Charleroi, Belgium. The $2 billion contract calls for Belgium to digitize its telephone networks. Other bidders for the contract included GTE-Atea, Siemens AG, the AT&T and N. V. Philips joint venture and the Swedish communications giant, L. M. Ericsson.

PARIS — Seventeen largely European high-tech manufacturers will join forces to develop an open architecture intended for industrial applications.

Called Open System Architecture (OSA), the system is the equivalent of Open Systems Interconnect, the model of the International Standards Organization.

The companies engaged in this development include Groupe Bull, IBM GmbH, Cap Sogeti, AEG Telefunken, Aerospatiale, Philips Telecommunications, British Aerospace, CGE and Siemens AG. Industry sources see this project as one aimed at General Motors Corp.'s Manufacturing Automation Protocol project.

TOKYO — Approximately 61% of Japan's leading companies have no computer security devices at all, according to the Metropolitan Police Department's recent survey. The police department surveyed the 1,451 companies listed on the Tokyo Stock Exchange and received 1,151 responses. In the survey, 62% of the respondents indicated that DP people can enter and leave corporate computer rooms without any identification or security check. In addition, 37% of the respondents said employees besides DP people can also access computer rooms without identification.

Widely used security procedures here include employee signatures and identification cards that unlock doors (20%), alarm systems (14%), television monitors (10%) and devices that record entrance and exit (6%).

To safeguard software programs, 21% surveyed claimed to have a backup plan for operating systems software, while 18% had contingency plans for applications programs. Approximately 46% said they had no specific protection plan.

RIJSWIJK, Netherlands — Control Data Corp. (CDC) has reorganized its Benelux operations, merging Control Data Belgium and Control Data BV here in the Netherlands. All Benelux operations are now reporting to Control Data BV here.

The reorganization follows similar CDC mergers, combining subsidiaries in Sweden and Finland and in Switzerland and Austria.

OSLO — Unlike American minicomputer makers, Norway's largest computer vendor is experiencing record sales, according to Roy Jensen, general manager of Norsk Data A/S domestic operations. Sales are expected to top $227 million, compared with last year's $155 million. Norsk's ND-500 series accounts for about 70% of the firm's revenue.

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Masterpiece is, in every aspect, a new family of software products.

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Previous software designs have been developed to better utilize the power of the computer.

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The Intelligent Architecture design means that all menus and screen prompts become common to all Masterpiece applications. It means that the way users interact with an application will be the same from application to application—a significant factor contributing to greater ease-of-learning and ease-of-use.

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CALENDAR

WEEK OF AUG. 4

AUGUST 4-9, DALLAS — **Systems Development: Analysis Phase.** Contact: Arthur Young & Co., Education Center, 1950 Roland Clarke Place, Reston, Va. 22091.

AUGUST 5-6, MINNEAPOLIS — **Unix/Xenix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 5-7, PARSIPPANY, N.J. — **TSO/ISPF.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

AUGUST 5-7, JACKSON HOLE, WYO. — **EDP Audit Managers Roundup.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

AUGUST 5-7, BOSTON. — **1985 American Society of Mechanical Engineers (ASME) International Computers in Engineering Conference and Exhibition.** Contact: ASME, 345 E. 47th St., New York, N.Y. 10017.

AUGUST 5-7, WHITE PLAINS, N.Y. — **The IBM Personal Computer.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 5-8, CHICAGO — **Vtam: From Start to Finish.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 5-8, HOT SPRINGS, ARK. — **The Seventeenth Annual Meeting of the National Association for State Information Systems (Nasis).** Contact: Nasis, P.O. Box 11910, Lexington, Ky. 40578.

AUGUST 5-8, FORT LEE, N.J. — **CICS/VS Application Design.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 5-8, WASHINGTON, D.C. — **Vsam: Its Structure and How to Use It.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 5-8, FORT LEE, N.J. — **CICS/VS Logic and Debugging.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 5-9, NEW YORK — **Basic Systems Analysis.** Contact: Thomas J. Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

AUGUST 5-9, NEW YORK — **Structured Analysis and Design Techniques Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

AUGUST 5-9, SAN ANTONIO — **CICS/VS Application Programming — Command-Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 5-9, ATLANTA — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

AUGUST 5-9, MILWAUKEE — **How to Plan for Factory Automation.** Contact: University of Wisconsin Extension, Center for Continuing Engineering Education, Civic Center Campus, 929 N. Sixth St., Milwaukee, Wis. 53203.

AUGUST 7-8, ATLANTA — **Recovery/Restart.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 7-9, LONG ISLAND, N.Y. — **Data Communications Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry Street, Santa Ana, Calif. 92705.

AUGUST 7-9, RALEIGH, N.C. — **Local-Area Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 7-9, PALO ALTO, CALIF. — **PBX/CBX.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 10-12, TORONTO — **Data Base: Technical Developments.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

Masterpiece: Common Functions.

The reason Masterpiece works so well is because each of its pieces work so well together.

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The MasterSecurity™ system, Online Help and Navigation features work across (and are common to) all Masterpiece applications.

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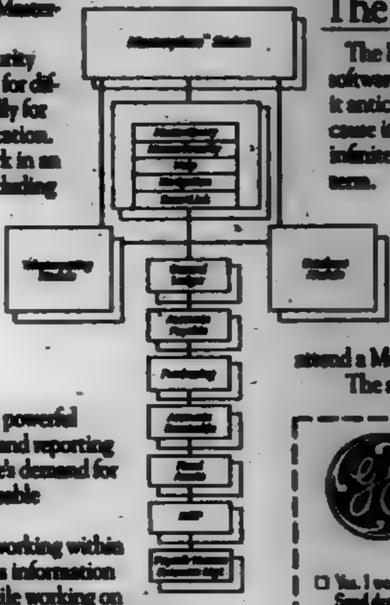
Everything is designed to work in an intelligent and modular fashion including what may now be the industry's most advanced query tool… MasterQuery.™



MasterQuery System.

The MasterQuery system is a powerful fourth generation borderless query and reporting tool designed to satisfy an executive's demand for instantly accessible and instantly usable information.

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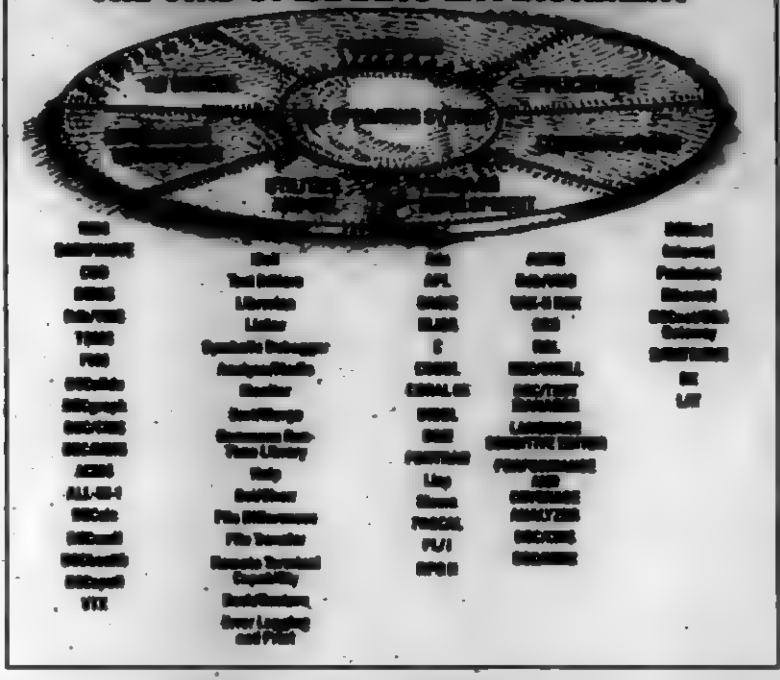

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EDITORIAL

Write your congressman

It almost goes without saying that programmers, no matter how well trained and how deeply motivated, cannot perform to their potential without the right tools. Similarly, it appears that a growing number of federal prosecutors are feeling hamstrung in the execution of their duties by the vagueness of laws pertaining to computer crimes [CW, July 1].

On the one hand, it can be weakly argued that we are lucky to have any federal computer crime legislation at all and that the Computer Fraud and Abuse Act of 1984 is a good start toward a more complete law. But this type of thinking ignores the realities of the modern technological state, in which the security of data bases that contain highly sensitive information is not keeping pace with the abilities of crooks who want to break into them.

To understand the scope of the problem, one need only look at the data on computer crime. The most significant aspect of the data is that most of the computer crime within the private sector is not reported intentionally to preserve the public's trust.

Moreover, the dollar value of many illegal computer entries cannot be accurately gauged. That is, what is the dollar value of damage done when secret *information* is accessed? Who is willing or able to judge the extent of long-term harm done by such an intrusion?

To understand further the need for comprehensive computer crime laws, MIS people and others must fully recognize that breaking into almost any system can be a fairly simple task today. This week, *Computerworld* examines hacking — often considered a more benign form of illegal system entry — and reports disturbing findings (see stories beginning on page 1).

One of the more notable hackers, now a consultant and author on hacking, admitted to recreational breaks into nearly 100 corporate computer systems. He was also part of a team claiming to have broken into hundreds more — all for the fun of it.

Couple that sort of fun and games with breaks of more malicious intent [CW, July 1], and the more prudent MIS managers must conclude that just about any system can and will be accessed illicitly.

That leaves one viable means of combating the problem in the short term, and that is stiffer, enforceable laws prohibiting it. It is not the fear of getting caught, per se, that deters people from cheating on their taxes, but the fear of the government penalties when cheaters are caught. It should be the same for illegal entries into systems.

There is potentially much more at stake in the latter case, both to individuals and corporations. Why, then, don't we have clearer statutes relating to computer crime?

According to some prosecutors, the current federal law is an easy target for sharp defense attorneys. It is confining and ill-defined and may result more in plea-bargained punishments than in the full application of the law, the prosecutors contend.

Whether acting through their companies, professional organizations or individual initiative, MIS managers need to play a lead role in a lobbying effort to put more teeth into computer crime legislation. Now is as good a time as any, as a U.S. House Subcommittee on Crime is mulling a modified computer crime bill that would extend the arm of federal prosecution into illegal access of private sector computer, not covered under federal law. As the saying goes, "Write your congressman."

Closing the gap

LETTERS

Shared tenant services here to stay

I'm writing not so much to congratulate you on your treatment but to respond to the information that was developed in the article, "Demand low for smart buildings" [CW, June 17]. The market for shared tenant services is not dead, not dying and shouldn't be going away soon. It's here to stay.

Why will shared tenant services live a long and healthy life? Because it's driven by simple economics. A small firm with 50 telephones or fewer cannot afford to spend even the $30,000 required to purchase a decent, integrated voice-mail machine. A provider of shared tenant services, however, can purchase a bigger machine with even greater capabilities for that mid-size tenant to use. And it will prove to be less expensive than trying to buy a cheap, inferior system.

If the offering doesn't catch on, it's the fault of the marketers for not seizing an opportunity. It could also be the fault of many of the companies that have developed and installed these systems; their design and comprehension of what the total offering could be leaves much to be desired.

And last, if the service does not make it, its demise could be linked to naive analysts who perform skimpy surveys, obtain negative results and, subsequently, have the results published by reputable journals. Such articles might be the most damaging vehicles as far as the industry observers, analysts and gurus are concerned. Fortunately, though, developers don't read those journals.

George R. Mackoff
Geneva, Ill.

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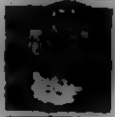
VIEWPOINT

Obtrusiveness in the age of automation



HUMAN CONNECTION
Jack Stone

The telephone rang last week, and the caller said, "Do not hang up, I am a computer. If you give me 30 seconds of your time, I will tell you how you can obtain a free oil change."

Click. I would have banged the handset down earlier when the word "computer" was mentioned, but I was paralyzed by surprise. Although this is an exaggerated, but true, example, it is certainly a dynamic case of how a computer system can intrude into one's personal life — and become thoroughly obtrusive.

There are similar situations in business, when the omnipresence of the computer interferes with a user's ability to adapt to systems operations.

One complaint about systems that I frequently hear is the continuing need for many users to focus on internal functionality rather than on the systems' uses. Obtrusiveness is related to the well-known systems characteristics and their ease of learning and operational simplicity. But it extends into the broader realm of how users relate to other, more established technologies in their everyday life, such as televisions and cars.

The following are comments from students after they reach the higher plane of amateurism:

"The terminal keyboard is a lot easier to use than I had previously thought, but I am disappointed that the systems are not as neatly packaged as I had hoped. Take spreadsheets, for example. Once the template is developed and macrocommands are implemented, the operation is straightforward. . . Presto! All done.

> **99**
>
> *'The way that operations start up is impressive. It's clear, clean and comprehensible. But when you call for the commands, splat! They come pouring onto the screen too quickly, and the presence of the computer becomes overbearing.'*

"The way that operations start up is impressive. It's clear, clean and comprehensible. But when you call for the commands, splat! They come pouring onto the screen too quickly, and the presence of the computer becomes overbearing.

"Spreadsheet development is downright intimidating. There's too much of the computer to deal with so that it gets in the way of my ability to construct the template in the first place.

'That's unobtrusive'

"The data base program falls into the same category. When the user starts off, there is nothing but a period to prompt the entry of a command — that's unobtrusive. But go beyond that — into the development of multiple file systems and the generation of command macros — and users find themselves unable to cope unless they become crackerjack programmers.

"Enormous strides have been made in keeping the complexities of computer technology away from the users. But there seems to be quite a way to go before the industry reaches the level of unobtrusiveness as automobile manufacturers.

"We appreciate that car buyers do not have to reprogram automobile engines. Technology is so well developed that, in spite of the complexity of the internal combustion engine, almost every citizen over the age of 16 can drive a car without understanding what's going on under the hood. Only when the nature of internally stored programs can be shielded from users to the same extent will computer systems be accepted by the entire business community."‡

Stone is a Washington, D.C.-based independent management consultant, educator and writer, specializing in DP human communications and personnel development.

Adopting a cost-of-quality metric for good measure

QUALITY
Wayne Smith

Data processing metrics have been a nagging disappointment to the industry for the last several years. Their almost total lack of acceptance by the commercial information management community stands in sharp contrast to the clear benefits that metrics appear to provide on paper or in journal articles.

One reason for this may be that metrics are often difficult to apply and don't appear to have an obvious correlation to the key business question: How do I better manage and organize my operation so that I can provide more effective services for the same cost?

Cost of quality may be the answer. Basically, cost of quality is a holistic metric that provides MIS with data on the total cost of producing DP quality systems for their users. Unlike many other local DP metrics, cost of quality is a global metric, measuring the full organizationwide DP costs.

Because it is a cost metric, it speaks the language of senior management. It becomes the definitive metric for MIS and provides both the initial motivation and ongoing performance measure for a quality program.

By using this metric, the MIS goal can be quantified quite easily: reduce the cost of quality by XX. Even if the goal is not met, the organization benefits by focusing management attention on relevant cost-of-quality factors.

Cost of quality as two components

If you think of MIS as a factory whose product is data and whose customers are the rest of the organization, then cost of quality can be thought of as comprising the two following components:

■ Cost of conformance.

The prevention and appraisal costs associated with ensuring that the delivered systems meet their requirements. Prevention costs are generally one-time costs or are characterized by relatively stable, predictable growth. Typical prevention costs are standards, quality assurance functions, training and education.

Appraisal costs are incurred by the organization in its attempt to uncover defects in work products before they are shipped to production. Typical appraisal costs are reviews, inspections and testing.

These costs are generally proportional to overall systems development costs and, as a consequence, are also relatively stable.

■ Cost of nonconformance.

The failure costs that the organization incurs when these systems don't meet their requirements.

Internal costs include project rework, corrective maintenance, reruns and excessive development costs. External costs include lost customers or lost business opportunities, unrealized or delayed systems benefits and lost MIS credibility within the organization.

> **99**
>
> *Unlike many other local DP metrics, cost of quality is a global metric, measuring the full organizationwide DP costs. Because it is a cost metric, it speaks the language of senior management. It becomes the definitive metric for MIS and provides both the initial motivation and ongoing performance measure for a quality program.*

The failure cost components are by far the largest and represent the biggest opportunity for information services management to reduce its total cost of quality.

These components are not stable, and in fact, failure costs, by their very nature are characterized by rapid, sometimes exponential, growth.

The earlier that defects are uncovered in any systems development, package acquisition or maintenance process, the less expensive they are to correct. Accordingly, the cheapest defect is the one uncovered in its planning stages before it has been manifested in an actual physical work product. This is the key to prevention.

To use the cost-of-quality metric in an overall quality program, one must establish the current cost-of-quality numbers for the organization and incorporate them into key program functions, based on where the highest return can be made.

Establishing cost-of quality measures and developing a set of factors or procedures are critical to the success of the effort. The approach consists of taking each of the components and determining the total cost for that component.

Developing factors

Quality Data Processing by Claude Burrill and Leon Ellsworth provides a good first clue at what these factors could be for each component. In addition, Guide, the IBM Users Group Association, is planning to publish its cost-of-quality report this summer.

Once the factors have been identified, a set of simple, straightforward definitions are developed. For each factor, a specific measurement method is then specified. This method must describe exactly how one can compute the costs for that factor.

With the cost-of-quality metric, information services has at its disposal a truly fundamental measure of the organization's actual performance. It also has a practical tool to effect the cultural changes required for a successful quality program.‡

Smith is vice-president, specializing in quality, at Applied Information Development, Inc. in Oak Brook, Ill.

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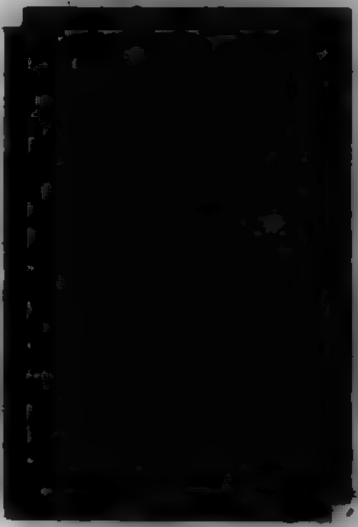
AN INTERVIEW



Ronald Kopeck

Microcomputer-to-mainframe links have been touted as the answer to boosting end-user productivity and adding flexibility to computing environments. But as they grow from their infancy, micro-mainframe link products are only beginning to meet the needs of MIS departments attempting to bring data down to the end-user. Some micro-mainframe products allow limited access to mainframe files; others permit only downloading; and some provide only screen capture capabilities. Nearly all succeed in stirring up confusion among MIS managers.

Ronald Kopeck, president of San Francisco-based Edgetech Associates, a consulting group specializing in micro-mainframe communications, recently discussed the issues involved in selecting a micro-to-mainframe link with Computerworld *staff writer Maura McEnaney.*

Describe the state of technology of micro-mainframe links today.
Quickly evolving. Customers and vendors are becoming more sophisticated. Companies are beginning to realize users need selective data extraction and data summarization capabilities. More sophisticated links are providing access to the data base without requiring a user to know anything about how the data is formatted or laid out. Vendors are realizing that basic hardware emulation links only do part of the job and are creating departmental nodes from the host, tying [personal computers] into the nodes.

Are micro-mainframe links selling well?
By our [Edgetech] estimates, the link market will reach almost $1 billion by 1988. In 1983, about $40 million [of link products were] shipped. In 1984, the figure reached about $250 million. [Digital Communications Associates, Inc.] claims it alone is going to ship $40 million this year with the Irma board. Other companies are right on the edge of survival. Vendors have to push really hard to make their revenue goals each month, because users are not buying in volume. They are buying five and 10 products at a time. We projected that the big volume buys would come in the second half of '85, and we're still holding to that.

What is holding users back?
Initially, users rushed into connecting their micros into the host, so they ran out and bought Irma cards. Then they realized

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- Softscope, a compendium of news from the software industry front/32
- Prime Computer enhanced the Primos operating system for its 50 series processors/33
- Math Advantage, a library of scientific/engineering algorithms, was unveiled by Quantitative Technology/33

AT&T's Unix: the formula for revolution?

SOFTLINE
Thomas O'Flaherty

AT&T's Unix strategy is an exception to the general rule that the success of a software vendor's short-term strategy is not normally of interest to the broad data processing community.

AT&T's software strategy — specifically its Unix strategy — has major goals and, essentially, no software base to worry about disrupting. This is a formula for revolution. AT&T as a revolutionary is ironic. To understand why, look at Unix's history and the AT&T strategy.

- Stage 0 (prehistory). Unix is created serendipitously by Bell Laboratories workers. Since AT&T could not at the time sell software commercially, it licensed Unix to universities but without any support. The power and flexibility of Unix, coupled with the need for self-support, made Unix an academic cult object. It also created almost as many Unix variants as users.
- Stage 1 (standardization). AT&T is freed to compete and realizes that it has a diamond in the rough. Unix has a great name but it is not really a product, in that it is not standardized and, more importantly, not oriented to performing real work such as applications processing. Thus, AT&T begins to standardize. One part of the standardization strategy is for major chip makers to implement inexpensive firmware versions of Unix.

See UNIX page 36

O'Flaherty is a Wood-Ridge, N.J., consultant who helps corporations coordinate MIS planning and the development of computer-based products. He is a principal of Information Service Strategies.

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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis; and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from mainframes to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

- Why not Cullinet, ADR or Focus? There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as the standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language - each one painting the user into its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few shops nowadays run only IBM mainframes. Why, then, even consider a database solution that runs only on *IBM mainframes?* Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE *are* identical.

FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

- Why not just go with DB2 or SQL/DS? A relational DBMS simplifies but does not by itself eliminate application programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are somewhat unlikely ever to run on another vendor's system). ORACLE runs on more IBM hardware and operating systems than do IBM's relational products.

- What about Goldengate, dBase III, Symphony or Framework? PCs need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload.

ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 1060.

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SOFTSCOPE

Notes from the software industry front

Applied Data Research, Inc. (ADR) and Billerica, Mass.-based Data Language Corp. have joined forces through a $2 million licensing agreement that allows ADR, located in Princeton, N.J., to develop software incorporating Data Language's Progress technology. Progress is an AT&T Unix- and Microsoft Corp. MS-DOS-based application development system. An ADR spokesman said the Progress technology represents an important addition to the company's IBM micro and mainframe product lines.

■

Look for a 1983 release of a version of the widely installed Syncsort, Inc. Syncsort sorting utility for Prime Computer, Inc. 50 series processors. Prime, headquartered in Natick, Mass., has contracted with Englewood Cliffs, N.J.-based Syncsort for the development of the new version, which will be the first Syncsort offering for the 32-bit superminicomputers. The version, currently under development, reportedly will be compatible with Prime's current sort utility.

■

Software AG Systems, Inc., based in Reston, Va., inked a joint development and marketing pact with American Software, Inc. of Atlanta to make American Software's application products available to Software AG's Adabas data base management system users. Through the agreement, according to a spokesman, native versions of American Software's materials management, distribution and accounting systems will be integrated with the Adabas relational DBMS and its Predict data dictionary.

■

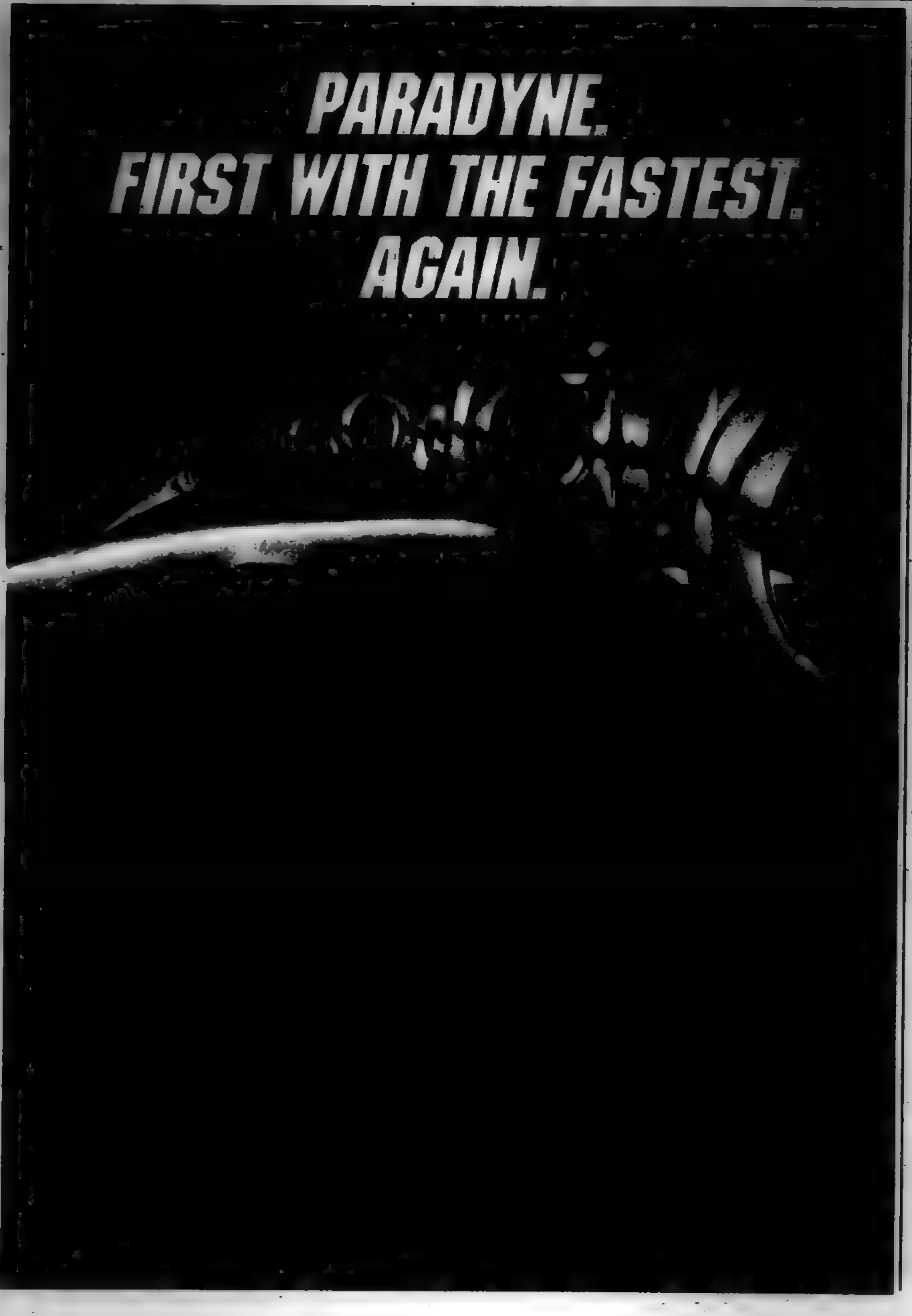
Gould, Inc.'s Compion Access software has been purchased by Internet Systems Corp. of Sunrise, Fla. Access provides users of Digital Equipment Corp.'s VAX minis under VMS with a communications interface to local-area networks, the Advanced Research Projects Agency Network and the U.S. Department of Defense's Milnet. Internet plans to integrate Access into its existing Hyper-Link communications software line.

■

Digital Equipment Corp. in Maynard, Mass., and Cognos Corp., of Peabody, Mass., have penned a cooperative marketing agreement for Cognos' Powerhouse fourth-generation language. DEC also linked up with Tektronix, Inc.'s Computer-Aided Engineering Systems Division, Sunnyvale, Calif., in a cooperative marketing agreement for the CAE 2000 integrated, hierarchically structured electronic design software. CAE 2000 capabilities reportedly include schematic capture, logic and circuit simulation and timing verification.

■

SAS Institute, Inc. of Cary, N.C., will begin marketing Lattice, Inc.'s C Native compiler for IBM 370 architecture systems as the result of an open-ended agreement signed by the two companies. SAS already markets Glen Ellyn, Ill.-based Lattice's IAPX 86 C cross-compiler.



Enhanced Primos boosts processor performance by 50%

NATICK, Mass. — Prime Computer, Inc. has introduced an enhanced release of its Primos operating system that is said to increase the performance rating of its current 50 series processors by nearly 50%.

According to a Prime spokesman, Primos Revision 19.4 increases the Whetstone performance rating of the 50 series machines by up to 45%. Whetstone ratings measure CPU performance in executing floating-point instructions used in applications such as finite element analysis, computer-aided design and simulation.

Revision 19.4 also features support for IBM's Systems Network Architecture and kernel support for Prime's recently announced Primix version of the AT&T Unix operating system. In addition, the enhanced version of Primos increases the number of asynchronous communications lines supported from 128 to 254 and roughly doubles the maximum program size supported from 32M bytes to almost 64M bytes.

The spokesman said the enhanced release employs a new run-file format called Executable Program Format that automatically shares programs and libraries among users. An additional improvement gives systems administrators increased control over the allocation of resources by allowing limitations to the number of segments and programs in each user's address space.

Revision 19.4 features improved security capabilities said to alert the system console to any logon attempt involving an incorrect user or project identification or password.

Revision 19.4 is available immediately. It is included in the pricing of the 50 series processors, which ranges from $30,000 to $500,000.

Prime Computer is located at Prime Park, Natick, Mass. 01760.

Firm's algorithm library out

BEAVERTON, Ore. — Quantitative Technology Corp. has announced Math Advantage, an extensive library of algorithms designed for use in numerically intensive scientific and engineering applications.

According to a company spokesman, Math Advantage was designed to improve the productivity of engineers and scientists who are developing high-speed applications that run on supercomputers and array processors.

The product operates on more than 20 different processors, ranging from the IBM Personal Computer to supercomputers, according to the vendor.

Math Advantage features nearly 180 coded and documented subroutines that can be called from programs written in either Fortran or C language using standard calling conventions used by computer manufacturers, according to the spokesman.

Routines can be tailored

For specific architectures, the spokesman said, Quantitative Technology will tailor the routines for performance.

For ease of use, the library is reportedly divided into categories containing groups of algorithms that provide a core for various applications.

Corporate and site licenses are available for multiple systems and multiple site installations.

Available immediately, Math Advantage is priced at $495 for micros, $2,000 for 32-bit workstations, $5,000 for superminicomputers, $7,500 for minisupercomputers and $10,000 for supercomputers.

More information is available from Quantitative Technology, which is located at Suite D, 8700 S.W. Creekside Place, Beaverton, Ore. 97005.

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Mega Group unwraps IBM mainframe WP package

Moves data to documents

IRVINE, Calif. — The Mega Group, Inc. has announced Megaword, a mainframe word processing package that enables users to move data from multiple spreadsheets into multiple documents. The Megaword package runs under IBM VM/CMS, MVS/TSO and MVS/XA environments.

Megaword's features include mail/merge facilities, printing support, menu systems, key sequences and editing capability, according to the vendor.

When a system has a microcomputer-to-mainframe link in place, Megaword on the mainframe enables users to read and write microcomputer and mainframe text files, according to a spokesman.

The product is said to be aimed at managers who wish to retrieve data from a central computer, create models and write reports.

Microcomputer users can use Megaword to store files on the CPU, enter or manipulate text and interact with other programs, Mega Group said.

Data reportedly can be transferred to Megaword from the company's other mainframe software, including the Megacalc spreadsheet, the Megafile file handling system, Megagraph decision support graphics and the Megastat statistical analysis package.

Megaword is priced from $4,000 to $6,500, depending on processor size, the vendor said.

Additional information is available from the Mega Group, which is located at 17701 Mitchell Ave. N., Irvine, Calif. 92714.

HP tool touts data base duplication

PALO ALTO, Calif. — Hewlett-Packard Co. has announced the HP Silhouette/3000 software for duplicating HP Turboimage and Image data bases on an HP 3000 superminicomputer.

The HP Silhouette/3000 is transparent to system users and duplicates the central HP 3000 data base on remote HP 3000 systems using network links. During a hardware or software failure, the primary data base shadow allows remote HP 3000 users to continue using data base applications, according to a spokesman.

When system messages indicate a failure has occurred, an operator transfers production from the main HP 3000 to another HP 3000 in the network. Incomplete transactions are removed from the secondary data base when a failure occurs to ensure data integrity. Users who need only inquiry access to a data base on the main HP 3000 system can be permanently moved to a secondary system for improved performance.

HP Silhouette was developed by Carolian Systems International, Inc. under the name Shadow. Marketed by Carolian Systems since September 1984, HP Silhouette/3000 is now being marketed by HP under a licensing agreement.

HP Silhouette/3000 is priced at $22,000 for the first copy; additional copies cost $9,000.

HP is located at 3000 Hanover St., Palo Alto, Calif. 94304.

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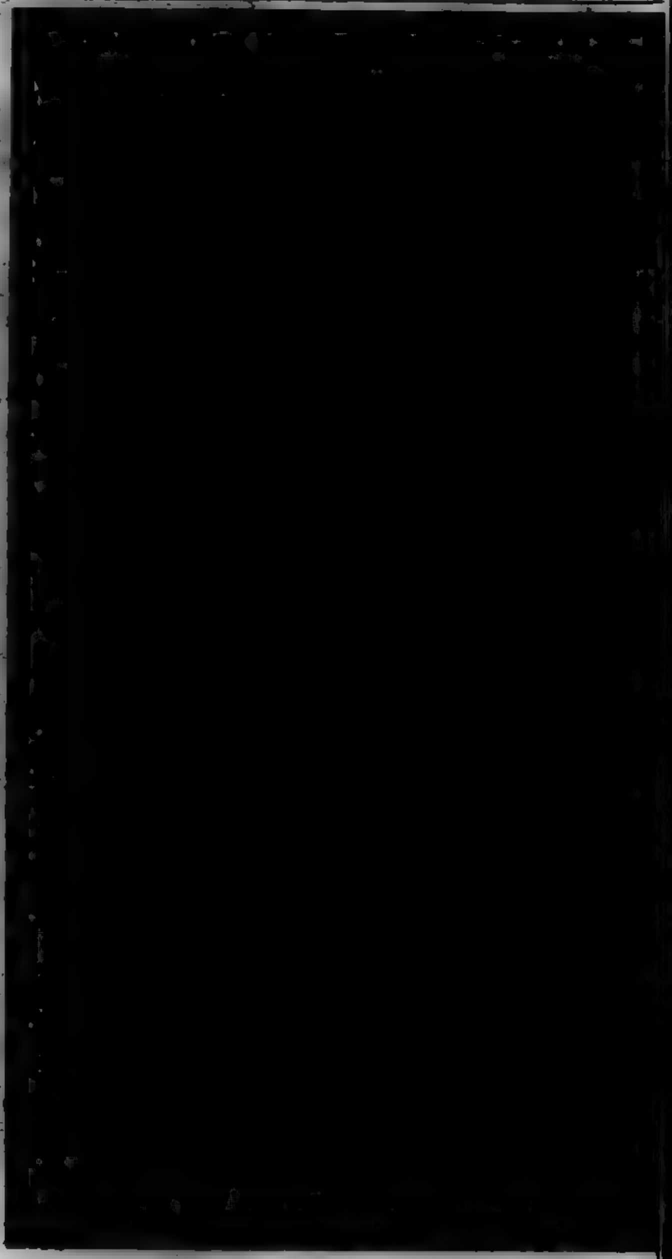

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UNIX

from page 31

- Stage 2 (hardware). AT&T produces Unix-based machines of its own and encourages other vendors to do the same. Many minicomputer makers and Bunch companies express support.
- Stage 3 (software). Enough Unix-based applications exist so that Unix becomes a self-contained world with families of Unix processors running a standardized Unix with all necessary applications modules.

Where is AT&T now? Stage 1 is almost successfully completed. AT&T's System V version of Unix will almost certainly triumph, and Unix microprocessors will soon be readily available.

Stage 2 has received good support, although the real test will be how many other hardware vendors give Unix wholehearted support. Stage 3 is a complete question mark.

The key to success in Stages 2 and 3 is successful partnerships.

Support two operating systems

First, consider what would happen to a computer manufacturer other than AT&T that gives Unix enthusiastic support. For some period of time — probably a lengthy one — the vendor would have to support at least two operating environments, its own proprietary operating system and Unix.

Vendor-supplied utilities and applications would have to be rewritten and then supported. The additional overhead would be significant. Sales of Unix-based systems would have to be large to justify such an investment. However, the more firms selling Unix-based systems, the less any one will benefit from the "Unix effect."

Even success with Unix would have its own pitfalls. A vendor's non-Unix customers would begin to wonder about the vendor's commitment to their needs. They might think, "As long as we have to make a conversion, we might as well go to IBM."

Unix success would have an even more disastrous effect for some manufacturers. Their hardware would become a commodity. Only low-cost producers would survive.

Thus, it appears against the interest of any established domestic hardware manufacturer — with the partial and ironic exception of IBM — to support Unix wholeheartedly.

Established independent software vendors would have at least as many problems as computer manufacturers. Those problems would include high development costs, duplicate support and enhancement costs and the obsolescence of existing products.

De facto standards

Unlike the hardware sector, Unix would not really introduce much in the way of software standardization since, at least for independent vendors, IBM's MVS and Microsoft Corp.'s MS-DOS have become de facto standards.

Would Unix-based software be inherently more desirable? The portability of Unix applicatons across different sizes of machines is a plus. So is its potential to be used in true distributed applications.

However, set against this is the increasing requirement for integrated, data base-driven applications. It would, for example, take many years to develop Unix equivalents to the Cullinet Software, Inc., McCormack & Dodge Corp. and Management Science America, Inc. families of products.

The flexibility of Unix is a two-edged sword. Unix applications buyers should not be allowed to get to the Unix core, since it takes systems programmer skills to deal with Unix. This is not a good advertisement for package flexibility or economy.

Given this set of issues, it is doubtful that many of the major producers of IBM-compatible software would see enough advantages to their customers and themselves to become Unix vendors. Only an attempt by IBM to reclaim large parts of the software market could force current software vendors into the Unix camp.

The essence of a partnership strategy is that both sides benefit. If the preceding analysis is on the mark, then many AT&T partners could find themselves disappointed; others could find themselves out of business.

What of AT&T itself? Certainly the widespread acceptance of Unix would benefit the company firm most iden-

See UNIX page 36

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UNIX

from page 35

tified with Unix.

It is not clear that AT&T can successfully produce commodity hardware. It is possible that AT&T could create a large amount of successful software in a short period of time. But no other firm has ever done so.

Hardware and software are coalescing around de facto IBM standards. The only flaw in this IBM world is the lack of good bridges between MVS and IBM's PC-DOS, but such bridges are now being built. Unix could never displace MVS applications inside large organizations. Consequently, a successful Unix would add complexity and costs.

However, AT&T is, at least implicitly, dedicated to just these goals. This puts AT&T, perhaps unconsciously, into the role of arch-revolutionary. Only revolutionaries benefit from damage to the existing — IBM — order.

Q&A

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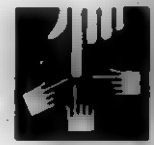
they had to be more methodical in their integration strategy. Users didn't want [links] to grow out of control, and they became more sophisticated about the technology. Companies are now caught at the point between just buying emulation products and attempting to get a more sophisticated, more transparent [micro-mainframe] solution that runs at a capacity and performance level consistent with the rest of their data center.



What are the most important steps a company should take when selecting a link?

Users [should] sit down and prepare a needs assessment. That means knowing what applications are going to run where. You have to know what you are going to run on the [personal computer] and what you [are] going to run on the host. Second, you must know the applications you are planning to install over the next two years.

What are the most common mistakes firms make when selecting a micro-mainframe product?

Not looking at the type of applications they have. Some companies buy an [IBM] 3270 emulator for mainframe connection and then find out that it is insufficient for their transfer needs. Another common mistake is that products are selected in a vacuum. When companies rely only on a technician to select the products, electronics are emphasized, not business applications.

Others look at a link as something that will implement the application. A link simply helps you move the data. As soon as you tie the application to the link, it will be more difficult to change. What may be a good link solution today may have to be changed in 18 months.

How can companies best deal with security issues presented by micro-mainframe links?

Right now, we still believe in centralized host security. Basically, links today don't provide any security. If the host system doesn't have any security, you don't have any.

Try to maintain centralized host control if you can. Make sure that when the data comes back to the mainframe, you can refer to an audit trail. Make sure you know who updated it and when they updated it. One solution is to put the uploaded data into a temporary holding area and allow the systems administrator [to] take care of the updates by running a separate job.

What kinds of applications are most commonly used with micro-mainframe links?

Financial applications where departmental budgets have to be rolled up into one corporate budget. In the manufacturing sector, we're seeing users make inventory data available on micros to manage production lines. In the retail sector, buyers can enter data to the mainframe via the [personal computers].

What will IBM's micro-mainframe strategy be?

I'm not so sure that [it] will jump into the fray with micro-mainframe link products per se. I suspect [it is] going to get into it via a more integrated approach, very much like what [it is] doing with the System/36. IBM has a lot of work to do to make all [its] systems integrate cleanly. I think there is still a big window for companies to develop a better mousetrap.

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Firm releases decision tool for IBM micros

NEW YORK — Announcing its merger with software vendor Management Decision Systems, Inc. late last month, Information Resources, Inc. a Chicago-based marketing research firm also unveiled PCexpress, a decision support system for the IBM Personal Computer, Personal Computer XT, AT and compatible machines.

The $1,495 PCexpress package is designed for decision support system applications in marketing and finance and combines data base management, query, modeling, statistical, reporting and graphics capabilities.

Graphics functions include capabilities for representing line plots, clustered and stacked bars, pie charts and scatter diagrams.

The product includes communications capabilities that allow users to access data from Information Resources' Express Decision Support System on IBM mainframes running VM/CMS and Prime Computer, Inc. systems running Primos, according to the vendor. Flat data files can be captured from any host computer that can communicate with an Ascii terminal, the vendor said.

The software reportedly permits a two-dimensional representation of business information, including different time periods, products, regions, customer types and distribution channels.

A menu interface, a mouse-driven interface, on-line documentation and user-defined Help screens are included.

PCexpress will be available during the fourth quarter.

As a result of Management Decision Systems' merger with Information Resources, all outstanding shares of Management Decision Systems common stock were converted into approximately 1.04 million shares of Information Resources common stock valued at approximately $26.1 million.

More information is available from Information Resources, 200 Fifth Ave., Waltham, Mass. 02254.

Designer aims to create more flexible software

By Eric Bender
CW Staff

"When I'm designing software I picture myself inside the computer, staring out at you," said Lotus Development Corp.'s principal technologist, framing his face with his hands to illustrate himself looking out through the screen of a microcomputer.

Kaplan

This perspective highlights the computer's raw speed, S. Jerrold Kaplan remarked in a recent interview. "Type a letter, and the program has all the time in the world to figure out what you need," he pointed out. Taking advantage of that time, "the program can adapt and become much more responsive — reach a higher level [of] activity."

Another way to describe the goal, according to Kaplan, is "creating new ways for people to instruct a computer which are vague. That allows the computer to interpret rather than execute commands; to be reactive, not passive." It also requires users to relinquish "the idea that the computer is always right."

Kaplan, 33, earned a doctorate in computer science from the University of Pennsylvania and did research at Stanford University before cofounding Teknowledge, Inc., a pioneer in artificial intelligence software, in 1981. At Teknowledge, he first handled marketing and sales and then moved into corporate development.

Finding himself investigating technology that was outside of Teknowledge's main business, he left the company this year, although he still acts as a consultant. Last spring Kaplan struck a deal to consult for Lotus on a variety of projects, and he also is contracted to develop a software product. He works at home in Portola Valley, Calif. "When appropriate I hop on a plane and come East," he said.

See KAPLAN page 41

■ Enertronics Research introduced a package that links mainframe graphics packages with IBM Personal Computers/38

■ Software Solutions upgraded its Dataease data base management system software/38

INSIDE

Software/38

Who will buy System/36 PC?

SMALL TALK
By Eric Bender
CW Senior Editor

IBM's System/36 PC, a truly curious machine, answers some questions about how Big Blue will link Personal Computers with its low-end multiuser systems. But the hybrid's current incarnation does not look much like a mainstream product for large corporations.

The System/36 PC does underline IBM's commitment to distributed computing. Here is a machine with workstations that may offer significantly more power, in some applications, than does a central CPU supporting a single user.

IBM did not release performance specifications on the 16-bit machine, but the current maximum internal memory is 256K bytes, and only three workstations are supported if a system printer is attached.

That makes the System/36 PC's pricing competitive but unremarkable. While many analysts were initially suprised that IBM would offer any System/36 with a $5,995 sticker, that starting price rises sharply for any reasonable configuration. The directly attached Personal Computer is a requirement, as is the $995 operating system, so a single-user base configuration costs almost $10,000

See IBM page 42

WHO IS THE WORLD LEADER IN IBM/38-36 BACKLOG REDUCTION?

FUSION

The world's most successful companies have made Fusion Products International the leading supplier of query/report-processor, PC interface and spreadsheet software for the IBM System/34/36/38.

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FUSION.

Fusion Products International [illegible] Larkspur L.C. Suite [illegible] Larkspur, California [illegible] Telephone 415 [illegible] Telex [illegible]. Also in New York and Newport Beach.

Software allows IBM micro to use mainframe graphics

ST. LOUIS — Enertronics Research, Inc. has introduced software for communication between mainframe graphics packages and the IBM Personal Computer.

The product, Enerconnect, runs on the Personal Computer and converts it into an IBM 3270-type graphics workstation that is able to communicate with a mainframe via an IBM 3274, 3276 or 3705 communications controller, according to Enertronics Research.

The software permits the Personal Computer to manipulate files downloaded from such mainframe graphics packages as Issco, Inc.'s Tell-a-Graf and Disspla.

Additionally, International Graphics Exchange Specification (Iges)-based mainframe computer-aided design files can be displayed and files from Enertronics' Energraphics graphics program can be merged with mainframe graphics files, the vendor said.

The latter feature permits data from such Personal Computer spreadsheet programs as Lotus Development Corp.'s 1-2-3 to be incorporated into a mainframe file.

Enerconnect is priced at $500 for use with IBM's Graphics Data Display Manager-based mainframe graphics software and at $650 for use with Iges-based mainframe graphics packages, according to the vendor.

The software requires 256K bytes of internal memory, IBM PC-DOS 2.0 or later, a graphics board such as the IBM Standard Graphics Adapter and a communications board.

For additional information, Enertronics Research is located in Suite 207, 150 North Meramec, St. Louis, Mo. 63105.

SCIENCE/SCOPE

The first full-scale development Amraam missile was fired successfully at the White Sands Missile Range in New Mexico. The missile was launched from a U.S. Air Force F-16 at 40,000 feet at a speed of Mach 1.2. It flew a preprogrammed course designed to evaluate the missile's control system and separation from the launch aircraft. It did not have a seeker but instead was programmed through its autopilot to fly a prescribed route. The advanced medium-range air-to-air missile is in full-scale development at Hughes Aircraft Company for the U.S. Air Force and Navy.

A new technique may expand the use of lasers in commercial and military applications. The approach, called optical phase conjugation, is considered a major advance in optics because it offers a solution to distortion problems that have limited the use of lasers. When a laser beam passes through a turbulent atmosphere or a severely strained optical component, the beam is distorted and the information it carries is degraded. The Hughes technique, however, forces the laser to retrace its path through the distorting medium so the beam emerges free of distortion. The method eliminates the need for complex electro-optical and mechanical components to correct the distortions.

A new process called vacuum brazing will soon help manufacture advanced radar components for U.S. fighter aircraft. Vacuum brazing forms extremely strong joints between lightweight metals, allowing engineers to design parts that previously could not be manufactured. The process involves treating parts with a special brazing alloy and a small amount of magnesium. The parts are placed inside the vacuum furnace, which normally operates at a pressure of one millionth of an atmosphere, and heated to temperatures of 1100°F. Because vacuum brazing requires no flux, it is far more economical than conventional flux dip brazing, in which components are dipped into molten salts. The process also eliminates corrosion caused by trapped or residual flux. Hughes engineers are investigating how vacuum brazing might be used to fabricate heat dissipators and other radar parts.

Acting as a kind of design and manufacturing prompter, a new artificial intelligence network increases productivity by automatically generating instructions for assembling complex electro-optical devices. The Hughes Integrated Classification System (HICLASS™) analyzes product design information to determine the best assembly techniques. It then selects the most efficient manufacturing processes available. Operators, on demand, are able to call up appropriate graphical and text instructions in color as they interact step by step with the system. As a result, workmanship improves substantially and products are made better.

Excellence in communications systems engineering has placed Hughes in a leading position in many of the major U.S. Air Force, Army, Navy, and Marine Corps communications programs, including PLRS, PJH, MILSTAR, and JTIDS. Our Communications Systems Division is committed to meeting the strategic and tactical communications requirements of the 1990s and beyond. We have a continuing need for qualified engineers in all communications systems disciplines at all levels. If your career goals include design of advanced antijam communications systems or HF through millimeter-wave radios, please send your resume to Hughes Ground Systems Group, Professional Employment, P.O. Box 4275, Dept. 53, Fullerton, CA 92634. Equal opportunity employer. U.S. citizenship required.

For more information write to: P.O. Box [illegible], Dept. [illegible], Los Angeles, CA [illegible]

HUGHES

Dataease enhanced

MILFORD, Conn. — Software Solutions, Inc. has announced enhancement of its Dataease data base management system for the IBM Personal Computer.

Dataease 2.5, priced at $600, reportedly offers a procedural language that does not require programming knowledge. It also requires fewer keystrokes to generate reports than needed in past versions and includes on-line transaction processing.

A relational data base manager, the software is also said to include such features as a library report template and expanded memory usage. Support for the Intel Corp. 8087 math coprocessor is included.

The software reportedly provides text-converted dollar amounts and complete date conversion functions.

Software Solutions is located at 305 Bic Drive, Milford, Conn. 06460.

NEC voice board out

MELVILLE, N.Y. — NEC America, Inc. has introduced its SAR-10 Voice Plus voice recognition board for the IBM Personal Computer.

The SAR-10 reportedly utilizes a custom large-scale integration chip set with a 250-word capability. Spoken words are digitized, and user-defined Ascii outputs are then transmitted to the Personal Computer.

The board comes with I/O jacks for attachment of microphones or speakers and with utility programs that reportedly allow voice I/O to be integrated into new and existing software applications. The SAR-10's menu reportedly lets the user create a vocabulary that defines spoken words.

The SAR-10 costs $895.

NEC America can be reached at 8 Old Sod Farm Road, Melville, N.Y. 11747.

Microstuf updates telecom software for IBM micro

ROSWELL, Ga. — Microstuf, Inc. has introduced Crosstalk Mark 4, a $245 telecommunications software package for use on the IBM Personal Computer.

Crosstalk Mark 4's features are said to include support for multiple concurrent communications, under which the software can accommodate 15 separate communications sessions simultaneously. Also supported are combinations of up to 15 local, modem and X.PC logical links, each occupying a page within the program. Crosstalk Mark 4 reportedly operates at up to 19.2K bit/sec. and emulates such terminals as the IBM 3101, in both page and character modes; the Digital Equipment Corp. VT100 series; the Televideo Systems, Inc. 912, 925 and 950 models; and the Applied Digital Data Systems, Inc. Regent and Viewpoint.

Crosstalk 4 permits the creation of macros that can automatically dial up and log in to remote systems.

All major file transfer protocols are supported, including Kermit, MNP, Xmodem and X.PC.

Microstuf is located at 1000 Holcomb Woods Pkwy., Roswell, Ga. 30076.

SIS unwraps Smart Ollie 1

NEW YORK — Strategic Intelligence Systems, Inc. (SIS) has announced a current economic information data base for strategic planners in corporations, research organizations and government.

Smart On-Line Linking of Intelligence for Executives (Smart Ollie 1) is stored on a floppy disk to run on the IBM Personal Computer XT and Personal Computer AT. The product reportedly is a data base of current business trends and issues and relevant written summaries that are accessible to the user by keyword searches.

Smart Ollie 1 is said to contain a cross-reference system that links current economic, social, political and technological trends to business issues, helping users focus their research on relevant connections within the data base.

The product uses a natural English language front end for user interaction. It requires 640K bytes of memory, PC-DOS 2.0 or later and a hard disk.

The cost of Smart Ollie 1 software is $7,500, and users receive updated diskettes monthly.

SIS is located at 575 Madison Ave., New York, N.Y. 10022.

SOFTWARE

■ **Computervision Corp. has introduced its Personal Architect software system for use on the IBM Personal Computer AT.**

Five software packages are available.

The packages include the following: architectural design and drafting ($9,200); advanced architectural drafting ($5,800); schematic/urban design ($3,500); architectural drafting ($2,500); and CV/CFMS, based on CFMS from Harper and Shuman, Inc., which includes modules for Project Control System ($1,995), Accounting System ($1,995), Payroll System ($395), Spreadsheet Interface ($95) and Billing System ($395).

A turnkey system is available at $13,200 for an IBM Personal Computer AT with architectural drafting

Continued on page 40

IBM offers law modules for its System/36 PC

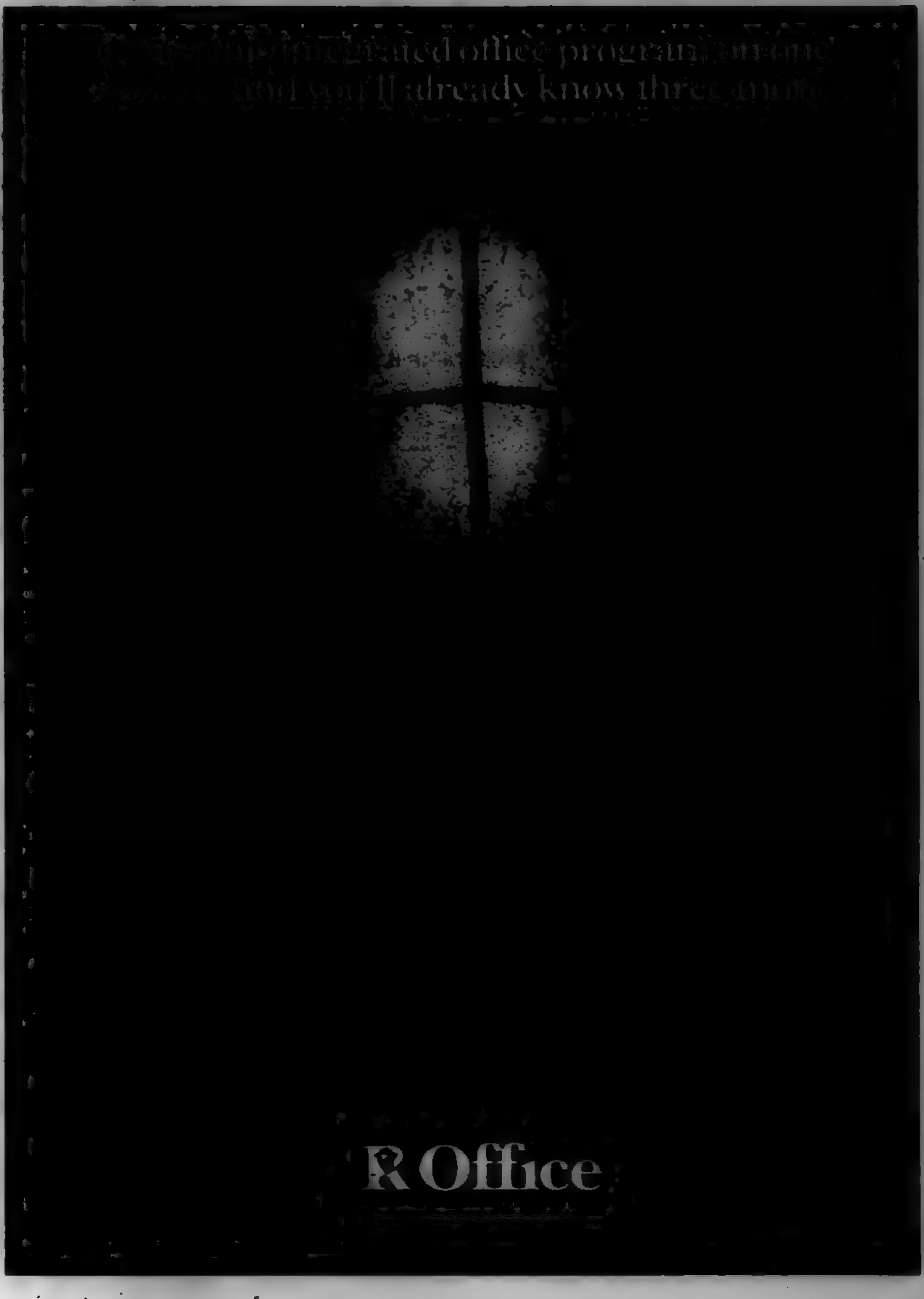
WHITE PLAINS, N.Y. — IBM has introduced two families of software modules for the IBM System/36 PC in use in law offices.

The Series 700 grouping includes individual programs for client financial management, lawyer financial management, law firm financial management, accounts receivable collections, statutory dates (docket), conflict of interest, client/matter records management, client statements and a controller system.

The second family of software products, the Series 900, reportedly offers expanded features for larger law firms and includes such programs as client financial management, lawyer financial management, client statements, library management, litigation support, research and retrieval and accounts receivable collection, among others.

Packages in the Series 700 family are priced from $175 to $2,250. Cost of software in the Series 900 family ranges from $175 to $6,400.

For further information, the National Accounts Division of IBM's Information Systems Group is located at 1133 Westchester Ave., White Plains, N.Y. 10604.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MICROCOMPUTERS

Continued from page 39

and graphics capability; and at $19,900 for a turnkey system including all the capabilities of architectural design and drafting.

The software requires a minimum of 512K bytes of random-access memory and IBM's PC-DOS operating system.

Computervision, 15 Crosby Drive, Bedford, Mass. 01730.

■ Information Processing, Inc. (IPI) has announced a micro version of its Blis/Cobol operating system for minicomputers.

PC-Blis reportedly allows users to run multiuser Blis/Cobol programs on the IBM Personal Computer XT and Star Technologies, Inc. PC. The software is said to support up to three Blis/Cobol users or two Blis/Cobol users and one PC-DOS user concurrently.

Blis/Cobol applications can operate on the micro running PC-Blis with no changes to the applications or files, according to the vendor.

PC-Blis resides in 256K bytes of memory. It is priced at $2,190 for a single-user system and $190 for each additional user. A Blis-to-Blis communications option that allows micro-micro or micro-mini file communications is available for $230.

IPI, 401 Whooping Loop, Altamonte Springs, Fla. 32701.

■ Unisource Software Corp. has announced a version of the Connector utility software for the AT&T Personal Computer 6300. The product was previously available for the IBM Personal Computer, Personal Computer XT and Personal Computer AT.

The Connector reportedly allows users to run an IBM PC-DOS and an AT&T Unix application concurrently on the same machine. The software enables the user to switch between PC-DOS and Unix with a single command, combining the multiuser and multitasking capabilities of Unix with PC-DOS programs, the vendor said.

The Connector running with PC-DOS and Unix requires a minimum of 512K bytes of memory.

The software costs $350.

Unisource Software, 71 Bent St., Cambridge, Mass. 02141.

■ Koch Industries has announced a version of its Sweep utility software for use with the Microsoft Corp. MS-DOS operating system on the IBM Personal Computer. Sweep was previously available for the Digital Research, Inc. CP/M operating system.

PC Sweep reportedly allows for concurrent execution of several MS-DOS commands. It also reportedly allows users to search files stored in any memory device and monitors the total amount of memory currently being used.

PC Sweep requires 128K bytes of memory and costs $79.95.

Koch Industries, Building G, 11 W. College Drive, Arlington Heights, Ill. 60004.

■ Intel Corp. has announced Irmx 286, a real-time operating system for micros incorporating Intel's 80286 microprocessor, including the IBM Personal Computer AT.

The Irmx operating system is said to permit users to access expanded memory and hardware traps built into the 80286 chip. Those traps reportedly can detect up to 90% of typical programming errors.

Irmx can address up to 16M bytes of memory and can be tailored to the needs of the specific application with which it will run, Intel said.

Irmx is priced at $7,500, according to the vendor.

Intel, Literature Department W-232, 3065 Bowers Ave., Santa Clara, Calif. 95051.

■ Fox & Geller, Inc. has introduced Passkey, a work sheet security program for use with Lotus Development Corp.'s 1-2-3 spreadsheet on the IBM Personal Computer.

Passkey reportedly protects against unauthorized use by permitting users to give each work sheet a password, without which access by others is prohibited. It also prevents access by permitting a work sheet to be encrypted.

The software resides in memory alongside 1-2-3, according to the vendor. No interruption of the spreadsheet is required for Passkey to be invoked.

Passkey is priced at $49.

Fox & Geller, 604 Market St., Elmwood Park, N.J. 07407.

■ Online/Database, Inc. has introduced Application Builder, a fourth-generation applications development tool for the IBM Personal Computer.

Application Builder was designed for use in developing software compatible with Cullinet Software, Inc.'s IDMS data base and ADS/Online language.

Application Builder permits users to develop applications for the Personal Computer and compatible machines and for IBM mainframes, according to the vendor.

The package is priced at $3,500, the vendor said.

Online/Database, 350 Phillips Hill Road, New City, N.Y. 10956.

■ United Software Security, Inc. has announced an enhanced version of its Privacy Plus security software and introduced the Private Eye security package. Both programs run on the IBM Personal Computer, Personal Computer XT and AT and compatible micros.

Continued on page 41

KODAK INTRODUCES THE COM
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You're looking at a real system, not parts stuck together. A design that started with a blank sheet of paper and then took shape over the years as we listened to what you needed—and translated those needs into fresh ideas that are years ahead.

For instance, there's a systems manager. A powerful new business computer that actually runs the operation, and also provides instant system access when requested. One benefit is that less experience and training are required for operators.

There's also an exclusive buffer for fiche masters, automatic exposure adjustments triggered by bar codes, and a programmable

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KAPLAN

from page 37

His position with Lotus began when Chairman Mitchell Kapor "approached me, we discussed what the effect of AI would be on the personal computer market, and I told him I think I know the answer," Kaplan said.

Kaplan, who describes AI as "a bad name for what I would call symbolic processing," sees three main routes by which AI or symbolic processing techniques can improve micro software. The most obvious, and hardest to discuss publicly in any detail, is in building new types of applications, he noted.

A second group of opportunities arises in enhancing existing applications, "altering the computer so that it becomes a partner in the problem," he said. Taking a spreadsheet program as an example, why not take all the information developers have about how spreadsheets are used and "design it, if I may anthropomorphize slightly, to know more about its anticipated use?" he asked.

'I'll show you a fool'

With this setup, users "must be tolerant of the system not always doing what they want," but this is acceptable as long as they know what's happening, he maintained. "People are accustomed to getting misinformation, and they know how to deal with it. Show me someone who trusts their computer output, and I'll show you a fool."

A third promising avenue of development lies in "improving the efficiency of the internal program," Kaplan said. "Typical architectures aren't flexible enough."

In one illustration from the AI world, Lisp machines often startle novice users by flashing a "disk-in-use" signal even when the system hasn't been asked to do anything recently, he said. "The computer knows you're just sitting there, and it's off cleaning itself up."

Kaplan has written prototype microcomputer software that bypasses the operating system so that "if it hasn't heard from you in 500 [msec], it will go off and do something," he said.

Today's personal computers offer plenty of power for this breed of software, he added. "I don't believe that special hardware or symbolic languages are required for this current generation of machines. The idea that we as software developers are waiting for a new generation of hardware is nonsense."

Continued from page 40

Privacy Plus Version 2 is said to offer ease-of-use enhancements such as resident code, improved displays, function keys and an on-line directory manager. Version 2 includes additional error protection, preconfigurable user options and an optional Master Key facility to recover from lost passwords. Version 2 requires 128K bytes of memory.

Private Eye reportedly allows the micro user to clear the screen at any time with a single keystroke without disturbing on-screen data. The software also blanks the screen automatically after a period of computer inactivity, preventing unauthorized people from viewing data and reducing screen wear.

Privacy Plus Version 2 costs $975 for a yearly site license and $2,925 for a corporate license. The Master Key option is priced at $300 and $900 for site and corporate license holders, respectively.

Private Eye is priced at $300 for an annual site license and $900 for an annual corporate license.

United Software Security, 6867 Elm St., McLean, Va. 22101.

■ Gracon Services, Inc. has announced a software package for Pascal programs on the IBM Personal Computer.

Turboref reportedly allows users to cross-reference a Pascal program and create a program listing. The software creates a list of each variable and constant reference in a given program, including the line number and type of use for each reference. The program listing includes boxes to indicate program control structures, underlines Pascal reserved words and highlights procedure names and comments.

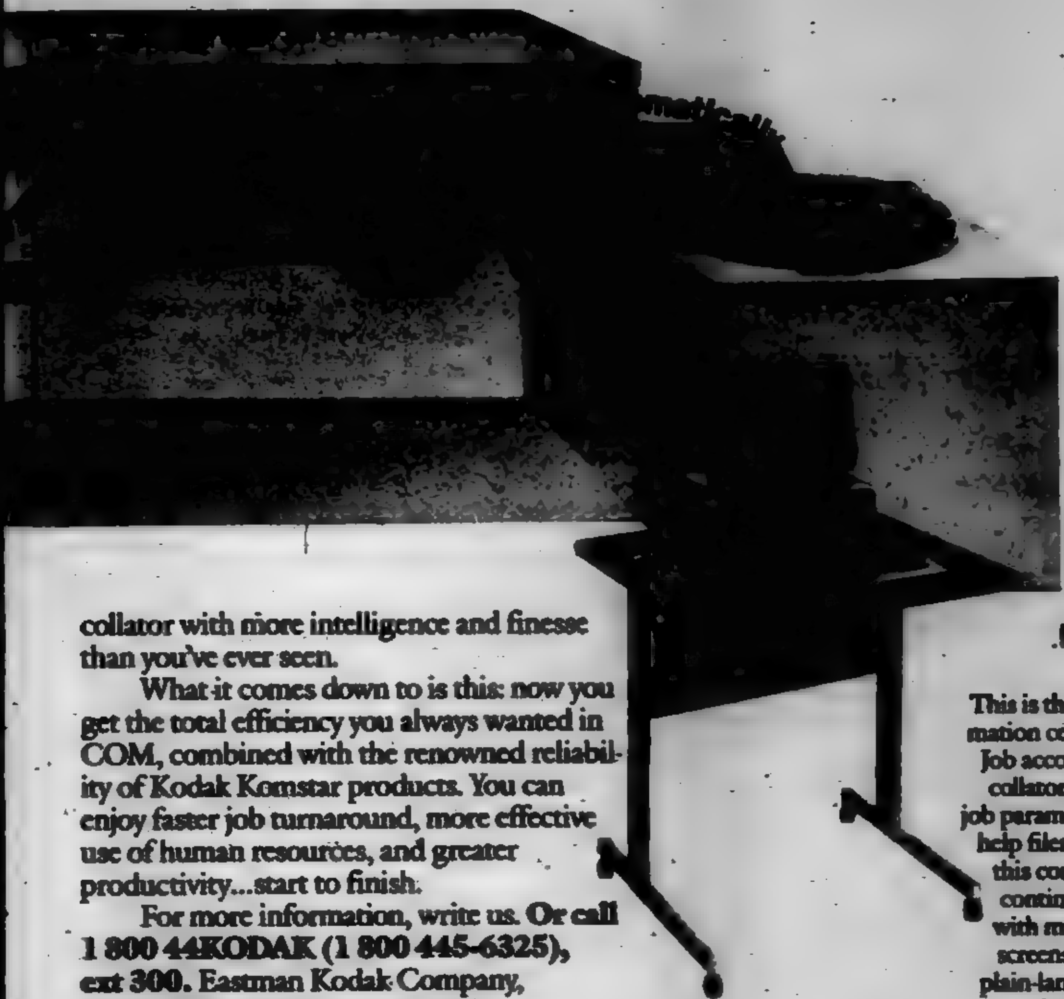
Turboref requires an IBM Personal Computer with 128K bytes of main memory and PC-DOS Version 2 or higher.

The software costs $49.95.

Gracon Services, 4632 Okemos Road, Okemos, Mich. 48864.

See TOOLS page 42

THAT DOES IT ALL:
THROUGHPUT, FINISH



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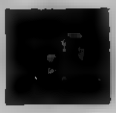

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MICROCOMPUTERS

TOOLS from page 41

■ **JB Systems has announced six application modules for its Mainsaver business software on AT&T 3B2 supermicros, IBM Personal Computers and compatible machines.**

The modules include work order processing and scheduling, budgeting, maintenance history, inventory management, preventive maintenance and purchase order systems. They are designed for use by plant management and equipment maintenance personnel.

The software system reportedly can generate a series of daily, weekly and monthly management reports including equipment history and costs, work order backlog, work load forecast and summary, deferred maintenance and status information.

Prices range from $975 for one module to $27,800 for the full six-module system.

JB Systems, Suite 640, 21600 Oxnard St., Woodland Hills, Calif. 91367.

■ **The Onware Project has announced Ontime, a data base manager-driven project-scheduling system for microcomputers that run Ashton-Tate's Dbase II.**

Ontime supports fixed and variable time and costs, automatically calculates time budgets when job quantities are defined or varied and will not overcommit resources, the vendor claimed.

The scheduling system is said to interface to Dbase, Ashton-Tate's Framework and Lotus Development Corp.'s 1-2-3 and Symphony.

Ontime costs $495.

The Onware Project, 535 California Drive, Burlingame, Calif. 94010.

■ **Blackridge Corp. has unveiled Inside, a two-pass**

Continued on page 44

UNIX SYSTEM V. SOFTWARE THAT STACKS UP.

High-quality application software written for UNIX System V is available now. And new business programs are continually being developed.

That means increased market opportunities for VARs and ISVs. And end users can be certain their investment in a UNIX System V-based computing system is a smart, sound one.

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The market for products that are based on UNIX System V has grown significantly over the last two years. There are now hundreds of packages written for UNIX System V. And this growth will continue.

Quality applications—general business packages and development tools—are now available for the AT&T UNIX PC. And AT&T is putting together even more hardworking, industry-specific software to run on AT&T 3B2 and 3B5 Computers.

With so many packages available, VARs can offer more turn key systems based on UNIX System V to an ever-growing customer base. ISVs can sell software to even more customers. And end users can invest in a UNIX System confident there is plenty of quality software available.

Software you can bank on

UNIX System V has gained acceptance as a powerful, versatile computing standard. More hardware vendors like NCR, Altos, Motorola, Perkin-Elmer and Sperry are joining AT&T in offering products based on UNIX System V.

And we've introduced the System V Interface Definition. Software written under the Interface Definition can run on current and future releases of AT&T's UNIX System V, as well as various System V derivatives offered by AT&T licensees. So there will be an even larger, more comprehensive base of portable software from which to choose.

Our comprehensive UNIX System V Software Catalog lists a full range of packages that run under UNIX System V. For end users it's a reference guide to the programs available. And for developers it's a smart way to ensure packages will have even greater exposure to the growing UNIX System V market.

To learn more about UNIX System V market opportunities, order the UNIX System V Software Catalog—at $19.95 plus tax. Call 1-800-432-6600 and ask for Operator 387.

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IBM from page 37

without any applications software.

Hooking up an IBM terminal will cost slightly under $2,000. Each additional Personal Computer requires a $995 terminal emulation package. The three-workstation configuration displayed at the announcement, which included a Personal Computer AT, came to well over $20,000.

Overall, the System/36 line offers a lot of customer blessings — they are reliable beasts, they run 4,000 programs and more than 50,000 of the systems already are in place — which often are compelling reasons for small to medium-size businesses.

But at the low end of the multiuser market where IBM's name does not count for quite so much, where price/performance is critical and where others have strong offerings, the System/36 PC will hardly be a dominant player.

Since last October, Big Blue has promoted the System/36 line as the mid-range hardware of choice for a distributed office architecture scheme, although these waters were muddied last month when IBM announced System/38 support of Office Systems software as well.

As the software components of this grand scheme appear, IBM is promoting it with newspaper ads designed to produce warm fuzzy feelings. The ads picture the System/36 "routing information all over the office faster than you can say 'Gosh, I should route this all over the office.'

"On the other hand," the ads continue, "if you need access to the facts and figures stored in your company's big mainframe computer, the System/36 is a doorway. Your personal computer plugs in one end, your mainframe in the other. And the System/36 contentedly hums away, letting you amble through the main data base just as far as your clearance will take you."

Clouds in the scenario

However, the low-end model's shotgun marriage of two architectures clouds this cheery scenario. A lot of other functions shut down elsewhere on the system while you're ambling through that data base.

Most strikingly, the personal computer directly plugged into the System/36 PC is substantially crippled, running IBM PC-DOS applications only as "a casual or secondary use," according to product material.

But despite all this, offering a small, relatively inexpensive System/36 both directly and through resellers is a good move for IBM, and many expect IBM to fix those glitches fairly promptly.

JOHN CULLINANE

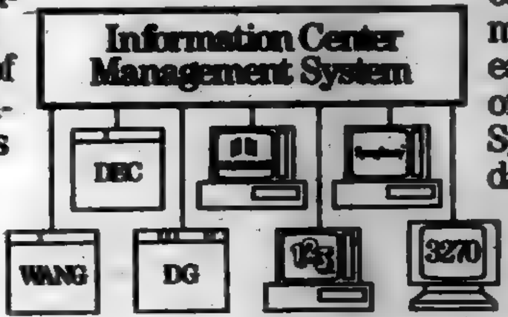
On the Information Center Strategy

Today, virtually every IBM mainframe user is attempting to implement an information center. Formulating a successful information system strategy for the 80's and 90's requires it.

However, one of the major problems many companies face is the variety of software and databases located on different mainframes, departmental minis and personal computers. The challenge is to create an environment that integrates this diversity, is responsive to the corporate user community in meeting its information needs and, most importantly, provides access that is consistent and transparent. This is why open system architecture is key in implementing an information center strategy.

> "Open system architecture is key in implementing an information center strategy."

It also makes particular sense for a software company like Cullinet to adopt a policy of open system architecture that allows corporations to standardize on Cullinet's products without losing a significant investment in other vendors' products—whether they are mainframe applications, microcomputer software such as Lotus 1-2-3, Symphony and other PC products or departmental minis from companies like Digital, Data General, Wang, Hewlett-Packard and others.



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MICROCOMPUTERS

Continued from page 42

disassembler for IBM Personal Computers and Personal Computer XTs that converts object code to source assembly code for Intel Corp. 8088, 8086, 80186 and 80286 microprocessors and for 8087 and 80287 math coprocessors.

The source code can be reassembled because its format is compatible with IBM's Macro Assembler and Intel's ASM-86 assembler, the vendor said. Code can be output to the terminal, printer, diskette or hard disk drive. Inside also is said to create a cross-reference table that lists each instruction that uses a particular value.

Inside costs $34.95.

Blackridge, P.O. Box 385, Bettendorf, Iowa 52722.

■ **SSI Software has unwrapped a spreadsheet program that interfaces with its Wordperfect word processing package running on IBM Personal Computers and compatible machines.**

Called Mathplan, the spreadsheet can save and combine partial worksheets, the vendor said. It reportedly provides 60 statistical, trigonometric and financial functions for building formulas and saves graphs as text files that can be included in Wordperfect documents.

Graphs are said to include vertical, horizontal and stacked-bar charts. The worksheet measures 999 rows by 64 72-char. col., the vendor said.

Mathplan costs $295.

SSI Software, 288 W. Center St., Orem, Utah 84057.

■ **Thorn EMI Computer Software, Inc. has announced two utility programs that provide prestructured financial and statistical models for the firm's spreadsheet package, Perfect Calc. Both utilities run on the IBM Personal Computer, Personal Computer XT and AT.**

The financial utility, Perfect Finance, is said to include 30 prestructured spreadsheets for investment planning; financial statement items; capital budgeting; and cash flow, loan and personal investment analysis.

Perfect Stat, the statistical utility, offers 80 models that include parametric and nonparametric hypothesis tests and regression analyses, the vendor said.

Each package costs $50.

Thorn EMI Computer Software, 1881 Langley Ave., Irvine, Calif. 92714.

■ **Gemini Software has announced an automated hard disk drive backup program for the Wang Laboratories, Inc. Professional Computer and IBM Personal Computer.**

Called Gemini Backup, the program automatically backs up either files that have changed since the last backup or only user-designated files or directories, the vendor said.

The program is said to back up to regular or high-density floppy drives, removable hard disk cartridges or disk emulation tapes and to run in parallel with other applications packages.

Gemini Backup costs $95.

Gemini Software, 91 Sheldon St., Providence, R.I. 02906.

■ **Migent Software, Inc. has announced a business package that reportedly combines artificial intelligence functions, a relational data base manager, a file manager and a spreadsheet. The software runs on IBM Personal Computer, Personal Computer XT and compatible systems.**

Called Ad-Lib, the software automatically creates record layouts and defines fields, requires no file names and lets the user change spreadsheet size and format with cursor keys, the vendor said. Data input is said to be through forms that can be drawn free-form on the screen.

Ad-Lib costs $495.

Migent Software, Suite 203, 8300 N. Hayden Road, Scottsdale, Ariz. 85258.

■ **STSC, Inc. has announced that its Statgraphics statistical graphics system for the IBM Personal Computer line now supports IBM's Enhanced Graphics Adapter and Enhanced Color Display Monitor.**

This allows Statgraphics to provide high-resolution color graphics without giving up text and numeric display quality, according to the vendor.

The Enhanced Graphics Adapter is said to provide 640- by 350-pixel bit-mapped graphics on Personal Computer and compatible monochrome displays, 16-color support in 320- by 200-pixel and 640- by 350-pixel modes on the original IBM color display and 16-color 640- by 350-pixel resolution on the Enhanced Color Display.

Statgraphics costs $695.

STSC, 2115 E. Jefferson St., Rockville, Md. 20852.

■ **Consumers Software, Inc. has announced a utility program said to improve the reliability of spreadsheet programs.**

The Spreadsheet Auditor operates with Lotus Development Corp.'s 1-2-3 and Symphony and Sorcim/IUS Micro Software's Supercalc on IBM Personal Computers and compatible machines.

Features include a flowchart utility that lists all the places a formula appears in the spreadsheet, a facility to print and cross-reference all macros used and Sideprint, a utility that prints spreadsheets and other text files sideways, according to the vendor.

The program costs $149.

Consumers Software, Suite B, 8315 Monterey St., Gilroy, Calif. 95020.

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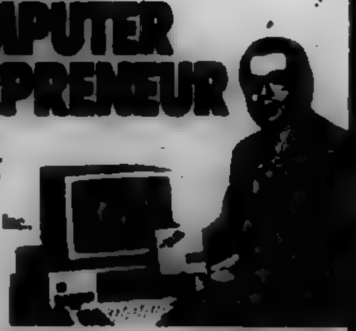

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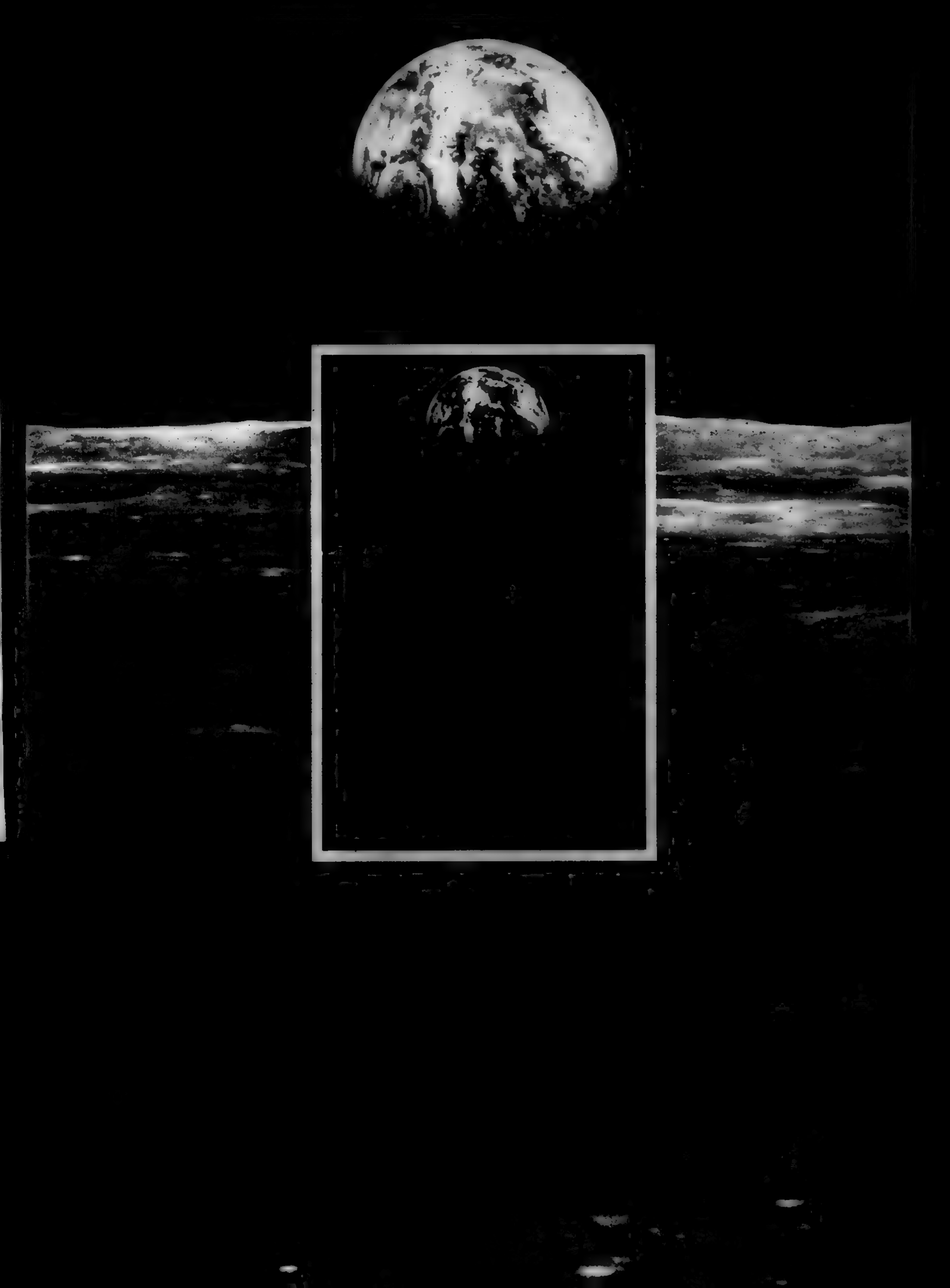

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Computer systems help keep NCC activities rolling at Chicago's McCormack Place/Preview/33

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COVER PHOTO COURTESY OF NASA

NCC '85: A look into the future

Draws together business, academic realms: director

By Clinton Wilder
CW Staff

Among the changes one notices between the 1984 National Computer Conference (NCC) program and the NCC '85 agenda is that the "Hardware and Architecture" program track has been replaced by the more elegant-sounding "Future Architectures and Supercomputers." The difference is deliberate.

"The change was a conscious decision to go along with the conference theme of 'Technology's Expanding Horizons,' " NCC program director Anthony S. Wojcik said in a recent interview.

"It's an indication of my own interests but also of what I believe are very hot topics right now. To me, NCC has a tradition of giving the people who attend it ideas about the future. Part of the mission of setting up the program was to bring back into the industry mainstream some ideas about what's going on technically," he said.

Wojcik

Wojcik has spent the last 18 months on that mission, screening nearly 200 session proposals. His success will be evident from the beginning of the conference with keynote speaker retired U.S. Navy Adm. Bobby R. Inman, chairman of Microelectronics and Computer Corp.

Future-oriented speaker

Wojcik wanted a future-oriented industry figure, and few have been as well-publicized as Inman, who is at the forefront of fifth-generation computer research.

"He fits perfectly into our theme of the future, and we had hoped we could attract someone like him," Wojcik said. "Advanced computer research today is clearly an area that interests not just the academic world but the business world as well."

Wojcik's own background spans both worlds. A professor of computer science and electrical and computer engineering at the nearby Illinois Institute of Technology, Wojcik has also served as a consultant to industry research at AT&T Bell Laboratories and the Argonne National Laboratory in Argonne, Ill. A lifelong Illinois resident, Wojcik has specialized in the fields of digital systems, computer organization and design automation.

In setting up his committee to pull the ambitious program together, Wojcik tried to draw equally from the academic and business arenas.

"The idea of NCC is to try to bring everyone together for better perspective," he said. "But it is a challenge. I've worked on several NCCs in the past and could see some problems that you face, but you don't anticipate all of them."

The scourge of NCC chairmen is the last-minute business commitment that pulls a top-notch session leader, committed more than a year before, out of the NCC city a week before the show.

Such headaches are inevitable with an all-volunteer program, but Wojcik is especially proud that three of the most future-oriented program tracks — artificial intelligence, architecture and networking (also new this year) — have remained intact.

"It is like a shell game at times," Wojcik said, "but we're particularly happy the way those three held out. In AI, for example, someone who attended all 10 sessions would come away with something pretty in depth."

Wojcik is well aware of the industry trend away from the large all-things-to-all-people shows like NCC to smaller, specialized conferences. But he believes that NCC, even with its smaller attendance, must continue to offer what it always has.

"We're serving a potentially giant market; we can't gear things just for the MIS audience or the academic," Wojcik said. "NCC gives nonexperts a chance to hear from the experts on a variety of topics, while the specialists can go to all the sessions in one program track. Some people think our focus is too broad, but we have to do it."

Wojcik also predicted a very strong attendance at NCC '85, in part because of its location in his home state.

Boats traverse the lagoon at Lincoln Park on Chicago's North Side.

NCC: Still computing's greatest show on earth

By Edward Warner
CW Staff

CHICAGO — The theme of this year's National Computer Conference (NCC), "Technology's Expanding Horizons," pervades the activities and presentations scheduled for the four-day show.

The conference's July 15 keynote speech, for example, "Managing the Creation and Commercialization of Technology," will be given by retired U.S. Navy Adm. Bobby R. Inman, director of the Austin, Texas-based cooperative research and development venture known as Microelectronics and Computer Technology Corp.

The NCC conference theme is also reflected in the technical sessions. This year's conference sessions have titles that include "Future Architectures and Supercomputing" and "Artificial Intelligence."

The show's theme, according to conference chairman Karl Martersteck, reinforces the fact that the industry "is clearly a technology-driven industry, and it's critically dependent for our national success to maintain our technological leadership position." Martersteck is executive director of the Digital Switching Systems Division at Bell Laboratories in Naperville, Ill.

The show is expected to draw 80,000 people to the 400,000-sq-ft McCormick Place convention center, according to a spokesman for the American Federation of Information Processing Societies, Inc. (Afips), one of the conference's cosponsors. The following are among the special features of the conference:

- Approximately 84 technical sessions offered in nine tracks to permit attendees to focus on areas of interest such as personal computing and computer networks.
- Twenty-seven professional development seminars on topics ranging from "Cost-Effective System Support" to "Implementing a Methodology — Do's and Don't's."
- More than 600 exhibitors representing more than 320 product and service categories.
- A forum featuring films and videotapes on computer industry advances.

NCC's technical-session tracks will focus on specific aspects of computer technology. The "Future Architectures and Supercomputing" track, for example, will look at "innovative computer architectures for both numerical processing and knowledge engineering," according to that track's chairman, Kai Hwang of the University of Southern California. Within that track, sessions will be held on such topics as multiprocessor architecture, interconnection networks and supermicroprocessors.

The other tracks for the conference's technical sessions are AI, business applications, educational and societal issues, end-user computing, information systems management, networking, personal computers and software systems.

Among the more exciting technical sessions, NCC program chairman Anthony S. Wojcik said, will be IBM's presentation on Systems Network Architecture, marking that structure's 10th anniversary, and a personal computing track session on AI on the personal computer. Wojcik is a member of the computer science department at the University of Illinois.

PHOTO COURTESY OF [illegible]

Chicago's McCormick Place

The 27 professional development seminars, meanwhile, will focus on updating professionals on specific key issues such as AT&T's Unix operating system and the interface between DP and computer-aided design.

Registration for the seminars, to be presented at the McCormick Center Hotel across the street from the exhibit hall, costs $55 for a half-day session and $95 for a full-day session.

"Fault-Tolerant Systems" is among the seminars planned for July 15. Those for July 16 and July 17 will include "Computer Networking" and "Breakthroughs in Strategic Planning and Electronic Data Processing Management," respectively. Among the July 18 seminars will be "Information Modeling."

The conference's July 17 Pioneer Day will pay tribute to the researchers and engineers in computer science at several Midwestern research laboratories, including the Argonne National Laboratory in Argonne, Ill. Their work, a conference spokesman said, resulted in such machines as the Avida, Oracle, Ordvac and Illiac computers of the early 1950s.

At the July 15 keynote session the recipients of the Harry Goode Award and the Distinguished Service Award (DSA) will be honored. The Goode Award includes a medal, certificate and cash prize and is given to honor "outstanding contributions to the information processing services," an Afips spokeswoman said. The DSA, she said, honors the outstanding contribution of an individual to the information processing field.

Registration for NCC costs $125 in advance and $150 on-site. One-day registration is $50; student registration is $10; registration for exhibits only is $50.

Afips is located at 1899 Preston White Drive, Reston, Va. 22091.

Keynoter Inman to explore R&D's evolution into products

By Clinton Wilder
CW Staff

The process of encouraging computer research advances and turning those advances into successful products on the market will be the topic of the 1985 National Computer Conference's (NCC) keynote address by retired U.S. Navy Adm. Bobby R. Inman, chairman, president and chief executive officer of the Microelectronics and Computer Technology Corp. (MCC).

Inman will deliver the speech "Managing the Creation and Commercialization of Technology" at 9:30 a.m. July 15.

Inman, the former director of the National Security Agency and deputy director of the Central Intelligence Agency, was named MCC chairman in 1983. He is in charge of directing the flow of technology from Austin, Texas-based MCC to its 21 member companies for incorporation into their product lines.

Inman is expected to discuss the procedures by which MCC hopes to advance American computer technology, as well as to encourage cooperative joint ventures and other innovative approaches to computer research.

"The challenge is our ability to commercialize technology," Inman said in a recent interview. "In the area of defense, for example, the time period from [a new technology's] conception to commercialization used to be four to five years. Now, as a result of bureaucratic requirements and weaknesses in our support of basic research, that time period is 12 to 13 years."

Inman believes that Japan's greatest competitive edge lies not in technological superiority but in the speed with which Japanese high-tech companies have brought their technologies into the marketplace. Because MCC was formed in direct response to Japan's announced effort to build the first fifth-generation computers, its biggest challenge lies in translating research breakthroughs into products.

"The 1980s and 1990s find us in an increasingly competitive international marketplace," Inman said. "This worldwide competition, coupled with scarce resources, particularly intellectual resources, here in the U.S., have forced us to seek new ways to go about the process of creating technology."

Inman predicted that cooperative corporate ventures, of which MCC is the largest and one of the best-known, will become increasingly commonplace in the computer industry. "U.S. companies are increasingly turning to the tool of procompetitive joint research ventures," he said. "Such an approach allows an efficient use of scarce technological problems and passing the results of the research back to the individual partners, who then carry the technology competitively to the markets of their choice in products of their own conception."

PHOTO COURTESY OF [illegible]

Inman

Inman has spoken often of a national awareness of the need for technological innovation and is expected to stress the point again at NCC.

"As we revise our tax system, we must be careful not to damage the process of capital formation, vital to the supply of investment funds for new ventures," he said. "The 1981 research and development tax credit is due to expire this year. I believe that the existence of this credit was the major factor in the continued increase in R&D spending, even during the deep recession of 1982. We should not take actions that once again reduce the incentives for critical investment in research."

Microelectronics and telecommunications are two of six industries identified by the National Academy of Sciences as deserving attention to ensure the continuation of technological advancement. Inman agrees that those industries, along with aerospace, energy, materials and biotechnology, must continue to seek paths to create and commercialize new technologies.

"The viability of the cooperative approach depends on the characteristics of specific industries, and the approach is certainly not a panacea to all problems of innovation and commercialization," Inman said. "But our competitiveness in a variety of industries will depend on our ability to facilitate the emergence and merging of technology in these six industries."

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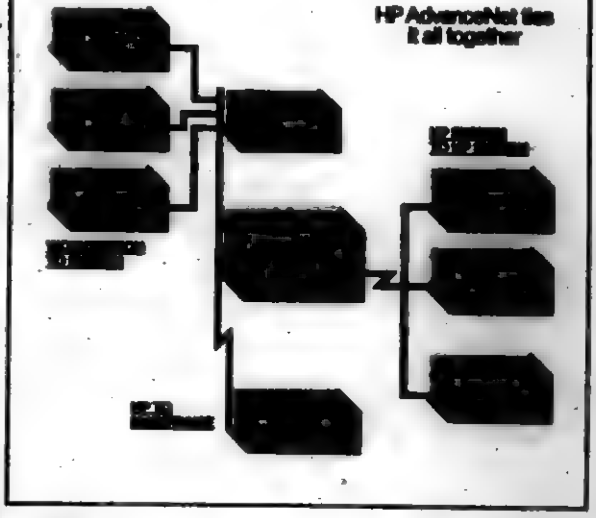

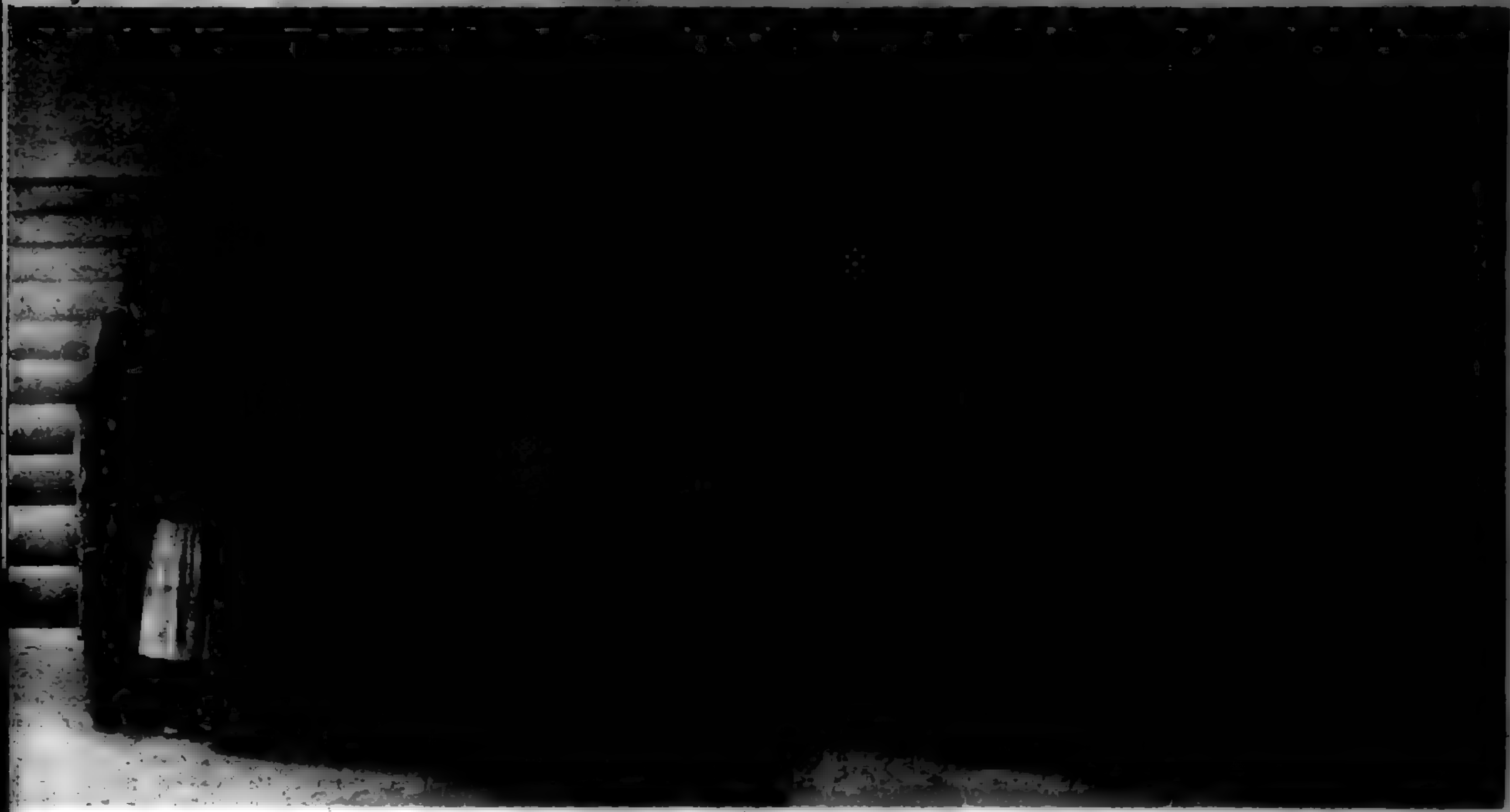

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NCC to host few large systems software vendors

But seek, and ye shall find

By [illegible]
CW Staff

You may have to search carefully through the maze of booths at the 1985 National Computer Conference (NCC), but if you are persistent, you will find the few large systems software vendors that plan to attend the annual computer industry gala.

Cincom Systems, Inc. will use its 20- by 30-ft booth to show off its major product lines, a spokeswoman said. In addition, the Cincinnati-based software vendor plans to hold a press conference to introduce products.

The spokeswoman declined to offer any specifics about the announcements but said they will involve applications software for IBM mainframes and Digital Equipment Corp. VAXs — Cincom's primary hardware environments.

Cincom was about the only mainframe software vendor to use NCC '84 as a product springboard.

Held press conference

The company staged a press conference in Las Vegas last year to introduce a Wang Laboratories, Inc. VS version of its Mantis applications development system and a set of AT&T Unix-based development tools.

Along with demonstrations of its existing products, Princeton, N.J.-based Applied Data Research, Inc. (ADR) is slated to exhibit a product that it plans to announce prior to the Chicago show.

ADR President Martin Goetz said the pre-NCC announcement will involve a micro-to-mainframe communications product and is related to the company's recent licensing agreement for Data Language Corp.'s micro-based Progress applications development system. Users can also get a look at ADR's recently unveiled [CW, May 6] DL1/Transparency migration aid at its NCC booth.

> *If you are persistent, you will find the few large systems software vendors that plan to attend the annual computer industry gala.*

An SAS Institute, Inc. spokeswoman said the Cary, N.C.-based software vendor will be exhibiting its line of software, with special emphasis on its new micro-based products.

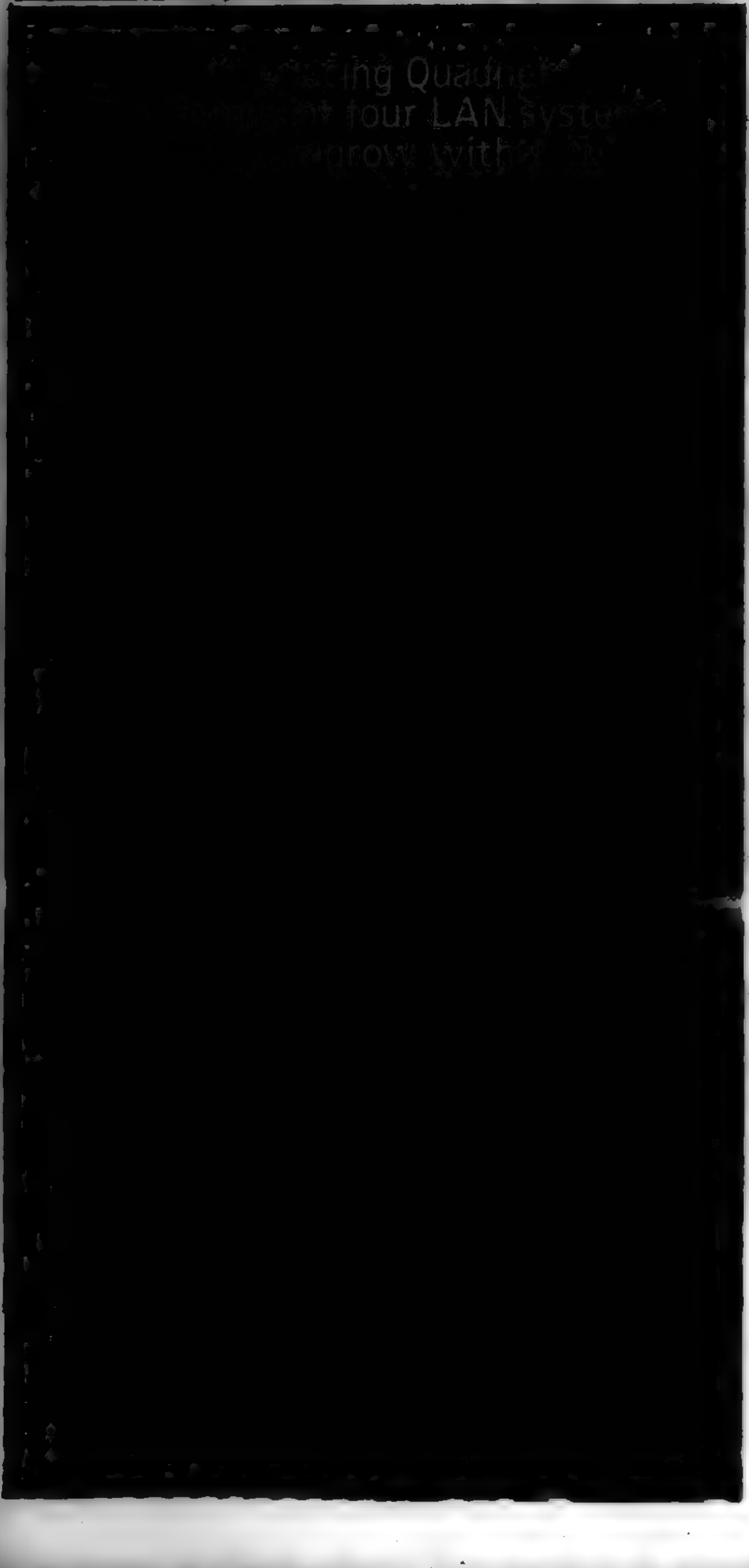
NCC visitors will be able to see the base SAS system for IBM's PC-DOS along with the recently introduced SAS/Stat statistical and SAS/Eterm terminal emulation packages designed for IBM Personal Computers [CW, June 24].

Attendees should also look for Los Gatos, Calif.-based Britton-Lee, Inc.'s announcement of a relational data base machine geared to PC-DOS-based multiuser micros. The machine, based on Britton-Lee's Intelligent Database Machine architecture, is expected to serve as many as 100 users on a network and be priced from $50,000.

Cullinet Software, Inc. will give users a look at its recently announced Information Center Management System (ICMS) products [CW, April 1] within the confines of its 30- by 40-ft booth at McCormick Place. The ICMS tools will be demonstrated along with the Westwood, Mass.-based vendor's other mainframe and micro software.

Computer Corp. of America will be at NCC for the first time, a spokeswoman said, to exhibit its complete product line.

Other companies scheduled to attend include Oracle Corp. and Relational Technology, Inc.



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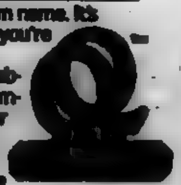

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NCC Preview

Lack of focus prompts software firms to skip NCC

By John Gallant
CW Staff

You have probably heard the old saw about the National Computer Conference (NCC) being primarily a hardware show.

The software community seems bent on proving that adage this year, as the majority of major large systems software vendors have elected to watch the Chicago extravaganza from the sidelines. Despite the health of the software industry — software vendors thus far seem immune from the forces plaguing their hardware brethren — and the impressive number of NCC '85 sessions focusing on software, the big players are, for the most part, staying home.

It seems NCC is just too vast and unfocused for software companies that are increasingly targeting their marketing resources to narrower, vertical markets or software-specific trade shows. In addition to perennial no-shows like Information Builders, Inc., Informatics General Corp., Hogan Systems, Inc. and Uccel Corp., powerhouses McCormack & Dodge Corp. and Management Science America, Inc. (MSA) decided to pass on this year's NCC. Both companies participated in the Las Vegas NCC gala last year.

As a M&D spokeswoman put it, "We canceled out this year because it is very expensive to attend and we found the results were not proportional. It's a very unfocused show and the payback is not big enough." An MSA spokeswoman said the Atlanta-based industry leader has become more selective about its trade show attendance, and NCC just did not fit the bill.

It is not that the software vendors have nothing to crow about. There have been plenty of major product announcements in recent months. But you will not get a demonstration of Uccel's Synova series or Computer Associates International, Inc.'s (CAI) CA-Unicenter software packages.

David Tory, senior vice-president at CAI, said the Jericho, N.Y.-based firm has backed off from NCC for a while. "NCC has become so enormous that we were not doing a level of business commensurate with the effort involved in trying to keep up with the Joneses, so to speak. There are a lot of tire kickers and students at NCC but not a lot of people making buying decisions."

Likewise, Software International Corp. will not be showing off its recently announced Masterpiece series products. A Software International spokesman said the company, which last attended NCC in 1983, has decided instead to introduce the products through a nationwide series of executive briefings and workshops.

If you want to learn about Software AG's planned Natural/Connection link to Ashton-Tate's microcomputer software, you will have to head to the company's Reston, Va., headquarters. Do not waste any time looking for Information Builders' booth or a demonstration of its Focus V.

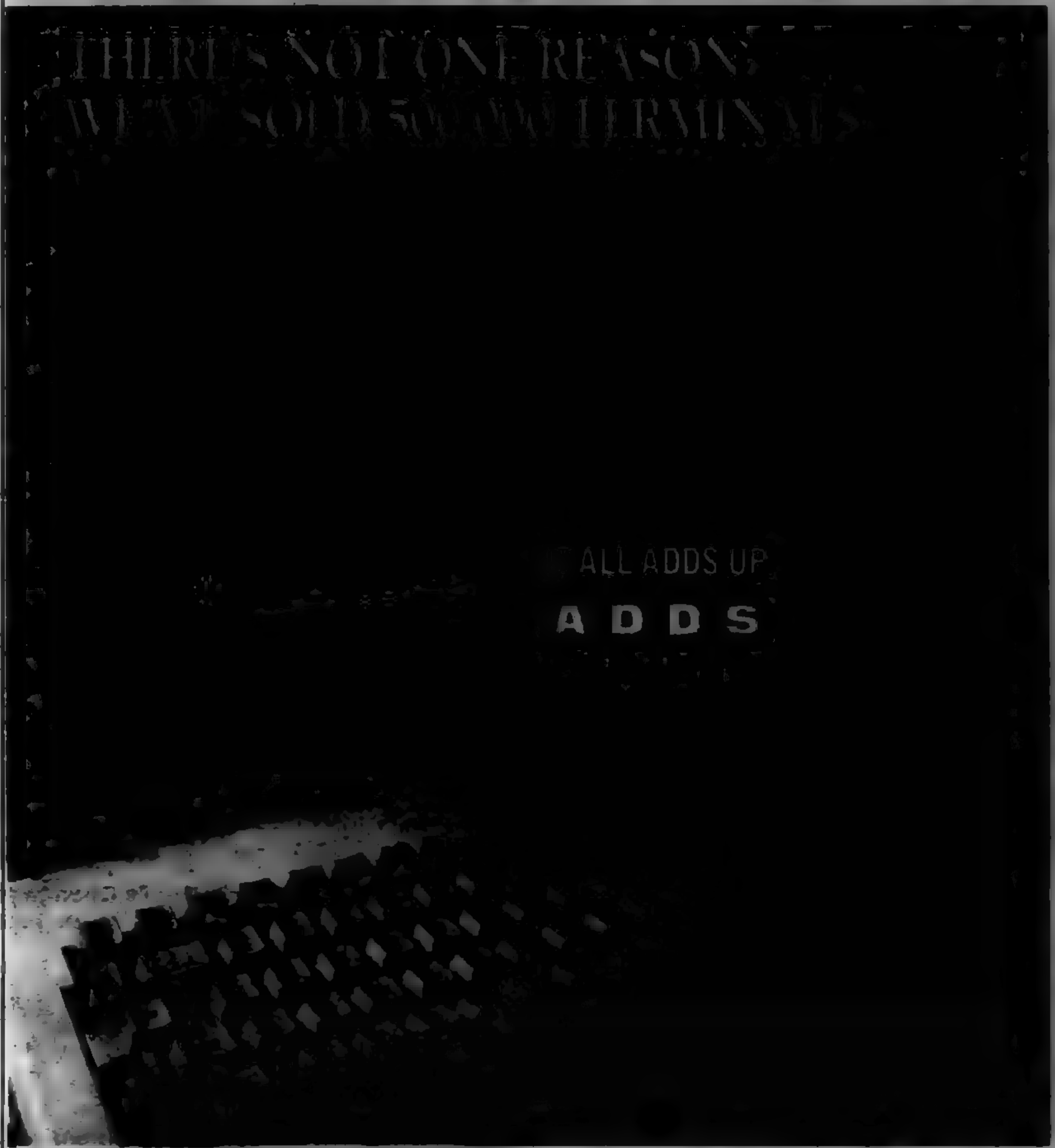
IBM will be there with its System/36 PC, but a spokesman said there will be no demonstrations of the office software announced last month for the System/38. Informatics will not be showcasing its recent micro-mainframe link introductions either. An Informatics spokesman said NCC just does not offer "enough bang for the buck."

Other software companies that have chosen to sit out NCC '85 include Boole and Babbage, Inc.; Comshare, Inc.; Issco Graphics, Inc.; Martin Marietta Data Systems; On-Line Software International, Inc.; Execucom Systems Corp.; and Walker Interactive Products, Inc.

This year's NCC will not be totally sans software vendors. Applied Data Research, Inc.; Cullinet Software, Inc.; Computer Corp. of America; SAS Institute, Inc.; and Relational Technology, Inc. will erect booths in McCormack Place.

But Michael Gallagher, product marketing manager for Software AG, explained the views of many of his peers. "After the [Anaheim, Calif.] NCC in 1983, we said, 'No more.' It's too big. NCC is just not as productive as some of the smaller, more tightly focused shows. We're going to stick with them. We are part of a growing group of software vendors."

> *'We were not doing a level of business commensurate with the effort involved in trying to keep up with the Joneses, so to speak. There are a lot of tire kickers and students at NCC but not a lot of people making buying decisions.'*
>
> — David Tory
> Computer Associates International, Inc.



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NCC past to present: A barometer of industry progress

By Paul Korzeniowski
CW Staff

The rapid progress of the computer industry has been well documented. If the space program had moved as swiftly, one might now work from an office on the moon.

Since 1973, computer professionals have gathered at the National Computer Conference (NCC) and tried to keep pace with the industry's rapid movement. To illustrate this progress, examine some past highlights.

The first National Computer Conference was held at the New York Hilton and Americana hotels in June 1973. There, IBM made its first appearance at a national data processing show since 1970 and showed its System/3 Model 10 and 370/145. Sen. Philip Hart (D-Mich.), in his keynote address, warned that the computer industry must restructure itself or face government regulation.

In national news, John Dean, former White House counsel, told a U.S. Senate committee that President Nixon, his staff and campaign aides had conspired to cover up Watergate.

Watergate was a topic of discussion at the 1974 NCC in Chicago. Vice-President Gerald Ford, the keynote speaker, warned users that computers had raised issues concerning privacy that would not be easily solved. The week of the conference, impeachment proceedings against President Nixon were begun by the House Judiciary Committee.

Product highlights in 1974 included Control Data Corp.'s announcement of plotting capability for its Cybernet time-sharing service and American Information Services' introduction of an enhanced version of IBM's VMF.

Approximately 32,000 computer professionals traveled to Anaheim, Calif., in 1975, and a *Computerworld* story stated that there was no evidence of the recession at NCC where 278 vendors displayed their wares in 799 booths. The week of the show, the government opened its antitrust case against IBM.

> *If the space program had moved as swiftly as the computer industry, one might now work from an office on the moon.*

At the conference, CDC announced its 38500 storage system as a competitor to IBM's 3850 storage system. Other debuts centered on enhancements to the growing number of minis.

In the bicentennial year, computer enthusiasts traveled to the New York Coliseum. The show's highlight was Univac's 90/70, a mainframe which offered 542K bytes of random-access memory (RAM) that could be upgraded to 4.1M bytes of RAM. Also, Telenet Communications Corp. held the largest demonstration of a packet-switching network with 16 firms connected on its network.

When the 1977 show opened in Dallas, Billy Martin was manager of the New York Yankees ball club, which was destined to beat the Kansas City Royals and Los Angeles Dodgers on its way to a World Series victory. Personal computer manufacturers were invited to the show, but they were not allowed to demonstrate their wares on the show floor. Downstairs from the show, Mits, Inc., Cromemco Corp. and Imsai, Inc. showed their products to curious spectators.

As 51,000 spectators gathered in Anaheim in 1978, a topic of discussion was passage of Proposition 13, which would limit California government spending. During the conference, Electronic Memories and Magnetics Corp. announced memory add-ons for the IBM 3030 series of mainframes.

The 1979 NCC was held in New York one week after a DC-10 plane crashed in Chicago, and 275 people were killed in the worst disaster in U.S. aviation history. Sperry Univac introduced its 1100/60 mainframe to compete with IBM's 4300 series. A major software announcement was SAS Institute, Inc. adding support for structured programming to its statistical analysis package.

Mount St. Helen's rumblings were in the news as NCC attendees met in Anaheim in 1980. During the conference, Data General Corp. brought out its Eclipse MV/8000 line of minicomputers and Zilog, Inc. announced its Z-Net packet-switched architecture.

Systems Engineering Laboratories, Inc. demonstrated the most important product at the 1981 conference in a hotel suite and not on the show floor. The company claimed that its Concept 32/87 ran three times faster than a Digital Equipment Corp. VAX-11/780. Perkin-Elmer Corp. announced its 3230 superminicomputer that ran AT&T's Unix.

In 1982 the show was held for the first and probably the last time in Houston. The week of the conference, John Hinckley was found not guilty of shooting Ronald Reagan by reason of insanity. Microcomputer manufacturers such as Cromemco, Lobo Drives International, Jonos Ltd., Onyx Systems, Inc. and Morrow Decisions, Inc. displayed their wares.

The economy had taken a turn for the better as the 1983 NCC began in the Anaheim Convention Center. There, IBM unveiled its System/36 and NCR Corp. released seven models for its mainframe line.

In 1984, NCC moved to the Las Vegas Convention Center. A number of storage product vendors announced hard disks and tape drives. Cincom Systems, Inc. introduced a set of Unix software development tools and a version of Mantis, its fourth-generation applications development system for Wang Laboratories, Inc.'s VS line of minis.

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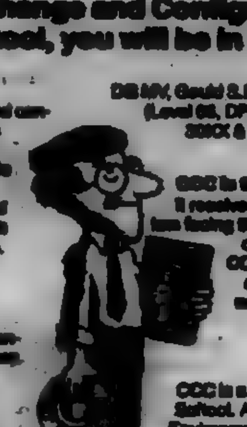

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NCC Preview

DEC, Wang top extensive list of NCC no-shows

By Peter Bartolik
CW Staff

CHICAGO — The National Computer Conference (NCC) has long been considered a hardware show, but some equipment vendors who showed up last year will not exhibit this year. Some have found better ways to spend their money, and some are faced with the need to cut costs as a result of adverse sales conditions.

Included in the list of no-shows are Apple Computer, Inc. and Wang Laboratories, Inc., both mired in consolidation efforts as a result of abrupt financial downturns. Digital Equipment Corp. also pulled out of the show at a late date.

Apple has pulled out of several shows in the past few months, most recently canceling an exhibit at Info last month, just seven days before it opened, and yanking a session speaker at the same show with just two days' notice. That came a week before the company announced it was laying off 21% of its work force.

Wang is in similar straits, recently announcing the layoff of 1,600 workers and pledging to cut expenses across the board. A Wang spokesman, however, said the company this year has found it more advantageous to exhibit at more targeted trade shows where it can more readily identify potential customers.

DEC spokesman Richard Berube also said his company has found it more advantageous to exhibit at more focused shows, particularly the company-sponsored DECworld, where customers may spend one or two days immersed in DEC products and seminars.

"We're looking hard at where we spend our resources," Berube said.

Targeting more focused shows

The desire to focus on more finely tuned shows was cited by several vendors as the reason for passing up this year's NCC.

Tandem Computers, Inc. spokeswoman Gina Burr said, "We find we get much better attendance at a number of other vertical industry shows."

Mike Cox, a spokesman for Gould, Inc.'s Computer Divisions, said, "We just feel that the show is way too broadly focused for the industries we're in."

Texas Instruments, Inc., which has been suffering in the depths of the semiconductor sales depression and has implemented two rounds of layoffs in less than a year, will not send its data systems group to NCC this year.

Ted Jernigen, spokesman for the group, said the company is not cutting back exhibits across the board, but, instead, seeking more targeted opportunities. "We're participating in more than 100 vertical market trade shows this year that reflect the targets of all of our programs," he said.

Canaan Computer Corp., which last year used NCC to launch a new product, this year has decided there are ways to get a bigger bang for the buck. Spokeswoman Sheree Parke said, "We have been doing a lot of media advertising, and that seems to be pulling in a lot more in terms of exposure and the quality of leads. We decided to take the money set aside for NCC and pump it back into the advertising budget."

Memorex Corp. earlier this year announced it was pulling out and would instead drive an exhibit trailer around the country.

Micro-oriented firms

A number of micro-oriented companies that are skipping this year's show, including several that are no longer in business, are operating on a greatly reduced scope compared with that of last year.

Gavilan Computer Corp. filed for bankruptcy two months after last year's show and later filed a liquidation petition with the court.

Fortune Systems Corp. is struggling along under reorganization protection.

Victor Technologies, Inc. fell on hard times and was sold to a Swedish company. And Visicorp lost the marketing rights to Visicalc and was absorbed by Paladin Software Co.

Compaq Computer Corp. is still booming along, yet it also will not repeat last year's show attendance. "It no longer fits our audience profile," according to Compaq spokesman Jeff Stives, who pointed out that Compaq sells through dealers and has no direct end-user sales. Compaq is attending shows that seem most meaningful to its sales efforts, he added.

Among the other micro vendors who attended last year but were not listed on the exhibitor list received last month include Sony Corp. of America, Sord Computer Corp. of America, North Star Computers, Inc., storage device manufacturer Tandon Corp. and Corona Data Systems, Inc.

Approximately 50 vendors from last year's show will not be here this year, according to information available prior to the show. Among the missing are the following: Beehive International, which is undergoing reorganization under Chapter 11 of the Federal Bankruptcy Act; Codex Corp.; Computer Consoles, Inc.; Dataproducts, Inc.; Digital Research, Inc.; Fairchild Camera and Instrument Corp.; NBI, Inc.; Pertec Computer Corp.; and Plexus Computers, Inc.

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SUNDAY – July 14

[illegible]	[illegible]	[illegible]
1:00 PM	"Career Planning Workshop"	McCormick Center Hotel Room 5
[illegible]	[illegible]	[illegible]
3:30 PM	Wall Street Journal Survey The Results of the Computer/Office Automation Survey	Lindheimer North Room McCormick Place

MONDAY

Program Track	10:00 AM	1:30 PM–3:00 PM	3:30 PM–5:00 PM
[illegible]	[illegible] & Computer Technology Conference [illegible]	[illegible]	[illegible]
Future Architectures and Supercomputers		**Multiprocessor Architectures** John Payne *National Semiconductor* *Lehr Theater*	**Interconnection Networks** Howard J. Siegel *Purdue University* *Lehr Theater*
[illegible]		[illegible]	[illegible]
End User Computing			**Smart Buildings for Intelligent People** Thomas Cross *Cross Information Co.* *Jane Addams Room*
[illegible]		[illegible]	[illegible]
Business Applications		**Business Graphics: The Experts Predict the Future** Alan Paller *AUI Data Graphics/ISSCO* *Lindheimer South Room*	**Optical and Video Technologies' Delivery Systems** D'Ellen Bardes *Alltech Communications* *Lindheimer South Room*
[illegible]		[illegible]	[illegible]
Software Systems		**Trends in Computer Systems Technology** John Berg *Sperry Corp.* *Jane Addams Room*	
[illegible]		[illegible]	[illegible]

NCC Preview

Schedule at a glance

ESDAY

m Track	8:30 AM–10:00 AM	10:30 AM–12:00 NOON	1:30 PM–3:00 PM	3:30–5:00 PM
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
re Architectures and percomputers	Digital Hardware Systems Faye A. Briggs *Rice University* *Lehr Theater*	Superminicomputers Richard [illegible] *National Semiconductor* *Lehr Theater*	Future Generation Computers Dharma P. Agrawal *North Carolina State University* *Jane Addams Room*	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
User Computing	Electronic Mail: Benefits and Challenges for the User Stephen Durham *Comstek* *Microelectronics, Inc.* *Evers Theater*		Managing Information Centers Henry Dolwell *Information Builders, Inc.* *Lehr Theater*	Managing Development Centers Steven Gibson *Information Builders, Inc.* *Lehr Theater*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ness Applications				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ware Systems	Dialog Engineering Adarsh K. Arora *Gould Research Center* *Mayer Theater*	Visual Languages S. K. Chang *Illinois Institute of Technology* *Mayer Theater*	Software Engineering Directions Mario Barbacci *Carnegie-Mellon University* *Mayer Theater*	Can We Make Programming Teams Succeed? Anneliese von Mayrhauser *Illinois Institute of Technology* *Mayer Theater*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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ADDITIONAL
ORMATION ON NCC: Write: NCC '85, AFIPS, 1899 Preston White Drive,
Reston, VA 22091, or call 800-NCC-1985
TWX 710-833-9037

WEDNESDAY

Program Track	8:30 AM–10:00 AM	10:30 AM–12:00 NOON	1:30 PM–3:00 PM	3:30 PM–5
[illegible]			[illegible]	
Future Architectures and Supercomputers		VLSI Arithmetic Accelerators Kai Hwang *University of Southern California* *Jane Addams Room*	Innovative Computer Architectures Jean L. Gaudiot *University of Southern California* *Lohr Theater*	Artificial Intel Engine Gerald Magu *Columbia Un* *Lohr Thea*
[illegible]	[illegible]			[illegible]
End User Computing	Choosing Application Software: The End User View Richard Linting *Arthur Andersen & Co.* *Evans Theater*	The Micro-Mainframe Connection Christine Hughes *Gartner Group, Inc.* *Evans Theater*		
[illegible]				
Business Applications	Computers in Manufacturing William Rankin *Deere & Co.* *Lindheimer South Room*	Online Transaction Processing Armond Inselberg *Synapse Computer Corporation* *Lindheimer South Room*	Decision Support Systems: The End User View Ephraim McLean *UCLA Graduate School of Management* *Lindheimer South Room*	Current B Applications t Cardis, Kaye a Lawrence R *The Kitty Co* *Lindheimer Sou*
[illegible]	[illegible]	[illegible]		
Software Systems	Decision Support Systems Robert W. Blanning *Vanderbilt University* *Lindheimer North Room*		Information System Support for Engineering Applications Peter Dadam *IBM — Heidelberg* *Evans Theater*	Software Prod and Mainten Nicholas Zveg *Software Mainten* *Evans Thea*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Special Sessions

[illegible] NOON	[illegible] P. Case, IBM — [illegible] *Lindheimer North Room*
1:30 PM–3:00 PM	**Pioneer Day: The First Generation in Illinois: The Challenge, 1949-1953: James H. A** *Lindheimer North Room*
[illegible]	[illegible] *Lindheimer North Room*

THURSDAY

Program Track	8:30 AM–10:00 AM	10:30 AM–12:00 NOON	1:30 PM–3:00 PM	3:30 PM–5:00 PM
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Future Architectures and Supercomputers	**Parallel Algorithms for Supercomputers** John R. Rice *Purdue University* *Lindheimer North Room*	**Supercomputers and Their Impact on Science and Technology** George Paul *IBM Research* *Lindheimer North Room*		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
End User Computing			**Managing End User Computing** Walter Popper *Inter Systems* *Lindheimer South Room*	**The Ergonomic Revolution** Howard J. MacKenzie *STAMCO Office Products* *Lindheimer South Room*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Business Applications		**Security: Now and in the Future** William Bremer *Arthur Andersen & Co.* *Lindheimer South Room*		**Output Devices** Alan Sobel *Lucitron, Inc.* *Lair Theater*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Software Systems	**Software Engineering Standards: Today and Tomorrow** Laurel V. Kaleda *IBM — San Jose* *Lindheimer South Room*		**Software Testing** James Vandendorpe *AT&T Bell Laboratories* *Mayer Theater*	**Database Implementation Issues** C.R. Carlson *Illinois Institute of Technology* *Mayer Theater*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Scientific 'gems' outshine drab hardware

By Tom Henkel
CW Staff

The continuing slump in computer sales and a round of mainframe announcements earlier this year may make it difficult to find many significant hardware announcements to savor at this year's National Computer Conference (NCC).

Vendors of scientific-oriented superminicomputers, which is one of the hot markets in a generally sluggish year, will announce a few gems, however.

Encore Computer Corp. will be showing, but not formally introducing, its Multimax multimicroprocessor mid-range system. Encore will be showing the Multimax as well as its recently introduced Hoststation 100 terminal at the National Semiconductor Corp. booth.

An Encore spokesman said the firm has yet to determine the final price and delivery dates for the National Semi 32032-based system; therefore, it is not making a formal announcement.

According to a spokesman for Pyramid Technologies Corp., it will unveil its answer to Digital Equipment Corp.'s VAX 8600, called the 90X. International Parallel Machines, Inc. will introduce another 8600 contender with what it claims is a parallel processing minicomputer, the IP-1, which is 1,000 times more powerful than DEC's VAX-11/780 in certain applications.

Some announcements early

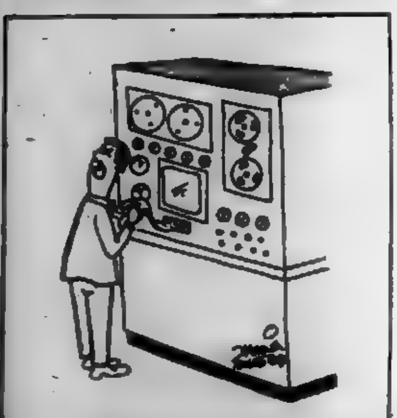
Other companies appear to have chosen to make product announcements just prior to NCC, rather than at the show itself.

NCR Corp., for example, which introduced a version of its Tower supermicrocomputer at last year's show, made a similar announcement again this year — but two weeks before the show.

IBM, which surprised industry watchers two years ago in Anaheim, Calif., with the introduction of its System/36, enhanced the System/36 product line in a voluminous late June product announcement that also included an enhanced Model 18 of the System/38 and six terminals.

New disk drives and tape drives, which in the past two years flowed freely at NCC, will be hard to find this year. The victims of the ongoing microcomputer washout and the overall slow market, relatively few disk and tape manufacturers said they will be showing new products.

Mitsubishi Electronics America, for example, said it would announce three 5¼-in. half-height Winchester drives, and Micro Technology, Inc. will unveil a line of DEC-compatible disk controllers.



"Who programmed the computer to ad-lib?"

Terminals, printers to be unveiled

There will be a fair number of printers and terminals unveiled this year. Chinon America, Inc. will introduce two letter-quality matrix printers, the 80-col. Model 101 24-pin matrix line printer that can print at 25 line/min in a letter-quality mode and 75 line/min in a draft mode.

The company will also introduce the Model 103, an 80-col. serial matrix thermal transfer printer that can operate at 105 char./sec. in a draft mode and 35 char./sec. in a letter-quality mode.

Bell & Howell, Co. will introduce the COM Print 6000, a microfiche printing system that the company claims occupies about half the floorspace of most automated COM systems. Designed for IBM and compatible mainframe environments, the unit uses special operating software resident in host processors. The software, called BH Writer, was developed by IBM under a contract with Bell & Howell.

The usual ample supply of board-level products and power supplies will also be on hand. For example, the Sola unit of General Signal will unveil a 3-kVA uninterruptable power supply that starts at $1,245.

A Barge on the Chicago River

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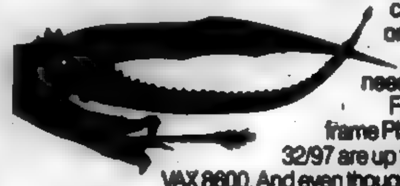

For starters, our mainframe PN9000 and CONCEPT 32/97 are up to twice as fast as the VAX 8600. And even though the mid-range PN6000 and CONCEPT 32/67 are 30-50% smaller than the VAX 11/780, they're still up to three times more powerful. Which means they'll run your applications faster, much faster, than VAX.

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Only Gould computers have a big enough edge to ax the VAX.

NCC Preview

Local net vendors to outnumber old guard at NCC

By [illegible]
CW Staff

CHICAGO — By rough count, local-area network vendors will outnumber any other group of communications-oriented companies at this year's National Computer Conference (NCC).

Local-area net vendors coming to the Windy City to hawk their wares include 3M Corp.; 3Com Corp.; Nestar Systems, Inc.; Network Systems Corp.; Bridge Communications, Inc.; and Interlan, Inc.

There will not be a repeat of last year's show-stealing demonstration of General Motors Corp.'s Manufacturing Automation Protocol (MAP), which intended to show how products from 15 vendors could communicate over a token-passing bus local network using international standard protocols.

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> *Only a smattering of manufacturers of modems, multiplexers, protocol converters and PBXs will attend the show. Interestingly, vendors of matrix switches, network management and control systems and data switches will be few and far between, if any show up at all.*

The demonstration has been moved to a factory automation conference later in the year. Users can catch up on some of the latest MAP developments at the Interactive Systems/3M booth.

This company will demonstrate its recently announced LAN/II, a 10M bit/sec. net that conforms to Release 2.1 of MAP. The Interactive Systems/3M network reportedly supports multiple-rate synchronous and asynchronous data links and meets both the IEEE 802.3 baseband and 802.4 broadband network standards.

Only a smattering of manufacturers of modems, multiplexers, protocol converters and private branch exchanges will attend the show. Interestingly, vendors of matrix switches, network management and control systems and data switches will be few and far between, if any show up at all.

Communications service providers will be conspicuous in their absence. AT&T Communications will have a booth, but its two closest competitors — MCI Communications Corp. and GTE Sprint Communications Corp. — will not. Nor, for that matter, will most of the major data communications network carriers, including GTE Telenet Communications Corp., Tymnet, Inc. and Uninet, Inc.

None of the divested Bell operating companies will participate in the event, although one company, Ameritech, the local telephone holding company in Chicago, will sell a mobile telephone service at its booth.

Paradoxically, while many data communications vendors will sit out this information systems show, the three largest manufacturers of voice systems will be represented. This reflects the PBX vendors' increased marketing efforts to sell the switches as hubs for office automation and data communications tasks.

AT&T Information Systems will display its recently announced Premises Distribution System (PDS), a building wiring scheme for voice/data systems. The company will also show how PDS can be used in conjunction with its mainstream local-area network product, the Information Systems Network, and System 85 and System 75 PBXs to support IBM 3270-type peripherals.

Northern Telecom, Inc. will demonstrate its line of Merridian products, including the DV-1 Data Voice System, a voice/data processing system for branch and small offices; and the SL-1 Merridian, a version of Northern Telecom's main voice switch that has been upgraded to handle more data. Both products reportedly provide digital voice/data integration over a twisted-pair wire link operating at 2.56M bit/sec.

Rolm Corp. does not have a booth of its own, but expect to see it represented in IBM's booth. The companies will display how IBM and Rolm products can coexist and how Rolm's PBX can be used to interconnect IBM devices. IBM is also expected to show products that were announced in June, including models of the System/38, System/36 PC, 3270 Personal Computer AT and a couple of graphics versions of the 3270 Personal Computer AT.

The sparsely represented, old-guard data communications vendors include Codex Corp., which will be displaying in the booth of parent company Motorola, Inc., and Timeplex Inc. Both companies will show T1 and other multiplexer products.

Many of the vendors in data communications markets reported that they are passing up NCC for communications-oriented trade shows.

MODEL	[illegible]	[illegible]
VAX [illegible]	[illegible]	7.6
PowerNode [illegible]	[illegible]	11.7
CONCEPT [illegible]	[illegible]	11.7
VAX 11/780	[illegible]	4.0
PowerNode [illegible]	140	12.1
CONCEPT [illegible]	140	12.1

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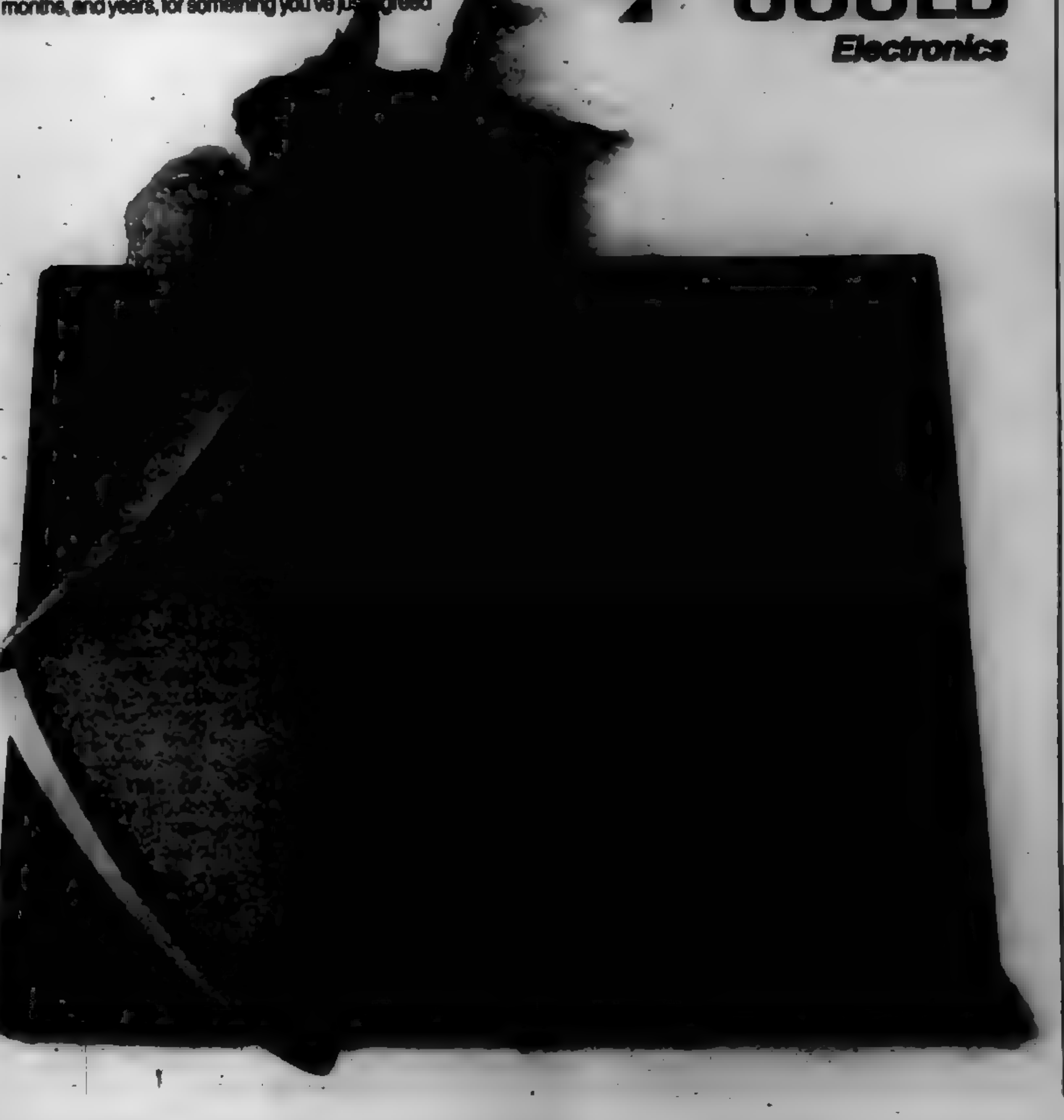

NCC Preview

Major micro vendors to skip NCC; few debuts expected

By Eric Bender
CW Staff

Important microcomputer product announcements rarely occur at trade shows these days, and this year's National Computer Conference (NCC) is expected to see relatively few significant introductions.

Most of the major players in the personal computer industry (such as Apple Computer, Inc. and Compaq Computer Corp. on the systems side and Lotus Development Corp., Microsoft Corp. and Ashton-Tate on the software side) have decided to skip this year's NCC.

There's one big exception to this trend. IBM is expected to show the Personal Computer AT, announced the month after NCC '84, and a host of other members of the Personal Computer family, including the 3270 Personal Computer AT series, which debuted last month (CW, June 24). Related products, including the System/36 PC, also should be on display.

Televideo Systems, Inc. and Zenith Data Systems Corp. are among a handful of exhibitors planning to show Personal Computer AT-compatible systems. Other suppliers, such as Quadram Corp. and Tecmar, Inc., will highlight add-on products for the Personal Computer AT, ranging from tape backup systems to memory expansion boards.

NCC '85 also should see several debuts of laptop and portable computers, including the PC-7000 from Sharp Electronics, Inc., an upgraded model of Sharp's PC-5000 with a 25-line display.

Among supermicrocomputers on display will be the Universe 32 from Charles River Data Systems, Inc., a Versabus design said to be the first Motorola, Inc. 68020-based system to incorporate open architecture features.

Other multiuser systems based on the Intel Corp. 80286 microprocessor will be unveiled, including a version of the Compupro 286 system, built around an 8-MHz 80286 chip, from Viasyn, Inc.

Local-area network products from vendors such as Corvus Systems, Inc. and Nestar Systems, Inc. also will be much in evidence. Several software vendors like Samna Corp. will demonstrate personal computer applications tailored for network use.

> **"**
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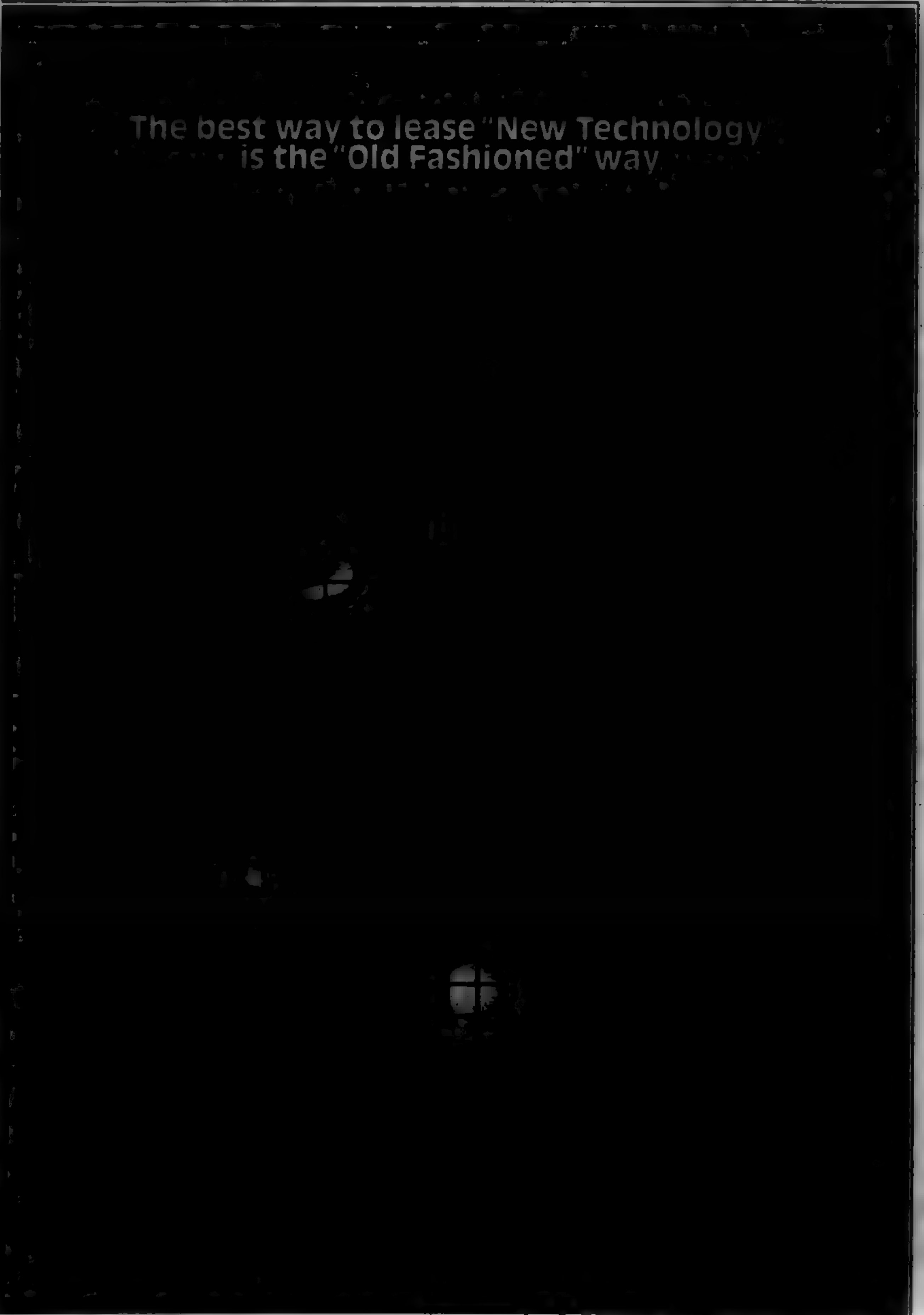
> *Most of the major players in the personal computer industry have decided to skip this year's NCC.*

Also in communications offerings, NCC '85 should highlight ongoing moves toward tighter micro-to-minicomputer links, with an emphasis on products connecting personal computers with the IBM System/34, 36 and 38 series.

In other examples of the trend to connect personal computers with many other computer systems, several vendors of microcomputer applications software will emphasize their intentions to provide document interchange facilities, and Multimate International Corp. will discuss plans to move its word processing software onto the System/36 and other minicomputers.

The show also will provide an opportunity to examine much of the recent crop of microcomputer programming and applications-generation software, with products such as Micro Focus, Inc.'s VS Cobol on display.

As always, peripheral products will be out on the show floor in bewildering numbers and variations. Among these, NCC '85 should spotlight the continual improvements in price/performance for small hard disk drives. Additionally, a few optical disk drives that may be used with microcomputers will be present, early signs of a flood of optical storage products expected in the next year.


The best way to lease "New Technology"
is the "Old Fashioned" way.

System helps meat packer trim waste, beef up yield

By [illegible]
CW Staff

CHICAGO — In his poem characterizing this Midwestern city, poet Carl Sandburg labeled Chicago "hog butcher for the world."

But the days of the sprawling stockyards on Chicago's South Side have long since disappeared. High transportation costs forced slaughterhouses to abandon their operations in favor of locations closer to rural production areas. Today, the wooden corrals of the Chicago stockyards stand on vacant lots.

Few meat-packing and meat-processing companies remain in Sandburg's "city of the big shoulders." One that does is the Rose Packing Co., which counts on technology as a means of survival.

The food-processing industry operates on a slim profit margin of 2% or less, which requires companies to come up with innovative processes to reduce product waste, according to Jerry Murray, Rose Packing's MIS director.

Murray said Rose Packing is the world's largest processor of Canadian bacon. The $100 million company also processes ham, sausage and bacon, supplying pork products to companies like McDonald's Corp. for packaging under private labels. Throughout this process, technology plays a key role, Murray said.

Between its Chicago plant and its Barrington, Ill., headquarters 40 miles west of here, Rose Packing uses an IBM 4331 mainframe, a System/38 and a group of IBM Personal Computer XTs and ATs for gathering data for product yield control, Murray said.

When slaughtered pork is delivered to the processing plant, information about the product type is input to the Barrington mainframe via personal computers. Data is then transmitted to the corporate office via leased lines. Proprietary software programs help Rose Packing workers determine the best use of the product and determine how to maximize yield levels, he said. "We want to get as much out the front door as came in the back door," he said.

Technology also helps the meat-packing house with its adherence to federal government regulations. The U.S. Food and Drug Administration has stringent requirements pertaining to food classifications, including restrictions on the amount of fat that can legally be allowed in particular products, Murray noted. Laboratories at the Chicago plant use personal computers to help determine quality-control levels. This involves monitoring the meat's moisture and fat content and the smoking process. The laboratory computers are also used to compose spice and flavor formulas, he said. "It's not too difficult to enhance yield and lower quality, but what we're trying to do is enhance yield and increase quality."

To protect profit margins further, personal computers at the Rose Packing plant are used to formulate ways to reduce packaging expenses, Murray said. Just as a manufacturing department uses a materials planning and control division, Rose Packing uses the older IBM 5110 and 5120 systems and proprietary software to determine the best method of deboning the pork prior to processing.

Aside from its manufacturing applications, Rose Packing uses an array of business applications to keep a careful eye on its profit margins. "We have to close the books every seven days," he said.

With an MIS department of only six doing all the programming, development and systems operations for the Rose Packing plant, there is more than enough work to keep Murray and his staff busy. "This place spins like a top," he said.

[illegible] WORLD PHOTO

The Chicago stockyards in busier times

Lotus on a VAX?

dBASE II on a VAX?
Friday! on a Micro VAX?
Condor on a PDP-11?
PFS:File on a PRO?
Personal Pearl on a VAX?
QuickCode on a Micro VAX?
Spellbinder on a VAX?
WordStar on an MV/10000?
R:base 4000 on a VAX?
Multiplan on a PDP-11?
PL/M on a VAX?
SuperCalc 3 on a PRO?
T/Maker Integrated on a VAX?
MS BASIC on a Micro VAX?
Milestone on a PDP-11?
Palantir on a PDP-11?

SpellStar on a PRO?
MailMerge on a PDP-11?
PMS II on a VAX?
dBASE II on a PDP-11?
Lotus 1-2-3 on a PDP-11?
Open Access on a PRO?
MS FORTRAN on a VAX?
Condor on an MV/10000?
Multiplan on a PDP-11?
WordStar on a VAX?
SuperCalc 2 on an Eclipse?
PertMaster on a PRO?
Palantir on a VAX?
QuickCode on a PDP-11?
DISC-DBL on a VAX?
PerfectWriter on a PD

WordStar on a PDP-11?
Spellbinder on an Eclipse?
Friday! on a VAX?
PerfectWriter on a PRO?
RM/COBOL on a PDP-11?
RTCS/UDI on a VAX?
Mass-11 on a PDP-11?
Milestone on an Eclipse?
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NCC Preview

Chicago exchange's systems keep pace with trading

By Mitch Betts
CW Washington Bureau

Down in the crowded trading pit of the Chicago Mercantile Exchange, arms are flailing and voices are shouting in a language of "buy and sell." This high-energy, fast-paced form of bedlam goes on from 7:30 a.m. to 3:15 p.m. each business day.

It results in an average 186,000 futures contracts being sold daily for a host of items, from pork bellies to foreign currencies. (A futures contract is an agreement to buy or sell something in the future at a price agreed upon today; the pork bellies almost never change hands.)

According to Vince Ambrose, a broker at the exchange for Heinold Commodities, Inc. of Chicago, millions of dollars can ride on a single transaction, and seconds count. Traders need quick access to price information, he said.

"The transmission needs to be almost instantaneous," Ambrose said. "And it is pretty good, pretty fast." Traders and brokers at the exchange can see the price data in a variety of ways: on the digital displays on the big board, on the 300 terminals on the trading floor, on the closed-circuit television system or from quotation vendors.

To keep up with the trading action, the exchange uses three IBM 4341-12 mainframes and nine Series/1 minicomputers, according to Don Serpico, the exchange's MIS vice-president.

"We have people in the pits who listen to the trading," Serpico explained. "They talk on walkie-talkies up to a balcony. And on the balcony we have about 80 terminals, where people [can key in the data] to the Series/1s." He said the Series/1s send their output to the big boards and the various localized video displays.

The 4341-12s are used by the exchange for administration and clearinghouse functions. After trading ends, the exchange's data (from the Series/1s) and data from the brokerage houses are transmitted to the 4341-12s to be reconciled, and the data base is updated.

Serpico said the floor terminals feature a system called Merc Quote, which enables traders to make queries of the trading system, such as "What were the prices from 9 a.m. to 9:30 a.m. today?"

The closed-circuit television system, with 28 stations, permits brokers in the exchange's 40-story office building to get trading information without having to be on the trading floor or buy expensive equipment, Serpico said.

"They can buy a black-and-white television, turn to a certain channel and see cattle prices," he said.

Serpico said his MIS staff of 91 is facing some major challenges, with a full plate of new projects. High on the list is a two-year project to migrate from the Series/1s to Tandem Computer, Inc. fault-tolerant units.

"We needed equipment for our very critical trading floor system that has to be up at all times," he explained. "Tandem offers a fault-tolerant concept that we felt was the best fit for us."

The exchange moved into its new building at 30 S. Wacker Drive just 18 months ago after outgrowing its 10-year home at 444 W. Jackson Blvd.

NCC telephone preregistration aims at reducing lines

CHICAGO — National Computer Conference (NCC) registration is just a phone call away in 1985.

The latest effort of the American Federation of Information Processing Societies, Inc. (Afips) to reduce the long lines that traditionally mark the beginning of NCC is to offer registration by telephone with a major credit card.

Prior to July 11, the number to call is toll-free, 1-800-NCC-1985, an Afips spokesman said. From July 9-13, from the hours of 9 a.m. to 8 p.m., conference-goers can register by calling 312-567-8000.

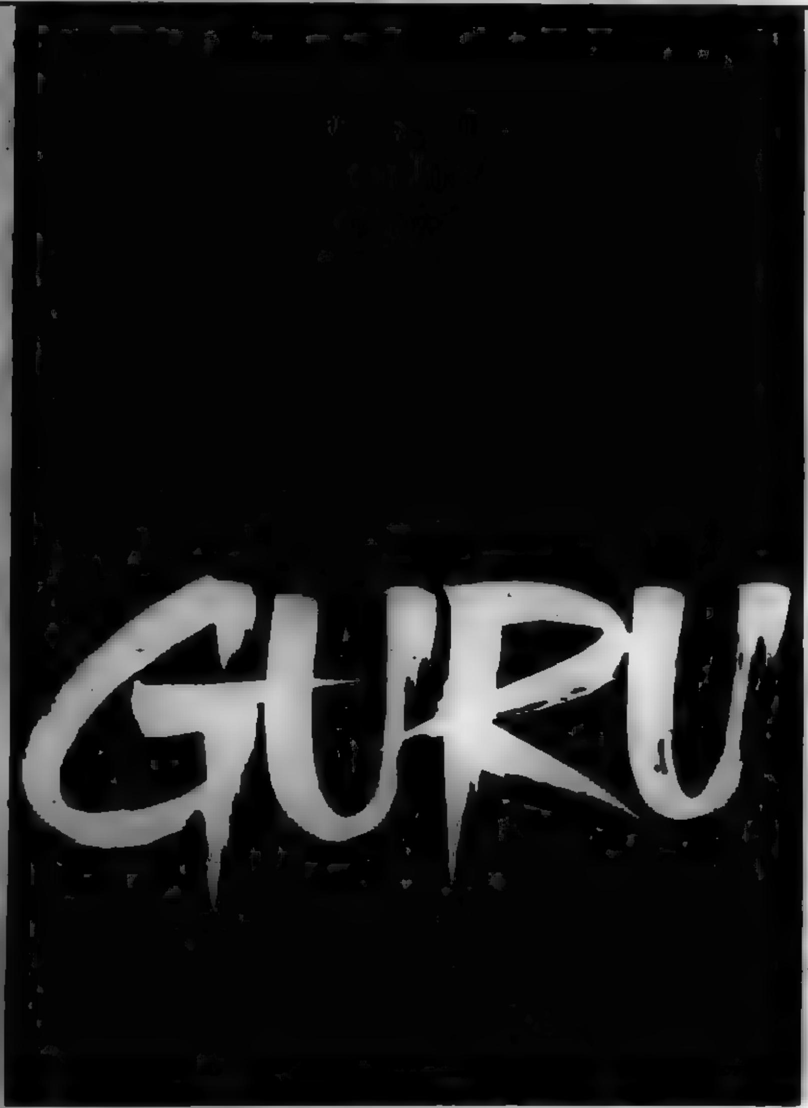
At the conference, early registration is offered on Sunday, July 14, from 10 a.m. to 8 p.m. From July 15-17, registration hours are from 7:30 a.m. to 6 p.m.; on July 18, registration is from 7:30 a.m. to 3 p.m. Those registering for Professional Development Seminars can make one stop for both conference and seminar registration, at Level 7 of McCormick Place or the McCormick Center Inn during registration hours.

A party for early-bird registrants is planned at Sauer's Restaurant, 311 E. 23rd St., from 2 p.m. to 6 p.m. on Sunday, July 14. Admission is with a conference badge.

While Afips is predicting a strong turnout of 80,000 at this year's conference, the spokesman said early registration has been heavy. Early registrants are sent through separate lines to pick up their conference materials and preprepared badges.

Color-coded signs will guide attendees to proper registration lines. Blue signs point to on-site registration; red signs point to exhibitor and guest registration; and grey signs are for those registered in advance.

The advance registration fee is $125; on-site registration costs $150.



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The new COMPAQ PORTABLE 286™ and COMPAQ DESKPRO 286.™ Advanced technology puts them in a class all their own. With power, performance, speed, and expandability that exceed even the IBM® Personal Computer-AT.™ They represent a new standard that makes others look like what they are—the products of compromise. In fact, the new COMPAQ 286 Personal Computers can be considered the most useful in the world.

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The COMPAQ PORTABLE 286 runs 30% *faster*. It can give you up to 20 Megabytes of internal fixed disk drive storage. And can come with features to make it even more useful. Like our *internal* fixed disk drive back-up system that protects 10 Megabytes of information on a single, pocket-sized tape cartridge.

But the most amazing thing about the COMPAQ PORTABLE 286 is that all these features come attached to a handle.

Our most advanced desktop computer

Like the COMPAQ PORTABLE 286, the new COMPAQ DESKPRO 286 runs all the popular programs designed for the IBM PC-AT, 30% *faster*. And it can also come with our convenient *internal* fixed disk drive back-up system for added data protection.

But we didn't stop there. We weren't content to compromise. We wanted to make the new COMPAQ DESKPRO 286 a more powerful, more efficient stand-alone personal

personal computers in the world.

computer, as well as a faster, more powerful, more useful file server. So we gave the COMPAQ DESKPRO 286 far more memory and storage capacity—over 8 Megabytes of RAM and 70 Megabytes of high-performance fixed disk storage.

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The unprecedented success of COMPAQ came as no accident. While others built limited computers, COMPAQ built expandable computers.

While others took two screens to display high-resolution text and graphics, COMPAQ was the first to do it on one.

While others were looking for ways to cut corners, COMPAQ looked for ways to eliminate downtime by building the most rugged, reliable computers in the world.

The COMPAQ commitment to a philosophy of "no compromise" made the COMPAQ Portable and COMPAQ PLUS the world's best-selling 16-bit portable personal computers. In 1983 COMPAQ sold $111 million worth of computers to achieve the most successful first-year sales of *any* company in American business history.

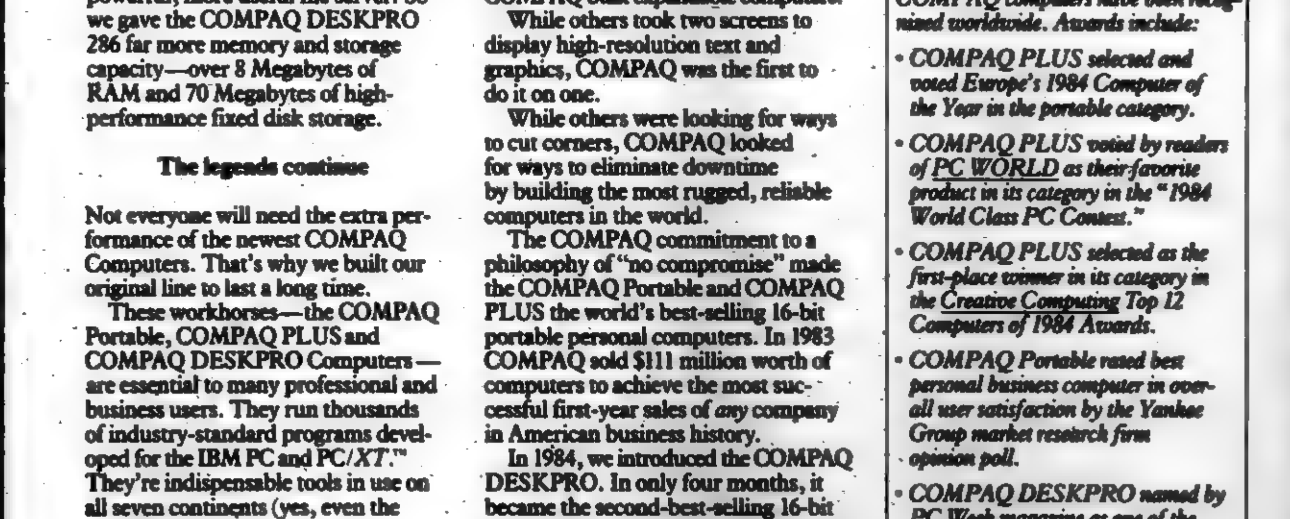
In 1984, we introduced the COMPAQ DESKPRO. In only four months, it became the second-best-selling 16-bit desktop business system in U.S. retail computer stores. And as a result, we've concluded the most successful second year of any computer company, with sales of $329 million.

The reason for this success is simple.

COMPAQ computers have been recognized worldwide. Awards include:

- *COMPAQ PLUS selected and voted Europe's 1984 Computer of the Year in the portable category.*
- *COMPAQ PLUS voted by readers of PC WORLD as their favorite product in its category in the "1984 World Class PC Contest."*
- *COMPAQ PLUS selected as the first-place winner in its category in the Creative Computing Top 12 Computers of 1984 Awards.*
- *COMPAQ Portable rated best personal business computer in overall user satisfaction by the Yankee Group market research firm opinion poll.*
- *COMPAQ DESKPRO named by PC Week magazine as one of the top ten products of 1984.*

We offer people personal computers that simply work better. And make no compromises doing so.



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The advanced capabilities of this microprocessor become even more apparent when you run complex programs. You can operate as part of a network. Or you can operate more than one program at the same time using multi-tasking software like IBM TopView.™ And you can handle the most difficult problems with breathtaking speed.

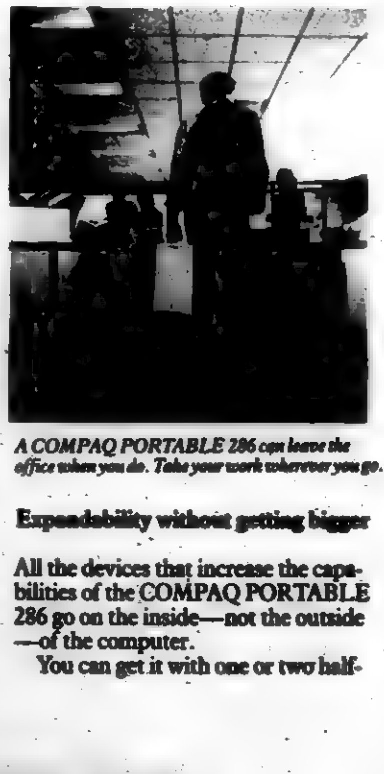
For many scientific and engineering programs you have the ability to add an 80287 coprocessor, which offers even more speed.

Both offer dramatic speed increases over earlier microprocessors. The faster response time means less waiting, and more productivity.

Power in a package

The COMPAQ PORTABLE 286 has the power of the IBM PC-AT. But the IBM PC-AT doesn't have a handle. Ours does. So it goes where you go. Works where you work. Whenever and wherever necessary. And it's easy to share with co-workers.

That's full-function portability, pure and simple.



A COMPAQ PORTABLE 286 can leave the office when you do. Take your work wherever you go.

Expandability without getting bigger

All the devices that increase the capabilities of the COMPAQ PORTABLE 286 go on the inside—not the outside—of the computer.

You can get it with one or two half-

286. Our fastest, most powerful portable
do more – anywhere.

height 1.2-Megabyte diskette drives. Although they can "read" diskettes formatted for 360-K byte diskette drives, they cannot "write" to them. Therefore, as an option, COMPAQ offers a 360-K byte diskette drive to let you exchange data with other industry-standard personal computers.

There's an additional slot for a 20-Megabyte fixed disk drive. All COMPAQ Portable Computers offer fixed disk drive systems that fit *inside* the computer.

Another of our options: An *internal* fixed disk drive back-up system keeps a safety copy of your work, reducing the chance of losing your data. COMPAQ pioneered the system first in desktop computers, and now in portables.

The COMPAQ PORTABLE 286 even comes with a security lock feature that locks "on" to prevent interruption of a file transfer, or "off" to deny access to confidential information.

Because it's a portable, self-contained unit, the computer can be easily stored away after use.

Two data protection features from COMPAQ: an internal fixed disk back-up system that stores data on tape cartridges, and a security lock for locking keyboard access to your system on or off.

Who can use it?

If you're an experienced user, you may be ready to upgrade your current equipment. The COMPAQ PORTABLE 286 gives you the latest technology.

For some, power is all-important: Speed, performance, and the ability to handle the most powerful software. All are leading qualities of the COMPAQ PORTABLE 286.

Starting a business? The COMPAQ PORTABLE 286 has tremendous data base capabilities to help you keep track of your inventory, your customers, your employees, your finances. Its exceptional storage capabilities make it ideal for the complexities of accounting. Its exceptional speed means greater networking ability. Its tremendous power enables you to get the edge on the competition.

In addition, large corporations can place several of these computers with field representatives to provide clients immediate information on current prices, product availability, even shipping dates and routing. So delivery shortages can be anticipated and avoided.

The COMPAQ PORTABLE 286 can also travel within the company. From office to office. Desk to desk. From accounting, to marketing, to research.

It's powerful and versatile enough to do almost any job. Light enough to carry. And tough enough to survive lots of users.

Established reliability

Despite its newness, the COMPAQ PORTABLE 286 is in many respects a proven product. It's based on the rugged, reliable design of the original COMPAQ Portable and COMPAQ PLUS. Many of the construction techniques like cross-bracing components and shock-mounting disk drives are identical. All of which goes to prove our point: No other portable computer can measure up to the advanced power and potential of the uncompromising COMPAQ PORTABLE 286.

The COMPAQ PORTABLE 286
Specifications

Processor: 16-bit 80286; 6 or 8 MHz clock speed. **Software:** Fully compatible with all major software applications written for the IBM PC-AT. **Expansion Slots:** 3 available slots in base configuration. **Memory:** 256-K bytes RAM, expandable to 2.6 Megabytes. **Storage Devices:** 360-K byte or 1.2-Megabyte diskette drives, 20-Megabyte fixed disk drive, fixed disk drive back-up (10 Megabytes per tape). **Interfaces:** RGB color monitor, RF modulator, composite video, parallel printer, and asynchronous communications interfaces. **Keyboard:** Standard IBM PC-AT layout (84-key). **Display:** 9-inch diagonal green monochrome dual-mode monitor, high-resolution text characters, high-resolution graphics. **Security:** Locks in operating and non-operating mode to prevent unauthorized keyboard access. **Physical Specifications:** 20"W x 8½"H x 16"D. **Options:** Technical reference guide, MS-DOS™/BASIC Version 3, 512/2048-K byte memory board.

Introducing the new COMPAQ DESKPRO 286.
offers more expansion,

The capabilities of the new COMPAQ DESKPRO 286 represent a personal desktop computer as practical as it is technically advanced. Plus, it maintains compatibility with the IBM PC-AT.

Utmost expandability

That's no exaggeration. The COMPAQ DESKPRO 286 can expand to give you massive storage and memory.

Without clutter. Expansion is *internal*.

It comes with a single, half-height, 1.2-Megabyte diskette drive You can add a second drive of the same capacity, or a 360-K byte diskette drive so you can exchange information with other personal computers.

For fixed disk storage, an internal 20-Megabyte system is available. You can also choose a 30- or 70-Megabyte high-performance internal fixed disk drive sytem. The storage capacity of each is equivalent to 10,240, 15,360, or 35,840 pages of double-spaced data.

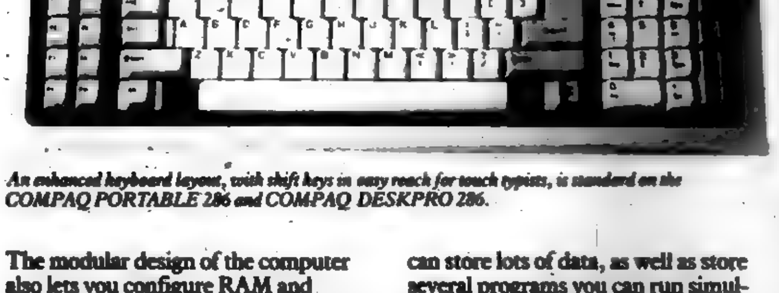
One expansion board works with all the fixed disk drives. When you upgrade to a larger fixed disk storage system, a new board is not required.

To back up data, use the COMPAQ internal fixed disk drive back-up system. It's also a safe and convenient way to store information for record keeping.

Hardworking, networking

Alone, the COMPAQ DESKPRO 286 is a tremendously useful computer. It doesn't limit you to using software under any one operating system. It runs all the popular programs designed for the IBM PC-AT. It can be configured for advanced color graphics display using a color monitor and the IBM Enhanced Graphics Adapter

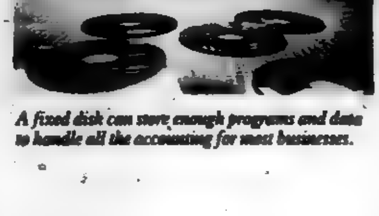
Our most powerful desktop personal computer
more speed and more flexibility.



An enhanced keyboard layout, with shift keys in easy reach for touch typists, is standard on the COMPAQ PORTABLE 286 and COMPAQ DESKPRO 286.

The modular design of the computer also lets you configure RAM and storage to the exact needs of any individual. So you never have to buy more computer than you need. Or worry about obsoleting your investment because you bought less computer than you need.

The COMPAQ DESKPRO 286 also makes the ideal hub of a local area network. Using networking packages, your computers (and your people) can share information and software, and can communicate with one another. With 70 Megabytes, the COMPAQ DESKPRO 286 becomes a powerful, high-performance file server. You can store lots of data, as well as store several programs you can run simultaneously when using software programs like IBM TopView. Your computer will perform at lightning speeds. And other configurations can make economical "nodes" of the network.



A fixed disk can store enough programs and data to handle all the accounting for most businesses.

Where to start

The flexibility of the COMPAQ DESKPRO 286 allows you to begin at any level of computing power and reach beyond the IBM PC-AT.

You can use your computer for writing extensive documents, preparing professional graphics for presentations, and for doing complicated financial studies. Chances are, however, you'll not want to stop there. You'll discover new ways for streamlining your work. You'll want to do customer lists, accounting tasks and business taxes, product inventory, annual sales projections on spreadsheets. You have the option of adding a second diskette drive, a fixed disk drive, more memory, even a fixed disk drive back-up system. All are available and can be added to the inside of your COMPAQ DESKPRO 286—easily, affordably, without losing your initial investment in hardware, software, or training.

A proven heritage

The COMPAQ DESKPRO 286 is of tested lineage. It has many of the reliable construction and design qualities of the COMPAQ DESKPRO. It has further conveniences like a dual-function security lock to prevent unauthorized access. As well as greater performance, power, and speed. The COMPAQ DESKPRO 286 stretches the limits of personal computing—with no compromises.

The COMPAQ DESKPRO 286
Specifications

Processor: 16-bit 80286; 6 or 8 MHz clock speed. **Software:** Fully compatible with all major software applications written for the IBM PC-AT. **Expansion Slots:** 5 slots available in base configuration. **Memory:** 256-K bytes RAM, expandable to 8.2 Megabytes. **Storage Devices:** 360-K byte or 1.2-Megabyte diskette drives; 20-(half-height), 30-, or 70-Megabyte fixed disk drives; fixed disk drive back-up (10 Megabytes per tape). **Interfaces:** RGB color monitor, RF modulator, composite video, parallel printer, and asynchronous communications interfaces. **Keyboard:** Standard IBM PC-AT layout (84-key). **Display:** 12-inch diagonal green or amber dual-mode monitor, high-resolution text characters, high-resolution graphics. **Security:** Locks in operating and non-operating mode to prevent unauthorized access; cover lock to protect internal components. **Physical Specifications:** System unit—19.8"W x 6.4"H x 16.5"D, Keyboard unit—18.0"W x 1.5"H x 7.0"D, Display unit—14.75"W x 10.25"H x 13.75"D, Weight—57–64 lbs., depending on configuration. **Options:** MS-DOS/BASIC Version 3, Tilt & Swivel Monitor Stand, Desk-Saver, Technical Reference Guide, 512/2048-K byte memory board.

COMPAQ makes full-function portability a full-fledged reality.

If you're anxious to put a computer to work for you, but don't need the extra power and added performance of our most advanced portable computer, we have the answer.

Lots of software, lots of uses

The COMPAQ Portable and COMPAQ PLUS are based on the 8088 microprocessor, one of the most popular computer technologies, so software is abundant. Integrated business programs, personal productivity, learning tools, even educational thoughtware to sharpen your business skills. Literally thousands of programs, compatible with the IBM PC and IBM PC/*XT*, will run on the COMPAQ Portable and COMPAQ PLUS.

Many businesses put the COMPAQ Portable or COMPAQ PLUS to work as a full-time computer for part-time users. Carry it from desk to desk. Office to office. Let several people use it for one or more hours a day. Or one person use it a few days a week.

Many companies use a COMPAQ Portable as a full-time computer for part-time users.

For heavy users, a COMPAQ Portable or COMPAQ PLUS can become a "second computer" for computing power away from the office.

With their rugged, uncompromising construction, they're built tough enough to pass around—something that's impractical to do with desktop computers. And because you stretch its use, you stretch your budget as well.

If you need more, it does more

How can one computer be so versatile?

One reason is the ability of the COMPAQ Portable to become a COMPAQ PLUS with the addition of a 10-Megabyte fixed disk drive. This expands storage capacity to the equivalent of 5,120 double-spaced pages of information.

Expansion boards let you add memory and extra functions inside, not out.

There are other ways to improve on your COMPAQ. Hundreds of industry-standard expansion boards are available. They fit neatly inside your COMPAQ. So you can run more advanced programs. Communicate over telephone lines. Network with other computers.

It's this kind of versatility and ease of use that makes COMPAQ Personal Computers second to none.

SPECIFICATIONS

The COMPAQ Portable

Processor: 16-bit 8088, 4.77 MHz clock speed. **Software:** Fully compatible with all major software applications written for the IBM PC/*XT*. **Storage Devices:** One or two 320-K byte diskette drives. **Expansion Slots:** 3 available slots. **Memory:** 128-K bytes RAM expandable to 640-K bytes. **Display:** 9-inch green diagonal monochrome dual-mode monitor, high-resolution text characters, high-resolution graphics. **Interfaces:** RGB color monitor, RF modulator, composite video, and parallel printer. **Keyboard:** Standard IBM PC layout (83-key). **Physical Specifications:** 20"W x 8½"H x 16"D.

The COMPAQ PLUS

Specifications the same with the exception of: One 360-K byte diskette drive, one 10-Megabyte fixed disk drive, 2 available expansion slots, and full compatibility with all major software applications written for the IBM PC and PC/*XT*.

Lasting value led to instant success for the COMPAQ DESKPRO.

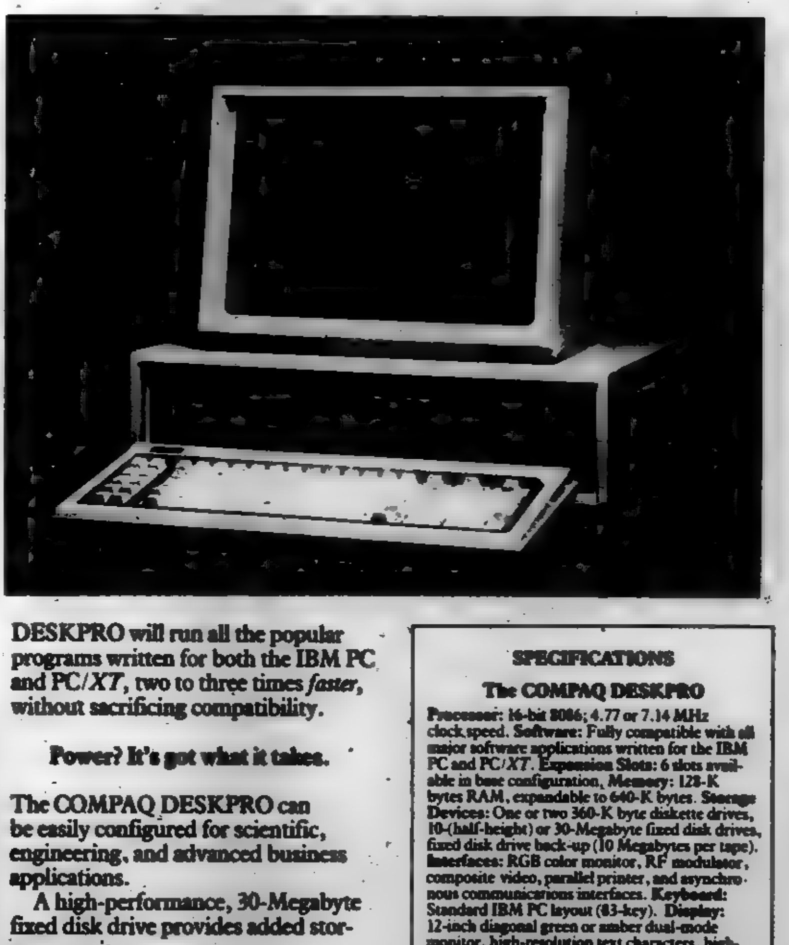
If you don't need all the extra performance of the COMPAQ DESKPRO 286, you can buy the popularly priced COMPAQ DESKPRO and still get many advanced features.

A command performance at every level

The COMPAQ DESKPRO Series allows you to buy as *much* computer as you need—not *more* computer than you need.

It's a polished performer, from entry level to advanced computing, in one totally expandable unit. Its plug-in, modular design accepts up to four separate storage devices. You select almost any combination of diskette or fixed disk drives you desire. And there's the practical, internal fixed disk drive back-up system to protect and store your data. So as your needs grow, the DESKPRO grows.

In fact it will grow from an IBM PC to far beyond the IBM PC/*XT* level of functionality. The COMPAQ DESKPRO will run all the popular programs written for both the IBM PC and PC/*XT*, two to three times *faster*, without sacrificing compatibility.



Internal expandability saves desk space.

Power? It's got what it takes.

The COMPAQ DESKPRO can be easily configured for scientific, engineering, and advanced business applications.

A high-performance, 30-Megabyte fixed disk drive provides added storage capacity.

The ability to add a high-speed 8087-2 coprocessor lets you deal with complex scientific calculations and economic models.

SPECIFICATIONS

The COMPAQ DESKPRO

Processor: 16-bit 8086; 4.77 or 7.14 MHz clock speed. **Software:** Fully compatible with all major software applications written for the IBM PC and PC/*XT*. **Expansion Slots:** 6 slots available in base configuration, **Memory:** 128-K bytes RAM, expandable to 640-K bytes. **Storage Devices:** One or two 360-K byte diskette drives, 10-(half-height) or 30-Megabyte fixed disk drives, fixed disk drive back-up (10 Megabytes per tape). **Interfaces:** RGB color monitor, RF modulator, composite video, parallel printer, and asynchronous communications interfaces. **Keyboard:** Standard IBM PC layout (83-key). **Display:** 12-inch diagonal green or amber dual-mode monitor, high-resolution text characters, high-resolution graphics. **Physical Specifications:** System unit—19.8"W x 5.8"H x 16.5"D, Keyboard unit—18.0"W x 1.5"H x 7.0"D.

Features common to COMPAQ in most other

It's been easy for COMPAQ to recognize the compromises other personal computer makers have been making.

It's been just as easy to avoid them.

That's why performance, expandability, compatibility, durability, and versatility are features you'll find in the entire COMPAQ family of computers.

How advanced technology affects the choice you make

There's an ever-growing library of fast, powerful programs designed for the IBM PC-AT and compatible with the COMPAQ PORTABLE 286 and COMPAQ DESKPRO 286. These programs will utilize the full potential of the computer "nerve center"—the Intel 80286 microprocessor.

If you own a COMPAQ Portable, COMPAQ PLUS, or COMPAQ DESKPRO, you may discover that these newer programs are simply too big to run on your computer.

Therefore you have a choice: the extra power and speed of the 80286 or the popular COMPAQ Personal Computers that use the 8088 and 8086 microprocessors. Remember that the COMPAQ PORTABLE 286 and COMPAQ DESKPRO 286 offer more power, speed and performance than any other personal computer. If your needs don't require the advanced technology, or you need a second computer to complement the one you have now, consider the COMPAQ Portable, COMPAQ PLUS, or COMPAQ DESKPRO. All three are hardware and software compatible with the IBM PC and PC/*XT*. Our intention is to give you a choice without forcing you to invest in more, or less, computing power than you think you need.

Of course, COMPAQ Personal Computers maintain compatibility with the add-on devices and expansion boards available for industry-standard personal computers, without any alteration or modification.

Increased power without increased size

All COMPAQ Personal Computers can take on more memory and storage without taking up more space. The COMPAQ Portable becomes a COMPAQ PLUS when you add a 10-Megabyte fixed disk drive. The COMPAQ PORTABLE 286 can accept a 20-Megabyte fixed disk drive. The fixed disk drive fits neatly beside the diskette drive inside the unit.

Internal add-on devices add greatly to the capabilities of a COMPAQ Computer.

With the COMPAQ DESKPRO and COMPAQ DESKPRO 286, you can install almost any available combination of diskette or fixed disk drives you desire to achieve the level of performance you need. The COMPAQ DESKPRO and COMPAQ DESKPRO 286, along with the COMPAQ PORTABLE 286, can accept the fixed disk drive back-up system as one of the internal storage devices.

There are slots inside each COMPAQ Computer for optional expansion boards. These boards greatly enhance the functionality and versatility of your computer. Literally hundreds are available to plug right in. Each lets you do something different. Like expanding the amount of memory in your computer. Or communicating with other personal computers. Or

[illegible] are features uncommon [illegible] personal computers.

even communicating with mainframe computers.

Built tough to take it

COMPAQ Portable Computers are expected to take some hard knocks. A specially designed shock isolation system protects the diskette drives from jolts and vibration.

Their inner components are surrounded by a cross-braced aluminum frame. Those equipped with fixed disk drives are protected by a triple shock mount system. Plus, the outer case is molded from high-impact plastic, the same kind used to make bulletproof windows and space helmet faceplates. COMPAQ Portable Computers are tough, protecting your data from every angle.

COMPAQ DESKPRO Computers are no pushovers, either. They're surrounded by a protective steel shell.

They're the only desktop computers made with protective shock mounts, isolating the disk drive compartments from those unexpected but inevitable bumps and knocks that can cause downtime.

Even our monitors do more

COMPAQ Computers display data on high-quality monitors. All models can display high-resolution text and graphics on the same screen. The dual-mode display saves you the cost and clutter of a second monitor. COMPAQ DESKPRO Computers give you a choice of an amber or green display.

High-resolution text and graphics on one screen eliminates the need for a second monitor.

From pinstripe suits to flight jumpsuits

The structure and design of COMPAQ Computers best characterize their widespread usefulness and respected capabilities. COMPAQ attentiveness to construction details and concern for functionality under stressful conditions are why these computers have received worldwide acceptance.

That's why you'll find a COMPAQ Computer on the bench of a major league baseball team tracking player performance.

At the South Pole monitoring weather conditions for the research team of a major university.

On tour with famous rock stars to help plan concerts, keep up with the finances, and receive electronic mail.

On motion picture sound stages scheduling production and maintaining equipment inventory.

On military surveillance planes logging information five miles aboveground.

In the halls of the Supreme Court answering complex questions on environmental issues.

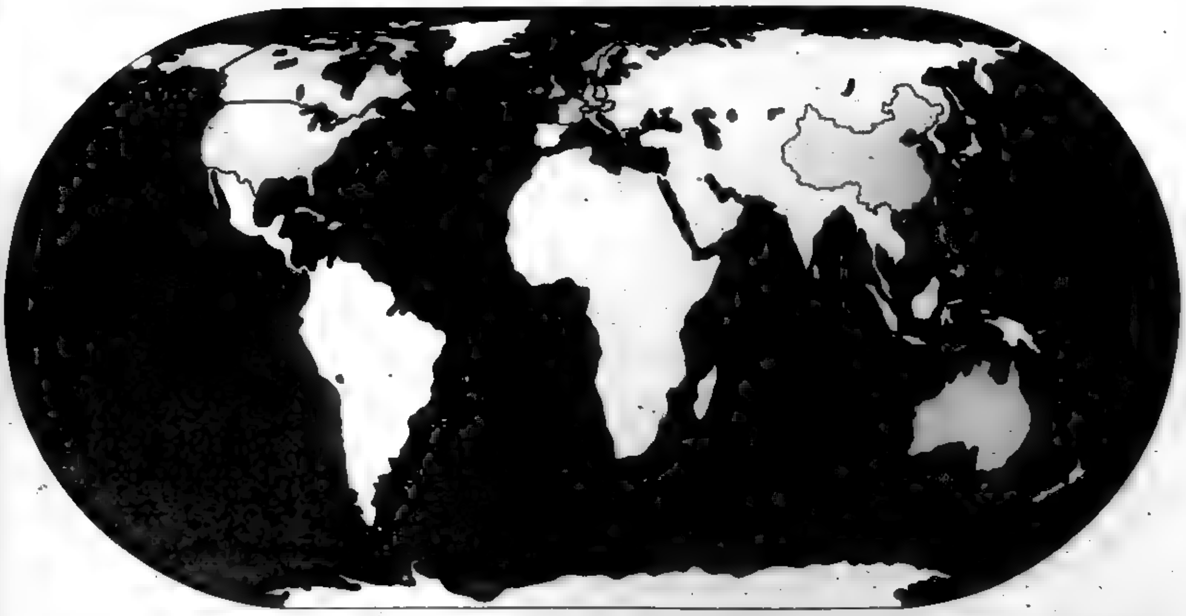
Computers people believe in

It didn't take long for the public to recognize COMPAQ Computer quality. No one builds them the way we do. Which is why no other computer company has grown the way we have.

As personal computers become more and more commonplace, more and more people have come to appreciate that quality. Our commitment to providing a product that's beyond compromise assures a product beyond compare. We like to think of it in a simple phrase that bears repeating: It simply works better.

COMPAQ Portable Computers have the ruggedness and durability for almost any work environment.

The Authorized COMPAQ Computer Dealer Network. For sales and service, there are over 2,200 worldwide.



Authorized COMPAQ Computer Dealers are carefully selected by a special review process. We make sure they are established business professionals with the expertise to provide technical service for every COMPAQ Computer they sell. Dealer technicians receive rigorous training by COMPAQ engineers.

No matter whether you're a professional on the move, or an international corporation with branch offices in dozens of states and countries, you'll find help readily available.

When you purchase your COMPAQ Computer, you'll be buying from the best in the business. Authorized COMPAQ Computer Dealers work hard to earn your respect. Because they had to work even harder to earn ours.

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A-Com-Plus
A-VIDD Electronics Computers
ABACUS Computer Center
Agraphics Computer
All Things Computers
Allied Computer Centers
Amerimpact
The AMS Computer Store
The Answer
Applied Data Systems
Arends & Sons Inc
ASAP Computer Products
Bamberger's
Bandstra Computer Center
Bass Computer Shop
Bell & Howell
Blumberg Photo & Sound
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Byte Shop
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Calculator and Computer Center
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Century Microcenters
Champlain Computer Systems
Chester Inc.
Cincinnati Computer Store
Clancy-Paul, Inc.
Command Performance Computers
Compu Computer Centers
Compu Group
Compu Net Computer Solutions
Compucenter
Compumark
Compumax MicroCenter
CompuShop Inc.
Computer Applications Business Center
Computer Center of Boca Raton
Computer Center Palm Beaches
The Computer Centre
Computer Concepts
Computer Depot
The Computer Edge
The Computer Factory
Computer Gallery
Computer-House
Computer Innovations
The Computer Learning Tree
Computer Nook
Computer Plaza
Computer Pro
The Computer Room
The Computer Shoppe
Computer Solutions
Computer Source Inc.
The Computer Store
Computer Superstores
Computer Systems Resources
Computer Systems Specialists
Computer Techniques
Computer Town
Computer Trends International
Computer Utility
Computer Ware
Computer Works
ComputerCraft
COMPUTERease
ComputerLand
Computers Unlimited
Computerware
Computerworks
Computique
CompUtopia
Computer-Center South
Connolly Data Systems Inc.
Contact Office Automation Centers
Custom Computing Systems
Data File, The
DATAGO
Data Systems of New Jersey
Data Terminal Mart
DBA Computer Center
Endata Business Products Corp.
Entre Computer Centers
First National Computer Center
Forsythe Computers
Future Information Systems
Future Systems
Future Visions Computer Store
Garland MicroProgram
Gateway Computer
General Microcomputer, Inc.
Hamilton Computer Business Centre
Hamilton Rentals
HLA Computers
ICA Business Center
Ideal Computer Systems
Idea Business Computer Center
Illini Microcomputers Inc.
Illinois Valley Computers
Inacomp Computer Centers
Inacomp Computer City
Infoland Computers
Information Connection
Interdynamics Data Systems
International Computer Systems
J.W. Kerns, Inc.
Jonathan's Computer Center
Khala
Le Magnum Xerox
Legacy Computer Systems
Lexington Computer Store
Light Computer Center
Logic Tree Computer
The Logical Choice
Lyceum Computers
M.C.W. Computers
Mahen Computer Services
The Math Box
MBI Business Center
Micro Center
Micro Mart
MicroAge Computer Stores
Microcomputer Solutions
Micronic Computer Centre Ltd
Microsource Financial
Mida Corporation
Midwest Computer Center
Miss-Lou Computer Center
Moore Business Centers
Morris Decision Systems
Mr. Micro
MSL Computer Store
Nabeh's Inc
Necco of Needham
Northbrook Computers, Inc.
Office Management Systems Inc.
Olsen Computing
Omni Computer Center
Omnifax Computer Stores
Online Computers Plus
PAX Computer Center
Personal Business Computers
Personal Computer Centre
Personal Computer Instruments
Photo & Sound Company
Pittsburgh Computer Store
Prodigy Computer Center
Professional Computer Centre
Professional Computer Systems
Quantum Computer Store
RAC Computers
Rainbow Computing Inc.
Sears Business Systems Centers
Sherman Howe Computer Centers
Silver Creek Computers
Snyder Computer Center
Societe Pierre Lanier
Solutions Inc.
Southwest Automation
Spectrum Computers
Star Business Computers
Sun Computers
Taskforce Business Centres
Universal Computers
Valcom Computer Center
Varsity Computing
Wabash Computer Systems
Waldec Computer Center
The Xerox Store

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Part No. 102941-001

Local network market making steady progress in U.S.

By Kathleen Sullivan
CW West Coast Bureau

Although they have not yet taken U.S. businesses by storm, local-area networks are "going in at a steady rate," said Harvey Freeman, vice-president of engineering at Architecture Technology Corp., a Minneapolis, Minn.-based consulting firm that specializes in networks.

Growth in the local-area network market is continuing, Freeman said, and eventually, networks will be as commonplace as personal computers. But a number of important issues remain to be addressed before they gain widespread acceptance.

Some of those issues will be discussed in seminar sessions in the local-area network track, which Freeman organized. "In choosing topics, I tried to stress practical issues in networks and distributed communications," he said.

"Since this is the 10th anniversary of IBM's announcement on Systems Network Architecture [SNA], I solicited speakers from IBM and from its main competitors, the companies that support the International Standards Organization/Open Systems Interconnect model," he said.

A number of software topics will be covered in the seminars, including the impact of communications software on networks, the arrival of network operating systems and the development of applications software tailored for networks, Freeman said. Networking in the factory will also be discussed.

In addition, a variety of panelists will explore the effect of industry standards on innovation in the market, as well as the practical impact of standards. "Standards are really becoming more important," Freeman noted.

In one session, a group of speakers from IBM will discuss SNA, its history and future direction. In another seminar, panelists will explore the impact of IBM's PC Net on the market.

"We've gotten past the point of talking about baseband, broadband, token-ring and [carrier-sense multiple access with collision detection], to talking about the real issues," Freeman said. Now users are raising questions, he said.

What impact will IBM have on standards in the network market?. What applications programs are available for networks? What are companies trying to do in factory environments? What about individual site locations? What cables will be used?

The impact of fiber optics on local-area networks will be the focus of another session. Freeman said he expects this nascent market to take off in the future. "With IBM and AT&T announcing fiber-optic cables, there will probably be a lot more happening in this market," Freeman said.

In another session, a group of panelists will explore some of the alternative communications systems for IBM personal computers. Presenting different perspectives on the issue will be representatives from a personal computer firm, a local-area network vendor, a vendor of microcomputer-to-mainframe software links and a user.

In the concluding session, panelists will talk about the future direction of networks. Topics to be addressed include the following: network costs vs. user budgets, functionality, network independence, "supernetworks," and gateways and bridges to other networks.

Goode, Afips prizes slated for keynote day

By Charles Babcock
CW New York Bureau

CHICAGO — The Harry Goode Memorial Award and American Federation of Information Processing Societies, Inc. (Afips) Distinguished Service Award will be presented to recipients Monday morning during the National Computer Conference's keynote address.

The awards recognize professional contributions by individuals to the development of the computer industry.

Harry H. Goode was the former chairman of the National Joint Computer Committee and has been described as a moving force behind the early cooperation of professional computer societies. Goode was killed in an automobile accident before the formal chartering of Afips, which created the award in his memory in 1964.

This award is given to an individual each year. Previous recipients have been Kenneth E. Iverson, Herman H. Goldstine, J. Presper Eckert and Grace Murray Hopper. Last year the prize was given to Ralph E. Gomory, director of research at IBM since 1970.

The Afips Distinguished Service Award has been given out seven times.

The award was established in 1970 to recognize outstanding service to the information processing community.

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Micro track agenda tackles wide spectrum of issues

By Kathleen Sullivan
CW West Coast Bureau

Under the rubric of personal computing, a variety of issues — from the continuing shakeout in the personal computer industry to the use of artificial intelligence on microcomputers — will be addressed at National Computer Conference (NCC) '85 sessions.

In a recent interview, James R. Gerdes, a senior information systems analyst with the Argonne National Laboratory in Argonne, Ill., who is the chairman of the personal computing track, said the sessions will cover general industry trends as well as the practical application of new technologies.

The track will feature a number of panel discussions. In one session, a trio of financial analysts will present a look at the current state of the industry, Gerdes said. The first half of 1985 has been a difficult one for most players in the personal computer industry; many companies have predicted reduced earnings and announced cutbacks, layoffs and plant closings. The panelists will discuss the shakeout and its implications for the future.

Another session will promote a panel discussion on the industry from a different point of view, that of the top executive, Gerdes said. A group of executives, representing a bank, a manufacturing concern, a hospital and a financial institution, will discuss their perspectives on data processing.

Panel of trade press reporters

Offering yet another outlook on the personal computer industry and its players will be a session featuring a panel of reporters from the trade press, Gerdes said.

In addition, Gerdes stated that the personal computing track will include sessions geared toward more technically oriented audiences.

In a session titled "Window Management Systems: Fact or Fiction," a speaker from the University of Arizona will take a hard look at windowing systems. The question that will be explored, according to Gerdes, is whether window management systems are gimmicks, or whether they serve a useful function in personal computer programs.

The application of artificial intelligence techniques to personal computer programs will be the focus of another session in the personal computing track. In this seminar, speakers will present an overview of the AI field. A survey of currently available programs will be presented, Gerdes said.

The session, titled "Microcomputer Software Testing," will address several questions, according to the track chairman. Questions to be addressed include the following: Will the personal computer industry adopt the equivalent of a "Good Housekeeping Seal of Approval" for software programs? What techniques are currently used to test software programs before they are shipped?

Another panel, which will include an industry analyst and representatives from two computer companies, will review the current crop of briefcase-size computers and discuss market trends affecting these "truly portable" systems, Gerdes said. The session is titled "Popular Portable Computers."

A trio of speakers will discuss keyless data entry techniques, such as bar code entry and optical character reading, Gerdes said. A representative of the U.S. Department of Defense will relate the agency's experiences with bar code readers, and a manufacturer will talk about what products are available.

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Visitors lounge offers services to foreign guests

CHICAGO — The International Visitors Lounge at the National Computer Conference (NCC) will be located in Lobby 8, Level 20, at McCormick Place.

Conference attendees from foreign lands are invited to take advantage of the various services available in the lounge. The room can be used as a place to relax or to exchange information with fellow international attendees.

Special services available to foreign visitors include translation, registration assistance, traveler's aid, local information and refreshments.

Available languages

Translation services will be made available in French, Spanish, Japanese, Chinese and German. Translation services for other languages can be arranged, if needed.

The International Visitors Lounge will be open during regular conference hours: Monday through Wednesday from 8 a.m. until 6 p.m. and on Thursday from 8 a.m. until 4 p.m.

Foreign visitors may register for NCC by sending registration forms and checks to NCC '85 Registration, 1970 Chain Bridge Road, McLean, Va. 22109.

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Contents of Volume I

Volume One is a comprehensive, 424-page reference manual on the features and functions of UNIX. Designed for clarity and day-to-day usefulness, it is organized by UNIX terminology and based on a common format. Each entry provides: the name of the command or subroutine...a synopsis and detailed description of the command and its use...a list of files built into the program...and the various condition codes you may encounter. There's even a helpful section that alerts you to known bugs in the command and sometimes suggests an appropriate fix.

Here is a sample of the topics covered:

Commands: These are general purpose programs which can be invoked directly by the user. You'll see how to use commands like adb to debug programs in a controlled environment...and bas, the UNIX BASIC dialect.

System Calls: You get a thorough list of entries into the UNIX supervisor, both error return codes and user instructions.

Subroutines: Here is a detailed introduction to the variety of subroutines available in the UNIX libraries. The functions are described in terms of C, but most will work with Fortran as well.

Special Files: The manual gives you a complete description of the UNIX "files" that actually reference system I/O devices.

File Formats: Here is full documentation on file structure for link editor output, special accounting information, archive data, core image files, and more.

Games: You also get a listing of computer games available in UNIX, including backgammon, blackjack, checkers and chess.

Plus details on macro packages, special functions and much more. Here in one volume is exactly what you need to know about UNIX. The pages are even perforated and punched for easy transfer into a three-ring binder.

Contents of Volume II

The UNIX Programmer's Manual: Volume II, Seventh Edition, is the ideal companion volume for UNIX programmers who want comprehensive, detailed information on all the many capabilities of the UNIX Time-Sharing System. Here is a vast collection of articles and tutorials on a wide range of specialized topics:

- how to log onto UNIX from a variety of system terminals
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- a computer-aided instruction program that walks you through the basics of UNIX files, the editor, and more
- an extensive series of papers on document preparation programs...basic formatting tools, how to typeset mathematics, plus NROFF/TROFF and TBL programming
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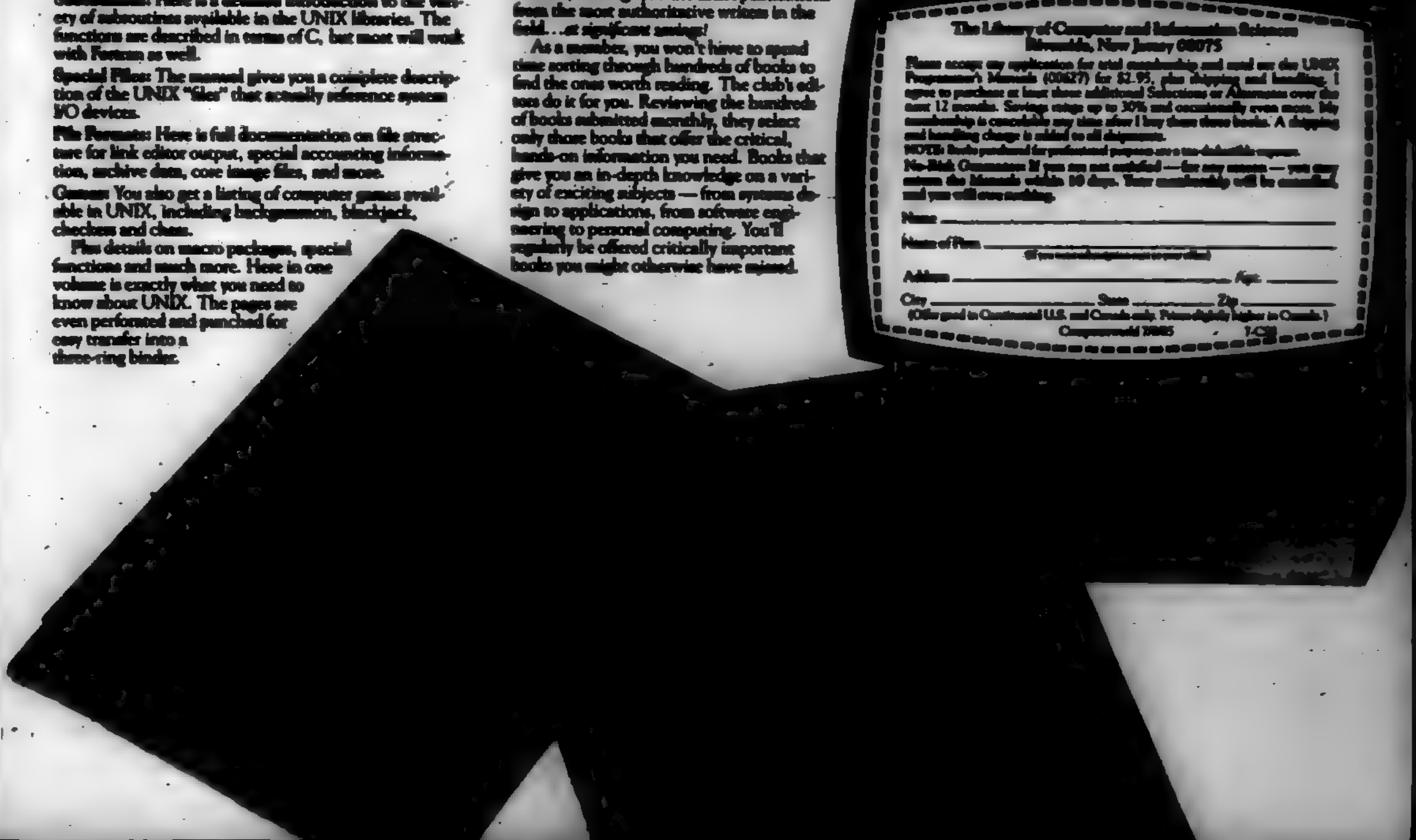

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Management system propels O'Hare airport operations

Assorted modules handle varied tasks

By Donna Raimondi
CW Staff

CHICAGO — O'Hare International Airport — said to be the world's busiest — serves 120,000 travelers a day and an equal number of visitors.

The airport, which is handling 15 million more passengers a year than it was designed to accommodate, is using a computer-based management system to track a $1.5 billion eight-year development program that will add to and upgrade facilities.

The computer-based management system allows managers of the Chicago O'Hare International Airport Development Program to highlight future problems and to provide information to run the program on a daily basis.

The airport's development program comprises 100 projects, including airfield improvements such as runways and grading for cargo and service complexes, new terminals, additional roads and access areas, a $100 million people-mover system and a taxiway for airplanes in the central core of the airport, said James Stevenson, general manager of O'Hare Associates, a consulting group that supervises and does consulting for the development program.

The system that tracks the airport's development program is Metier Management Systems, Inc.'s Artemis, which runs on a Hewlett-Packard Co. HP 1000 minicomputer, said Paul Dembovich, cost and schedule engineer for Envirodyne Engineers, Inc., one of the joint venture partners in O'Hare Associates. Dembovich and his staff perform critical path analysis for each of the 100 projects using one module of Artemis, he said.

The critical path module calculates and predicts end dates for projects based on monthly information updates, Dembovich said. It associates the information fed into it with labor data, such as workers' days off because of holidays and extra work-shift information, he said.

A relational data base module allows the creation of data bases that link schedules with cost information and allow the staff to calculate cash flows, to project commitment curves and to perform trend analysis, he said.

Three graphics modules

Three different graphics modules allow Dembovich to present end-of-month reports in three large charts, instead of in the report — the size of the city phone book — that the system generates, he said. The management graphics module allows bar, pie and line charts, histograms, curves and profiles, he said.

It is used to compare budgets to current estimates, and it allows a breakout of major categories of accounting for jobs in question, Dembovich said. Curves compare where money was actually spent with where it was projected to be spent.

Accumulated year-to-date information and yearly budget information is shown in a vertical box. There is a cash flow graph to the end of a project, and a graph for cash commitments and their amounts to the end of the project, he said.

A bar-chart drawing package links to the critical path program schedules so it can automatically draw charts for use in presentations, Dembovich said. "We can summarize 100 projects on one page, with a calendar across the top," he said. This helps management to see where each project is in terms of construction, design or completion, he said. Dembovich produces critical path schedules for each project separately as well.

Graphics reports for a variety of people, including Chicago Mayor Harold Washington, the directors of O'Hare's development program, bond holders, project managers and field staff, are customized to give each person what he needs, he said.

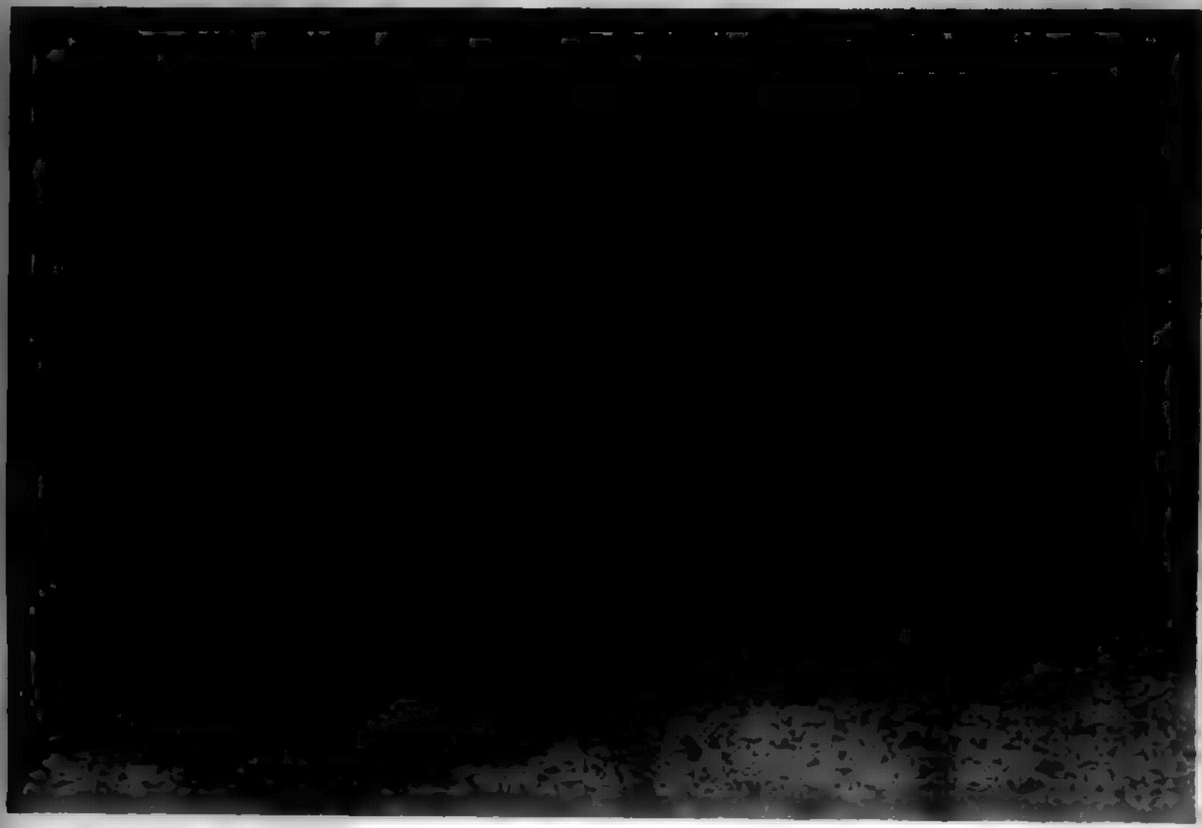
A linked bar chart package draws bars and shows the relationship between projects, Dembovich said. It can show the status of separate jobs within a project, he added.

A report-generating module of Artemis uses data from the critical path and the data base modules to create tabular reports, Dembovich said. It has a free format, so he can change headings and columns for particular needs, he said. The module has five or six sorts, but Dembovich claims he rarely uses more than three of them. He uses this tabular report to show schedule dates and the dollars associated with dates and activities.

When the company bought the system, "we loaded data for three months to be productive and for six months to be proficient," Dembovich said.

Dembovich stated that the collection and loading of data is a full-time job for four people. There are hundreds of people to collect data from or give reports to, he said. There are often time lags in getting needed information from city personnel, he said, and sometimes information gets lost.

The system has 1M byte of main memory, 520M bytes of disk storage, four text-only terminals, two text and graphics terminals, three dot matrix printers and two eight-pen plotters.



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NCC Preview

Systems tracking NCC events get the show on the road

By [illegible]
CW West Coast Bureau

CHICAGO — A variety of computers, terminals and videotex systems will keep National Computer Conference (NCC) activities on track at Chicago's McCormack Place this year.

Without this equipment, show operations would be paralyzed, said Gerald Roper, director of marketing and sales for the Chicago Convention Bureau, which rents space at McCormack Place.

On the show floor, for example, videotex systems will be used to help attendees locate more than 600 exhibitor booths spread out over 25,000 square feet of cavernous floor space.

Behind the scenes, show sponsors will use computer systems to bill exhibitors and keep track of thousands of hotel reservations, Roper added. The equipment will be supplied by McCormack Place, the Chicago Convention Bureau, contractors and manufacturers' donations.

The following computer systems will form the backbone of NCC's 1985 operations:

■ McCormack Place will use an IBM System/36 minicomputer, running a customized version of IBM's SSP operating system, to store a show status calendar and to bill exhibitors for electricity and plumbing services used during the show, Roper claimed.

Ten IBM Model 68 terminals will be used by McCormack Place staff to access the system, which runs customized data base, accounting and word processing software.

> *Without this equipment, show operations would be paralyzed.*
>
> — Gerald Roper, Chicago Convention Bureau

■ The Chicago Convention Bureau will use an IBM Series/1 minicomputer, running under IBM's EDX operating system, and five IBM Model 5 terminals to make hotel reservations for many of NCC's 80,000 attendees. Up to 100,000 hotel reservations can be maintained on the system using the bureau's proprietary Bold Pack Housing Systems software package.

In addition to hotel information, Roper said, exhibitor booking records and data on exhibit space and NCC seminars will be stored on the Series/1 using customized data base management system (DBMS) software.

Other computer systems at NCC will be donated by manufacturers and contractors hired by the show's cosponsor, the American Federation of Information Processing Societies, Inc. in Reston, Va. These systems will include the following:

■ Seventeen Sperry Corp. Model 500 personal computers donated by the Blue Bell, Pa.-based vendor to the NCC pressroom. About 1,000 journalists are expected to attend NCC and use the computers, which will be equipped with high-resolution color monitors, 10M-byte disk drives and a 256K-byte memory, a Sperry spokesman said.

The computers will be networked to two Sperry User-Net local-area networks.

Sperry will also provide four Epson America, Inc. Model 5 dot matrix printers, four Hayes Microcomputer Products, Inc. Smartmodems and Wordstar 2000 from Micropro International Corp. in San Rafael, Calif., the spokesman said.

■ On the show floor, public-access videotex will be provided by Chicago-based Convention Communications, Inc. (CCI). Each of CCI's 18 videotex Touchscreen terminals will function as an electronic message center, an exhibitor locator and an entertainment guide for showgoers, said CCI President Tony Stenkis. Attendees can switch modes on the terminal by touching the screen and following the directions of icon-oriented menus.

At the heart of the system is a 32-user microcomputer from Molecular Computer Corp. in San Jose, Calif., running under Digital Research, Inc.'s CP/M operating system. The microcomputer, at CCI's Chicago headquarters, will receive data from the show floor via proprietary communications software inside the terminals, Stenkis said. CCI will also use 18 modems from CTS Corp. in Elkhart, Ind., to transmit data, Stenkis said.

■ The Ventura, Calif.-based Contractor Registration Control Systems Corp. (CRCS) will provide computerized, on-site registration for show attendees using a Data General Corp. Model 30 minicomputer linked to 40 Liberty terminals from Liberty Electronics Corp. in San Francisco. Sixty percent of NCC's attendees will register at the show, and CRCS' staff will enter the registration data and make badges on an automatic embosser interfaced with the computer, said Gary Palmer, CRCS director of research.

CRCS' proprietary operating system, data entry, DBMS and communications software will reside on the Model 30, according to Palmer. A customized version of DG's Star-Lan local-area network will also be used, he said.

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NCC Preview

Fresh views expected on end-user computing topics

By Kathleen Sullivan
CW West Coast Bureau

> *Many MIS departments are struggling to find the best way to manage new end-user computing tools.*

When organizing the sessions that fall under the umbrella of end-user computing, track organizer Marvin Ehlers, an assistant vice-president at Lombard, Ill.-based Natural Gas Pipeline Co., said he recruited speakers who would be able to provide "a new and different view of existing topics."

A number of the topics to be discussed have more to do with economics — how to provide end users with the necessary tools to do their work efficiently — than with the technology itself, Ehlers said.

A wide range of issues will be covered, from designing ergonomic workplaces, to selecting the software that will facilitate end-user computing, to planning the intelligent buildings that will house the workers and technologies of the '80s.

With the growing number of workers sitting in front of computer screens, ergonomics — the science of designing equipment and workplaces to suit the worker — has become an increasingly important topic. Panelists will discuss the ergonomic requirements of the modern office. The speakers will also talk about legal issues related to the use of VDTs, including pending state legislation regarding worker safety.

Many MIS departments are struggling to find the best way to manage new end-user computing tools. With the advent of data bases, fourth-generation languages and other user-friendly tools, many MIS professionals are asking the question: What is the best way to get these tools into the hands of end users, Ehlers said. A group of speakers will explore this topic, presenting their ideas for managing these technologies.

Micro-to-mainframe links

An assessment of the state of the art in the micro-to-mainframe link market will be the focus of another panel discussion. The speakers will explore the problems and privileges associated with gaining access to the mainframe, Ehlers said. The presentation will include a user's perspective on the planning required to implement a micro-to-mainframe link strategy.

Another group of speakers will provide a look at electronic mail systems, bringing the audience up to date on recent developments in the market, Ehlers said. What is available today? What have we learned since last year? What can be expected in the future? These and other questions will be discussed, Ehlers said.

Managing the information center will be the focus of another session in the end-user computing track, Ehlers said. "Information centers are fairly widespread," he noted. As a result, managers can now look to each other for advice on how to run them. "There are many general management principles that can be applied to information centers," Ehlers said. A group of speakers will share their experiences in running information centers.

Within the MIS department, staff members are looking for the easiest, fastest and most economical way to develop programs, Ehlers said. Prototyping methods, for example, are generating interest. One panel will discuss the challenge of managing the development center.

The selection of the appropriate applications software package, which Ehlers described as an ongoing problem for many users, will be the subject of another presentation in the end-user computing track.

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Shell Programming*	Apr 29-30 July 1-2 Sept 2-3 Oct 28-29	Feb 4-5 June 17-18 Oct 28-29	Apr 22-23 Aug 19-20	Feb 4-5 Apr 22-23 June 17-18 Aug 19-20 Oct 28-29	Mar 11-12 July 15-16 Nov 18-19	May 6-7 Sep 16-17	Jan 28-29 Mar 11-12 July 15-16 Nov 18-19	May 6-7 Sep 16-17	$480	$1125
Using Advanced UNIX Commands*	May 1-3 July 3-5 Sept 4-6 Oct 30-Nov 1	Feb 6-8 June 19-21 Oct 30-Nov 1	Apr 24-26 Aug 21-23	Feb 6-8 Apr 24-26 June 19-21 Aug 21-23 Oct 30-Nov 1	Mar 13-15 July 17-19 Nov 20-22	May 8-10 Sep 18-20	Jan 30-Feb 1 Mar 13-15 July 17-19 Nov 20-22	May 8-10 Sep 18-20	$735	
UNIX Internals	May 7-10 July 9-12 Sept 4-6 Oct 30-Nov 1	Feb 11-15 June 24-28 Nov 11-15	Apr 29-May 3 Aug 26-30	Feb 11-15 Apr 29-May 3 June 24-28 Aug 26-30 Nov 11-15	Mar 18-22 July 22-26 Dec 2-6	May 13-17 Sep 23-27	Feb 4-8 Mar 18-22 July 22-26 Dec 2-6	May 13-17 Sep 23-27	$1375	
UNIX Administration*	May 15-17 July 15-17 Sept 18-20 Nov 11-13	Feb 19-21 July 9-11 Nov 19-21	May 7-9 Sep 10-12	Feb 19-21 May 7-9 July 9-11 Sep 10-12 Nov 19-21	Mar 26-28 July 30-Aug 1 Dec 10-12	May 21-23 Oct 1-3	Feb 12-14 Mar 26-28 July 30-Aug 1 Dec 10-12	May 21-23 Oct 1-3	$735	
Advanced 'C' Programming Workshop*	May 20-21 July 22-23 Sept 23-24 Nov 18-19	Feb 25-26 July 15-16 Dec 2-3	May 13-14 Sep 16-17	Feb 25-26 May 13-14 July 15-16 Sep 16-17 Dec 2-3	Apr 15-16 Aug 5-6 Dec 16-17	Jan 14-15 June 3-4 Oct 7-8	Apr 15-16 Aug 5-6 Dec 16-17	Jan 14-15 June 3-4 Oct 7-8	$480	$1125
Advanced 'C' Programming Under UNIX*	May 22-24 July 24-26 Sept 25-27 Nov 20-22	Feb 27-Mar 1 July 17-19 Dec 4-6	May 15-17 Sep 18-20	Feb 27-Mar 1 May 15-17 July 17-19 Sep 18-20 Dec 4-6	Apr 17-19 Aug 7-9 Dec 18-20	Jan 16-18 June 5-7 Oct 9-11	Apr 17-19 Aug 7-9 Dec 18-20	Jan 16-18 June 5-7 Oct 9-11	$735	
Berkeley Fundamentals and 'vi' Editor*	June 3-7 July 29-Aug 2 Sept 30-Oct 4 Nov 25-29	Mar 4-8 July 22-26 Dec 9-13	May 20-24 Sep 23-27	Mar 4-8 May 20-24 July 22-26 Sep 23-27 Dec 9-13	Apr 22-26 Aug 12-16	Jan 28-Feb 1 June 10-14 Oct 21-25	Apr 22-26 Aug 12-16	Jan 28-Feb 1 June 10-14 Oct 21-25	$1225	

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310 S. Michigan Ave., Chicago, IL 60604

First aid facility available at NCC

CHICAGO — For National Computer Conference attendees needing medical assistance, a four-room first aid facility is located just south of the main lobby on the concourse of McCormick Place. A registered nurse will staff the station during show hours.

Lorin Tomaszewski, McCormick Place fire warden, said five security officers and two fire inspection officers trained in first aid assistance will be on duty on the showroom floor throughout the conference.

In case of emergency, Chicago Fire Department ambulances will be available for transportation to one of two local hospitals: Michael Reese Hospital, 292 S. Ellis Ave., or Mercy Hospital, Stevenson Expwy. at King Drive. Both are less than 1 mile south of McCormick Place.

NCC Preview

Ancient idea reborn in computer-based learning aids

AI at forefront of systems R&D

By Kathleen Sullivan
CW West Coast Bureau

The concept of an expert system is a relatively new one in the computer industry, but according to Prof. David Rine, interest in "expert tutors" dates back to the ancient Greeks, when Socrates used dialogue as a teaching tool.

"Interactive questioning and dialogue has always been a very popular way of teaching," said Rine, a professor of computer and information sciences at George Mason University in Fairfax, Va. Those interested in modern-day expert tutoring systems can find out more at a panel discussion Rine organized for this year's education and social issues track.

The speakers will focus on recent developments in artificial intelligence and the impact of that work on the development of educational systems. "There is a great deal of development and interest in designing high-quality, computer-based learning systems for business and training programs," Rine said.

> "*Interactive questioning and dialogue has always been a very popular way of teaching.*"
>
> — Prof. David Rine
> George Mason University

In another panel discussion, "Computers and the Handicapped," a group of speakers will explore two major questions, Rine said: How can systems be designed for use by severely handicapped students? What tools are available for developing systems to aid the handicapped person?

A speaker from Johns Hopkins University in Baltimore will discuss its multisensory authoring package, a tool that allows developers to create lessons geared for students with specific disabilities. In addition, a speaker will present a look at how one system is being used by physically and mentally handicapped children in an experimental classroom.

Another set of seminars will focus on legislative and legal issues regarding computers and society, Rine said. A variety of topics will be addressed, including the legality of employment agreements, privacy and the protection of individual rights, copyright agreements and software piracy.

The tax benefits of philanthropic giving will also be addressed, Rine said. "The speakers will discuss how companies can get the best tax write-off when they give hardware to educational institutions," Rine said.

Selling computers to developing nations will be explored in another seminar. "A lot of companies want to get involved with Third World countries," Rine explained. "The speakers will discuss what firms need to know, in terms of social and cultural concepts, to most effectively introduce new technology into developing countries."

For others, recent developments in instructional delivery systems are an important topic, Rine said. A panel will discuss the advantages of satellite-based computer networks that can send instructional materials from a central location to training centers around the world.

A tutorial seminar on structured editing will also be offered. The audience will get a demonstration on how to use structured editors to develop programs, Rine said. The advantages of structured editing will be discussed. "One of the nice things about structured editing is that it speeds up the development and understanding of programs," Rine said. "Another side effect is more reliable data entry."

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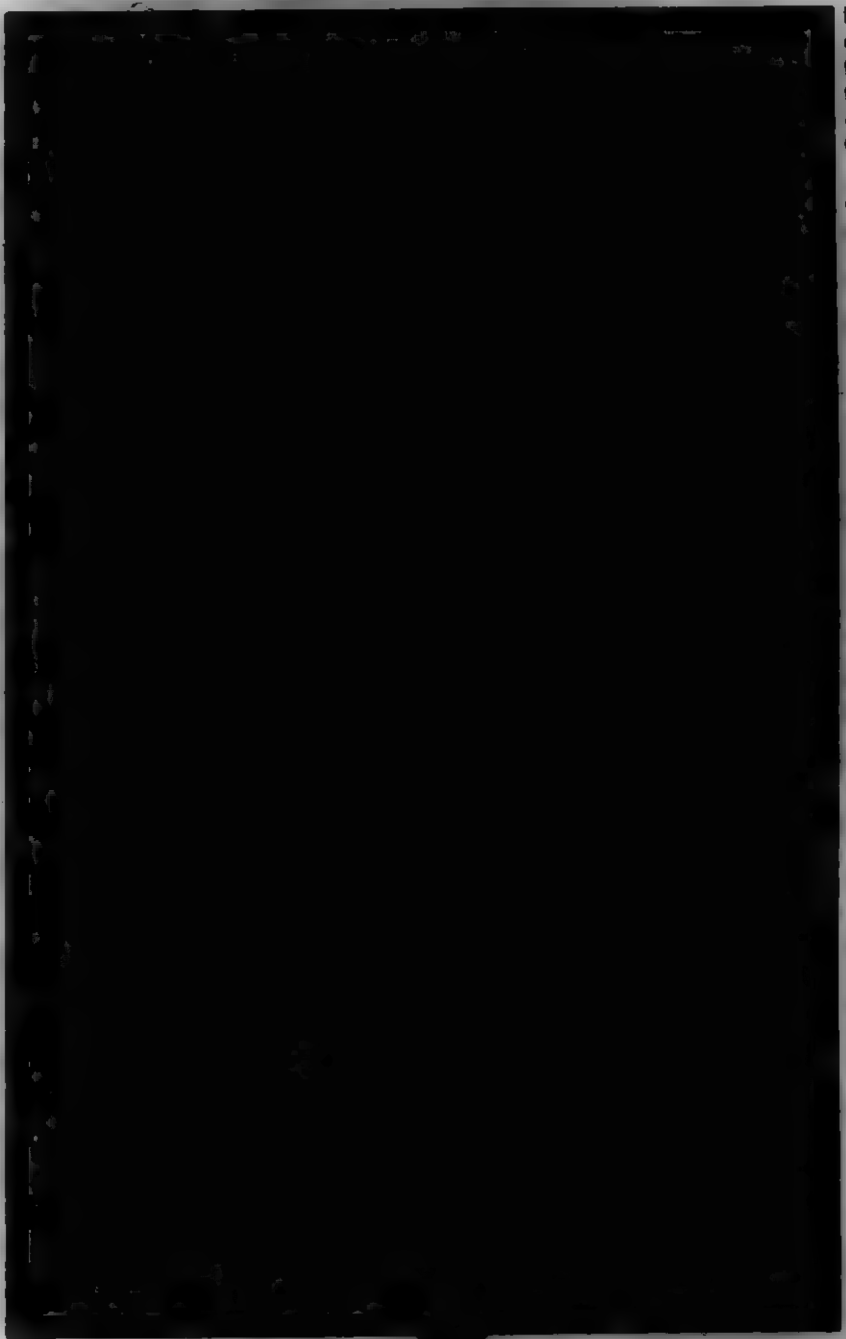

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Software at NCC

THE SOFTWARE GROUP
Booth 1120

The Software Group will exhibit Enable, an integrated software system that provides a spreadsheet, word processing capability, graphics, a data base manager and telecommunications for the 256K-byte dual-floppy IBM Personal Computer and compatible computers.

In that configuration, the spreadsheet provides up to 136K bytes of work space and the data base manager holds 1.3G bytes of data, according to the vendor.

Enable reportedly provides windows to view spreadsheet, graphics and documents at the same time. Data can be transferred from window to window.

The menu-driven integrated package also offers concurrency, allowing users to continue their work session while documents print out or data comes in from a remote computer, the vendor said.

Enable sells for $695. Site licenses are also available.

The Software Group, Northway 10 Executive Park, Ballston Lake, N.Y. 12019.

SAMNA CORP.
Booth 2364

Samna Corp. will showcase word processing and office automation software for local-area networks and updates to its stand-alone personal computer software at its booth.

Initial releases of Samna software for local nets will support Novell, Inc. and 3COM Corp. local-area networks; releases later this year will support the IBM PC Network, the vendor said.

Local net versions are available for Samna Word III and Samna+.

Release 3.0 of Samna Word III and Samna+ support IBM's Document Content Architecture revisable form text format.

Samna Word III costs $550; Samna+ sells for $695.

Samna, Suite C-700, 2700 N. E. Expwy., Atlanta, Ga. 30345.

MICRO FOCUS, INC.
Booth 5631

Micro Focus, Inc. will demonstrate software that reportedly generates IMS/MFS and CICS/BMS macros and associated Cobol source statements for the IBM Personal Computer, Personal Computer XT, AT, 3270 Personal Computer and compatible microcomputers.

Called Co-Maps, the software lets users load and modify BMS macro definitions to produce maps and map sets. This capability allows users to convert CICS application screens to IMS, and images produced by Micro Focus Forms to MFS and BMS maps.

Other features include single keystroke map set, map and field definition and Help, directory and copy facilities.

Co-Maps costs $500.

Micro Focus, 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

LEXEME CORP.
Booths 2867, 2868

Lexeme Corp. will present its computer language translation service.

The firm develops software to translate one high-level language to another from among C, Fortran, Cobol, Bliss, Pascal, PL/I, Ada and other languages, a spokesman said.

Lexeme software is also said to translate between dialects of the same language.

Prices vary according to the number of lines of code.

Lexeme, Suite 250, Commerce Court, Four Station Square, Pittsburgh, Pa. 15219.

BBJ COMPUTER SERVICES, INC.
Booth 2144

An AT&T Unix application development system will be the highlight of BBJ Computer Services, Inc.'s exhibit.

Called Today, the software is said to provide recursive logic and decision tables; synonyms, menus, prompts, Help and default facilities for streamlined definitions; screen painter; report generator; push-button self-documentation; audit trails; and source code security.

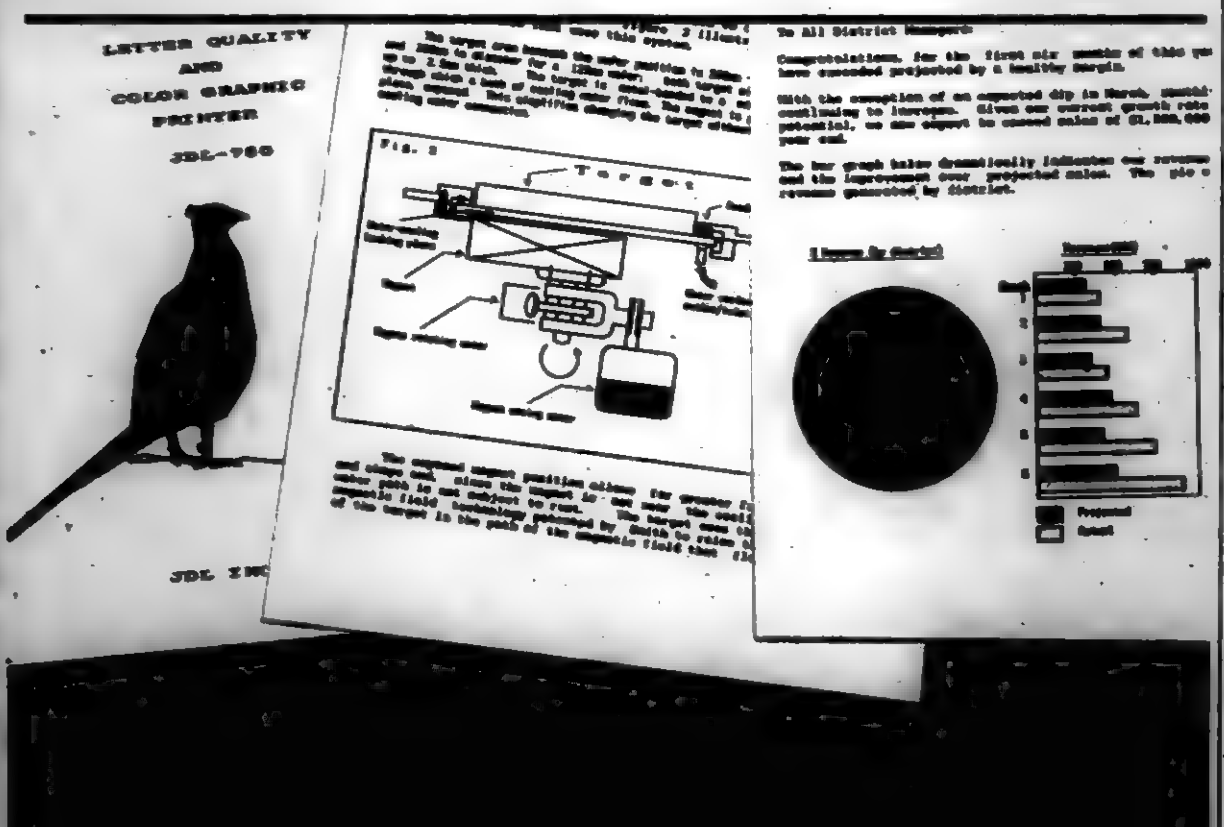
Today creates applications that are portable across Unix-based minicomputers and micros.

For an IBM Personal Computer AT, Today costs $1,500.

BBJ Computer Services, 2946 Scott Blvd., Santa Clara, Calif. 95054.

LAWSON ASSOCIATES, INC.
Booth 1254

Lawson Associates, Inc. will show an accounts payable package upgraded to include distribution default codes.



Continued on Preview/42

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European agents: Software Engineering Benelux Inc., The Netherlands, Telex 84431117; Thorn EMI Computer Software, U.K., Telex 851858015.

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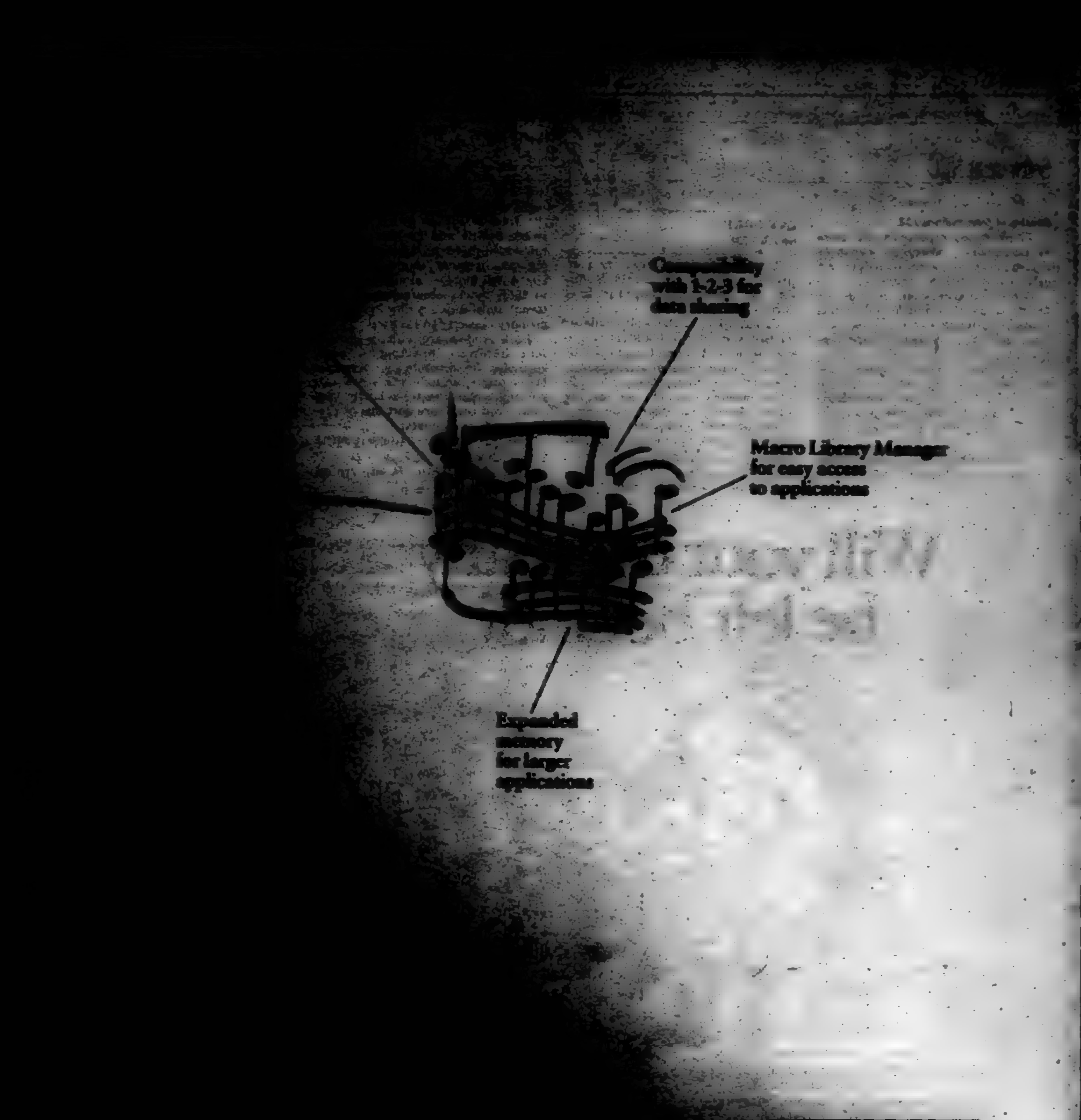
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Software at NCC

Continued from Preview/38

These codes reportedly let users automatically allocate expenses across multiple general ledger accounts and multiple companies.

Other enhancements include the ability to track, reconcile and control employee advances and expenses and track due and payable taxes, the vendor said.

Prices, which include source code and training, are $14,000 for the IBM System/38, $19,000 for IBM mainframes and $24,000 for large-, medium- or small-scale Burroughs Corp. systems.

Lawson Associates, 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.

ZAX CORP.
Booth 1736

Zax Corp. will showcase two in-circuit emulators, one for the Motorola, Inc. 6809 and one for Intel Corp.'s 80186.

Called ICD-178, the 8-bit emulator for Motorola 6809 or 6809E is said to operate at 2 MHz and contain 64K bytes of static random-access memory (RAM) for downloading files, altering memory contents and loading future memory into a target system.

Memory can be mapped to selected addresses in 1K-byte blocks and designated as read-only, read/write, user and no memory, Zax said.

The ICD-278, a 16-bit emulator for the Intel 80186 or 80188 runs between 8 MHz and 12 MHz and contains 128K bytes of static RAM. Adding an optional internal memory board will increase available storage to 256K bytes; interfacing to an external hard-disk facility will boost memory capacity to 1M byte.

Both models are said to provide four hardware breakpoints, eight software breakpoints, an external break probe, an external break output and a real-time trace buffer that can record and store portions of program memory contents.

The ICD-178 costs $4,995; the ICD-278 is priced at $7,995.

Zax, 2572 White Road, Irvine, Calif. 92714.

ORACLE CORP.
Booth 2624

Oracle Corp. will present the SQL-based Oracle relational data base management system and Oracle Link.

The data base manager is said to include an application generator, report writer and color graphics capability.

Through question-and-answer dialogues, the applications generator helps users build multiuser data entry, query and update applications.

A report writer creates production and ad hoc reports and automatically formats SQL query results into reports with column headings and data formats taken from the data dictionary. Oracle graphics reportedly lets users display data in color as pie charts, bar charts or multiline plots, according to the vendor.

The Oracle Link program provides connections among Oracle data bases to upload and download both data and applications between a personal computer and any other Oracle system in any host environment.

Oracle costs $30,000 for an initial systemwide license.

Oracle, 2710 Sand Hill Road, Menlo Park, Calif. 94025.

IMSL, INC.
Booths [illegible]

IMSL, Inc. will show the IMSL Library, now available for Hewlett-Packard Co. Series 9000 computers.

The IMSL Library contains over 600 Fortran subroutines for mathematical and statistical applications. It is compatible with the HP Series 9000 Models 520, 530 and 540 running the Fortran 77 compiler under the HP-UX operating system. A first-year license is priced at $1,200.

IMSL, NBC Building, 7500 Bellaire Blvd., Houston, Texas 77036.

SEASIDE SOFTWARE
Booth 2838

Seaside Software will exhibit a text-oriented data base management system for the IBM Personal Computer, PCjr, Personal Computer XT, AT and compatible processors under DOS 2.0 or higher.

Called Asksam, the software supports free-form, variable-length records. Keyword retrievals can include logical operators and wildcards and can be routed to screen, printer or disk and sorted on any field.

The software costs $149.95.

Seaside Software, 536 Parade Drive, Corpus Christi, Texas 78412.

WINTEK CORP.
Booth 1727

Wintek Corp. will show Smartwork software, a tool for creating printed circuit board artwork running on the IBM Personal Computer, Personal Computer XT and AT.

Smartwork produces single-sided or double-sided printed circuit boards up to 10 by 16 in. Prototype quality 2X plots can be made on a dot matrix printer and production-quality artwork can be produced with a pen-and-ink plotter.

The program sells for $895.

Wintek, 1801 South St., Lafayette, Ind. 47904.

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Rip Van Winkle Waking Up. Engraving by Darley. Courtesy: The Bettmann Archive

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NCC Preview

Microcomputers at NCC

ITT INFORMATION SYSTEMS
Booth 4315

ITT Information Systems will exhibit ITT Xtra XP, its IBM Personal Computer XT-compatible personal computer.

The Xtra XP is based on an Intel Corp. 80286 processor and incorporates a zero wait state architecture.

The product uses 512K bytes of random-access memory that is expandable to 640K bytes. An additional 1M byte of memory is available through an expansion board, the vendor said. The Xtra XP also includes five Personal Computer XT expansion adapter slots and read-only-memory-based diagnostics said to be capable of analyzing faults to chip level.

The ITT Xtra XP is priced from $3,995 to $4,595.

ITT Information Systems, 2350 Qume Drive, San Jose, Calif. 95131.

VIASYN CORP.
Booth 2117

Viasyn Corp. will demonstrate an enhanced version of its Compupro 286 multiuser microcomputer that is said to include an Intel Corp. 8-MHz 80286 processor supported by an upgraded version of Concurrent DOS 8/16 with PC-DOS Version 2 compatibility.

Other features are a multitasking slave processor for simultaneous execution of 8-bit tasks and electronic mail software for data file transfers between workstations.

Viasyn, 3506 Breakwater Court, Hayward, Calif. 94545.

PYRAMID TECHNOLOGY CORP.
Booth 5163

Pyramid Technology Corp. will exhibit the AT&T Unix-based Model 90X 32-bit computer, Model 90MX dual-processor version and the OSX version of Unix.

The 90X is said to provide a 120-nsec cycle time on three boards plus up to 128 user connections.

A three-tiered memory hierarchy consisting of virtual address space, physical memory and cache offers 4G bytes of user address space, the vendor said.

The 90MX reportedly offers 1.70 to 1.85 times the throughput of the 90X plus a maximum of 256 user connections.

OSX Unix derives from the University of California at Berkeley Unix 4.2 and AT&T's Unix System V. Features include virtual paging supported by demand paging, shared code and data during process creation and local-area networking.

Pyramid Technology, P.O. Box 1295, 1295 Charleston Road, Mountain View, Calif. 94039.

QUADRAM CORP.
Booth 2821

Quadram Corp. will showcase its line of microcomputer enhancement products, including the Quadscreen monochrome monitor, Quadlaser printer, Asher enhancement boards for integrating voice and data communications and Quadnet networks.

The Quadscreen monitor is designed for computer-assisted design and manufacturing applications and compatible with such programs as Autocad II and Cadmaster. A 17-in. screen reportedly provides a resolution of 968 horizontal dots by 512 vertical lines.

The monitor also includes dot addressability, spreadsheet and split-screen functions, according to the vendor.

The Quadlaser printer uses diode laser technology and electrophotographic imaging techniques. Print speeds run up to 8 page/min or about 330 char./sec., the vendor said.

A 300 by 300 dot/in. resolution is said to allow users to mix multiple font styles and graphics on one page.

Asher C1200 and C2400 voice/data communications cards can be installed inside a personal computer. The keyboard then controls all communications commands. Voice and data communications can occur simultaneously, according to the vendor.

Quadram will also display local network products including Quadnet II, a baseband network that reportedly links up to 32 IBM Personal Computer and compatible processors.

Quadscreen costs $1,995; Quadlaser sells for $3,795; the Asher C1200 is priced at $695; the C2400 costs $995.

A Quadnet II Master Kit, which consists of a network interface card, manual, software and key card, costs $1,095. The User Kit, containing only an interface card, costs $395, while a Starter Kit with cabling to interconnect three network stations sells for $95.

Quadram, 4355 International Blvd., Norcross, Ga. 30093.

Continued on Preview/44

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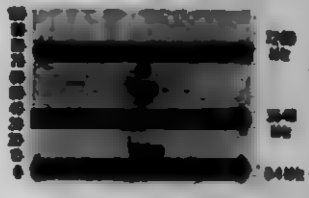

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Microcomputers at NCC

Continued from Preview/43

SHARP ELECTRONICS CORP.
Booth 4265

Sharp Electronics Corp. will showcase the PC-1350 pocket computer that includes a four-line display and 16K-byte expansion random-access memory (RAM) card.

The computer comes with 5K bytes of RAM plus 40K bytes of read-only memory that contains Sharp's Basic language, Help function, graphics, machine language support as well as 810 software.

The PC-1350 costs $195, the vendor said.

Sharp Electronics, 10 Sharp Plaza, Paramus, N.J.

JUKI OFFICE MACHINE CORP.
Booth 6965

Juki Office Machine Corp. will be displaying five printers for micros and a software package that allows the Apple Computer, Inc. Macintosh to use Juki printers.

The 5510 dot matrix printer prints 180 char./sec. in draft mode and 30 char./sec. in near-letter quality mode. It is IBM and Epson America, Inc. compatible and has a 3K-byte buffer memory. The 5510 costs $582 for a serial ported version and $499 for a parallel port.

The 6000 letter-quality daisywheel printer prints 10 char./sec. and comes with either a Centronics Data Computer Corp. parallel or an RS-232C serial interface. It costs $296.

The 6100 letter-quality daisywheel printer reportedly performs word processing functions such as underscoring, boldface, superscript and subscript. It comes with a parallel interface for $599 or with a serial interface for $658.

Another daisywheel printer, the 6200, has a maximum print speed of 30 char./sec. and also comes with either serial or parallel interfaces. The serial version costs $804, and the parallel version costs $745.

The 6300 letter-quality daisywheel printer has word processing functions and graphics. The unit prints at 40 char./sec. and costs $995.

The company will also exhibit its Letterprint software that allows the Macintosh computer to work in conjunction with Juki's 6100 or 6300 printers. The Letterprint kit costs $75, or $95 with cable included.

Jeff Einstein, author of "Einstein's Computer Guides," will be at the Juki booth July 15 from 1 p.m. to 4 p.m. and July 16 from 2 p.m. to 4 p.m. giving away copies of his various computer guides.

Juki Office Machine, 299 Market St., Saddle Brook, N.J. 07662.

VERBATIM CORP.
Booth 5465

Verbatim Corp. will show prototypes of an erasable read/write optical disk and a disk drive, which are currently in the development phase. The demonstrations will take place on all four days of the National Computer Conference.

The 3½-in., thermomagneto-optical disk is said to store a minimum of 40M bytes of formatted information.

The Monday and Tuesday demonstrations will be hosted by Geoff Bate, Verbatim's senior vice-president of engineering. Ingolf Sander, chief scientist of the company's new storage technology department, will host demonstrations Wednesday and Thursday.

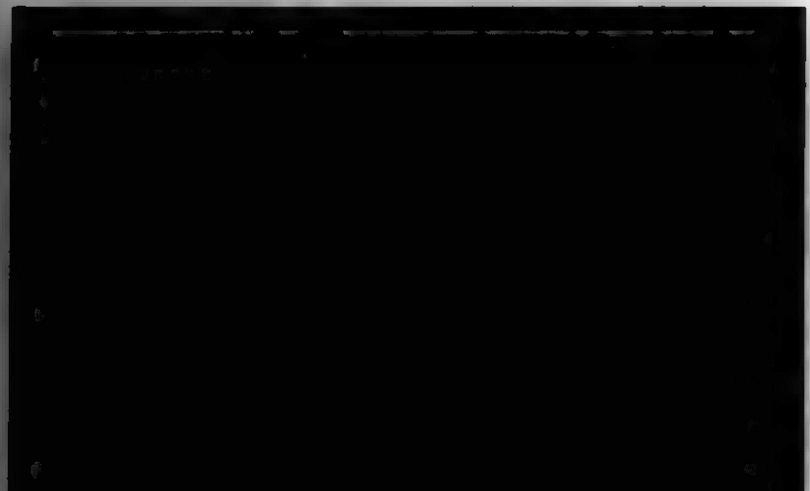
Demonstrations will take place all four days at 10:30 a.m. and 1 p.m. and at 3 p.m. Monday, Tuesday and Wednesday.

Verbatim, P.O. Box 3477, 323 Soquel Way, Sunnyvale, Calif. 94088.

MEGADATA CORP.
Booth 4411

Megadata Corp. will exhibit its 8300 series of Unix processors including the Model 7 stand-alone data

Continued on Preview/46



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At NCC, see us at the Motorola Information Systems booth #5541.

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  The "path of least resistance"...but is it for you?
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  New technology is not a good enough reason for choosing 3380's. A combination of 3350/3380 may work best!
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  The sensible way to get a Disaster Recovery Program in motion.
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CW

NCC Preview

Microcomputers at NCC

Continued from Preview/44

processing system for one to eight users.

The basic system is said to contain two RS-232 ports, a 26M-byte Winchester disk, a 360K-byte floppy disk, 512K-bytes of random-access memory (RAM) and the Unisoft System Corp. Uniplus+ operating system, derived from AT&T Unix Systems III and V.

A two-port Unix-based system costs less than $5,000 and can be expanded to eight ports and 2M bytes of RAM for under $6,000.

Megadata, 35 Orville Drive, Bohemia, N.Y. 11716.

KEY TRONIC CORP.
Booth 5606

Key Tronic Corp. will exhibit the KB5153 touch-pad keyboard for the IBM Personal Computer, Personal Computer AT and compatibles.

Three printing modes, including cursor key, mouse and graphics and a function key mode, are standard, according to the vendor.

Cursor key mode is said to convert finger or stylus motion into cursor key codes identical to keyboard input. In mouse mode, stylus or finger movement reportedly sends position changes to the host, where they are interpreted by a software driver as if they came from a mouse.

Graphics mode sends a digitized point-of-touch to the host where driver software translates the data and moves a screen pointer to the corresponding monitor location. Function key mode divides the touch-pad surface into areas that each represent an operator-selected string of characters.

The KB5153 lists for $399.95.

Key Tronic, P.O. Box 14687, Spokane, Wash. 99214.

PREH ELECTRONICS INDUSTRIES, INC.
Booth 1227

Preh Electronics Industries, Inc. will show keyboards and graphics tablets.

Graphic Commander 106, a combination keyboard and graphics tablet, costs $550; Commander PC-I, an IBM Personal Computer-compatible keyboard, costs $195; and Bitmap 12, a graphics tablet with zoom functions, costs $350.

Preh Electronics Industries, 5665 Howard St., Niles, Ill. 60648.

ENTER COMPUTER, INC.
Booth 2996

Plotters, a mouse and lettering software will highlight Enter Computer, Inc.'s booth.

The six-pen Sweet-P Model 600 plotter includes 14 in./sec. plotting speed, RS-232 and parallel interfaces, 18 internal English and foreign language character sets and 1.5K-byte buffer memory storage.

Like its single-pen predecessor, the Sweet-P Model 100, the Model 600 can be used with many systems compatible with Apple Computer, Inc., IBM Personal Computer and CP/M machines. The Model 600 also is compatible with the Hewlett-Packard Co. Graphics Language.

The Sweet-P mouse reportedly uses an independent suspension system and leaf springs that keep a constant load on the X-Y drive wheels. It is available for the IBM Personal Computer, Personal Computer XT and AT, 3270 Personal Computer and compatible processors.

Typ-Set, a high-resolution, presentation-graphics-quality lettering system, is said to provide six fonts and let users place 100 lines and save all data for each job file. It runs with a 192K-byte, dual-floppy IBM Personal Computer and compatible computers.

Prices are $1,095 for the Model 600 plotter, $395 for the Model 100, $179 for the mouse and $299 for Typ-Set.

Enter Computer, 6867 Nancy Ridge Drive, San Diego, Calif. 92121.

HOUSTON INSTRUMENT
Booth 5063

Houston Instrument will exhibit digital plotters and graphics digitizers.

The PC Plotter, a four-pen plotter for personal computers, uses the vendor's DM/PL plotting language. The PC Plotter 595 lets users produce 8½- by 11-in. graphics; the PC Plotter 695 produces both 8½- by 11-in. and 11- by 17-in. graphics.

The DMP single-pen plotter reportedly offers speeds up to 4.2 in./sec., and 8½- by 11-in. and 11- by 17-in. graphics plotting. It is said to generate circles, arcs, ellipses and general curves automatically as well as clip, window, viewport and scale to size.

Continued on Preview/50

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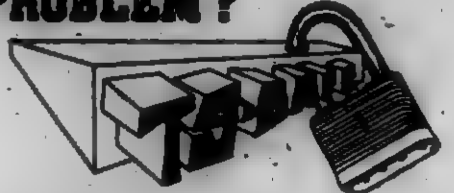

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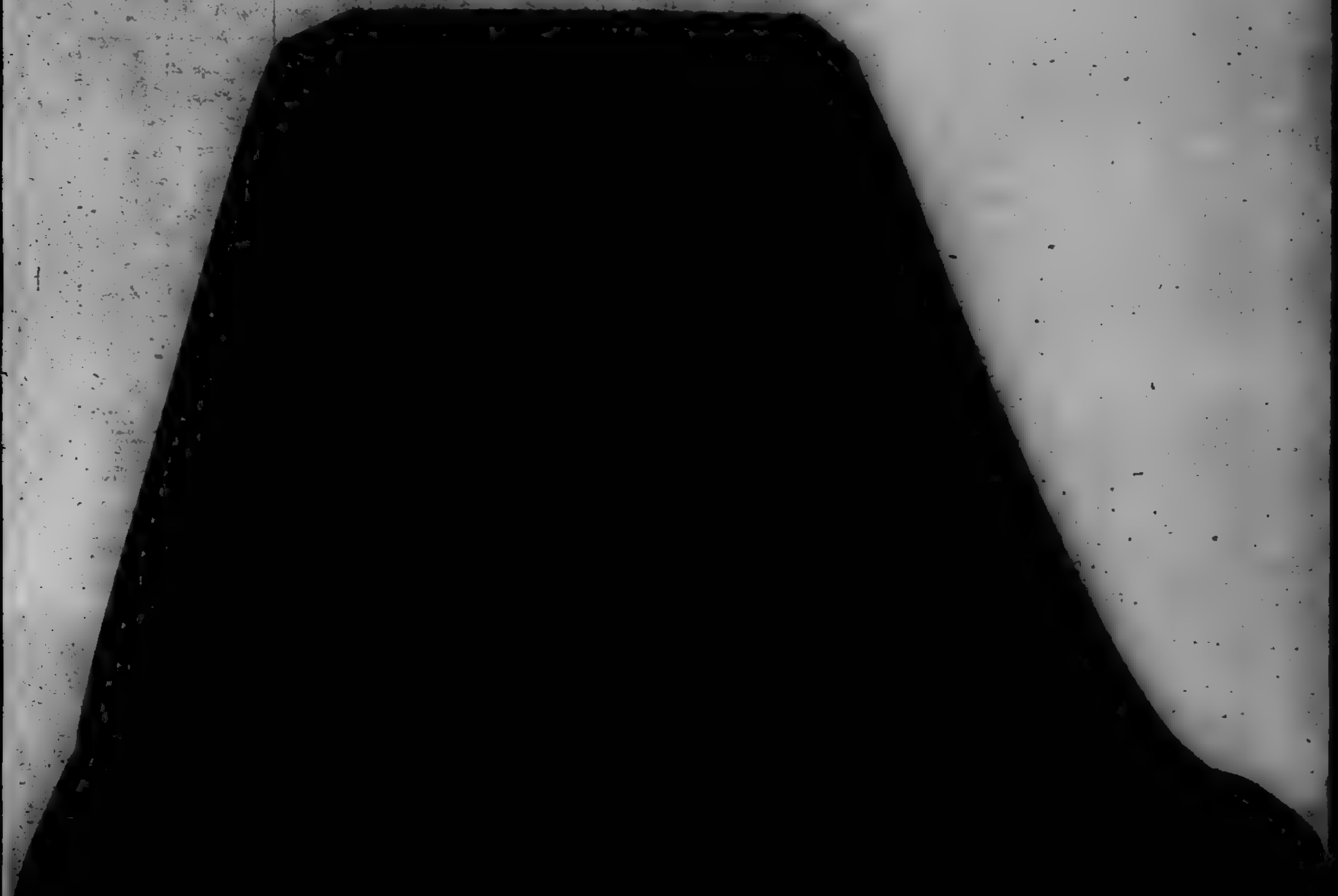


The new IBM 3161 ASCII Display Station is really seven different ASCII displays in one.

In addition to its own function-rich native mode, the new IBM 3161 can emulate:

- IBM 3101 Model 881
- ADDS Viewpoint*
- Hazeltine 1500*
- Lear Siegler ADM-3A*
- Lear Siegler ADM-5*
- TeleVideo 910*

Besides fitting nicely into existing systems, the IBM 3161 also offers impressive improvements in ergonomics.

Improved Ergonomics For Improved Productivity

Take the 102-key ASCII-style keyboard, for example. Its low profile, gentle contour and typewriter touch make for faster keying with fewer errors. The keyboard has programmable function and editing keys so it can be custom-tailored to meet your application needs.

Then, for comfortable viewing, there's the tilt and swivel of the 12" display. And the sharp, clear 8 x 16 character matrix for easy reading. Plus cursor, character and field attributes (blink, reverse video, underscore, dual intensity, etc.). And scrolling. And partitioning. And lots more.

The IBM 3163 with Plug-in Cartridge

The sharp 8 x 16 character matrix helps make for easier reading and fewer operator errors.

And, as if that weren't enough, we're also announcing a second new ASCII display station with even higher function—the IBM 3163.

Outwardly, these two new displays look alike. But the 3163, in addition to its built-in emulation of the IBM 3101 Model 881, also offers the ability to emulate the DEC VT 52 and VT 100* by means of a unique plug-in cartridge.

And while you'll like the power and flexibility of the 3161, for your high-function applications the 3163 goes even further. For example, a 7,680-character buffer and up to three windows enable you to view and modify portions of different host data bases. The 3163 lets you redefine and even recap the keys.

On both displays the setup is menu-guided and written in plain English, so it can be done easily and quickly. The point is, both are designed to improve your user productivity.

Very Attractive Prices

The price per terminal is $695 for the 3161 and $1,095 for the 3163. Quantity discounts are available. What's more, IBM maintenance offerings start as low as $35 per year per terminal for customer carry-in repair.

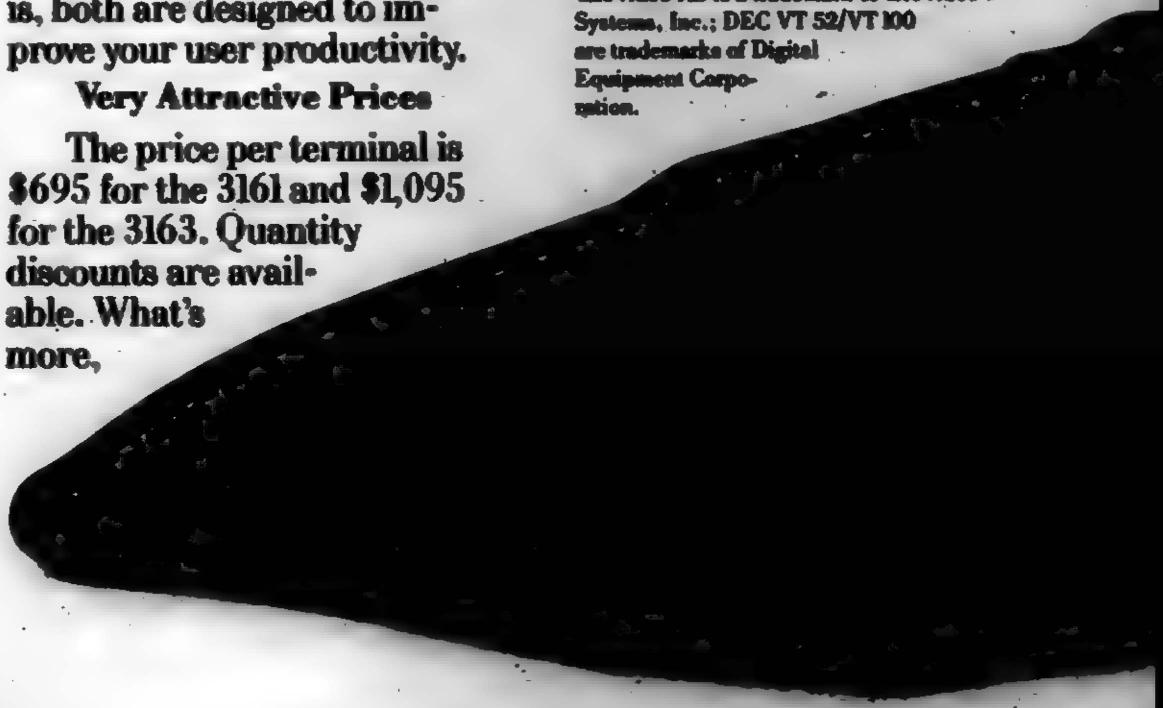
Now there's a new family of ASCII displays with the quality, service and support IBM is famous for. Both displays are available through IBM Authorized Distributors and IBM marketing representatives.

FEATURES	3161	3163
Lines x Characters	25 x 80	25 x 80
Double-sized chars	No	Yes
Line drawing chars	24	24
Vertical scroll	Jump	Jump/Smooth
Definable function keys	24	24
Windowing	No	Yes
Partitioning	Horiz	Vert/Horiz

Call 1 800 IBM-2468, Ext. LE/90 for the name of an Authorized Distributor near you.

IBM

*ADDS Viewpoint is a trademark of Applied Digital Data Systems, Inc.; Hazeltine 1500 is a trademark of Hazeltine Corp.; Lear Siegler ADM-3A/ADM-5 are trademarks of Lear Siegler, Inc.; TeleVideo 910 is a trademark of TeleVideo Systems, Inc.; DEC VT 52/VT 100 are trademarks of Digital Equipment Corporation.



in one.

The IBM 3161 ASCII Display Station

Microcomputers at NCC

Continued from Preview/46

The intelligent DMP-41/42 cut-sheet plotters automatically generate circles, ellipses and curves, the vendor said. The 14-pen DMP-51/52 MP series plotters reportedly provide 0.001-in. resolution, maximum plotting speed of 22 in./sec. and constant velocity control to ensure uniform inking regardless of pen movement angle.

PC Pad is said to function as a digitizer and mouse under software control and interface via an RS-232C port.

Providing 0.005-in. resolution, the PC Pad can address more than one million points on a computer screen, according to the vendor.

Hipad desktop digitizers reportedly can send up to 100 coordinates in one second.

Prices are $695 for PC Plotter 695, $995 for the DMP-40 plotter, $2,995 for the DMP-41/42 series plotters, $5,995 for the 51/52 MP series plotters, $495 for PC Pad, $840 for the Hipad DT-11 and $920 for the four-button cursor version of Hipad DT-114.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753.

DIGITRAN
Booths 1657, 1658

Digitran will exhibit an IBM Personal Computer AT keyboard that reportedly is also compatible with the Personal Computer and Personal Computer XT.

The keyboard is available with tactile or linear keys, a curved design and 0.15-in. travel.

The single-quantity price is $195 for keyboard, enclosure and cable.

Digitran, 3100 New York Drive, Pasadena, Calif. 91107.

COMPSOL CORP.
Booths 4060, 4061

Compsol Corp. will present a solid-state disk emulator for the IBM Personal Computer, Personal Computer XT and AT that is said to transfer data at 5M byte/sec.

Called Quick Byte, the system reportedly can be expanded from 1M byte to 4G bytes of random-access memory using one bus slot and can host up to four computers.

Quick Byte with 1M byte of RAM costs $1,495.

Compsol, 318 Montgomery St., Alexandria, Va. 22314.

MINISCRIBE CORP.
Booth 2217

Miniscribe Corp. will display its 8000 series of 3½-in. disk drives plus its 3000 and 6000 series of 5¼-in. drives.

Model 8425 reportedly provides 25.6M bytes of storage; Model 8212 offers 12.8M bytes. Both models reportedly feature 68-msec access times and 5M bit/sec. data transfer rates.

Miniscribe, 1861 Lefthand Circle, Longmont, Colo. 80501.

MOTOROLA SEMICONDUCTOR PRODUCTS, INC.
Booth 6329

Motorola Semiconductor Products, Inc. will show the VMESystem 1000 family of rack-mounted OEM microcomputer systems.

The systems provide a VME chassis with card cage, 400W power supply, 15M-byte or 40M-byte hard disk drive and 1M-byte floppy disk drive.

Other features reportedly include multiuser capability and Motorola's Versados and System V/68 support.

Motorola Semiconductor Products, 725 S. Madison Drive, Tempe, Ariz. 85281.

KUSTOM ELECTRONICS, INC.
Booth 3457

Kustom Electronics, Inc. will present the Sunflower MS 10/10 removable hard-disk system.

A dual 10M-byte unit, the MS 10/10 is said to be compatible with the IBM Personal Computer and the Novell, Inc. and 3Com Corp. networks. MS 10/10 is priced at $3,395.

Kustom Electronics, 8320 Nieman Road, Lenexa, Kan. 66214.

ALPS ELECTRIC (USA), INC.
Booth 6415

Alps Electric (USA), Inc. will exhibit 3½- and 5¼-in. disk drives and data input devices.

The 3½-in. rigid disk drives provide 10M- or 20M-byte storage capacities; the 3½-in. flexible drives have 512K-byte and 1M-byte storage capacities; 5¼-in. rigid disk drives offer 10M-, 20M- and 40M-byte capacities.

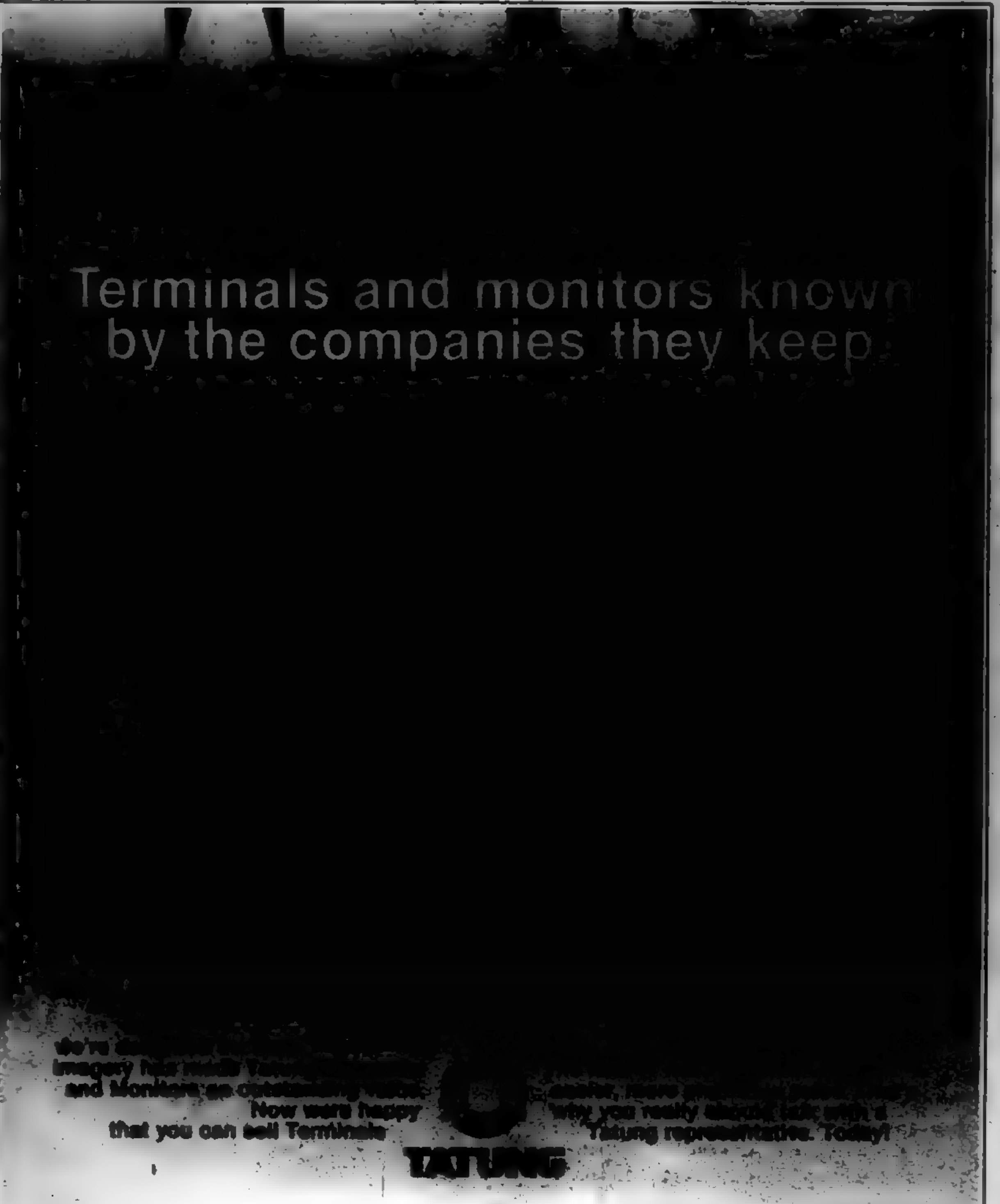
Alps Electric, 3553 N. First St., San Jose, Calif. 95134.

VIDEX, INC.
Booths 4169, 4171

Videx, Inc. will display the Mail Center, an information transfer program for the Apple Computer, Inc. Appletalk personal computer network.

Mail Center software for two Macintosh computers costs $299; the price is $499 for use with six Macintosh systems.

Videx, 897 N.W. Grant Ave., Corvallis, Ore. 97330.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Communications at NCC

M/A-COM LINKABIT, INC.
Booth 2921

M/A-Com Linkabit, Inc. will display its IDX-3000 local networking products.

The IDX-3000 local communications network allows users to switch between computer resources automatically, providing nonblocking, full-duplex asynchronous communication for up to 3,072 lines at rates of up to 19.2K bit/sec.

Other features include logical addressing of lines and resources and the ability to queue and hold user connection requests, establish a second connection and return to the first connection.

An IDX-3000 local communications network system costs between $150 and $200 per port; multiplexers range from $3,000 to $4,900; and TMX144 trunkmasters cost between $2,500 and $3,500.

M/A-Com Linkabit, 3033 Science Park Road, San Diego, Calif. 92121.

CODEX CORP.
Booth 5541

Codex Corp. will present the 6240 Digital Transmission Multiplexer (DTMX), said to integrate voice, data and digital image applications for transmission over a single link at rates from 56K bit/sec. to 2.04M bit/sec.

The time-division multiplexer will accommodate up to 64 data channels or 64 voice channels. It can be programmed to reconfigure networks from a central site; users can redefine parameters and reallocate aggregate bandwidth, the vendor said.

Prices begin at $14,000 per unit.

Codex 20 Cabot Blvd., Mansfield, Mass. 02048.

INTERPRETER, INC.
Booth 5315

Interpreter, Inc. will exhibit its Interpreter CCU line of devices that reportedly allows dissimilar office automation equipment to communicate with 100% data integrity.

The CCU-4 is a four-port interpreter that provides two floppy disks with 256K bytes of store and forward capabilities. Up to four dissimilar asynchronous or synchronous systems can communicate with one another and retain the integrity of documents being exchanged. The CCU-W is a six-port interpreter with a Winchester disk providing 10M bytes of store and forward capabilities.

Other features include password protection for screen access and a menu access control facility that tells the operator what documents are queued. Prices are $12,490 for the CCU-4 and $18,990 for CCU-W.

Interpreter, 11455 W. 48th Ave., Wheat Ridge, Colo. 80033.

EXTEL CORP.
Booths 3187, 3188

Extel Corp. will exhibit the Comwriter Jr. message communications terminal that reportedly lets users send messages over ordinary telephone lines, dedicated Telex or private-wire networks.

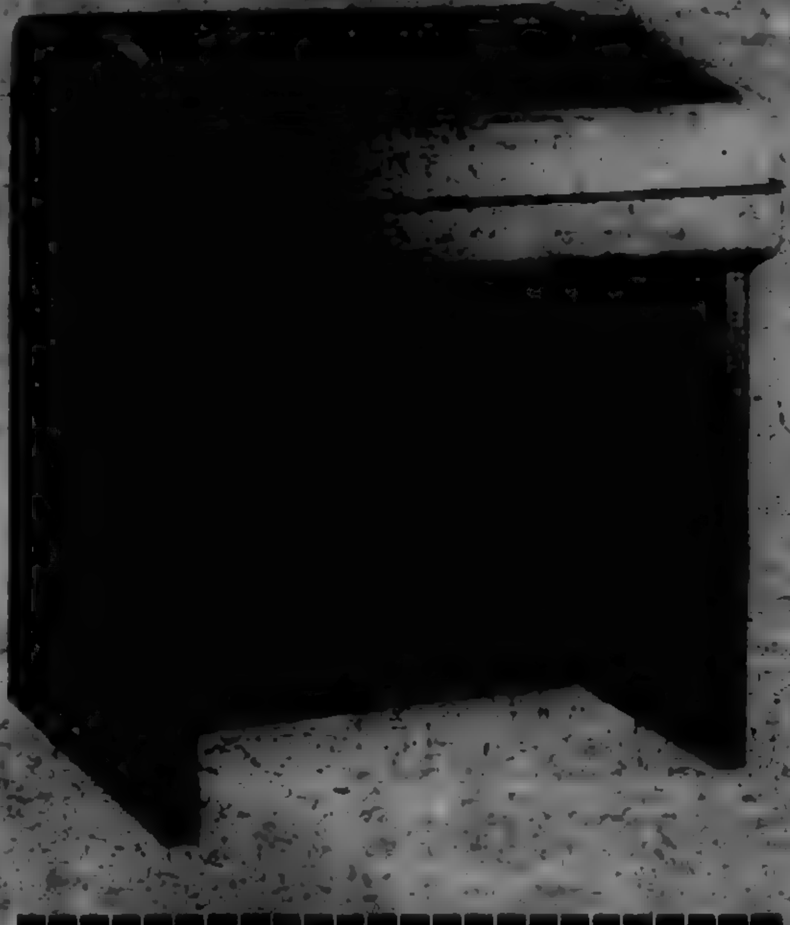
According to the vendor, the terminal also can access Telex, TWX and other message communications services for electronic mail applications.

Comriter Jr. comes with a printer, modem, text editor and autodial keys that are said to allow single-key message transmission over common carrier services.

Prices start at $1,300.

Extel 4065 Commercial Ave., Northbrook, Ill. 60062.

Continued on Preview/62



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- ☑ Do they offer operator-friendly features such as easily changed bands, membrane touch controls, form length select switch?
- ☑ Is the printing near letter-quality?
- ☑ Diagnostic display? Internal self-test?
- ☑ Long-life ribbon cartridge?
- ☑ Does SSI guarantee compatibility with my computer? (Whether it's IBM, PC LANs, DEC, DG, TI, HP, etcetera.)
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(416) 229-2688

Communications at NCC

Continued from Preview/31

LOCAL DATA, INC.
Booth 2957

Three stand-alone protocol converters will be displayed at the Local Data, Inc. exhibit.

The Versalynx Rack is a rack-mount configuration of the Versalynx 3278 coaxial deconverter. The rack-mount version contains up to 16 6- by 12-in. cards, individually fused and designed to enable insertion or removal while the rack is under power.

Trulynx/3270 software is said to execute as an application program under Microsoft Corp.'s MS-DOS or IBM's PC-DOS, emulating the file-transfer mode of IBM's 3278 or 3270 Personal Computer control program.

Barelynx/3287, Barelynx/3278 and Barelynx/VL 78 are board-only versions of the Interlynx/3287 NP printer controller converter, the Interlynx/3278 deluxe coaxial controller converter and the Versalynx Model 3 coaxial deconverter, the vendor said.

The Versalynx Rack costs $2,150. Other prices are not available.

Local Data, 2771 Toledo St., Torrance, Calif. 90503.

DIGITAL COMMUNICATIONS ASSOCIATES, INC.
Booth 5000

Digital Communications Associates, Inc. (DCA) will exhibit data communications networking systems and microcomputer-to-mainframe communications products including Netlink high-speed time-division multiplexers, the Irma micro-to-mainframe interface board and the Network Management System software package.

There are three Netlink multiplexers.

Netlink I is a bit-synchronous time-division multiplexer that is said to provide voice, data and compressed video transmission at speeds of up to 1.544M bit/sec.

Switching Netlink adds the ability to assign individual channels or groups of channels to various network destinations.

Netlink II adds support for traditional drop-and-insert and bypass applications, redundancy of power, logic and T-carrier modems, support of independent trunk clocks and D4 framing capability.

The Irma board reportedly provides communications facilities between a personal computer and a mainframe.

The Network Management System is a package that lets an IBM Personal Computer XT or AT serve as an intelligent monitoring and reporting device when attached to DCA's Series/300 network processors.

Prices are $4,195 each for Netlink I and II; $1,195 for Irma and $9,995 for the Network Management System.

DCA, 303 Technology Park, Norcross, Ga. 30092.

AMP, INC.
Booth 1119

Amp, Inc. will show a four-position data connector that includes self-shorting contacts required for IEEE 802.5 token-passing ring networks.

The hermaphroditic connector permits axial, right-angle or 45-degree cable entry and contains a locking device to prevent accidental disengagement.

Selectively plated gold contacts are rated for 1A, maximum, at 30V ac.

Shielding performance is specified to 1 GHz, according to the vendor.

Amp, P.O. Box 3608, Harrisburg, Pa. 17105.

TELENEX CORP.
Booth 4505

Data communications diagnostic and performance analysis devices will highlight Telenex Corp.'s exhibit.

Autoscope monitors and interprets line activity, detects line and protocol errors automatically, monitors and provides graphic statistical analyses of performance and emulates any network element, according to Telenex.

Portascope 1000 reportedly provides removable, interchangeable test application cartridges. These cartridges allow the device to adapt modularly and specialize on any protocol, in turn letting the service engineer change from one interface and break out to another, the vendor said.

Autonex is said to extend the 50-ft limitation of the RS-232 data set cable to over 1,000 ft.

A cable converter unit passes all control, clock and data leads of the RS-232 interface to distances of more than 1,000 ft at speeds of up to 19.2K bit/sec., the vendor said.

Telenex, P.O. Box 249, 503 Pleasant Valley Ave., Moorestown, N.J. 08057.

TELTONE CORP.
Booths 1557, 1558, 1559

Teltone Corp. will display the DCS-2SE data communications system said to eliminate the need for cables between terminals, peripherals and the host computer.

The system sends either synchronous or asynchronous data over existing phone pairs for up to four miles.

Voice and data can be transmitted simultaneously, according to a spokesman.

Asynchronous speeds reportedly can reach 9.6K bit/sec.; synchronous speeds range from 300 bit/sec. to 9.6K bit/sec.

Teltone, P.O. Box 657, 10801 120th Ave. N. E., Kirkland, Wash. 98033.

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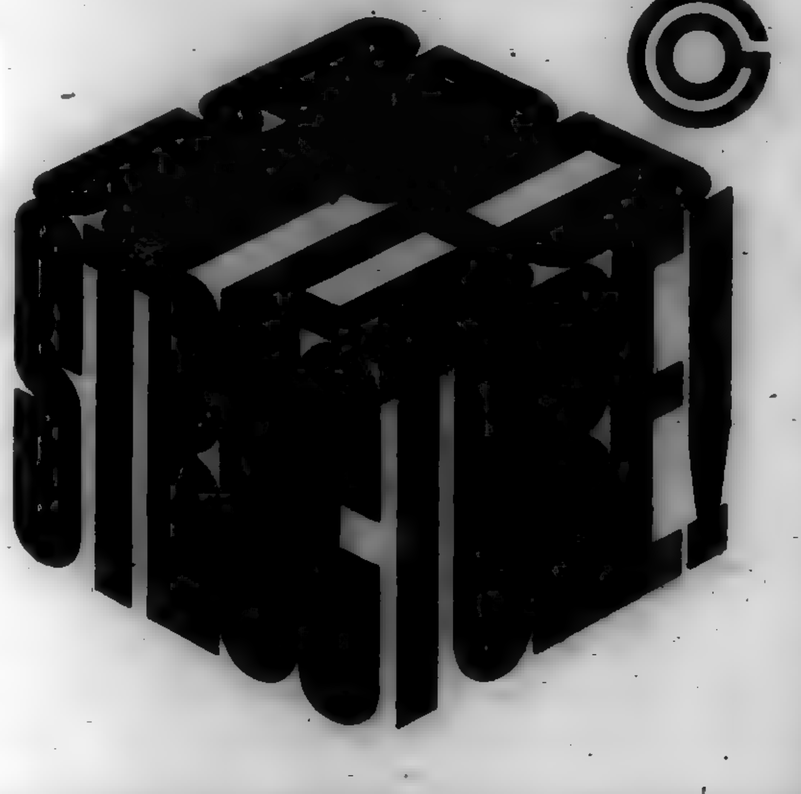

NCC Preview

Systems & Peripherals at NCC

FLEXIBLE COMPUTER CORP.
Booth [illegible]

A demonstration of the Flex/32 multicomputer will highlight Flexible Computer Corp.'s booth.

The Flex/32 consists of two to 20 32-bit superminicomputers, each with its own memory, operating system and I/O (VMEbus).

Each 32-bit computer can be programmed by the user, the vendor said. Software includes AT&T Unix System V, a concurrency simulator for testing parallel systems, the Multicomputing Multitasking Operating System, Concurrent C, Concurrent Fortran and Ada.

The aggregate bus bandwidth of the 36 buses in each Flex/32 cabinet is 696M bytes per second, according to the vendor.

The basic system, which consists of two computers, costs $126,000.

Flexible Computer, Building 2, 1801 Royal Lane, Dallas, Texas 75229.

BELL & HOWELL CO.
Booth 1696

Bell & Howell Co. will exhibit COM Print 6000, a computer output microfilm print and duplicating system.

COM Print 6000 is an on-line system that reportedly produces complete master and duplicate fiche printouts in one step.

Compatible with IBM and plug-compatible mainframes, the system can generate a 1,000 page report for less than $1 in fewer than 22½ minutes, a spokesman said.

Bell & Howell, 16901 Hale Ave., Irvine, Calif. 92714.

VOTAN
Booth 2317

Voice terminals and a voice management system will highlight Votan's exhibit.

The VTR 3270 is said to allow 3278 terminal users to add voice control to their applications.

The VTR 6050 terminal provides local 3½-in. floppy disk storage that can be controlled by the host or a locally connected terminal. Each floppy provides 320K bytes of storage for saving messages and other voice files.

This terminal also offers continuous speaker-dependent recognition to allow individuals to speak to a computer in a normal conversational flow, the vendor said.

The Voice Management System (VMS) is said to provide continuous voice recognition, voice store and forward and telephone interfacing capabilities for up to eight independent voice channels running simultaneously.

VMS also includes 5¼-in. Winchester and floppy drives for storing voice messages and voice applications programs.

Votan, 4487 Technology Drive, Fremont, Calif. 94538.

DATAGRAPHIX, INC.
Booth 5552

Datagraphix, Inc. will demonstrate Computer Output Management (COM) systems including the Mini-Autocom Model III recorder, Autocom XR microfilm recorder, Aris II microfiche recorder and Datagraphix laser printer.

The Mini-Autocom Model III recorder includes an IBM Personal Computer that provides operator interface, message display and diskette storage features.

The recorder reportedly converts computer-generated tapes into cut, dry nonreversal or optional reversal microfiche for immediate diazo or vesicular duplication.

The on-line Autocom XR is configured as a 3211 line printer that interfaces directly with IBM Series 370, Series 303, 308 or 43 computers plus plug-compatible mainframes.

Autocom XR processes data into 105mm, 82½mm or 16mm roll microfilm for off-line processing. The 105mm film is titled and indexed at an average speed of one fiche per minute, according to the vendor.

Aris II reportedly uses raster scan laser-imaging and dry heat development processing to produce titled and indexed microfiche at speeds of up to 12,000 line/min.

The system is configured as a 3211 printer and interfaces with IBM 360/25 and higher models, Series 370, 303 and 43 computers plus Amdahl Corp. V6 and other IBM plug-compatibles.

An Interlink transport option to cut-fiche COM systems connects the recorder to the duplicator and automatically carries cut silver original microfiche from the Aris II or Autocom for duplication.

The 9800 series laser printer reportedly outputs characters at speeds of up to 21,000 line/min.

Datagraphix, P.O. Box 82449, San Diego, Calif. 92138.

Continued on Peripherals/[illegible]

The first DBMS designed for online systems from the start, finishes first.

Compared to any other DBMS, CCA's MODEL 204 software is faster in a VM, OS, or DOS environment.

And, its productivity stays ahead of the pack even as you add more and more users. Incredibly, the MODEL 204 can support any size network from 30 to 30,000 terminals.

Like the cheetah's speed compared to other animals, the MODEL 204 was designed to be fast from the start. Because instead of being designed for batch, then retrofitted, this DBMS was specifically designed for online systems right from the start.

Impressive as its speed, is capacity. It can handle a few hundred records, or as many as 523 billion! With no limit on each record's size.

Because of its fourth generation tools, tough applications are easy to create, test, or change without affecting the database. And unlike any other DBMS, as your business data tracking requirements change, you can add or change new or existing fields without unloading, recompiling and reloading the database. A dramatic savings of time and manpower.

Very quickly, let us tell you more about MODEL 204's speed and superiority. Send the coupon for more information fast. Or, call 1-800-258-4100.

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Systems & Peripherals at NCC

Continued from Preview/53

XYLOGICS, INC.
Booth C4175

Xylogics, Inc. will exhibit the 451 disk controller for IEEE 796 multibus applications and two 32-bit bus products, the 751 VME-bus storage module drive (SMD) disk controller and 772 VME-bus ½-in. tape controller.

The Model 451 disk controller can address up to 16M bytes of memory and control up to four enhanced SMD disk drives per board at data transfer speeds up to 2.4M byte/sec., the vendor said.

The 751 disk controller supports an industry-standard SMD interface disk drive. The controller also provides VME address and data support, allowing users to select in 8-, 16- or 32-bit modes, the vendor said.

The 772 tape controller is said to handle industry-standard, formatted ½-in. tape interfaces and support tapes ranging from start/stop models at 12½ in./sec. to group-coded recording streaming models up to 200 in./sec.

The 451 peripheral controller costs approximately $1,500. Prices for the 751 disk controller range from $1,600 to $2,700 and for the 772 tape controller from $1,300 to $2,000.

Xylogics, 144 Middlesex Tupk., Burlington, Mass. 01803.

C. ITOH ELECTRONICS, INC.
Booth 4421

C. Itoh Electronics, Inc. has added a 22 char./sec. print mode to its Model 8510 80 char./line and Model 1550 136 char./line serial dot matrix printers.

This print speed provides near-letter-quality output, the vendor said. The three print modes can be selected from the front panel or by software.

The single-unit price for the 8510T is $550; the 1550T is priced at $769. The color models are priced at $650 for the 8510TC and $869 for the 1550TC.

C. Itoh Electronics, 5301 Beethoven St., Los Angeles, Calif. 90066.

GENERAL OPTRONICS CORP.
Booths 2244, 2245

General Optronics Corp. will exhibit the Holoscan 40, a 40 page/min nonimpact laser printer said to support up to 25 workstations in a multitask environment.

The printer provides 300 by 300 dot/in. resolution and a volume range of 45,000 to 60,000 print/mo, a spokesman said. A plain paper and dry toner xerographic system is said to allow printing on most standard bond and letterhead, label stock and transparencies in portrait and landscape modes.

Multiple downloadable fonts can be interspersed on a single page, according to the spokesman.

Single-unit prices start at $22,500.

General Optronics, 275 Park Ave., New York, N.Y. 10152.

CENTRONICS DATA COMPUTER CORP.
Booth 4[illegible]

Centronics Data Computer Corp. will exhibit dot matrix and line printers.

The dot matrix printers include the Great Little Printer for micros, priced at $299; the Horizon series for IBM Personal Computers and compatible processors, priced from $699 to $899; the Model 240 Printstation letter-quality printer, priced at $1,495; the Model 250 Printstation for workstations and micros, priced at $1,295; and the Printstation 350 series letter-quality printers, priced between $2,195 and $3,150, the vendor said.

Centronics will also show line printers like the TIP series dot matrix line printers, ranging in price from $5,400 to $6,900; the E-Series Model III band line printer, priced at $16,800; and the Linewriter series, priced between $4,885 and $6,595.

Centronics, 1 Wall St., Hudson, N.H. 03051.

ANN ARBOR TERMINALS, INC.
Booth 2228, 2230

Ann Arbor Terminals, Inc. will showcase the VXL multihost, multiwindow terminal that can work with up to four hosts simultaneously.

Users reportedly can switch from one host to another with one keystroke, even while receiving results from other hosts in other windows.

The VXL provides 20K bytes of local display memory, which reportedly can be divided into up to eight pages, each of arbitrary width and height, to a maximum of 255 columns and 512 lines. Users can dynamically connect and disconnect any page to any host and switch the keyboard from host to host, according to the vendor.

Windows may be positioned so all are visible or are fully or partially overlapped. Each window is a view port into its underlying page and may be moved or changed in size and shape without affecting underlying data, the vendor said.

VXL screen density is dynamically variable from 80 to 160 col. and from 36 to 60 lines, according to the vendor.

The VXL lists for $2,795.

Ann Arbor Terminals, 6175 Jackson Road, Ann Arbor, Mich. 48103.

Continued on Preview/[illegible]

MAN SAVED FROM A SEA OF PAPER...

Huge oceans of information can be standardized into computer output microfiche (COM) that takes up less than 5% of equivalent paper space.

And it's simply the most cost-effective storage/reproduction medium available.

For example, a 1,000-page report using old reproduction methods would cost $[illegible] and take 1 hour to reproduce. An NCR COM can perform the equivalent task in 15 minutes for $[illegible]

NCR's COM systems can be a real life saver.

Computer Output Microfiche

NCR

Micrographic Systems Division

Micrographic Systems Division, [illegible] Logue Avenue, Mountain View, CA [illegible], ([illegible]) [illegible], ([illegible]) 227-[illegible]

TOTAL INTEGRATION
FROM PC TO MAINFRAME:
THE DIFFERENCE BETWEEN COMPUTERS
THAT FUNCTION AND SYSTEMS THAT
WORK.

NCC Preview

Systems & Peripherals at NCC

Continued from Preview/84

PRINTEK, INC.
Booth 2126

A demonstration of the Model 930/DD forms printer will highlight Printek, Inc.'s booth.

The Model 930/DD contains a bottom-entrance vertical feed of up to six-part continuous forms. Tractors beneath the printer reportedly provide a positive paper feed without delamination between copies for accurate print positioning.

Print speed is 200 char./sec. for data processing applications, 80 char./sec. for letter-quality printing.

No prices have been established yet, the spokesman said.

Printek, 1517 Townline Road, Benton Harbor, Mich. 49022.

ELECTRONIC INFORMATION TECHNOLOGY, INC.
Booths 1660, 1662

Electronic Information Technology, Inc. (EIT) will exhibit a monochrome image processing device that converts hard-copy materials into electronic files that can be used on personal computers.

The EIT Personal Scanner (EIT-PS) automatic graphics digitizer and text input device reportedly provides optical character recognition and image processing capabilities.

EIT-PS hardware consists of a desktop scanner and cable, plus interfaces to IBM Personal Computers and Personal Computer XTs and Apple Computer, Inc. and Motorola, Inc. 68000-based microcomputers.

The single unit price is $2,487.

EIT, 373 Rte. 46 W., Fairfield, N.J. 07006.

TATUNG CO.
Booths 6377, 6380

An IBM-compatible color monitor for text and graphics displays will debut at Tatung Co.'s exhibit.

The CM-1380 monitor reportedly provides a resolution of 640 horizontal dots by 200 or 350 vertical lines, with scan frequency at 21.85 KHz or 15.75 KHz.

The unit offers 16 colors at 15.75 KHz and 64 colors at 21.85 KHz. The display is switch selectable from color screen to an all-green screen for word processing, according to the vendor.

Designed for use with the IBM Enhanced Graphics Adapter, the CM-1380 costs $849.

Tatung, 2850 El Presidio St., Long Beach, Calif. 90810.

COMPUTER MEMORIES, INC.
Booth 6871

Computer Memories, Inc. will display the CM 4000 series of disk drives, including the 26.6M-byte CM 4426 drive.

The CM-4426 is said to provide a typical access time of 40 msec and to use high-output Winchester-type read/write heads.

In OEM quantities, the half-height CM 4426 costs $650. A delayed motor start option is available, according to the vendor.

Computer Memories, P.O. Box 2740, 9216 Eton Ave., Chatsworth, Calif. 91311.

TRUE DATA CORP.
Booths 3708, 3710

A wall-mount version of the Source Data Terminal (SDT) for shop floor data collection and TDC Perform, a manufacturing software package, will bow at True Data Corp.'s exhibit.

The wall-mount SDT can be used in environments with limited work space. It reportedly provides an employee identification badge reader, an optical card scanner, 32-col. LCD and 16-key data input touch pad.

SDT is built around a Rockwell International Corp. 6502A microprocessor with 4K bytes each of random-access memory and erasable, programmable read-only memory. Up to 64 user-defined prompts and 30 transactions for later communications to the computer may be stored, according to the vendor.

TDC Perform is said to offer communications polling, file editing, reporting and forms design.

Designed to run on IBM Personal Computer XTs and ATs operating under Microsoft Corp.'s MS-DOS, TDC Perform lets users define up to 32 relational data bases with up to 32 different forms within each data base.

SDT costs $1,995. TDC Perform sells for $8,295, with individual modules priced separately.

True Data, 17092 Pullman St., Irvine, Calif. 92714.

MICRO TECHNOLOGY, INC.
Booth 2944

Micro Technology, Inc. will show Digital Equipment Corp.-compatible disk controllers and subsystems, including the Microsafe streaming-tape cartridge upgrade kit and the MD4000 series of subsystems.

Microsafe addresses the backup deficiencies in DEC's MicroPDP-11, MicroPDP-11/73 and Microvax by replacing those systems' dual floppy drives with a half-height streaming-tape cartridge drive and half-height floppy drive, according to the vendor.

The MD4260 is a 40M-byte Winchester subsystem that includes a

NOW THERE'S A NEW 1200 BPS
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For companies already populated by 300 and 1200 bps modems, the new generation of 2400 bps modems does not always offer welcome relief.

Unless those new modems are Rixon 1224s from CASE.

The new Rixon 1224 modem communicates equally well at 300, 1200 and 2400 bps.

To say the least.

The Rixon 1224 also boasts full autodial capabilities, complete with a speaker and front panel volume control. It even allows switching between DDD and private lines.

It features 11 indicators, 9 switches and synch selection, all conveniently located right on the front panel.

It expresses a CASE design so advanced and compact that you can fit

USA CASE RIXON Communications, Inc., Columbia, MD, Telephone: (301) 381-2300, TLX: 89-6847
UK & Europe World Headquarters: CASE, England, Telephone: 0923-33500, TLX: 923325

Systems & Peripherals at NCC

60M-byte tape for backup and the firm's Mavo5 ¼-in. streaming tape cartridge controller with QIC-02 interface.

A combination 40M-byte fixed and 10M-byte removable Winchester drive, the MD4110 emulates four RL02 drives, thereby providing 41.6M bytes of storage, the vendor said.

The MD4910 integrates two 10M-byte Winchester drives.

OEM quantity prices are $2,450 for Microsafe, $4,626 for the MD4260, $4,100 for the MD4110 and $3,365 for the MD4910, according to the vendor.

Micro Technology, 1620 Miraloma Ave., Placentia, Calif. 92670.

APPLIED INFORMATION MEMORIES
Booths 2795, 2796

Demonstrations of the Dart-130, Dart-250 and Dart-170 5¼-in. disk drives will highlight Applied Information Memories' exhibit.

The Dart-130 is said to provide 129.27M bytes of storage capacity, 18-msec average positioning time and a 9.68M bit/sec. data transfer rate.

A 250.4M-byte device, the Dart-250 reportedly offers 18-msec average positioning time and a data transfer rate of 14.5M bit/sec.

The Dart-170 is a 166M-byte disk drive that provides 18-msec average positioning time. Data transfer occurs at 9.68M bit/sec.

Applied Information Memories, 776 Sycamore Drive, Milpitas, Calif. 95035.

OPTOTECH, INC.
Booth 2924

Optotech, Inc. will show its Model 5984 optical disk drive, a 5¼-in. write-once-read-mostly storage system for personal and small business computers and workstations.

Double-sided, 400M-byte removable cartridges offer more than 200M bytes of on-line storage, the vendor said.

Other features include pregrooved media, a pointer field that links previously stored information with new data, direct-read-during-write techniques for verifying data and read/write and tracking servo systems.

Error rate is said to be better than 1 in 10 to the 13th power; mean time between failure is 20,000 hours.

Optotech, Suite 109, 770 Wooten Road, Colorado Springs, Colo. 80915.

ANRITSUI AMERICA, INC.
Booth 2742

Tape drives and subsystems for backing up hard disks will be on display at Anritsu America, Inc.'s exhibit.

Product features include power-on diagnostics, automatic tape loading and threading, Ansi/IBM compatibility, rack mounting and cache memory. The DMT 730 series consists of ¼-in. cartridge tape drives in streaming or start/stop models that retrofit to identical ½-in. drives without modifying existing tape handlers, the vendor said.

The DMT 2500 series includes ½-in. streaming drives that reportedly offer up to 138M bytes of storage at 3.2K bit/in. and 64K bytes of cache memory.

For mainframes, the DMR 3000 series provides ½-in. start/stop drives that accommodate up to 10½-in.reels.

Anritsui America, 128 Bauer Drive, Oakland, N.J. 04736.

CHINON AMERICA, INC.
Booths 1944, 1946

Chinon America, Inc.'s Information Equipment division will showcase matrix line printers and multicolor thermal printers.

The 80-col. Model 101 24-pin dot matrix line printer reportedly offers letter-quality speeds of 25 line/min, with draft-quality speeds measuring 75 line/min. The diameter of each dot is .02mm.

The Model 108 is an 80-col. serial matrix thermal transfer device that can print bidirectionally in up to four colors, the firm said.

Draft mode speed prints 105 char./sec.; near-letter-quality mode prints at 45 char./sec.; and true letter-quality mode runs at 35 char./sec. This printer also uses 24 pins and a dot diameter of .02mm, according to the vendor.

Chinon will also show 5¼-in. and 3½-in. single- and double-sided floppies.

Chinon America, Suite 350, 11340 W. Olympic Blvd., Los Angeles, Calif. 90064.

DENNISON KYBE CORP.
Booth 5363

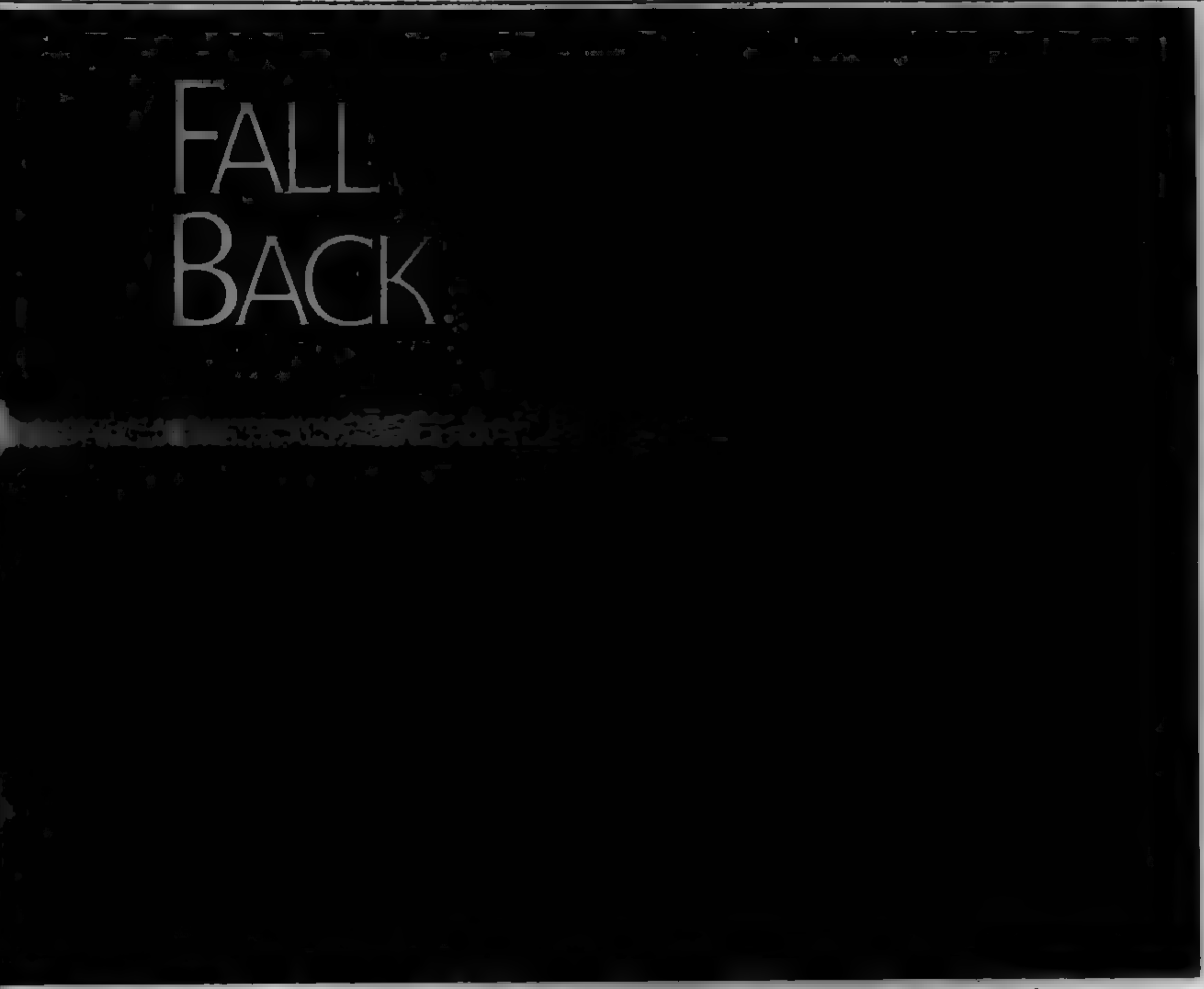
Dennison Kybe Corp. will showcase the Series 6000 system for maintaining and evaluating computer tapes used on 800-, 1,600- and 6.25K-bit/in. drives.

The tape maintenance system is said to provide dual RS-232C ports for communication with CRTs, printers and computers.

It can also reportedly rewind a 2,400-ft reel of tape in less than two minutes.

Prices range from $9,995 to $16,995, depending on configuration, the vendor said.

Dennison Kybe, P.O. Box 472, 132 Calvary St., Waltham, Mass. 02254.



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NCC Preview

Power systems at NCC

SOLA ELECTRIC CO.
Booths 6077, 6177, 6178, 6179

Sola Electric Co., a unit of General Signal Corp., will display a 1200VA standby power source (SPS), a power line monitor with printer and a 3-kVA uninterruptible power supply (UPS).

The SPS switches from line to battery/inverter power within four to 10 msec when line voltage drops below -15% of nominal, the vendor said. When ac voltage returns to within 10% of nominal, retransfer reportedly occurs within two to four msec.

The power line monitor is said to enable continuous, unattended analysis of power line quality and provide user-adjustable disturbance thresholds plus printouts of date, time and value of disturbances.

The 3-kVA UPS includes on-line battery reserve to supply the load with uninterrupted power automatically.

The 120V, 60Hz SPS costs $1,245; the 220/240V, 50Hz model sells for $1,340. The power monitor is priced at $1,595. Prices for the 3-kVA UPS with one battery pack start at $7,500.

Sola Electric, 1717 Busse Road, Elk Grove Village, Ill. 60007.

INSTRUMENTATION AND CONTROL SYSTEMS, INC.
Booth 6444

Instrumentation and Control Systems, Inc. will present uninterruptible power supplies (UPS) for large systems and microcomputers.

The ICS Electro-Pac Model E UPS reportedly provides stable output, high overload capabilities and a range of alarms. If a total loss of incoming power occurs, the system transfers to the battery backup.

The Lifeline UPS for microcomputers is said to provide voltage regulation and line filtering at all times plus an inverter that supplies power only during power outages.

Prices for the ICS Electro-Pac Model E UPS range from $7,000 to $23,000. The Lifeline UPS runs from $1,040 to $2,300.

Instrumentation and Control Systems, 520 Interstate Road, Addison, Ill. 60101.

IMUNELEC, INC.
Booth 3045

Imunelec, Inc. will exhibit its Star Series 01 uninterruptible power supplies (UPS) that reportedly protect microcomputers against blackouts, brownouts, surges, noise and other power line disturbances.

The UPS units feature an audible alarm, automatic temperature- and battery-protection circuits and a sealed battery.

The 250VA UPS sells for $1,360; the 500VA unit costs $1,595; and the 1,000VA UPS is priced at $2,180.

Imunelec, 517 G Acorn St., Deer Park, N.Y. 11729.

SOLIDSTATE CONTROLS, INC.
Booth 2336

Solidstate Controls, Inc. will exhibit uninterruptible power supplies (UPS) for DP applications.

The Powerbase 1000 UPS series models are said to provide automatic power protection against blackouts, and brownouts, among other things.

It costs $2,500 for the 750VA model, $5,100 for the 1.5-kVA model and $6,200 for the 3-kVA model.

Solidstate Controls, P.O. Box 1216, Columbus, Ohio 43216.

ACRAN, INC.
Booths 4410, 4412

Acran, Inc. will display a relocatable uninterruptible computer power backup system.

Called a Critical Power Module (CPM), the system reportedly includes an insulated enclosure, an uninterruptible power supply (UPS), battery, switch gear and air-conditioning, heat, acid neutralization pits, eyewash, drench shower, dielectric flooring, halon fire suppression and internal and external lighting.

The cost of engineering a UPS installation by a consulting engineer runs is said to be approximately $25,000.

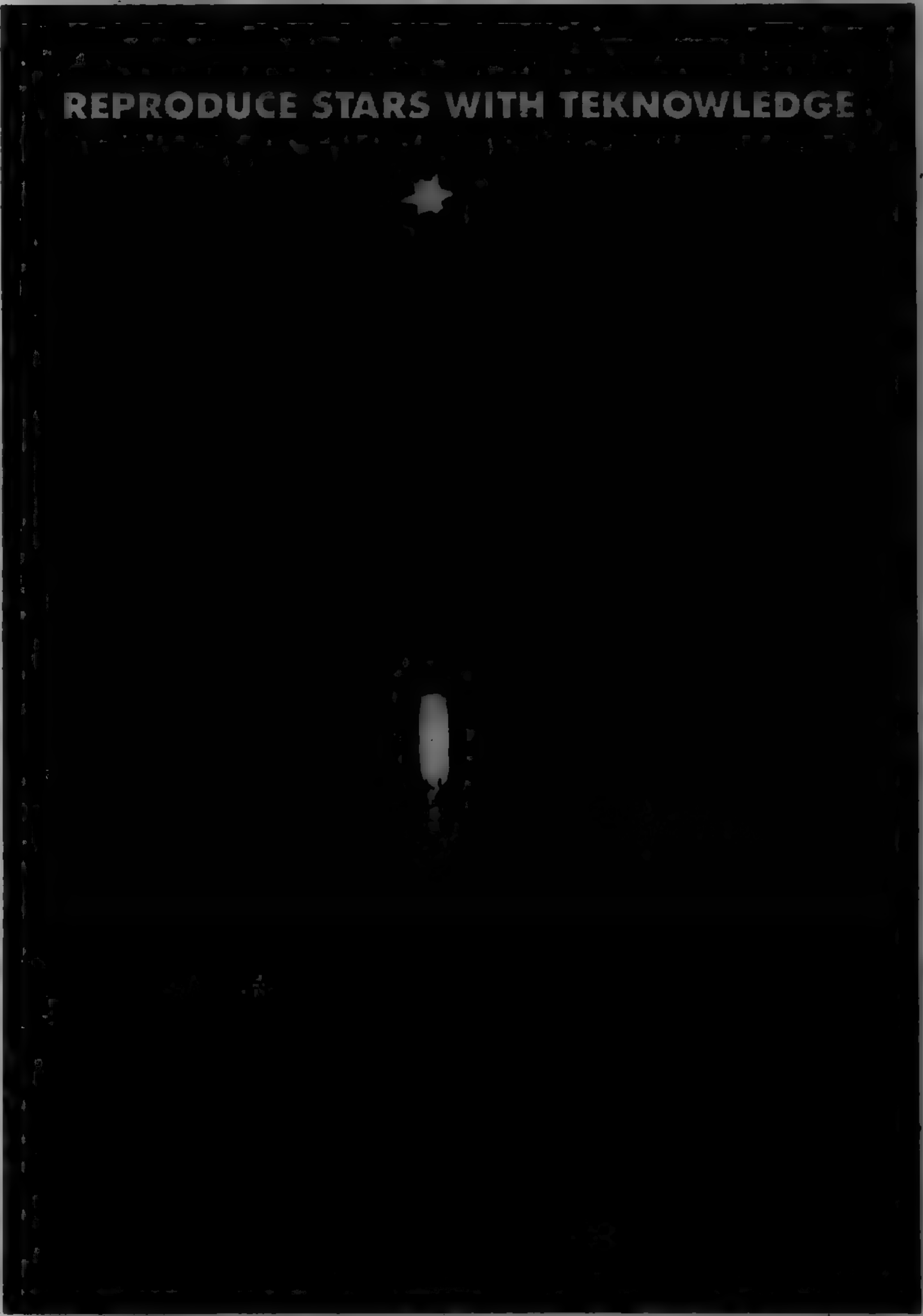
Acran, P.O. Box 18328, Austin, Texas 78760.

TRIAD POWER SYSTEMS
Booth 2514

Triad Power Systems will show its TRI-UPS 300+600 uninterruptible power supply (UPS) for the IBM Personal Computer, Personal Computer XT and compatible micro-based systems.

The TRI-UPS is said to provide uninterruptible power, conditioned power, power distribution, and requires no transfer time when commercial ac power fails. It costs $995.

Triad Power Systems, 10362 Miller Road, Dallas, Texas 75238.



NCC Preview

Other things to see at NCC

MICRO SECURITY SYSTEMS, INC.
Booth 2810

Micro Security Systems, Inc. will present a software security device that runs on IBM Personal Computer and compatible processors.

Called Securikey, the device has a key that is said to interface with the computer's microprocessor. This allows a vendor to place a serial number in his software that the computer compares to the key's serial number.

Securikey costs $100.

Micro Security Systems, 3706 W. 2100 South, Salt Lake City, Utah 84120.

ALPHA AUDIO ACOUSTICS
Booth 5079

Alpha Audio Acoustics will exhibit Soundtex, an acoustical fabric wall treatment said to filter noise in the computerized office.

Soundtex costs $25 a linear yard. A 54-in. by 35-yard piece sells for $729.

Alpha Audio Acoustics, 2049 W. Broad Street, Richmond, Va. 23220.

ADE, INC.
Booths 1942, 1943

ADE, Inc. will display its Caddy-Pack C-D Transporter, a static-free electronic component protection system said to provide EMI/RFI attenuation.

A two-part protective system, the Caddy-Pack C-D consists of a component-holding transporter and a mated shipping sleeve.

ADE, 1560 E. 96th St., Chicago, Ill. 60628.

DATAPRO RESEARCH CORP.
Booth 5068

Datapro Research Corp. will show an information service that is said to help businesses cut down on data loss from computer downtime.

Called "Datapro Reports on Information Security," the two-volume publication contains management reports, evaluations of security hardware and software plus reports on the latest standards, policies and regulations adopted by the U.S. Department of Defense.

Subscriptions cost $455. Presubscription is $395.

Datapro Research, 1221 Avenue of the Americas, New York, N.Y. 10020.

ROYAL SEATING CORP.
Booth 2145

Royal Seating Corp. will display computer accessories including a mobile data rack, printer-paper basket, paper caddy and furniture for the IBM Personal Computer and PCjr.

The Model 0840 adjustable mobile data rack is said to accommodate 9½- by 11-in. or standard 14⅞-in.-wide hanging data binders.

The Model 0890 H&M Gravity Master Universal Basket reportedly allows smooth flow and refold of printed forms for all types of printers and can accommodate up to 25 lb of large standard forms.

The Model 0865 H&M Forms Flow Paper Caddy provides a cantilevered slant of the retrieval basket that forces printed forms to force fold automatically on impact.

The Model 5800 series computer furniture for IBM Personal Computers includes data drawers, data boards and facility compartments.

The 0840 data rack costs $71; the 0890 basket sells for $32.60; the 0865 paper caddy is priced at $68.80; and starting prices for 5800 series furniture start at $346.40.

Royal Seating, P.O. Box 753, Cameron, Texas 76520.

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COMMUNICATIONS

AT&T: Waking up to market but still not awake

DATA STREAM
Paul Korzeniowski
CW Senior Writer

AT&T executives have been reading the newspaper. For almost a year, stories concerning the communications company's haphazard transition from regulated monopoly to nonregulated competitor in the computer field have appeared in numerous publications.

These publicized problems have changed the AT&T brass' thinking, as was evident when the company released products at a press conference held last month. When AT&T first entered the computer field, it boldly talked about taking on IBM. Talk has now shifted to coexistence with IBM and even acknowledgment of the stranglehold that IBM has on many market segments.

IBM's strong grip has left few markets open for AT&T. The communications giant has been forced to recognize that only the regional operating companies were interested in its hardware. It has acknowledged that sales to other market segments have to be made for it to become a major player in the computer market. By year's end, AT&T expects that one-third of its sales will come from other markets. New sales will hopefully be secured from two areas: niche markets and departmental processors.

In its latest product announcement, AT&T emphasized vertical market software and vertical marketing. Marketing does not sell systems. Software does, but there is still very little vertical market software that runs on the 3B line. Also, AT&T had already introduced some packages that it included in its recent announcement.

Another problem stems from the fact that the departmental computing market is quickly becoming saturated. Recent woes at Wang Laboratories, Inc. and Data General Corp. mirror problems many firms are having in this arena.

The communications links to the IBM world AT&T announced will help it compete in this market. However, the communications company is still a few steps behind its chief competitors. Companies such as Digital Equipment Corp., DG and Wang have more extensive gateways into IBM systems than AT&T does. AT&T said it intended to supply links to IBM's Document Content Architecture, Document Interchange Architecture and LU6.2 in the next 12 months. Whether it can deliver on that intention remains to be seen.

Since these firms are a few steps ahead of AT&T, gossip has centered on an AT&T buy-out of one of these companies, specifically Wang. AT&T has denied interest in a deal. In many respects, the deal might not make sense.

See AT&T page 46

WIRE TAP/DANIEL MINOLI

The path to good network design

To implement a trouble-free network smoothly, it helps to ask and answer key questions beforehand. Presented here is a set of design factors whose consideration will facilitate network implementation.

These principles can be used whether one is adding a network component such as a centralized diagnostic system, expanding a network into a new geographic area or replacing a network with a new, more sophisticated network.

The word component is used to encompass anything from a modem or multiplexer to a major packet-switched network.

- *Reliability*. What is the reliability of the new component measured in terms of mean time between failures and in mean time to repair? How will this additional component affect networkwide reliability?
- *Availability*. What availability, measured in terms of uptime, can be expected of the new component and its systemwide effect?
- *Restorability*. How easy will it be to restore the network before and after the new addition?
- *Fault tolerancy*. Is the component fault tolerant? Does it compromise existing fault tolerancy?
- *Security*. Is the new component secure under all pertinent measures? How does it mesh with existing security measures?
- *Grade of service*. Is the grade of service of the existing network — in terms of things such as delay, blocking noise and so on — compromised by the new addition? What performance targets are being sought?
- *Operability*. How does the new component fit in with existing operation issues? Must new procedures be instituted?
- *Business risk while in transition*. Does the

See NET page 46

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

HP offers SNA analysis software

PALO ALTO, Calif. — Hewlett-Packard Co. has announced IBM Systems Network Architecture (SNA) analysis software for the portable HP 4951A and the high-performance HP 4953 protocol analyzers. The packages are the HP 18186A and the HP 18153A.

The analysis packages are said to eliminate the need to hand-decode the bit-packed fields presented by analyzers equipped with lower level Synchronous Data Link Control (SDLC) formats. Using the SNA analysis software, HP protocol analyzers extract the upper level information field by field from SDLC I frames and display it in SNA terms, the company reported.

The HP 18186A/4951 is a portable SNA testing tool that is said to provide information needed to locate problems, particularly between cluster controllers and the SNA network where FID Type 2 communications are used. The software displays the transmission header, the request/response unit and the function-management header in high-level mnemonics.

Other SNA communications using FID 0, 1, 3, 4 and F transmissions are partially decoded for analysis by the HP 18186A and may be stored for more complete analysis by its sister product, the HP 18153A/4953, the vendor said.

The HP 18153A SNA analysis application for the HP 4953A protocol analyzer allows the user to monitor, capture and analyze data traffic anywhere on the SNA network, including host-to-host communications.

The testing tools can be employed anywhere SNA data flows over an SDLC link that uses any HP physical interfaces, including RS-232C, CCITT V.35 and RS-449.

The HP 18186A is priced at $600, and the HP 18153A is priced at $750.

HP is located at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Data Switch offers matrix switch

Product allows isolation of faulty components

NORWALK, Conn. — Data Switch Corp. has announced the Model 2810 integrated digital matrix switching and analog access and sparing system, said to allow isolation of faulty components and lines.

The product reportedly can operate as a standalone switch for small central sites or can be located at a remote site in conjunction with the company's XY-Max Model 2840 switch. According to a spokesman, the Model 2810 handles any combination of up to 64 RS-232/CCITT V.24 lines, up to 14 CCITT V.35 lines and up to 64 two- or four-wire telephone lines.

Analog upgrades of up to 128 lines are available.

The Model 2810 is controlled either by a local CRT terminal or through Data Switch's Configuration Management System (CMS) control console, the vendor said.

As many as 16 Model 2810s located anywhere in a network can be centrally controlled through CMS, the company reported. CMS stores up to 1,000 network configurations predetermined by the user.

CMS is also said to enable time- and event-sensitive switching.

Time-sensitive switching allows users to instruct the switch to reconfigure equipment and line interconnections automatically at a certain time and date and to smooth traffic loads at peak hours. Event-sensitive switching causes the switch to reconfigure when it senses a failed line or component, the vendor said.

The Model 2810 also support IBM diagnostic modems.

Data Switch said that the basic price for a Model 2810 that supports 64 digital lines and 64 analog lines is $49,100. The digital-only model costs $24,300, and the analog-only model that supports 64 telephone lines costs $28,900. The product is scheduled for August availability, according to the vendor.

For additional information, Data Switch is located at 444 Westport Ave., Norwalk, Conn. 06851.

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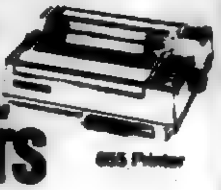

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WESTWOOD COMPUTER CORPORATION

COMMUNICATIONS

NET from page 45

transition put the company at risk? How long is the transition? For a modem, it could involve a few hours of downtime; for a new network, it could take months or years to implement. Is there a good transition plan?

- *Business risk*. Is the new component likely to be a risk because it uses totally new technology, existing technology but new products or a new company?
- *Network control*. Is the new component amenable to rational network control? Does it add to or detract from network control?
- *Cost-effectiveness*. Is the new component cost-effective? Have several vendors been contacted? Is there a more cost-effective way to approach the problem?
- *Stability*. What is the technological stability of the product? Does the component affect the viability of the existing network?
- *Interoperability*. How well does the new product integrate with the existing network at the technical, management and vendor level? Does it create compatibility problems?
- *Growth*. How does the new component affect the growth capability of the system? Does the new product peak out at some level — ports, memory, addresses, throughout — beyond which it is not possible to expand?
- *Capitalization*. What is the cost of the component? Should one lease or buy?
- *Vendor parity*. Does the new component imply an increase in the total number of vendors that serve the communications network? Does the component have to be embedded within the domain of another vendor's equipment?
- *Accountability*. Are the accountability issues, such as cost assignment, management and maintenance responsibilities and security, clearly defined for the new component?
- *Measurability and reporting*. Can the added component be measured by way of various norms to ensure things such as proper grade of service or response time? Are MIS reports available, where applicable, for the new component?
- *Competitive edge*. Given the additional effort and cost to install the new component, does it now make the network better? Does it give the organization a business edge over its competitors?

AT&T from page 46

AT&T has a product line comparable to Wang's line. Why purchase Wang's VS line when the 3B line is already positioned against it? Integrating the two lines would be a difficult task.

Perhaps AT&T should be more interested in Sperry Corp. AT&T has expanded its product line from microcomputers to superminis. Yet, a glaring hole exists at its high end where IBM reigns supreme. Analysts have predicted that Amdahl Corp. products will fill that hole. The two companies have a close relationship. A closer relationship would make economic sense.

A year ago, a wide-eyed AT&T entered a new market. A disappointing year has changed the company. It now understands the challenges it faces. For better or worse, IBM owns great chunks of the computer market.

IBM's moves to acquire Rolm Corp. and invest in MCI Communications Corp. have demonstrated that Big Blue is ready, willing and able to move swiftly into AT&T's turf. Before AT&T can talk about challenging IBM, it has to demonstrate the same type of management mettle.

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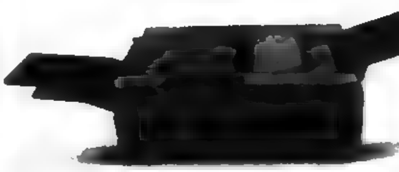

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Telecopier 295

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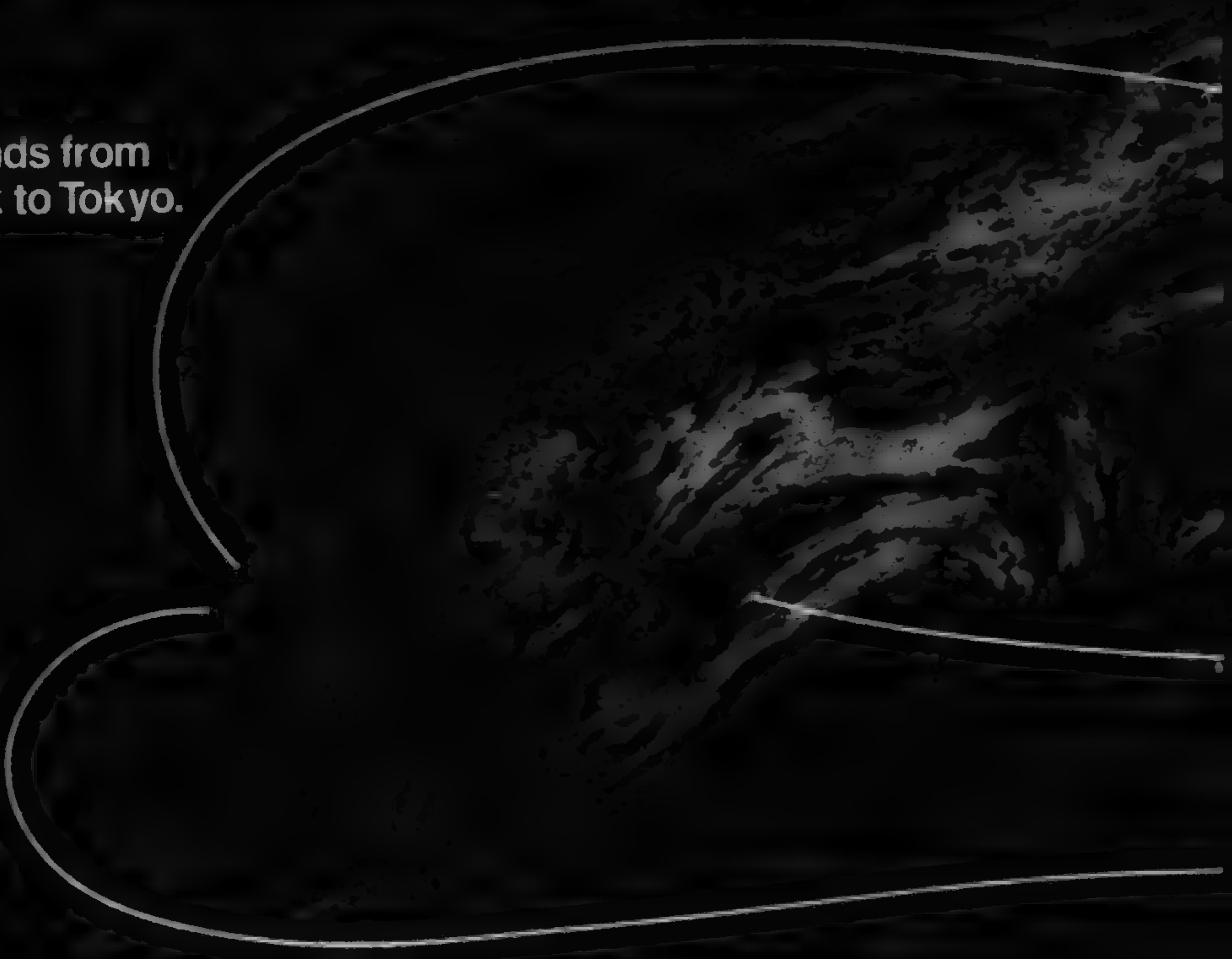

keystrokes. It stores documents electronically, can forward messages automatically, and acts as an electronic mail terminal. Remote users can even call a FaxMaster hub and retrieve documents stored in their mailboxes. And it keeps a meticulous accounting of every activity, delivery, and pickup, worldwide.

FaxMaster automatically dials the numbers. If it reaches a busy signal, it will continue down the distribution list, then redial until it gets through. It can even transmit to multiple locations at night or on the weekend when phone rates are lowest.

With the G1/G2 analog compatibility option, the Xerox Telecopier 495-I can communicate with slower speed facsimile terminals. The RS-232-C option lets it convert and print ASCII encoded information from many other computers.

Xerox also offers a desktop digital facsimile terminal, the Xerox Telecopier 295. It's easy to operate, and will transmit your entire message in 25 seconds or less.

Both the 495-I and 295 are compatible with other makes of facsimile terminals, and workstations that are part of Team Xerox.

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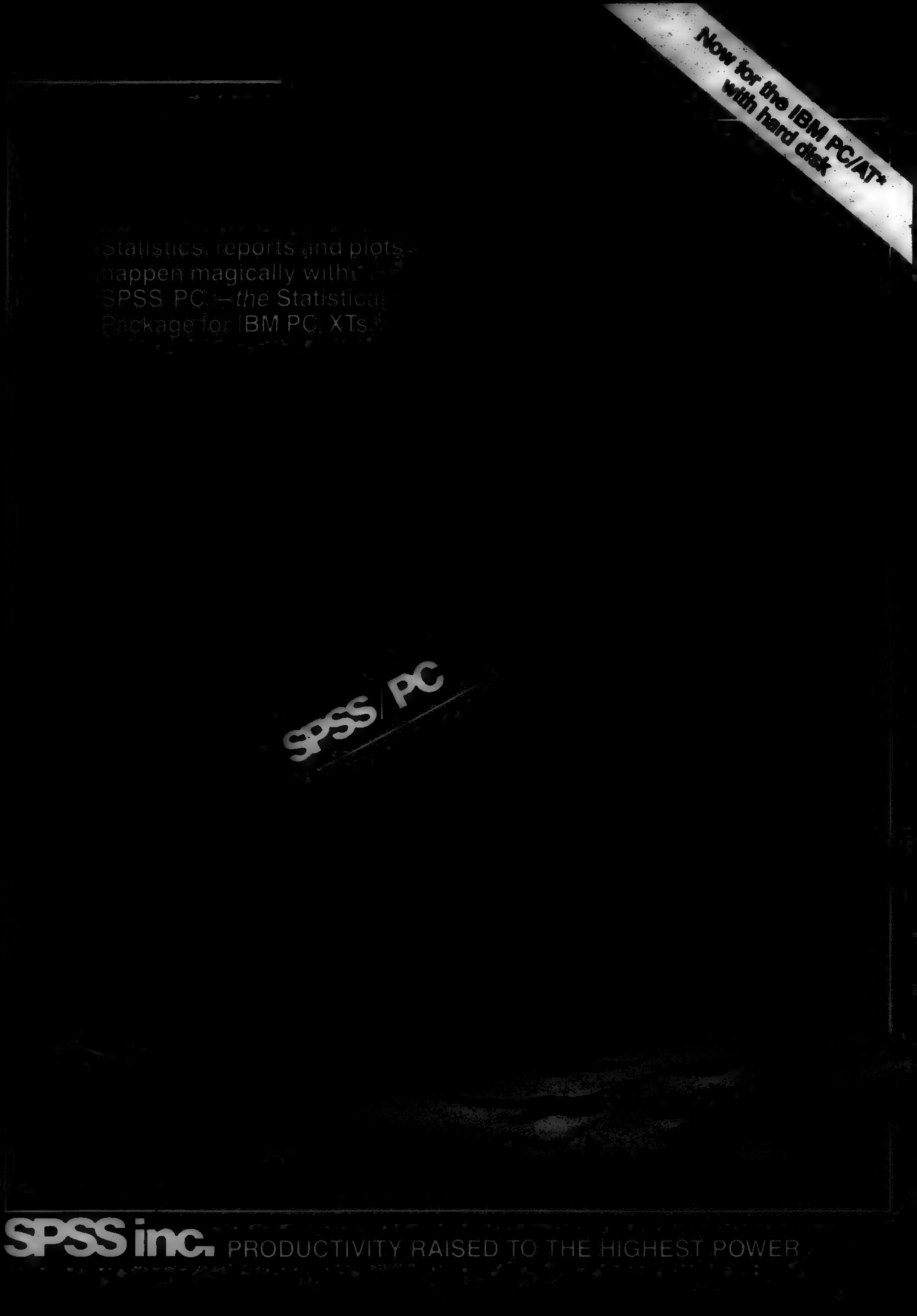

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SYSTEMS & PERIPHERALS

Cray slices $1 million off solid-state storage tag

By Donna Raimondi
CW Staff

MINNEAPOLIS — Cray Research, Inc. has slashed $1 million off the price of its top-of-the-line Solid-State Storage Device (SSD) and unveiled a $3 million model of the SSD.

In addition to announcing the middle-of-the-line SSD, which is said to offer 512M bytes of random-access memory, the company also increased the performance and dropped the prices of two other models in the SSD product line.

The SSD products are high-speed storage devices designed to complement the Cray X-MP supercomputer's multiprocessor architecture, a spokesman said. The devices can be used for temporary storage of system programs.

The SSD units are said to be field upgradable from the smallest to the largest sizes. The newly announced version is software compatible with earlier models, the company said.

The top-of-the-line 1.024G-byte model introduced in 1984 and originally priced at $5 million has been reduced to $4 million. A 256M-byte model introduced in 1982 and previously priced at $3.28 million is now available for $2 million, a spokesman said.

Improvements and price cuts on the SSD line are primarily a result of the incorporation of higher density MOS technology, a spokesman said. The primary enhancement is an increase in the memory bandwidth. The SSD's maximum burst transfer rate is now 27G bit/sec.

More information is available from Cray Research, 608 Second Ave. S., Minneapolis, Minn. 55402.

DG minis get controllers

MOUNTAIN VIEW, Calif. — Spectra Logic Corp. has released disk and tape controllers for Data General Corp.'s Eclipse and Nova minicomputer systems. The four controllers are said to allow the integration of any storage module drive (SMD)-compatible device.

The controllers support 2.5M byte/sec. data transfer rates. Standard emulation of more than 150 different DG disk drive subsystem configurations is said to be supported. Optional software support is included for DG's AOS and AOS/VS operating systems for those exceptions when a disk drive cannot be mapped for maximum capacity.

Because of the emulation capability of the controllers, disk drives such as those offered by Ampex Corp.; Control Data Corp.; Fujitsu America, Inc.; Century Data Systems, Inc.; and NEC Information Systems, Inc. can be configured to use the maximum formatted disk capacity possible, while operating at the 2.5M byte/sec. transfer rates, the vendor said.

The 27-Plus, which interfaces with the burst multiplexer channel or the data channel, costs $5,300. The 120-Plus, which connects to the data channel, costs $4,500. The 17-Plus interfaces with the burst multiplexer channel and is also priced at $4,500, and the 210-Plus for the data channel bus costs $3,700.

More information can be obtained from Spectra Logic, 297 N. Bernardo Ave., Mountain View, Calif. 94043.

Xerox offers automated mail system

PASADENA, Calif. — Xerox Corp. has announced a model of its Xerox Message Processor system that can print, collate and distribute narrative messages automatically with or without operator intervention. The system is for use in large telecommunications centers handling time-sensitive messages. It interfaces with Data General Corp. Eclipse minicomputers, the vendor said.

The Xerox Message Processor 500 (XMP 500) is said to be based on the company's 10 series copier/duplicators. The system is the first 10 series system to use a laser printer, the vendor said. The unit has an average printing rate of 70 page/min and features optional two-sided printing and automated stapling. It reportedly can deliver messages to as many as 300 different message addresses. Additional printers and sorters can be included as message processing requirements grow.

The XMP 500 prioritizes incoming messages for printing and prints those with higher precedence first, the vendor said. Once printed, messages are automatically deposited into their respective message bins.

The unit includes the central communications processing controller, a Winchester disk storage subsystem, electronic laser printers for message output, sorter bins for message routing and a communications interface.

Depending upon the mainframe computer used in the telecommunications center and the system configuration ordered, an average XMP 500 will cost from $650,000 to $750,000, and deliveries will begin in the third quarter of 1985.

More information is available from Xerox, Xerox Centre, 101 Continental Blvd., El Segundo, Calif. 90245.

- DEC announced ruggedized versions of its microcomputers and terminals/52
- Lundy Electronics unveiled three graphics workstations/53
- Chromatics introduced a color graphics display for use with DEC VAX series superminicomputers/54
- EMC is offering 4M- and 8M-byte memory cards for DEC VAX-11/785 CPUs/54

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AT&T marketing strategy: A failure to communicate?

HARD TALK
Tom Henkel
CW Senior Editor

For a company that many speculate had the strongest chance of giving IBM a run for its money in the computer business, AT&T seems to be a slow learner when it comes to meeting IBM on its strongest turf, the marketing game.

AT&T has just bungled another product announcement with an overhelping of confusion and uninformed company representatives. As with previous announcements, it is still difficult to get information out of AT&T because the people appointed to answer questions about new products don't seem to understand them fully. Many basic questions have to be relayed to a hierarchy of people within AT&T.

AT&T's inability to pull off a press conference is, by no means, a fatal flaw. But it does seem to be part of an underlying issue: On the surface, AT&T says it is ready to do business in the highly competitive systems marketplace, but there seem to be remnants of the sluggish, bureaucratic and monopolistic Ma Bell that appear to be hampering AT&T's effectiveness in a very intense business.

The company's June 24 announcement of more than 30 products stood in stark contrast to a similarly large announcement by IBM a week earlier [CW, June 24]. IBM made its announcement armed with an impressive package of product literature that, if one took the time to read through 237 pages of specifications, completely described what IBM had announced.

AT&T released a mishmash of specifications, many of which had no apparent relevance to the announced products. Furthermore, much of the information that AT&T released was incomplete.

Models were mentioned, but no attempt was made to indicate what was included with these models or how they differed. AT&T said it improved the performance on its 3B5 product line but could not explain how it accomplished this feat or by how much performance was increased. It said prices on the 3B2/300 were cut by 20% but could not say what the old prices were. The list goes on.

AT&T was clearly unprepared for its latest announcement. In a marketplace where a company's success is becoming increasingly dependent on its sales and marketing prowess, AT&T seems to send its new products off on the wrong foot.

It has been a little more than a year since AT&T formally jumped into the commercial systems marketplace. While the firm seems to have done all right in selling other products to end users, it has made little headway in competing with entrenched vendors in the systems marketplace. For example, it has sold a handful of its high-end 3B20 machines to a tiny group of users and has only had marginal success in selling its smaller systems.

The unfortunate thing is AT&T may actually have some decent products to sell. But who knows? The company does not seem able to explain its current product lineup adequately, nor does it appear to have the foggiest idea of where it is going in the future. What is worse, the firm seems arrogantly unwilling to make changes to its current marketing approach.

AT&T will never be able to match the master of marketing, IBM, as long as it continues with its current haphazard techniques. There are too many good products and good marketing and sales people in the business today for AT&T simply to sit back and wait for users to line up at its door begging for information about the AT&T product line.

SYSTEMS & PERIPHERALS

TURNKEY SYSTEMS

■ Vector Automation has announced an addition to its Cadmax family of computer-aided design and manufacturing systems.

The Cadmax-IIB includes dual microprocessors with 1M byte of memory each, a 31M-byte disk drive and a 2.5M-byte floppy disk subsystem. The system features a 4096- by 4096-pixel resolution display and two-dimensional design and drafting software.

The Cadmax-IIB costs $46,000.

Vector Automation, Village of Cross Keys, Baltimore, Md. 21210.

PRINTERS/PLOTTERS

■ General Business Technology has announced two line printers for the IBM System/34, 36 and 38 processors.

The printers are said to feature operator-changeable bands of 48-, 64- and 96-character sets. The 3310LP prints at 450 line/min using the 48-character band set, 375 line/min using the 64-character set and 280 line/min using the 96-character band set. The 3320LP doubles the print speed of the 3310.

The 3310LP printer costs $8,800, and the 3320LP costs $12,500.

General Business Technology, 1891 McGraw Ave., Irvine, Calif. 92714.

■ Interface Systems, Inc. has released an IBM 3270-compatible printer that is said to support IBM programmed symbols and APL/Text and connect to an IBM Personal Computer.

The ISI 468 can print seven colors and also provide compatibility with the IBM 3287 and 3287-2C four-color printers. It can be directly plugged into any IBM 3274 control unit, 3276 control unit display station or 4300 CPU, the vendor said. Users are not required to have color software or color displays to print in color; through data input procedures, users of monochrome displays can print with ISI 468's color character printing.

The standard 468 costs $4,950, and a 468 II model, which corresponds to the IBM 3268-2C and 3287-2C, costs $6,450.

Interface Systems, 5855 Interface Drive, Ann Arbor, Mich. 48103.

■ Infoscribe, Inc. has released its Model 800 professional demand document printer for printing multipart, preprinted forms on microcomputers.

The dot matrix Model 800 prints to within 1/20th of the tear-off bar, which is said to allow immediate tear-off of the document so the next one can be printed on. It prints at 200 char./sec. for draft quality, 100 char./sec. for correspondence and 40 char./sec. for near-letter quality and has graphics printing resolution of either 72 by 72 dot/in. or 144 by 144 dot/in. The model is said to print six-part carbon or carbonless paper forms, and it comes with either a serial or parallel port.

The unit costs $1,895 with discounts for volume purchases.

Infoscribe, 1808 Michael Faraday Court, Reston, Va. 22090.

GRAPHICS SYSTEMS

■ Infodetics has announced a graphics workstation for use with its Computer-Assisted Document Management and Control system.

The full graphics workstation features 512K bytes of memory; a 16-bit processor; scroll, pan, highlighting and zoom functions; and the ability to rotate three-dimensional models. An optional drawing change capability allows authorized users to make changes to display images, the vendor said.

The basic system includes the processor and 512K bytes of memory, an I/O controller and a 35.6M-byte Winchester disk drive. A 1M-byte floppy disk drive is optional.

Prices range from $44,000 to $59,000, depending upon configuration.

Infodetics, Suite 200, 1360 S. Anaheim Blvd., Anaheim, Calif. 92805.

■ Disc Instruments, a Honeywell, Inc. subsidiary, has announced its Dial Set multimodality manual graphics input device that allows users of large computer-aided design and manufacturing equipment with serial ports to vary all perimeters of a three-dimensional graphics drawing.

The device contains a digitized microprocessor-controlled terminal that can be used in conjunction with Disc's Series T500 three-axis trackball device, which provides systems with an X, Y and user-definable third axis for the rotation of 3-D figures as well as for zoom.

The Dial Set capability is available in blocks of four, eight, 12 and 16 dials. It uses either an RS-232C or standard transistor-transistor logic serial connection and has a transmission speed of 9.6K bit/sec. or an optional speed of 4.8K bit/sec.

The basic system — consisting of a microprocessor, an output interface, four dials and 250 lines of firmware code — costs $450 each in quantities of 100. Extra dial module sets cost $110/pair (two dials), in quantities of 100.

Disc Instruments, 102 E. Baker St., Costa Mesa, Calif. 92626.

■ Lundy Electronics & Systems, Inc. has announced a trio of graphics products, including a three-dimensional raster graphics workstation, a stand-alone graphics workstation and a Tektronix, Inc. 4027-type graphics terminal.

The Ultragraf III 3-D raster graphics workstation is said to feature local intelligence for rotation, scaling, translation and perspective functions. It displays up to 256 colors from a palette of 16.7 million colors and is said to permit multiwindow operation with single-pixel addressability. The workstation connects to Digital Equipment Corp.'s VAX-11 series machines, Prime Computer, Inc.'s 2250 minicomputer and Control Data Corp.'s Cyber 1810 computer.

The Lundy 2000 is a stand-alone

Continued on page 64

DEC micros ruggedized

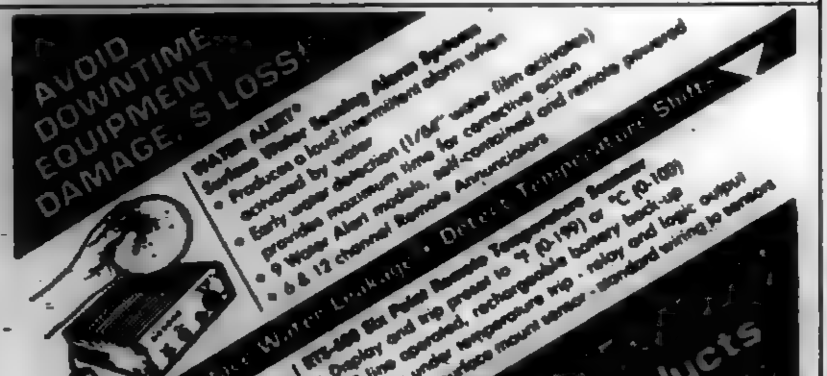
MAYNARD, Mass. — Digital Equipment Corp. introduced ruggedized versions of its microcomputer systems and terminals for use in industrial environments. The RT950 series includes factory-hardened versions of the MicroPDP-11, MicroPDP-11/73 and Microvax II computers in protected enclosures.

The companion RT200 video terminals are DEC's VT200 series terminals packaged inside air-vented enclosures.

The entry-level MicroPDP-11/23 system features 512K bytes of memory without storage peripherals and costs $9,975. Another MicroPDP-11/23 system includes the same memory and an 11M-byte hard disk and a dual 400K-byte floppy drive. It costs $14,250. A MicroPDP-11/73 model with 512K bytes of memory, a 31M-byte hard disk and dual 400K-byte floppy disk drive costs $18,250. The Microvax II-based system features 1M byte of memory, a 31M-byte hard disk and a dual 400K-byte floppy drive. It costs $19,975.

The terminals include the RT220 monochrome text terminal with a 12-in. screen that costs $2,995, the RT240 12-in. monochromatic terminal for $4,995 and the RT241 13-in. color terminal that costs $5,995.

DEC is located in Maynard, Mass. 01754.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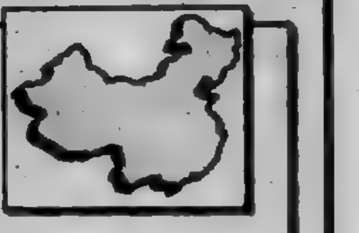

According to International Data Corporation, the world's leading information industry research firm, the Chinese computer market is growing at an annual rate of 30 percent. China is opening its market to foreign computer suppliers and annual DP expenditures are expected to reach the multi-billion dollar range by the end of the decade.

China Computerworld represents the first joint venture in the People's Republic of China between a foreign publishing company, CW Communications/Inc., and the government. *China Computerworld* is published twice a month and reports on computer hardware and software technologies. The total paid circulation is 65,000. Total readership is estimated at 2,000,000, with total distribution of 180,000 copies per issue.

China Computerworld, modeled after it sister publication in the U.S., *Computerworld*, is the best way for advertisers to reach top officials in foreign trade and financial departments responsible for purchasing China's computer and communications equipment.

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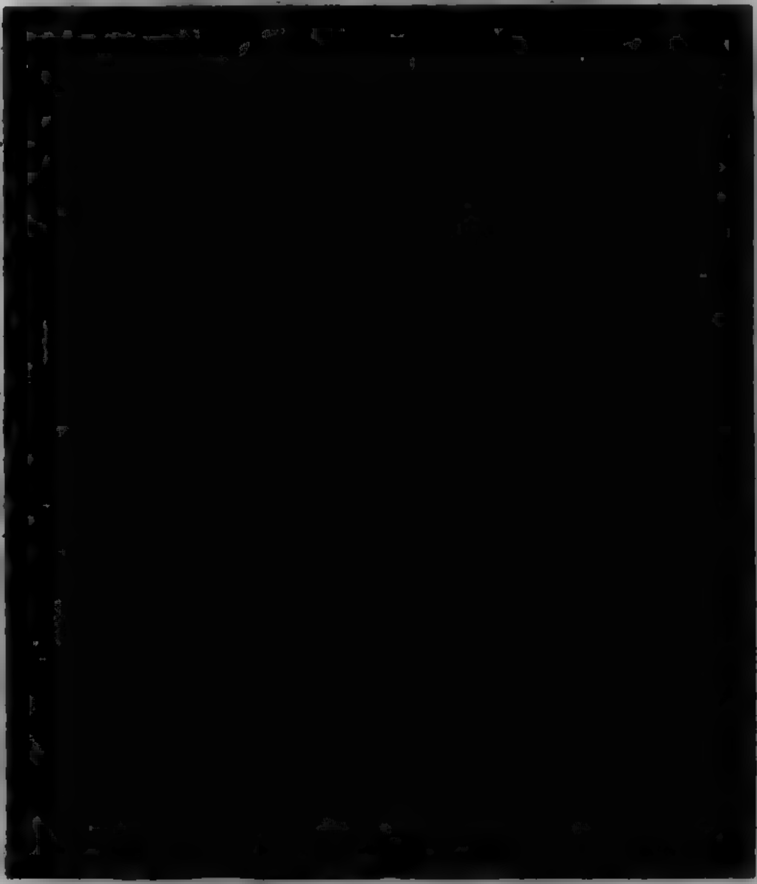

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SYSTEMS & PERIPHERALS

Continued from page 52

graphics workstation that runs under either or both Microsoft Corp.'s MS-DOS or Digital Research, Inc.'s CP/M operating systems. The system is said to emulate Tektronix, Inc.'s 4010 terminal so that the user can add color.

The GTC-327 graphics terminal is said to provide the capabilities of the Tektronix 4027 terminal. It is said to display 640- by 480-pixel resolution and eight simultaneous colors on a 14-in. monitor.

The Ultragraf III costs $45,995. The Lundy 2000 is priced at $21,900, and the GTC-327 costs $4,200.

Lundy Electronics & Systems, One Robert Lane, Glen Head, N.Y. 11545.

■ **Chromatics, Inc. has released a color graphics display system that supports Digital Equipment Corp. VAX machines under DEC's VMS operating systems and Sun Microsystems, Inc. workstations under AT&T's Unix.**

The CX 1536 Colorgraphic Display System was designed for command, control, communications and intelligence; artificial intelligence; simulation; and computer-aided design, manufacturing and engineering applications, the vendor said.

The system employs a two- and three-dimensional display list architecture.

The system has a 1,536- by 1,152-pixel, 60Hz noninterlaced color monitor and is programmed through a graphics kernel system package.

The basic system, which includes four single-buffered image planes, 512K bytes of display list memory, CX 1536-resident firmware including the GKS emulator and a DEC VT100 terminal emulator, costs $34,995.

Chromatics, 2558 Mountain Industrial Blvd., Tucker, Ga. 30084.

POWER SUPPLIES

■ **Dynatech Computer Power, Inc. has released a version of its Powerhouse uninterruptible power supply that will accommodate up to 300W of power and is said to provide protection for business and industrial applications such as microcomputers, computer peripherals and video products.**

The Powerhouse 300 provides surge and outage protection and has a typical transfer rate of 1 to 4 msecs, transient-free switching and five to 15 minutes of uninterrupted power, the vendor said.

The Powerhouse 300 costs $595.

Dynatech Computer Power, 4865 Scotts Valley Drive, Scotts Valley, Calif. 95066.

■ **Bipac Power Systems has released its EDS200-1 switching power supply for hard disk-based systems and peripheral memory storage devices that would be connected to a mini-based system.**

The EDS200-1 is a four-output supply with a main output of 5V, 15A with a 20A peak. The unit has second and third outputs of 12V to 15V with 2A of current on both outputs.

The fourth output is 24V, 2A with a 4A peak, the vendor said. The unit is said to have a minimum holdup time of 40 msec at nominal input voltage and maximum output power.

The units cost $157 apiece in OEM quantities, the vendor said.

Bipac Power Systems, 3131 S. Standard Ave., Santa Ana, Calif. 92705.

■ **NJE Corp. has added a dc-to-dc single-output switch mode model to its MK power supply series that provides output from 500W to 1,500W.**

The MK Series DC Input was designed for telecommunications applications where equipment is operating off of 48V station batteries and in equipment requiring battery-backup circuitry. Input levels can range from 42V to 56V dc and the output is isolated from the input.

The dc-to-dc switcher meets the Federal Communications Commission's Electromagnetic Interference/Radio Frequency Interference requirements. Features include overvoltage, overcurrent and thermal protection, remote sensing, inhibit capability, short-circuit protection and soft start.

The dc-to-dc switcher costs $1,060 in quantities of 100.

NJE, P.O. Box 669, 339 Culver Road, Dayton, N.J. 08810.

BOARD-LEVEL DEVICES

■ **EMC Corp. has introduced 4M-byte and 8M-byte memory cards that are reportedly compatible with Digital Equipment Corp.'s VAX-11/780 and VAX-11/785 computer systems.**

The EMC VX-4MB-780 and the EMC VX-8MB-780 use 256K-bit chips and can be used in any VAX machine that accepts either DEC's MS780-E or EMC's 780 memory system.

Using the 4M-byte arrays, the 11/780 can be configured with up to 64M bytes of memory, the vendor said.

The VX-4MB-780 costs $9,100; the VX-8MB-780 costs $16,000.

The company also announced that it will give 100% credit for owners of EMC's 1M-byte and 2M-byte arrays, the vendor said.

EMC, 12 Mercer Road, Natick, Mass. 01760.

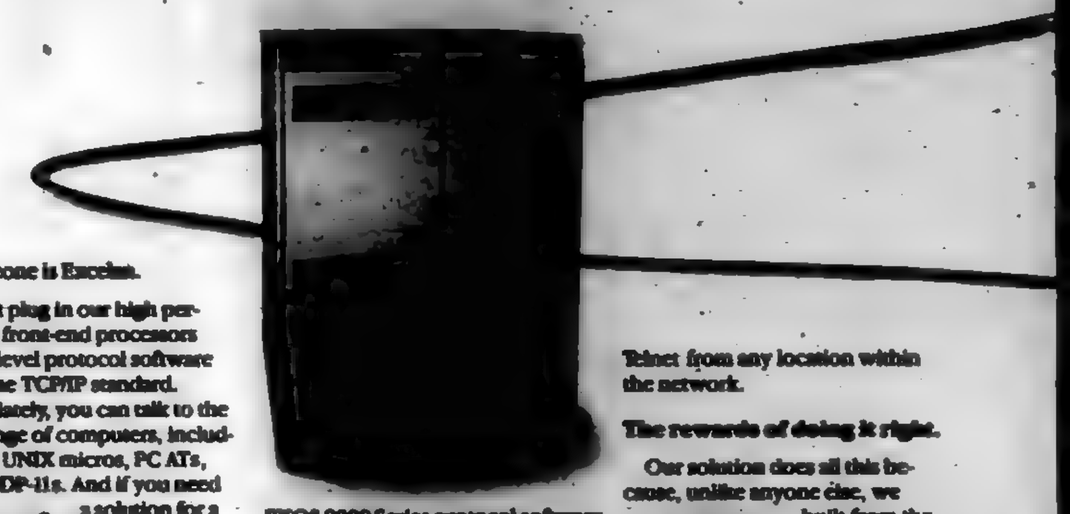
AUXILIARY EQUIPMENT

■ **Atlantic Research Corp. has announced several new features for its Interview 4600 Data Analyzer for testing circuits.**

Additional features include func-

You'd think someone would finally straighten out the Ethernet interoperability tangle.

Someone has.



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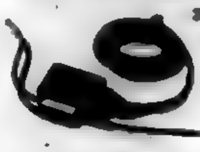

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Together, our hardware and software give you total connectivity. So you can transfer files between computers with FTP and remotely log into any system with Telnet from any location within the network.

The rewards of doing it right.

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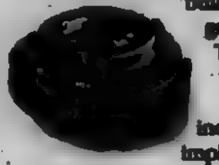

That means we can offer you the industry's best implementation of communication technology for current and emerging standards.

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tions for automatic callback; automatic configuration of the tester and data display; unattended remote control, data reanalysis; up to 16 states in one test; eight triggers, which perform 120 separate diagnostic events; a terminal mode to allow it to act as an asynchronous terminal for field applications; four counters; and a 32K-byte CRT data buffer.

The unit costs $4,200.

Atlantic Research, 5390 Cherokee Ave., Alexandria, Va. 22312.

■ Nicolet Instrument Corp.'s Digital Test Division has announced an Intel Corp. 8086 emulator, a logic analyzer and a digital test station.

The Nice 8086 emulator was designed to be used for system development, troubleshooting, debugging or testing. The emulator measures 3½- by 5½-in., is 1-in. thick and features hardware breakpoints, overlay random-access memory, Intel and Tektronix, Inc. Hex upload and download function, program histographs and is to be run in maximum mode only, the vendor said.

Target system interface is via a 40-pin cable assembly or a 40-pin adaptor plug. The unit can be plugged directly into a target system's processor board. An RS-232-compatible interface allows the emulator to talk to most terminals and modems, the vendor said. It costs $1,250.

The company also released an OEM 50-MHz, 16-channel also, 1,000-word analyzer called the NPC 400 for $3,995. It features parallel, serial and General-Purpose Interface Bus monitor recording, a menu system, timing and state displays, trigger functions and recording speeds up to 11.92K bit/sec.

The DTS 8000 Digital Test Station is modularly expandable and features plug-in subinstruments for state, timing, waveform, time tag, emulation and pattern generation. It features software for the development of digital microprocessor-based electronic instruments. Depending upon configuration, the test station is priced from $20,000 to $45,000.

Nicolet Instrument, Digital Test Division, 201 Fourier Ave., Fremont, Calif. 94539.

■ Eventide, Inc. has announced the Eventide intelligent buffer/spooler for use with Hewlett-Packard Co.'s desktop computers. The product is said to allow simultaneous operation of a plotter and printer on an IEEE-488 standard interface bus without tying up the host processor.

The Expressway is said to route data intended for different peripherals automatically so that more than one peripheral, such as a printer and a plotter, can operate simultaneously. The Expressway uses a Motorola, Inc. 6809 8-bit internal and 8-bit external microprocessor.

The Expressway accepts data at speeds of up to 20K byte/sec. The product has three ports and either 256K bytes or 1M byte of main memory.

The Eventide Expressway is priced at $1,295 for the 256K-byte version and $2,495 for the 1M-byte version. The product is scheduled for June availability.

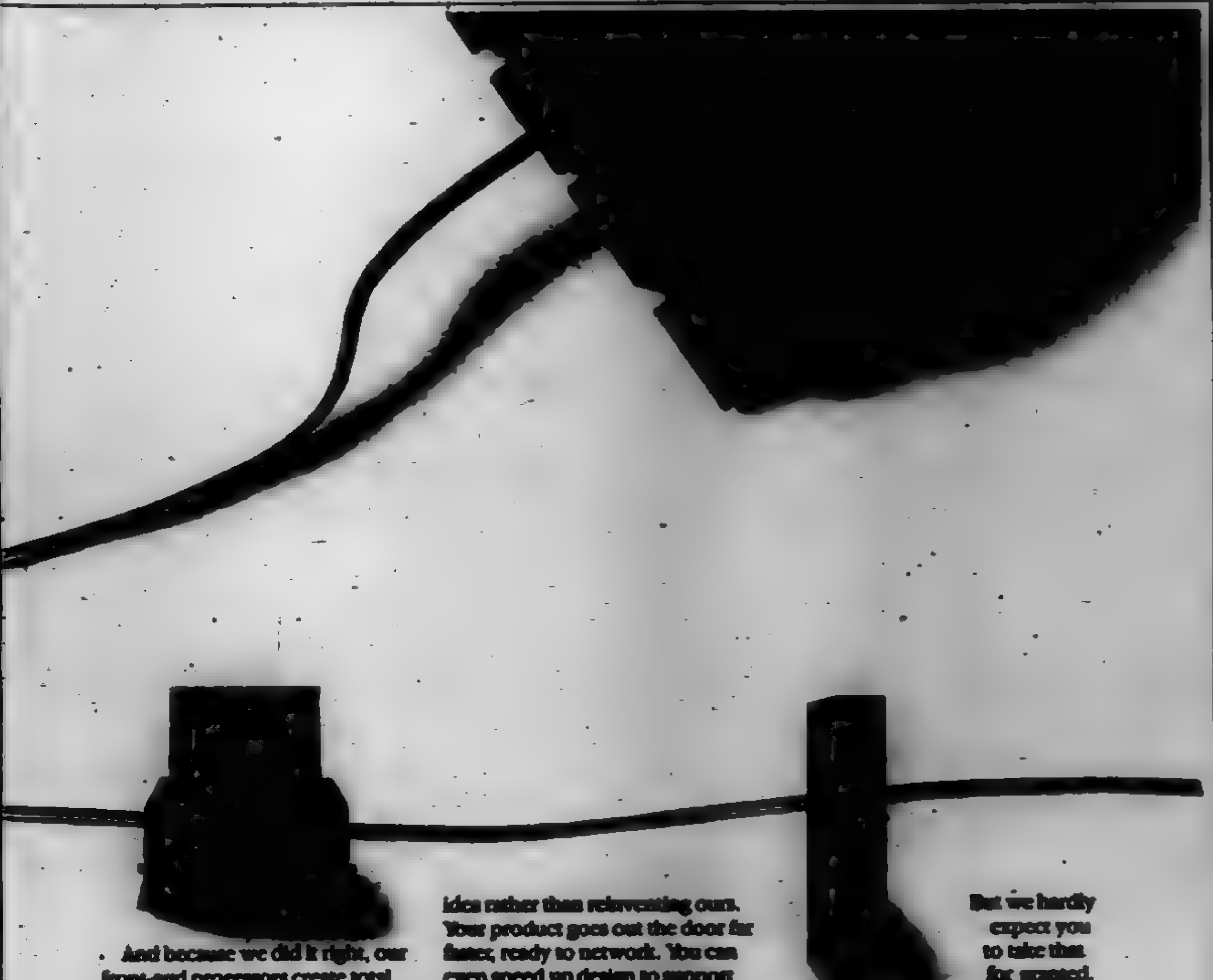
Eventide, One Alsan Way, Little Ferry, N.J. 07643.

■ Datacopy Corp. has announced a version of its Series 600 Electronic Digitizing Cameras that capture photographs for electronic publications and drawings for computer-aided design.

The Model 620 and the Model 620F, which features a built-in focus and framing aid, have a maximum resolution of 3,456 by 4,472 pixels by 8-bit picture elements, the vendor said.

The Model 620 costs $11,950, and the 620F costs $13,950. The units are available with copy stand, lighting system, power supply, personal computer interface software and Datacopy's Word Image Processing System software for $14,950 and $16,950 respectively.

Datacopy, 1215 Terra Bella Ave., Mountain View, Calif. 94043.



And because we did it right, our front-end processors create total connections between computers without disturbing them at all. That not only gives you blinding network speeds, it saves host CPU cycles, too. Your net throughput is close to 1M bps.

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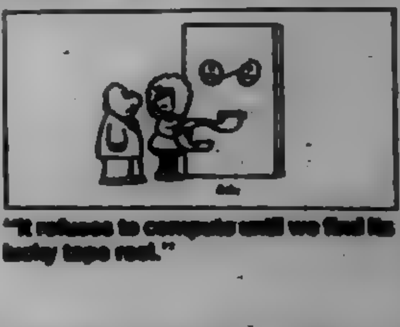
Apollo unwraps dual-density tape drive

CHELMSFORD, Mass. — Apollo Computer, Inc. has introduced a dual-density tape drive, the Model MSD6250, for use with the company's Domain local-area network-based workstations and server processors.

The MSD6250 can read or record data at 6,250 byte/in. in a group code recording format and 1,600 byte/in. in a phase-encoded format.

The tape drive can be used as a shared resource in a Domain local-area network and can be used with Apollo's DSP80 and DSP80A server processors, the monochromatic DN460 workstation and the color DN660 workstations. Available immediately, the MSD6250 costs $26,000 with a monthly maintenance fee of $175. The vendor is located at 330 Billerica Road, Chelmsford, Mass. 01824.



"It refuses to compute until we find its lucky tape reel."

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COMPUTER INDUSTRY

Retail contacts key to firm's success

By Edward Warner
CW Staff

DALLAS — The days of the ever-changing organizational chart, known by employees as the "chart du jour," are over for the market research firm Future Computing, Inc. Gone too are the offices in a suburban shopping mall, to which the firm had moved after it outgrew its founder's spare bedroom.

Today, five years after its founding, Future Computing occupies the entire top floor of a Dallas office building. In the view of Future Computing's chairman, Egil Juliussen, such success is not so startling; the firm's founder, he said, had the forethought to focus the firm's efforts on only one growing area — personal computing — and to leverage her contacts within personal computer retailing to gain data on their sales. The firm's founder and president is his wife, Portia Isaacson.

Future Computing's success is largely due to a good relationship with the personal computer retailer, Juliussen said. Retailers, he explained, "had a warm spot in their hearts" for Isaacson, an early personal computer retailer herself who had provided other neophyte dealers with much advice. Many of Isaacson's contacts, he noted, later became respondents in the twice-a-year Future Computing survey of retail stores, a survey now done monthly.

Retailers had a good reason to fill out the questionnaire, besides liking Isaacson: In return for completing the form, they received a copy of the results and learned for themselves what products were selling best nationwide. More important, because the stores were independents, the manufacturers were at last presented with a way of learning their retail sales figures — and those of competitors.

While Future Computing claims to be the first to do regular surveys of retail stores, it no longer has personal computer market research all to itself. Such firms as Infocorp, Cupertino, Calif.; Dataquest, Inc., San Jose, Calif.; and the Newton-Evans Research Co., Ellicott City, Md., all now cover aspects of personal computing.

When it makes its sales pitch to potential clients, Juliussen said Future Computing can point to a string of accurate predictions going back to its announcement of the impending demise of the first personal computer, the Mits Altair. Other occasions when the firm was on target include its prediction of bright futures for both the Apple Computer, Inc. Macintosh and the IBM Personal Computer, shortly after the birth of the two machines.

Juliussen wrote Future Computing's first report on the personal computer, titled "Billion Dollar Babies," shortly after he joined the firm in June 1981. He still

See FUTURE page 65

- The U.S. House and Senate finally got around to agreeing on a new Export and Administration Act, replacing the 1979 act that expired almost two years ago/58
- A recent Supreme Court libel ruling places a heavy burden on providers of electronic data base services, according to legal experts/66
- An Idaho-based semiconductor manufacturer spurned diplomatic efforts being waged by the rest of the industry and filed a formal petition asking the U.S. government to impose 'antidumping' penalties on Japanese vendors/62

Downturn's effects stretch coast to coast

Ex-Wang workers consider options

By Clinton Wilder
CW Staff

CHELMSFORD, Mass. — A brief three months ago, the idea of attending a job fair was unthinkable to Clara Currier. The 36-year-old programmer in the corporate MIS department at Wang Laboratories, Inc. had been with the formerly fast-growing office automation company for almost five years and had envisioned a lifelong career there.

"Until March, I would tell people I worked for the most prosperous, most secure computer company around," Currier said. "I thought I'd be there until I was 70, when I would retire to the Wang old-age home, which I figured they would probably have by then."

Instead, Currier was spending a rainy Friday morning looking for a new job at

See HUNT page 63

Beating layoffs a matter of skills

By Kathleen Burton
CW West Coast Bureau

Systems and field engineers and other highly skilled workers who have been dismissed in the current computer industry slump are most likely to find new employment quickly, according to placement specialists and industry executives.

"Unskilled manufacturing laborers and white-collar workers in sales have the most difficult time after a layoff," said Michael Eisenacher, a labor consultant in San Jose, Calif. The most easily rehired are secretaries, who can go to a broad diversity of firms, and systems and field engineers, whose services can transfer as the industry's needs shift, Eisenacher said.

"If you are an engineer or a technician, you can walk out the door of a company

See [illegible] page 64

Hardware surplus blamed for slump

By Kathleen Burton
CW West Coast Bureau

MENLO PARK, Calif. — At an analysts meeting earlier this year, an Intel Corp. vice-president summarized the semiconductor market with a slide. On it were written two words: "Business stinks."

It was an apt summary of the condition of the Silicon Valley today. Only a year ago, this Northern California complex of semiconductor, microcomputer and other electronics companies was regarded as a showpiece of the American economy.

But in the past year the downturn has been sudden and dramatic. Scarcely a week goes by without once high-flying firms announcing staff cuts, cost cutbacks, plant shutdowns or poor financial results. Intel has implemented two rounds of lay-

See DOWN page 67

Industry recession in line with author's dismal 'law'

INDUSTRY INSIGHT
Clinton Wilder
CW Staff

Rule No. 1: It never rains bad news; it pours.

Thus begins the list of McClellan's Laws at the end of former Salomon Brothers Vice-President Stephen McClellan's 1984 book, *The Coming Computer Industry Shakeout.*

At no time have events followed the rule more closely than in the last few turbulent weeks, with Wang Laboratories, Inc., Apple Computer, Inc. and Data General Corp. biting down hard on the proverbial bullet with massive layoffs, shutdowns and other assorted loss cutters. Meanwhile, successive Mondays have found *The New York Times* and *Business Week* blasting the same front page message from the computer industry to the world: slump.

The explanation of McClellan's primary precept goes on to say, in effect, that things will get worse before they get worse. "When you first hear bad news about a company, always expect more of the same to follow. What you first heard is usually only the tip of the iceberg," McClellan wrote.

That logic has held true with Wang, where a simple mandatory July vacation grew quickly into 1,600 layoffs, and with Apple, where another production shutdown was followed in short order by 1,200 pink slips and cofounder Steve Jobs' swift kick upstairs to the guru's office.

The pattern does not bode well for the employees of Hewlett-Packard Co., enjoying their enforced vacations this month.

Nor does it foreshadow good news for the folks at Digital Equipment Corp., where attrition shrinkage and frosted discretionary spending have been in effect, and word has it that the company is pointing out that its record of no layoffs is a tradition, not a policy.

IBM, too, seems to be itchy. After President John Akers' June announcement that Big Blue is depending on a strong fourth quarter to post any growth at all this year, the company appeared to try and kick-start its own recovery (independent of the industry's) with the recent spate of price cuts and new products like the System/36 PC.

In short, the overused term "downturn" is no longer a strong enough word to describe what is going on. This industry is in a recession, and when it recovers, which it will, it is not going to look the same.

The list of industry casualties will continue to grow. As Prime Computer, Inc. Chief Executive Officer Joe Henson pointed out to reporters in a recent informal session, when the top four floppy

See SLUMP page 64

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COMPUTER INDUSTRY

Congress OKs revised export act

WASHINGTON, D.C. — The U.S. House and Senate recently passed and sent to President Reagan a revised Export Control Act that the president is expected to sign.

The 1979 version of the law expired two years ago but was kept in force by presidential declaration while a vigorous debate raged among advocates of stricter enforcement of high-technology exports to prevent the diversion of exports to Soviet bloc countries.

The revised export bill sets new standards to determine the availability of products overseas, so U.S. firms can export more easily. U.S. industry has mounted a campaign to loosen restrictions on export licensing, which it charged took too long and resulted in lost sales.

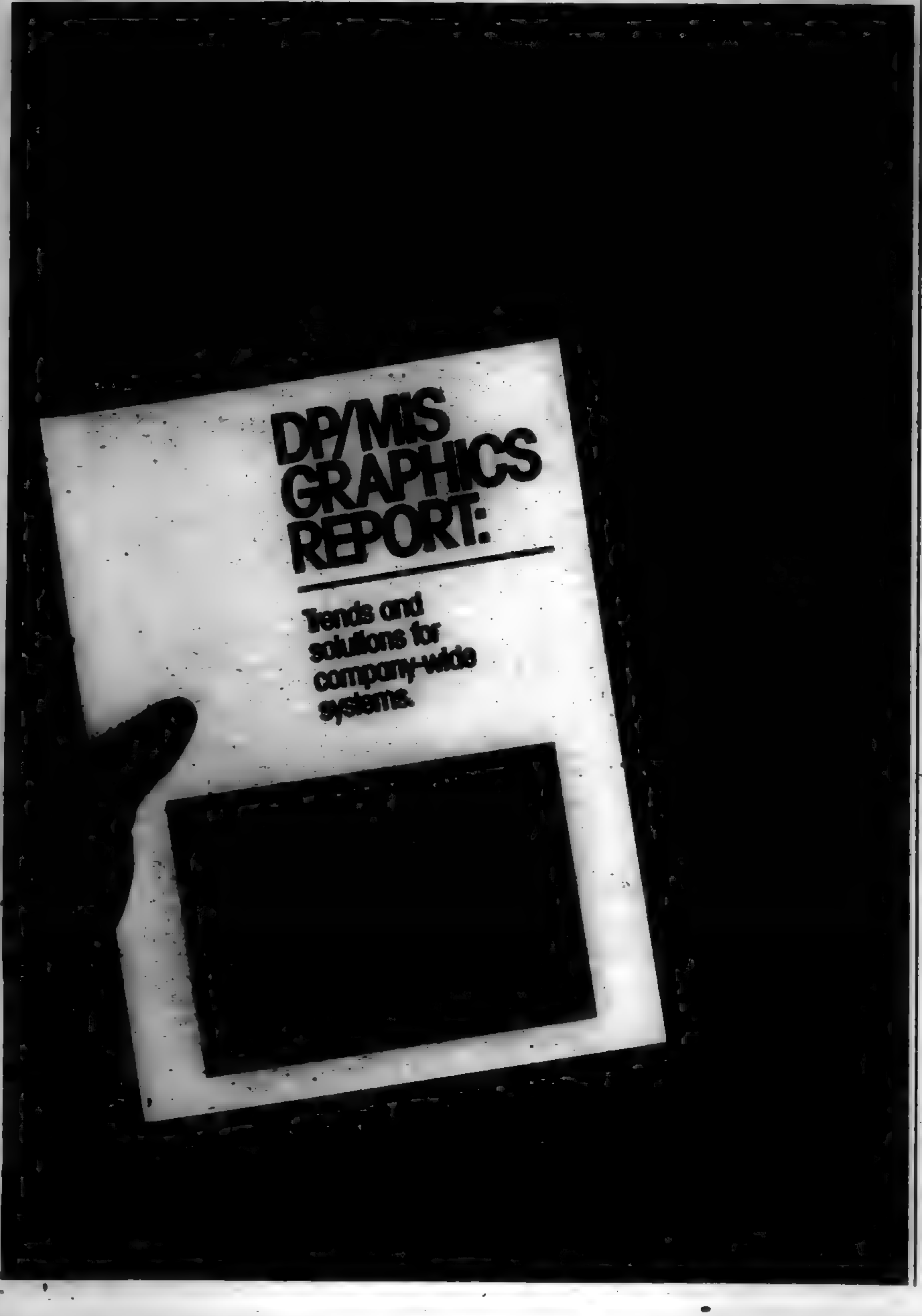
President Reagan has given the Department of Defense the power to review license applications, and the new law adopts the regulations spelling out the coordination of export license review that currently exist between the Department of Commerce and the Defense Department.

License categories

New license categories are created by the export bill. Validated licenses for multiple exports are created, of which there are two types. There is a distribution license that permits multiple exports to non-Soviet bloc countries and is based on a Department of Commerce review of the destination and the intended user or receiver of the products. Defense will slowly be able to review this category.

The other is a comprehensive operations license, which permits multiple exports of high-tech goods by firms to their subsidiaries and other business partners that have "defined relations" with the exporter. Internal company controls will be examined by the Commerce Department to ensure that diversions to Soviet bloc countries are thwarted.

The bill would establish an Undersecretary of Export Administration and Office of Foreign Availability in the Commerce Department, increase penalties for illegal exports or transfers of restricted technology and spell out the working relationship between the Commerce Department and the U.S. Customs Service, which is legally charged with enforcing the laws dealing with export/import.



Miniscribe's CEO resigns

LONGMONT, Colo. — Miniscribe Corp. recently announced that Roger Gower, president and chief executive officer of the firm since last November, has resigned.

Gower's responsibilities will be assumed temporarily by an office of the chief executive, consisting of Q. T. Wiles, chairman of the board of both Miniscribe and the investment firm of Hambrecht & Quist, and other executives of Hambrecht & Quist.

The San Francisco-based investment firm headed by Wiles was the lead investor in a venture capital group that provided Miniscribe with $20 million in financing this past April.

[illegible]

Q. How can a superior modem [illegible] in any telecommunications [illegible]?

A. The primary purpose of a [illegible] is to move information to end [illegible] and thereby improve their [illegible]. And a superior modem can [illegible] performance of your network [illegible] four areas: It can make your [illegible] reliable. Give your end users [illegible] response times. Minimize the time [illegible] your people spend on network [illegible]. And a superior modem can [illegible] you money in line charges.

Q. What makes a superior modem?

A. As you know, a modem converts a data stream into a signal that can be sent (usually over a phone line) from Point A to Point B.

Now that may sound simple enough, but there are a number of variables in that seemingly simple scenario. Such as, what's the distance between Points A and B? What's the line between the points? What's the condition and stability of the line? And many, many more. The point is, each variable carries technical implications that affect the design of the modem. And simply stated, a superior modem enjoys a superior design.

Q. Be specific. How can a superior modem save my company [illegible]?

A. Let's face it, modems are a [illegible] expensive part of your telecommunications network. Chances are, line charges are. If you design a modem that can transmit more reliably, then that modem can begin to affect your line charges. Every time a modem has a "hit," or an unsuccessful transmission of data, the data must be retransmitted, slowing down response time. The net effect is a reduction in the amount of information carried by the network.

If you use superior modems that give fewer hits, you'll have lower line costs per data unit transmitted and better throughput. Better throughput translates into time and cost savings.

Q. Can a superior modem correct the problem of faulty lines?

A. A superior modem can go a long way toward compensating for poor line [illegible] these [illegible] modems [illegible] in the [illegible] case.

[illegible] Modem, for [illegible], utilizes a coding [illegible] with an advanced [illegible] that [illegible] the largest [illegible]. The result is that the reliable 9,600 bps modem can operate very effectively over unconditioned lines. Now imagine all the line conditioning charges you won't have to pay your common carrier.

[illegible]

There are a number of [illegible] reasons why you should [illegible] IBM's line of 2,400, 4,800 and 9,600 bps [illegible] modems. Not the least of which is that we've recently announced two new modems—the IBM [illegible] and [illegible]—which feature lower prices, smaller packaging and improved serviceability. And like all IBM modems, they can fully utilize IBM's Communication Network Management capability.

The New IBM Modems

	IBM [illegible]	IBM [illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	standard	standard
[illegible]	[illegible]	

[illegible]

What's more, we've also recently lowered the prices of the IBM [illegible] Modems by as much as [illegible] percent. And there are also volume discounts available. If you're looking for modems that offer reliability, [illegible] and user productivity and are competitively priced, talk to your IBM marketing representative.

If you would like to receive a free brochure on IBM modems, call 1 800 IBM-[illegible], Ext. 90. Or use the coupon below. After all, it pays to be *informed*, because not all modems are created equal.

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90

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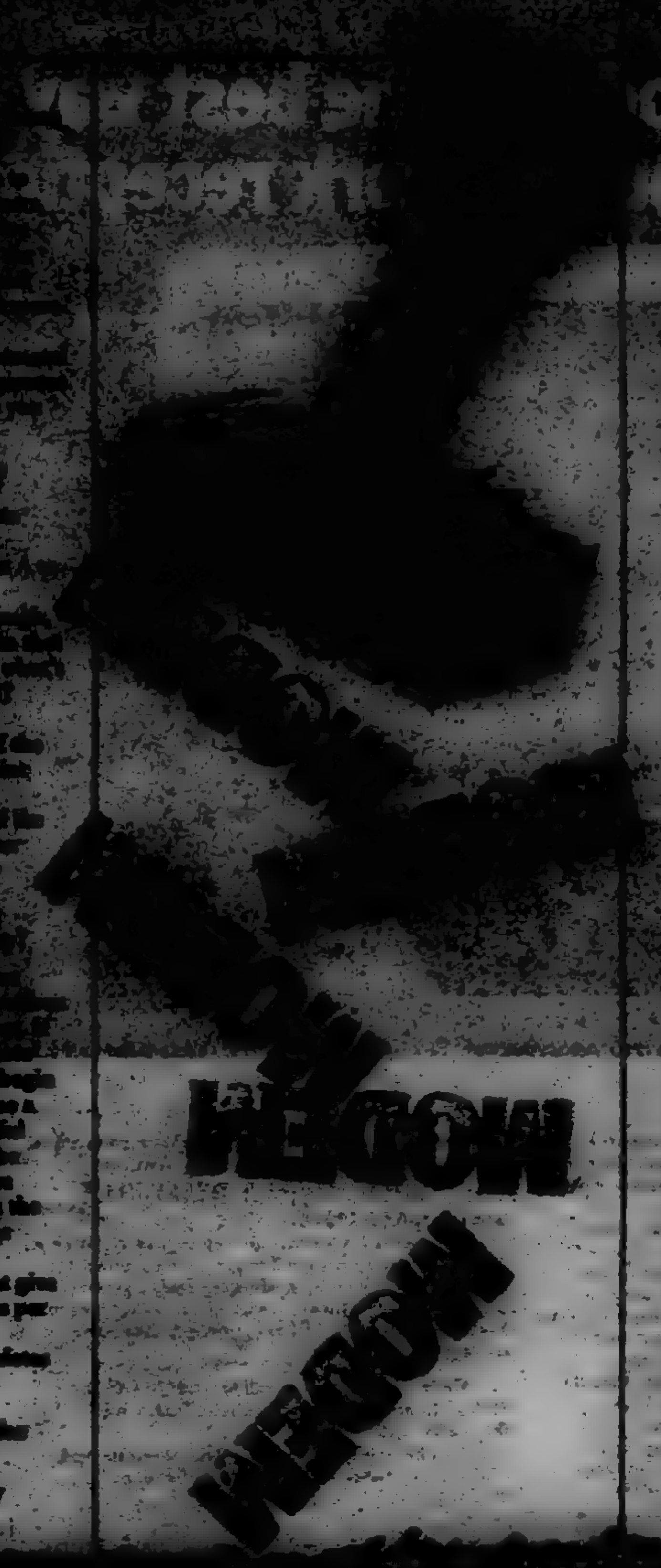


Data base libel decision termed 'blow to info industry'

By Glenn Rifkin
CW Staff

In what one legal expert termed "a blow to the information industry," a controversial libel decision was handed down recently by the U.S. Supreme Court. In a 5-4 ruling, the court upheld a jury decision against the Dun & Bradstreet Corp. for libeling, via a computerized economic data base, Greenmoss Builders, Inc., a Vermont developer.

In upholding the Vermont jury's decision, the high court has ruled that the First Amendment protects for libel statements only in "matters of public concern."

Though the court did not define matters of public concern, the implication is that in libel cases that are not of public interest, private individuals or corporations may collect punitive damages along with compensatory damages for libel without proving malice or reckless disregard for the truth.

This alters the precedent established by the court in the 1974 *Gertz v. Robert Welsh, Inc.* decision.

The Greenmoss case originated in July 1976 when Dun & Bradstreet erroneously reported in its electronic online data base "Business Information Reports" that Greenmoss had filed for bankruptcy.

In fact, it was a former Greenmoss employee who had filed for bankruptcy; a 17-year-old high school student reviewing bankruptcy records in Vermont for Dun & Bradstreet had incorrectly reported the material. Greenmoss sued Dun & Bradstreet for punitive damages of $300,000 and compensatory damages of $50,000 and won in a decision upheld by the Vermont Supreme Court.

Decision seen as ominous

Though most experts agreed that the ruling's implications were as yet unclear, the decision was considered ominous by news organizations and the information processing industry.

Peter Marx, an attorney with the Boston law firm of Goulston & Storrs, representing the Information Industry Association, said the decision has put a heavy burden on electronic publishers, credit reporting services, computer data base producers and newsletter publishers by not defining "matters of public concern."

"These organizations are so varied and go to such focused audiences that it's going to be a lot easier to say whether something published in *The Wall Street Journal* is a matter of public concern than something coming out of the Dow Jones News Retrieval Service, even if it's the same information," Marx stated.

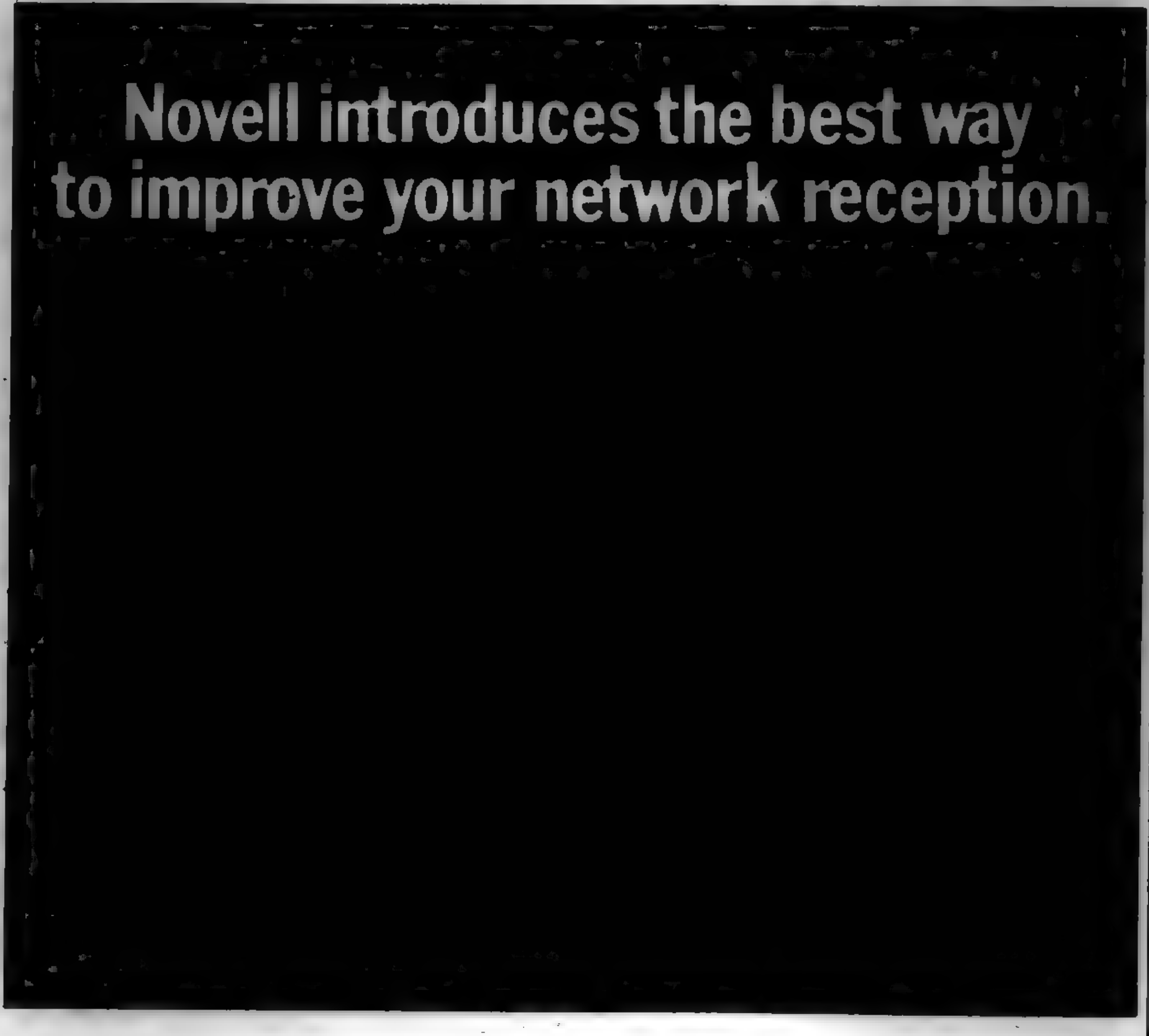
According to Marx, the ruling may serve to stifle the growing information industry by forcing smaller firms to become so careful that they stunt their growth. Those who heed the dangers risk being sued and forced out of business.

Dun & Bradstreet responded to the verdict in a press statement that said, "Business information services are of great value to the commerce of the nation, and, thus, activities of an information supplier should not be unduly inhibited by the fear of libel judgments based on occasional, unintentional error."

"This decision illustrates the difficulties these organizations face trying to build 21st century information businesses within a 19th century legal system," Marx said. "The law still hasn't come to grips with how to handle these new technologies in these contexts."

Ironically, the high court did not decide the case based on the issue of whether an organization was considered media or nonmedia a major point in the Vermont Supreme Court decision.

Many following the case had anticipated the U.S. Supreme Court to follow suit. By ruling out that distinction as a criteria, the court implied that it will treat both media and nonmedia groups the same under libel law.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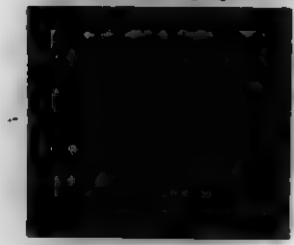

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*LAN Benchmark Report, May, 1985, Novell, Inc. and "Software, Not Hardware Key to LAN Performance," *PC Week* 1/15/85.

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Chip firm petitions to curtail dumping by Japanese

Tariff would double prices

BOISE, Idaho — Micron Technology, Inc., a 900-employee semiconductor firm based here, recently filed the U.S. chip industry's first petition to prevent dumping, or selling below cost, by Japanese chip makers.

If successful, the petition would impose duties on imported 64K-byte dynamic random-access memory (RAM) chips that would nearly double the cost of the chips in the U.S.

To impose the 94% duties sought by Micron Technology, the U.S. Commerce Department must find that the seven defendants are selling 64K-byte dynamic RAM chips below cost, and the U.S. International Trade Commission must rule that Micron's sales have been hurt by the practice.

The petition alleges predatory pricing by Fujitsu Ltd., Hitachi Ltd., Masushita Electric Corp., Mitsubishi Corp., NEC Corp., Oki Ltd. and Toshiba Ltd. Micron Technology charged that the production cost of a 64K-byte dynamic RAM chip is $1.36 and that the Japanese vendors' chips are selling for as little as 70 to 75 cents in the U.S.

Micron Technology's action is the strongest import-curbing move to date by a U.S. chip maker. The San Jose, Calif.-based Semiconductor Industry Association (SIA) recently called for an effort to equalize U.S. vendors' share of the Japanese chip market and the Japanese market share here but did not call for import restrictions.

Micron Technology attorney Larry Grant declined to directly comment on why his firm chose to pursue a stronger remedy than the SIA to shore up U.S. firms' declining share of the domestic chip market. Last month, Sunnyvale, Calif.-based Advanced Micro Devices, Inc. and a leading U.S. trade official verbally charged Hitachi with dumping 256K-byte erasable programmable read-only memory chips [CW, June 17].

Ashton-Tate revenue, profits jump

CULVER CITY, Calif. — Citing strong sales of its Dbase III and Framework microcomputer software packages, Ashton-Tate recently reported that its 1985 first-quarter revenue more than doubled and posted an almost fifteenfold increase in profits from the year-earlier period.

Sales for the quarter ended April 30 were $24 million, compared with $11.2 million in the first quarter of 1984. Profits soared from $149,000, or 2 cents per share a year ago to $2.3 million, or 25 cents per share.

Ashton-Tate President and Chief Executive Officer Edward M. Esber Jr. said international sales of the firm's products increased significantly in the past year, particularly in Europe and Japan. During the quarter, the company signed distribution agreements in Japan and Australia.

Ashton-Tate has also announced its intention to purchase the remaining 85% of outstanding stock of Forefront Corp., the developer of the Framework integrated software product now marketed by Ashton-Tate.

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IBM's best efforts are now going into Macintosh.

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Nearly 10,000 IBM PC software programs designed for general business and specific applications in real estate, insurance, law, medicine, banking, etcetera, can now join forces with Macintosh's own popular programs.

And, the myriad of IBM PC-compatible software adopts Macintosh's many beloved features, including desktop utilities such as the clipboard and the calculator.

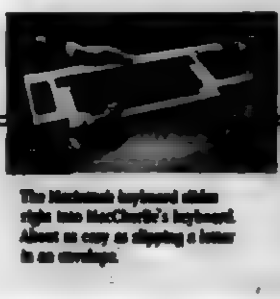
In addition, MacCharlie allows IBM PC and Macintosh data files to be exchanged. Talk about flexibility.

But the good news gets better.

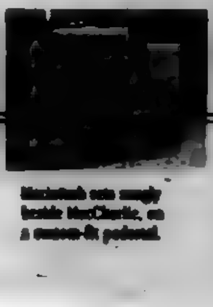
You see, MacCharlie delivers hardware compatibility, as well. For example, IBM letter-quality printers can be easily used with Macintosh.

Furthermore, MacCharlie now allows Macintosh to perform virtually any networking an IBM PC can perform. Even to the extent of tying in with IBM mainframes.

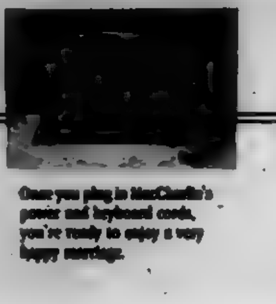
In other words, your networking capability goes beyond the Apple family.



The Macintosh keyboard slides right into MacCharlie's keyboard. About as easy as slipping a letter in an envelope.



Macintosh sits snugly beside MacCharlie, on a custom-fit pedestal.



Once you plug in MacCharlie's power and keyboard cords, you're ready to enjoy a very happy marriage.

HUNT

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Wang's management development center here, where the company hosted a one-day job placement fair. Like many of her colleagues among the 1,600 Wang employees laid off last month [CW, June 10], Currier found her faith in the strength of the computer industry had been shaken by the downturn of 1985.

"I still want to work in corporate MIS with IBM or Wang equipment," she said. "But I think it's time to get away from computer companies. In eastern Massachusetts, they're talking about how the industry won't be doing well for the next two years, at least."

'I'd rather stay in high tech'

"I could go back to banking, but I'd rather stay in high tech," said David Lops, a laid-off Wang revenue analyst. "[Before joining Wang] I had done financial analysis on the oil industry, when [the industry] collapsed. Now I'm faced with the same thing. The economy controls the fate of a lot of companies, and I feel very inferior to those forces right now."

Lops, 28, said Wang's layoff announcement came as a total shock: "Heavy rumors had been going around, but when they announced the July production shutdown [CW, April 1], we were reassured there would be no major layoffs. That's what really got me. I was really devastated ... I always thought the computer world was where you want to be."

"I haven't found anything here [at the job fair] yet," said Lamont Alford, 47, a five-year manufacturing supervisor at a Wang printed-circuit board production facility. "The company is making a very good effort to help us out, though. I think it's just a matter of time, but [my new job] might not be as close to home as I'd like."

Some 30 Massachusetts and New Hampshire companies attended the Wang job fair to collect resumes and conduct brief initial interviews with the newly available Wang employees. Although most represented were electronics-related firms such as GTE Corp., General Electric Co. and Analogic Corp., computer vendors were limited to Prime Computer, Inc. and Apollo Computer, Inc.

'Have to give Wang credit'

"We've slowed down somewhat, but not as much as others," said Hank Vezina, an Apollo human resources manager seeking to fill research and development engineering positions. "I have to give Wang credit — not many companies would do something like this. But it's still a tough way to find R&D engineers, because most go through agencies. Of the 1,600 Wang employees laid off, 400 to 500 at the most will come through here."

Since announcing the layoffs, Wang has also converted a former training facility in Burlington, Mass., into a job counseling center to teach interviewing techniques, help with resume preparation and offer job leads.

Other firms with massive layoffs, such as Data General Corp., have instituted similar programs after suddenly finding themselves in the job placement business.

Televideo sales dip 46%

SAN JOSE, Calif. — Televideo Systems, Inc. recently announced a loss for the second quarter as sales plummeted 46% from the year-earlier period.

The company announced a loss of $678,000 for the quarter, or two cents per share, compared with profits of $5.6 million, or 14 cents per share in the same period a year earlier.

Revenue dipped to $26 million, from $48.4 million in the second quarter of 1984. That compares with a similar first quarter, when sales dipped to $26.7 million, compared with $43.2 million during the same period a year earlier.

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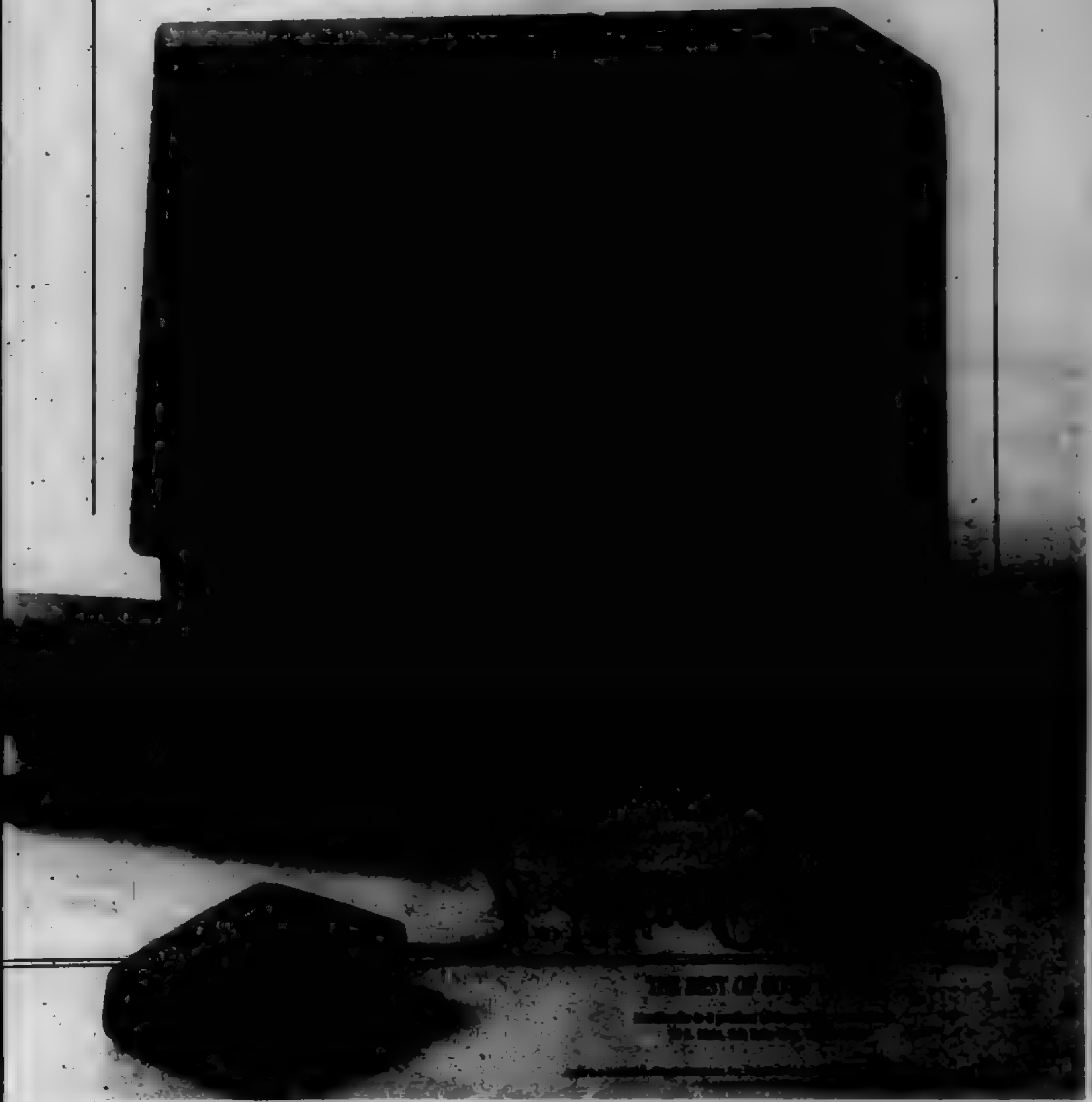

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REHIRE

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one day and have five offers to choose from a week later," claimed Don Turnley, a service and maintenance engineer for large systems at Amdahl Corp. in Sunnyvale, Calif.

Though two of the companies he has worked for in the past three years have closed their doors, Turnley said he has never missed a day of work. When Storage Technology Corp. closed its Santa Clara, Calif., research operations in 1984, more than 100 companies sought the laid-off employees. He had four job offers before the division closed, Turnley said.

According to Turnley, some of his fellow engineers move from company to company like high-tech migrant workers, following the highs and lows of the industry.

But rehiring also can depend on the worker's geographic location, according to analysts. In areas with a high proliferation of electronics firms, like California's Silicon Valley and the Boston and Minneapolis areas, the chance of getting rehired is relatively good, said Rika Pirani, a California state labor market analyst.

The job market in the Silicon Valley is still growing, Pirani said. "The large number of microwave, software, telecommunications and defense firms in the area means there are still 40 pages of want ads in the Sunday paper," she said.

Growth in high-technology sectors is also apparent in the Boston area, noted Chris Anderson, a spokesman for the Massachusetts High Technology Council, Inc. in Boston. In spite of recent layoffs at computer systems manufacturers in the Boston area, other companies in that area are actively hiring. These include software companies and computer-aided design and engineering workstation manufacturers, Anderson said.

But, he warned, the hiring boom may be temporary. If the computer industry slump continues, more companies will institute hiring freezes, and new hiring will plunge.

Data General Corp. in Westboro, Mass., is providing its 1,050 laid-off workers in the U.S. with a two-day employment seminar staffed by an outside placement firm and with individual counseling sessions using outside trainers, said Steve Hobbs, corporate employment manager for the company.

"We have found that employees are usually pretty angry at the company, and it's important that outside employment counselors staff the outplacement centers," Hobbs said.

Control Data Corp. in Minneapolis, which laid off an undisclosed number of workers in June, is attempting to reassign the employees to temporary jobs inside the company and eventually move them to permanent CDC jobs, a spokesman said. Of 1,000 employees laid off at CDC last September, only 11 were terminated, he said.

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SLUMP

from page 57

disk drive vendors by themselves have enough capacity to meet the current market demand, some of the more than two dozen players in the overcrowded marketplace are going to get squeezed out.

But the long-term impact of the slump of '85 will be even more significant for the Wangs, DGs and other companies playing in many markets. The growth rates and profit margins of the last five years simply will never be repeated. The firms that emerge from this slump in the best shape will be those that successfully lower their break-even points and become the true "lean and mean" firms that everyone likes to say they are.

In the good old days ("old" being relative, since the phrase applies to December 1984), "high tech" was virtually synonymous with economic prosperity, job creation and nothing less than the hope of the future. Steelmill America was dying, the experts said, but the computer industry would rescue it with a boom that would last forever.

It's a shame so many people swallowed the hype and forgot that not even computer technology could outwit the most simple of economic principles — supply and demand. This year has brought a strong dose of reality to some success-bloated companies. It has shown that high tech is not so different from any other industry — where the winners are the smartest, best-managed and most realistic companies.

FUTURE

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oversees production of the reports and supervises Future Computing's research, while Isaacson runs the business side of the company and works one to one with client companies. Both hold doctoral degrees — he in electrical engineering, she in computer science — and each, according to observers, plays a complementary role in Future Computing's leadership. She is dynamic, he more reserved, according to those who know them.

Future Computing's 1,000 clients make up a "who's who" of the personal computing business and include such giants as IBM, Hewlett-Packard Co. and Apple. For anywhere from $7,500 to $100,000, clients get a package of services that usually includes consulting and telephone access to the company's researchers, explained Ken Orton, vice-president of sales and marketing.

Other services include seven newsletters; the monthly Storeboard report, a survey of 800 retail outlets; seminars and forums; and perhaps the most unique service of all, testing of personal computer hardware and sofware for compatibility with the IBM Personal Computer. The firm's testing lab has a staff of seven, and "almost all of the [personal computers] on the market today have been through [it]," Orton said.

One client, Infocom, Inc., a Cambridge, Mass.-based personal computer software firm, values Future Computing's data and advice. According to Richard Ilson, an Infocom senior scientist, "Our chairman has found them useful and has given Future Computing feedback when he hasn't found [it] useful."

Future Computing's research is done on the basis of forecasting off the current sales trend — but with a twist. The firm creates a model of the adoption curve of that product and fits the curve against the trend line. If the product is near the end of the adoption curve, for example, no amount of sales in previous years will offset the curve's impact on Future Computing's bleak expectations.

It was this method, Julitussen said, that brought Future Computing to within 5% of the mark when it predicted 1983 sales for the home personal computer market would hit $5 million. Unpredictables can enter into the equation, though; for 1984, using the same method in same market, Future Computing was off by 35%.

The adoption curve allows Future Computing to go out on a limb occasionally; for instance, it has predicted that laptop portable personal computers will be a hot-selling item in 1990, though they are presently selling slowly. The firm's willingness to fly in the face of conventional wisdom — when the data warrants — has won it headlines, most recently for a report that concluded that 50% of all personal computer software in use in business was pirated (see story below). That survey, according to the man who supervised it, Joe Curry, represented a departure for Future Computing.

While previous studies had been based for the most part on data gained from retail store surveys, the software piracy study was based on responses of 13,000 end users. Curry said that Future Computing will place "more emphasis on end-user research" in future reports.

Speaking more broadly, Curry, who headed the firm's surveys and statistics group, said that Future Computing is evolving toward the use of "more statistical rigor" in its research. That does not mean that testing for accuracy was lax in the past, he added. In February 1984, Curry said, he became the first statistician hired by the firm. He worked there only 14 months, leaving to join an Idaho-based software development company.

While he was with Future Computing, Curry recalled, the corporate culture was marked by rapid growth. "Just about every day the company would change," he reminisced. Curry's observation was confirmed by analyst Tod Court. During the early years of the firm, Court recalled, the company was growing rapidly, and "jobs were changing real fast" — so quickly, in fact, that the printed outline of the corporate hierarchy became known as the "chart du jour."

Rapid growth, slow growth

Those were the days, roughly from 1981 to 1984, when the firm was gobbling up office space in the Richardson, Texas, shopping mall to which it had moved after it outgrew the spare bedroom at Isaacson and Julitussen's home. In that time, the company reorganized from five groups into three: personal computer products, distribution and markets.

According to Curry, growth has slowed considerably in the last eight months, a result of the slowdown in the computer industry as a whole. The boom times made the comments of Future Computing researchers grist for the mills of such publications as *The New York Times* and *Fortune* magazine. Aware of his firm's power to influence public opinion, Julitussen said he has alerted his employees that they are "playing with fire" when they air a controversial statement without substantiation.

Looking back, Julitussen said his only regret is that he failed to tell the makers of IBM Personal Computer clones to get into niches in the vertical personal computer market. Nearly all of the clone makers attended the research firm's forums on the Personal Computer, he explained, and all were angling for the limited shelf space in retail stores. Several of them have since fallen on hard times, as their dash for shelf space failed.

One year ago this month, McGraw-Hill, Inc. purchased Future Computing for an undisclosed sum. While reluctant to talk about his firm's new parent, Julitussen did admit that it is "a lot better banker than what we used to have."

Previously, he said, bankers would scratch their heads when approached for loans by the research firm; the bankers did not understand how so much value could be tied up in a research project, and they tended not to view data as suitable collateral.

Pressed for cash to expand into new lines of business, Future Computing turned to a Dallas real estate financier for the more than $40,000 needed to fund each of the research firm's industry forums. The sale agreement reportedly permits Isaacson and Julitussen to run the research firm without interference for four years.

AT A GLANCE

FUTURE COMPUTING McGraw-Hill

811 LBJ Freeway
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Founded - 1980
Employees - 115
1984 Revenue - Estimated $7 million
1984 Profits - Not available
Area of expertise - The personal computer industry, especially its retail channels

[illegible]

FUTURE COMPUTING McGraw-Hill

[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	Vendor	
Home Division	Focus on home market for personal computers and software; reports on home computer distribution, consumers and hardwares; "Home Views" newsletter	Vendor	
[illegible]	[illegible]	[illegible]	A package of services is priced from approximately $15,000 per year.
Value-Added Reseller (VAR) Division	Directed to VARs; research on specific vertical markets; profiles on VARs	Vendor	
[illegible]	[illegible]	[illegible]	
Products Group			
Integrated Circuit Division	Focus on the integrated circuit industry; reports on robotics, integrated circuit usage in personal computers and trends in hardware; "IC Views" newsletter	Vendor	
[illegible]	[illegible]	[illegible]	
Peripherals Division	Examination of the personal computer peripherals market, including printers, modems and mass storage devices	Vendor	

Source: Future Computing, Inc.

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   23. Systems Manager/Systems Analyst
   31. Manager/Supervisor Programming
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   38. Data Comm. Network/Systems Mgmt.
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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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DOWN

from page 57

offs totaling almost 2,000 people.

Examples of struggling companies are plentiful. Six months ago, Sunnyvale, Calif.-based Advanced Micro Devices, Inc. lavished $700,000 on a massive Christmas party for employees. This summer, four-day workweeks are the order of the day.

This downbeat story is being echoed throughout the valley. National Semiconductor Corp. announced a 1,300-person layoff. Apple Computer, Inc. laid off 1,200 workers, closed three plants and revamped its marketing strategy. Hewlett-Packard Co., the valley's blue-chip firm, reported a 12% earnings drop for the latest quarter, compared with last year.

"It's the worst downturn ever," said O. Ralph Finley, a senior vice-president at Dataquest, Inc., a market research firm in San Jose, Calif. According to Finley, many valley semiconductor firms, especially hard hit by the recession, have resorted to desperate measures. Some have delayed posting order cancellations until the third quarter in an attempt to inflate this quarter's earnings estimates. Others have flatly refused to pay their bills until later in the year.

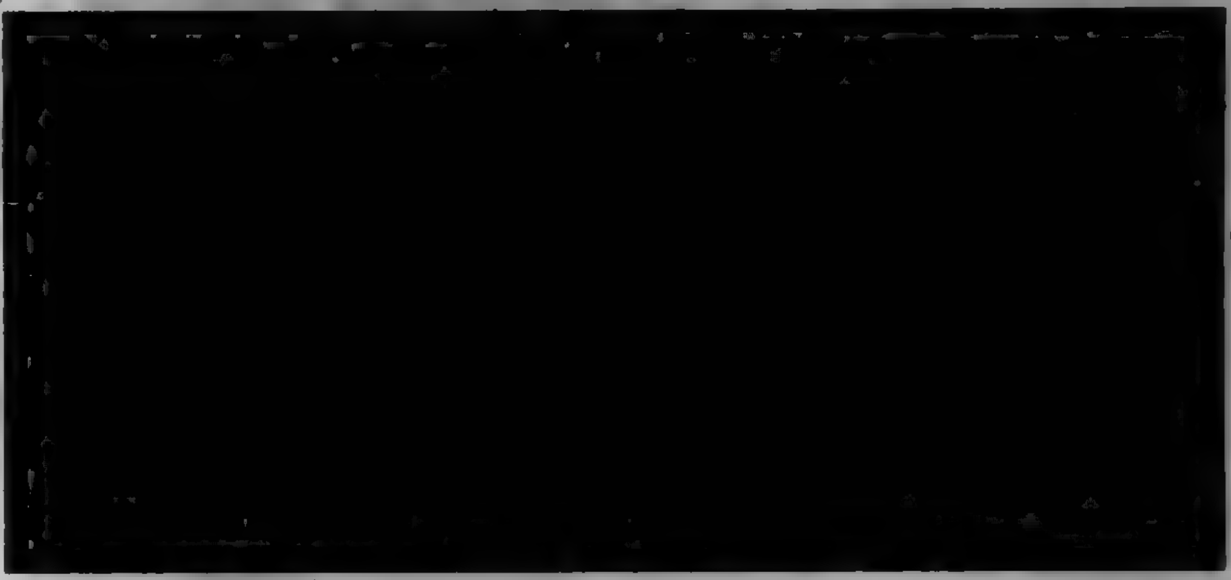
The sluggish sales of micros are a major factor in the industrywide downturn, said Aaron Goldberg, director of microsystems services at Santa Clara, Calif.-based International Data Corp. The personal computer industry slump is due primarily to the oversupply of computer hardware, which lacks sufficient networking capability, applications and trained users to make the equipment live up to its potential, he explained.

According to Goldberg, it may take the industry several years to recover from a shakeout fueled by an entrepreneurial outpouring of funds in 1982 and 1983. Most venture capital companies underwrote firms that merely produced variations of each other's products, and now, "the shakeout bloodbath is just starting," he said.

Micro firms have not been the only ones to suffer. HP, one of the valley's oldest electronics firms, has seen slumping financial performances across many areas of its business. According to Dean Morton, HP's chief operating officer, current troubles are caused by a reaction to the unrealistic user demand in 1984, amplified by the long-term effects of the strong dollar internationally.

"It's a difficult balancing act to try to be fair to employees, investors and the products themselves," Morton said, referring to sweeping cost-cutting measures instituted by the company in an attempt to avoid layoffs. On the optimistic side, however, he said sales of several HP products, such as the HP 3000 Series 37 mini and several personal computer peripherals, have not been affected.

Michael Murphy, editor of the "California Technology Stock Letter," a San Francisco-based investor newsletter, predicted that there will be an upturn after Labor Day but mostly for well-established firms like IBM and Apple. Personal computer sales, which doubled for several years, are expected to increase only 30% this year, but "sales would have to be up 200% to keep all the smaller personal computer-related companies in business," he said.



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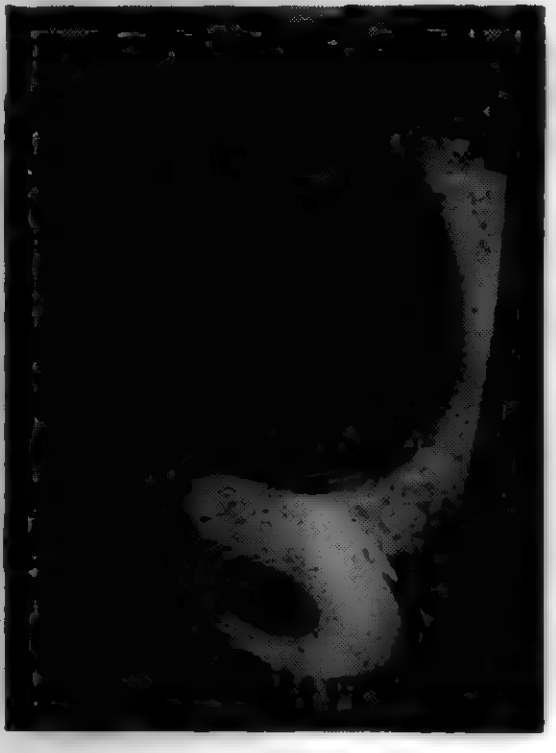

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3600 Wilshire, #2000
Los Angeles, CA 90010
(213) 386-6805

PACIFIC NORTHWEST

COBOL P/A

Seeking individual with 2+ years experience programming in COBOL in an IBM OS/MVS shop. Banking or insurance applications experience necessary; IMS or BAL helpful. To $32,000

IMS DB/DC

Contract firm has permanent position in their organization. Seeking heavy IMS background, especially DC. Strong COBOL skills and large IBM OS/MVS mainframe environment – 3xxx series. To $40,000

P/A CICS

Position requires 3-5 years data processing experience programming in COBOL in an IBM OS 3xxx mainframe shop. Strong CICS skills essential. DL/1 helpful. Excellent opportunity.
To $36,000

Debbie Romily
ROBERT HALF
of Seattle
800 University St. #2626
Seattle, WA 98101
(206) 624-8000

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ST. LOUIS

DEC/VAX OFFICE AUTOMATION

Many positions available in a new group! Fortune 500 firm, will develop office networks, electronic mail, all the latest using DEC hardware and software plus like UNIX and All-in-1. Excellent benefits. Salary to $40,000

CRAY PROGRAMMERS/ANALYSTS PROJECT LEADERS

Fabulous opportunity! CRAY is new to this Fortune 500 shop and they need CRAY expertise immediately. Will work on engineering applications. Salary to $40,000

MVS SYSTEMS PROGRAMMERS

Several opportunities are available with some of the most prestigious companies headquartered in St. Louis. Industries vary and salaries can go as high as $40,000

S/38 DP MANAGER

New shop in town, buying a S/38, needs a strong manager/programmer. Best would be 2 yrs of mgmt and 2 or more yrs programmer/design. Company involved with distribution.
Salary $35-40,000

CENTRAL ILLINOIS

Manufacturer in Central Illinois has an opening for a solid 3 year COBOL Programmer Analyst with any of the following: COPICS, CICS, CMS, DL/I, DOS/VSE/VM, VSAM.
Salary to $30,000

TELECOMMUNICATIONS ANALYSTS

Several positions available due to rapid expansion of this service organization. Currently supporting Data and Voice Communications with Series 1 and may move to Satellite in the future.
Salary to $36,000

Randy Pace or Warner Coffman
ROBERT HALF
of St. Louis
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

MINNEAPOLIS ST. PAUL

DEC/FORTRAN

Minneapolis-area firm seeks manager responsible for systems development, installation of new releases, and being central resource for VAX/VMS problem-solving activities. Requires extensive DP background and 2+ years VAX/VMS. To $40,000

BAL

Twin Cities-area financial services in urgent need of person proficient in BAL programming. Major opportunity for advancement within company, with diverse needs. Requires 2–10 years BAL programming and analysis. To low $30's

IMS/IDMS

Minneapolis-based firm has important new opening for systems project leader in data base area. Will supervise design of DB to interface with all company departments. Both physical and logical/functional responsibilities. Requires 2–4 years IMS or IDMS. To $40,000

Mark David or Tim Smith
ROBERT HALF
of Minnesota
3636 IDS Center
Minneapolis, MN 55402
(612) 339-9001

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Solid-state imaging is an exploding technology. And Kodak is in the vanguard with an experimental 350,000-element solid-state sensor array. Its capabilities make it possible to record, store, enhance, manipulate, project, and produce hard copy with resolution, clarity, and impact generations beyond other such devices. What an exciting time to be working at Kodak.

Come, help us discover more high-tech excitement.
If you're determined to expand your horizons into new worlds of high technology—this is the time and this is the place. We need imaginative, motivated EEs, CSs and solid-state physicists. We can put your talents and experience to work immediately—in an environment that encourages initiative, recognizes ingenuity, and rewards contributions. If you're ready to accept the challenges of our fast track in high tech, send your resume to Personnel Resources, Dept. DCPW, Eastman Kodak Company, Rochester, NY 14650.

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Florida's DP community is Booming!
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ANALYSTS/PROGRAMMERS

[illegible]

SOFTWARE/INTERNALS

[illegible]

Other Positions Available [illegible]

MANAGER SYSTEMS AND PROGRAMMING

ST. LOUIS COMMUNITY COLLEGE, has an opportunity for a Systems Professional. The position reports to the Director of Data Systems and is responsible for the management of 7 Programmers/ Analysts. Although this is a management position, the successful candidate must have a solid technical background for hands-on problem solving. Proficiency in COBOL is essential, as is experience in an IBM mainframe environment utilizing VM, DOS/VSE and CICS applications.

Minimum qualifications include an appropriate Bachelor's degree and 6 years of relevant full-time experience. Please submit your resume to:

Personnel Services
ST. LOUIS COMMUNITY COLLEGE
Administrative Center
5801 Wilson Avenue
St. Louis, MO 63110

An Affirmative Action/ Equal Opportunity Employer

Senior Systems Analyst

In international banking system (IBS) environment. [illegible] bank applications such as [illegible] automation, international wire transfer, letters of credit, account liquidation, funds transfer and mail system, accounting and database support. Uses IBM hardware and MICROFLEX software. Handles interface between mainframes and microcomputers. Customizes software to needs of individual user, debugs system and responds to technical inquiries. Must have four years experience same job using IBM hardware and microcomputers and tools, writing abilities. Monday-Friday 8AM-5PM, [illegible] year salary. Send resume to Job Service Of Florida, PO Box 42-1490, Miami, FL 33242-1490. Job order # [illegible]

MAINE - N.H.

We have specialized in data processing professional placement in Maine & N.H. for a fifth of a century. If you qualify for positions in the $25-60,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC.
477 Congress St.
Portland, Maine 04101
(207) 773-[illegible]

CONSULTANTS

IBS is one of the premier consulting services groups in the Midwest. The demand for our services has continued to increase, creating a number of excellent consulting opportunities for experienced professionals in the following areas:

IDMS/ADS-0
DATACOM/IDEAL
NOMAD/FOCUS

If you have qualifications in these areas and you're interested in consulting on a salaried or contract basis, now or in the future, please call (collect) or forward your resume to: John [illegible].

IBS [illegible]

PURDUE UNIVERSITY

DATA BASE ADMINISTRATOR

Combine campus lifestyle with challenging position as Data Base Administrator. The person we seek will be responsible for the design, development, maintenance, documentation, security, and control of agricultural data bases utilized by an international user community consisting of universities, governmental agencies, and private corporations. Duties include supervision of data processing personnel and user training in data base functions. The successful candidate will have a BS or MS degree in computer science or a related field and four years major management responsibility for data base or other software systems in a service-oriented environment. Demonstrated abilities in system design with good organizational and communication skills are essential. Preferred background includes VM/CMS and ADABAS experience. Starting salary [illegible], plus exceptional benefits, depending upon qualifications.

Qualified applicants are invited to send resume and three references to:

Dr. Richard H. [illegible]
Purdue University
[illegible] Hall, Room [illegible]
West Lafayette, IN 47907

or call (317) 494-[illegible] for an application.

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EDP AUDITOR

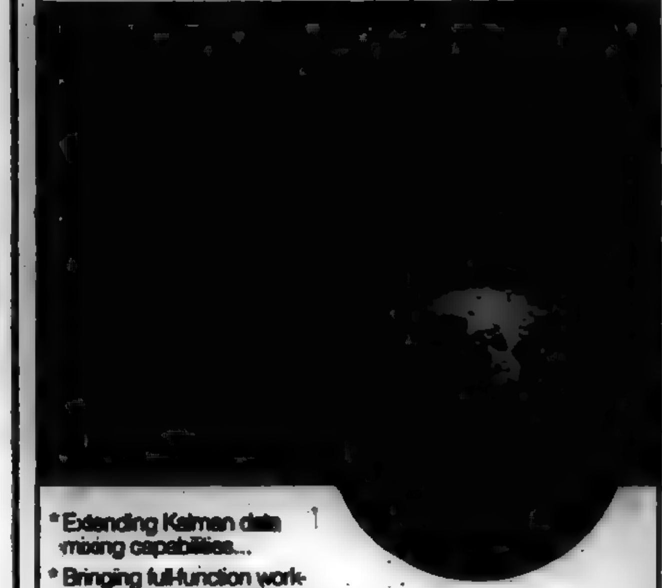
Armour-Dial, Inc., a leading consumer products company, currently has a need for an EDP Business Systems Controller. Position requires a degree in Computer Science or related field and some accounting course work. The ideal candidate will possess 3-5 years audit experience with a good working knowledge of EDP audit techniques; some experience in EDP systems and programming is essential.

This position involves limited travel and is based at our Corporate Headquarters in Phoenix, Arizona. To be considered, your resume must include salary history and requirements. Submit to:

ARMOUR-DIAL, INC.
Greyhound Tower
Suite 112-CW
Phoenix, AZ 85077

Equal Opportunity Employer M/F/V/H

SOFTWARE ENGINEERS/SYSTEMS PROGRAMMERS



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Utilizing the very last word in large-scale IBM realtime systems, operating systems and software for military, scientific and MIS applications.

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Prepared for a fast climb in software? Almost everything at Singer's Kearfott Division flies on software—including careers. There are three mainstays to much of what we're achieving in navigation, guidance, reference, control, airborne computers and our growing leadership in C^3: operating systems development, MIS development, and scientific programming development.

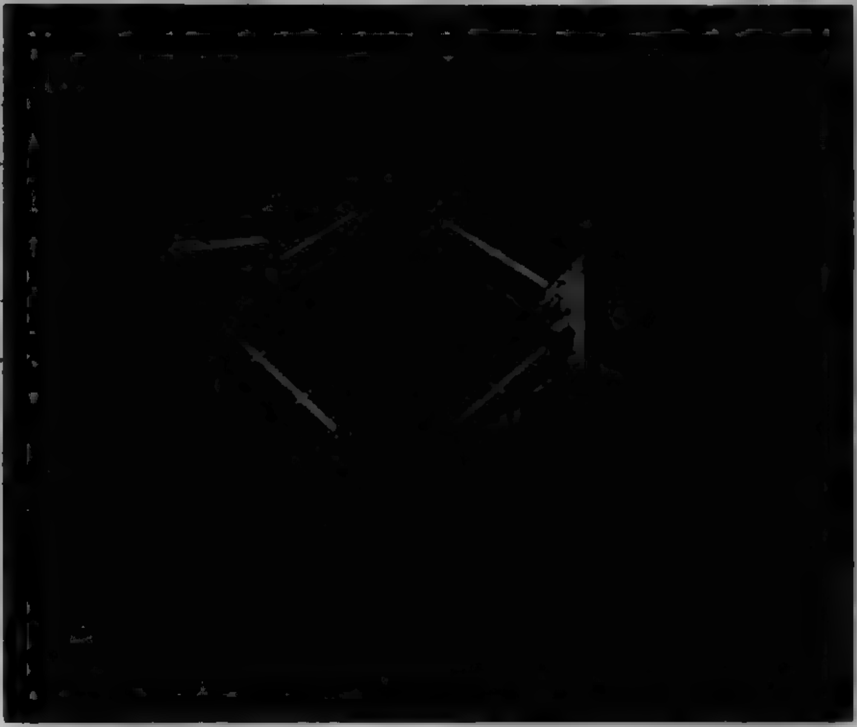
If you have at least 3 years experience in a large-scale IBM system, or with HP, DEC or airborne computers, or micros in realtime military systems, learn how hurdling obstacles—technological and professional—comes with the territory, Kearfott Territory.

Let us tell you more. Please send your confidential resume with salary history and requirements to: Mr. E.J. Murphy, Kearfott Division, Singer Company, Mail Code [illegible], 1150 McBride Avenue, Little Falls, NJ 07424. U.S. citizenship required. An equal opportunity employer, m/f, who creates opportunities.

SINGER

CCB ONLINE SYSTEMS, INC.
TOLL FREE 1-[illegible]
[illegible]

Telecommunications Opportunities with Boeing



For years, Boeing has been an industry leader in advanced technology, with a worldwide reputation for innovative design, engineering, integration, and management. We've developed one of the largest and most sophisticated privately managed telecommunications networks in the world. And now we're applying this expertise to assist other corporations and government agencies in designing, installing, and operating their own networks.

We have openings in Seattle, WA; Vienna, VA; Huntsville, AL; and Harrisburg, PA for telecommunications professionals with the following skills to work on voice, data, video, message and integrated networks:

- Network Traffic Analysis, Modeling and Simulation
- Network Architecture and Topology Development
- Detailed Network Design
- Transmission System Engineering
- Local Area Network Technology and Design
- Cabling and Wiring Systems Design and Implementation
- Central Office Systems Design and Engineering
- Equipment Evaluation and Selection
- Network Installation and Operation and Maintenance
- CCIS Database Systems
- Integrated Network Management System Development
- Data Communication Protocols and Standards
- Project Engineering Management

Boeing provides an attractive compensation and benefits program and a thriving professional environment. To investigate a telecommunications career with us, send your resume including salary history in complete confidence to:

Darlene Robinson
BOEING COMPUTER SERVICES
Dept. CW7-8
7980 Boeing Court
Vienna, Virginia 22180

BOEING

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COMPUTER PROFESSIONALS

Space Telescope Science Institute has positions available for highly motivated professionals who would like the opportunity to make a contribution to one of the most exciting scientific enterprises of the decade.

STScI, which will be the site for scientific operations of NASA's Space Telescope, is presently involved in building and integrating ground support systems for the operation of the satellite. Work involves design, coding, enhancement of systems as well as software-development tools. On our prototype-oriented development team, you will have access to a wide range of languages on a project that spans the computing spectrum, including Artificial Intelligence, scientific programming, as well as state-of-the-art database management hardware. You will work in a small group, where your technical decisions will matter, and your expertise will be well recognized.

, STScI offers an atmosphere of intellectual stimulation and reward and an excellent comprehensive benefits package in a university campus setting. If you are a qualified computer professional, with a solid background in practical applications of computer science, and would like to work in an environment that encourages initiative and technical excellence while affording the opportunity to learn new skills, please forward your resume, and a portfolio of your work to:

SPACE TELESCOPE SCIENCE INSTITUTE
Eric A. Gwaltney, Personnel Officer
3700 San Martin Drive
Baltimore, Maryland 21218

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M/F/H

Engineering

MICRO-TO-MAINFRAME and DATA COMMUNICATIONS

DIGITAL COMMUNICATIONS ASSOCIATES, INC., is a leader in the design, manufacturing and marketing of highly sophisticated products for high-speed multi-host to terminal networks and for micro-to-mainframe communications.

Strong growth dictates extensive needs in several key areas of software engineering, technical support, technical writing, and computer operations. DCA needs people with 2+ years experience in the following areas of expertise:

- **SOFTWARE DESIGN ENGINEERS:** protocols, packet switching, modems, multiplexers, or other C language programming for real-time communications systems; experience needed in initial design, enhancements and modifications, or in software verification and diagnostics of hardware design; appropriate degree.
- **HARDWARE DESIGN ENGINEERS:** will design circuit boards, create firmware, and purchase components (power supplies, chips, etc.), to create modules or complete products. Some software knowledge required. Need solid experience in printed circuit board design; appropriate degree.
- **APPLICATIONS ENGINEERS:** customer interface, systems specifications, site planning, overseeing installations, and network troubleshooting; need experience with voice/data networks (both hardware and software), solid understanding of distributed DP, muxing, etc., and ability to work with multi-vendor networks. Atlanta, Houston, Denver, San Francisco, Los Angeles (no relocation).
- **SYSTEMS MANAGER:** manage in-house computer systems for engineering design. Handle systems fine-tuning, allocation of CPU, disk space, etc., hardware/software installation, and some utilities and software development tool programming. Need solid VAX/VMS or 68000-based UNIX/C experience; degree preferred.
- **TECHNICAL WRITER:** need 1+ year writing specifications and documentation for hardware and software. Knowledge of data communications highly preferred. 4 year degree preferred.
- **MICROSYSTEMS ENGINEER:** will work closely with customers and users on DCA's micro-to-mainframe products. Need 2+ years in user support, operations, or programming of IBM mainframe systems with specific knowledge of TSO, CICS, CMS, MS-DOS, RS-232 interfaces, etc. Excellent communication skills are needed. Atlanta, Chicago, New York City, San Francisco (no relocation).
- **SALES:** need 2+ years selling mainframes, minis or data communications equipment. Need proven expertise in over 100% quota sales and systems versus component selling approach. Expansion openings in major U.S. cities.

DCA offers a professional, yet relaxed work atmosphere, competitive salary and bonus, excellent benefits including major medical and dental coverage, eligibility to participate in tax-free retirement plan, profit-sharing, and as of this month, brand new corporate facilities in North Atlanta with in-house health club!

If qualified and interested in any of the above positions, please send resume and salary history to:

Technical Recruiter
DIGITAL COMMUNICATIONS ASSOCIATES, INC.
1000 Alderman Drive
Alpharetta, GA 30201

Equal Opportunity Employer

dca

FLORIDA OPPORTUNITIES

Lockheed Space Operations Company (LSOC) is the prime contractor to NASA and the U.S. Air Force for the Shuttle Processing Contract. This long-range contract involves our employees in the support engineering of the orbiter's on-board equipment and associated ground support systems. We have needs for qualified computer professionals who seek the stimulating, challenging environment that Lockheed Space Operations in Florida offers.

HONEYWELL

As a contributing member of a team of Programmers and Programmer Analysts, you will be involved in the development, implementation, and support of a large scheduling and production system based on Honeywell DPS-6 environment utilizing COBOL. Preferred candidates for these positions will possess three or more years' experience and will have a good working knowledge of DM-4.

HEWLETT-PACKARD

If you have a current Hewlett-Packard background in a business application environment utilizing COBOL, we may be your ticket to a career opportunity in Florida! Upon joining our team, you'll be a member of a small EDP support team and involved in the enhancement and modification of our company's MIS applications.

We are located in the Florida Space Coast Resort area, where you will earn a nationally competitive income while paying NO state or local income taxes—AND enjoy the generally lower cost of Florida living. If you are qualified in either of the above areas, and you wish to further explore these opportunities, please call Don Culik collect at (305)-[illegible]-2070 during normal working hours or send your resume for immediate consideration.

LOCKHEED SPACE OPERATIONS COMPANY
Employment Office
P.O. Box 2807
Titusville, Florida 32781-2807

Lockheed
Space Operations Company

Giving Shape To Imagination An Equal Opportunity/Affirmative Action Employer. U.S. Citizenship Required.

SOFTWARE PROFESSIONALS

Rand Systems Corporation, an eleven year old software services firm, is constantly looking for talented professionals with the following skills:

- IBM DB/DC, CICS, Cobol, PL/1, RAMIS, FOCUS, IDMS, ADS/O
- VAX/VMS, PDP-11, IBM SYSTEM 38/36/34
- DEC DIBOL, PASCAL
- ENGINEERING/SCIENTIFIC, FORTRAN
- MICROCOMPUTER ENGINEERING, [illegible]
- DEC MANUFACTURING SYSTEMS
- REAL-TIME PROCESS CONTROL

Rand Systems Corporation is preparing for another period of major growth in our exciting industry. We provide excellent benefits (including Blue Cross Medical/Dental), year-end bonus, and over-time pay. Please call Mr. Rand at 313-855-6877 or send resume:

RAND SYSTEMS CORPORATION

RAND SYSTEMS CORPORATION
7071 Orchard Lake Road, Suite 325
West Bloomfield, MI [illegible]
(313) 855-6877

All replies held in strict confidence

DATA PROCESSING PROFESSIONALS

State of South Dakota

Rewarding professional opportunities are available to experienced individuals who can work with and relate to large scale data processing organizations. We use dual 3033's and will expand to a 308X or 3090 next year. Our operations environment includes MVS, CICS and ADABAS/NATURAL. We support 200 IBM and compatible microcomputers with a variety of software.

Currently, we are looking for PROJECT MANAGERS with proven track records, DP SPECIALISTS to work with a number of government agencies on technical issues, and PROGRAMMER ANALYSTS at all skill levels.

The capital city of Pierre is located on the Missouri River and is an outdoor person's paradise. If you are concerned about quality of life, but want challenge and opportunity too, write us!

Send resume, with Social Security number, and salary expectations to:

James K. McAtee
Commissioner
SOUTH DAKOTA BUREAU OF PERSONNEL
118 West Capitol Avenue
Pierre, South Dakota 57501

OPERATING SYSTEMS SPECIALIST

Is wanted by Nebraska Public Power District at the Columbus General Office. The applicant must have a degree in Computer Science or a related technical field, and at least two years experience as a systems programmer on the IBM MVS operating system. Thorough knowledge of internals of MVS, operating system structure, and MVS systems software maintenance using the System Maintenance Program (SMP) is considered essential. The applicant must be fluent in the use of IBM System/370 assembler language, and should have a working knowledge of one or more high level programming languages. Familiarity with SAS* or PL/1 will be considered an asset. A strong understanding of the basic concepts of IBM System/370 computer hardware architecture, including data storage devices, is mandatory. Salary range $27,[illegible] to $34,400.

Excellent Fringe Benefits. Equal Opportunity Employer M/F.

Send resumes to:

Gary A. [illegible]
Human Resources Department
NEBRASKA PUBLIC POWER DISTRICT
P.O. Box [illegible]
Columbus, NE [illegible]

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DUNHILL OF ANDERSON YOUR EXTENSION TO DATA PROCESSING PROFESSIONALS

It only takes a call to Dunhill of Anderson to ascertain job opportunities available to Data Processing Professionals on a national basis.

Our office specializes in locating experienced Programmers, Programmer Analysts, Systems Analysts, and Systems Programmers for the most respected corporations in the nation.

We don't require an obligation and we never charge a fee. All matters are held in strictest confidence.

To obtain an update on current market trends, salary ranges, and specific employment opportunities please call or mail resume to:

[illegible]
Computer Specialist
Dunhill of Anderson, Inc.
P.O. Box [illegible]
Anderson, South Carolina [illegible]
1-800-[illegible]-7017 (Collect)

PROJECT MANAGER (ANALYST) - To direct and coordinate planning and production activities of the electronic data processing and analysis for computer project; consult with management to define boundaries and priorities, determine information requirements, and confer with appropriate personnel to [illegible] and further define nature of project. Assign, schedule and review work and [illegible] progress reports; [illegible] program testing, [illegible] and analyze data requirements and flow; direct training of [illegible] and maintenance of existing business application systems; [illegible] of complete online [illegible] systems using structured methodology. Must have experience with database [illegible], [illegible]. Must also be familiar with [illegible], COBOL, and ALGOL. Must be willing to travel on short term basis, and be able to translate customer requests into usable computer systems. Must have demonstrated management experience. B.S. degree in Computer Science or related field together with 4 years experience in position or 5 years as Consulting Analyst. Salary - $[illegible] per year. Apply with resume and proof of experience to Georgia Department of Labor, 2372 South Cobb Drive, Smyrna, GA. Control number GA[illegible].

MANAGER DATA MANAGEMENT SECTION

The South Carolina Tax Commission is seeking a Manager proficient in database DB technology to join the management team in the Information Resource Management Division. This position is responsible to the Director of the IRM Division for formulating, implementing, and directing the activities of a technical staff charged with data delivery, [illegible], data base administration, systems standards administration, systems quality assurance, teleprocessing communications, hardware and software evaluation and analysis. An undergraduate degree with 5 years technical software experience with a minimum of 2 years in a mainframe data base environment (preferably IDMS) and one year supervisory experience or an equivalent combination of education and experience. Salary range is $31,775-$46,[illegible]. Send resume with salary history to:

S.C. Tax Commission
Personnel Department
P.O. Box 125
Columbia, SC 29214
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PROJECT MANAGER

Develop, design and implement complete hardware and software systems for Burroughs equipment (micro-computer) in the area of computer networking, data communications and systems software. Develop applications to meet specific client user requirement. Client interfacing and management of teams of computer professionals on various sophisticated projects. Bachelors degree in Engineering or Computer Science. 3 years experience in job offered or 3 years as a systems analyst, computer consultant and/or computer teaching experience in a university setting. At least 2 years of above experience must be with micro computers including one year of on Burroughs and/or Prime equipment. 40 hour week, 9-5, $[illegible] per year. Employer paid ad. Resumes to: 7310 Woodward Avenue, Room 415, Detroit, MI 48202. Reference #[illegible].

SYSTEMS ANALYST ADMINISTRATIVE COMPUTER SERVICES

- Bachelor's degree in Computer Science or closely related field and three years of programming experience on large mainframe computer, with high proficiency in COBOL required. Hands on experience with on-line transaction processing and data base systems and/or college application systems preferred. Extensive experience in the areas indicated will be considered in lieu of the formal education requirement. To apply, submit a letter of application and resume by July 15, 1985, to: A.J. Brooks, Director of Personnel, Sinclair Community College, 444 West Third Street, Room 7240, Dayton, OH 45402. Equal Opportunity Employer

data processing

Opportunities For Managers Experienced In Health Insurance Membership & Billing Systems

The news is out. The time is now. This is your opportunity to join us from the very beginning.

We're looking for shirt sleeve leaders. Each of the following positions requires a minimum of 5 years DP experience – including 1 or more at the management level – and an indepth knowledge of health insurance membership and billing systems.

BUSINESS SUPPORT MANAGER
Responsibilities include development of business support staff, coordinating in-house and client training, reviewing systems support documentation, and performing administrative duties. You must have demonstrated abilities in business requirements definition and systems analysis.

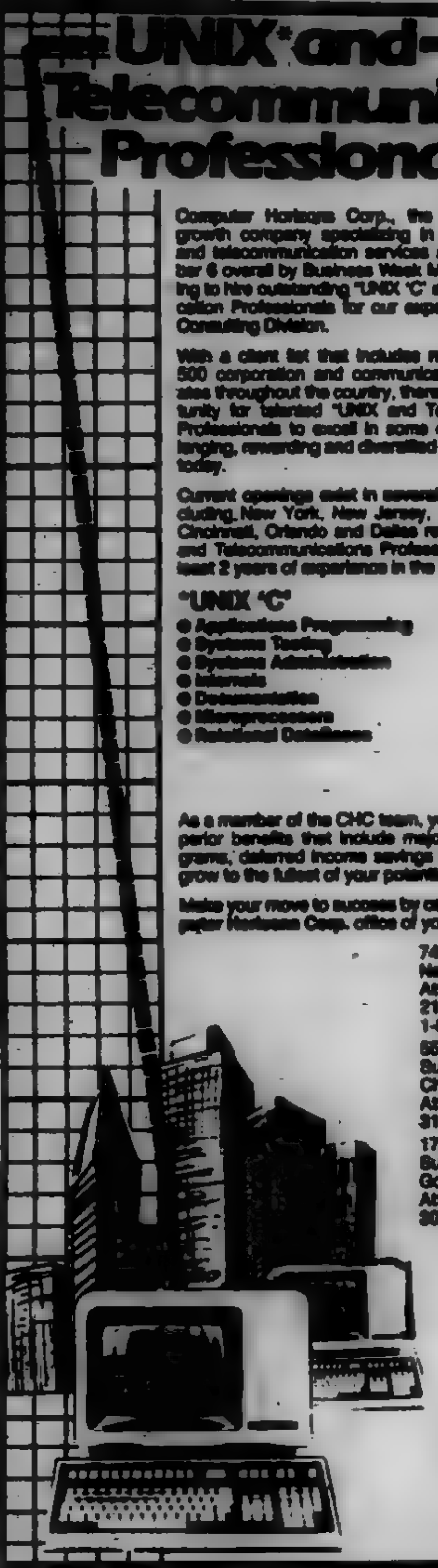
PROGRAMMING MANAGER
As head of the programming staff, you will schedule resources, prepare and administer budgets, prepare cost estimates, and provide technical consulting. Experience in IMS, CICS and DL/1 is necessary; knowledge of formal life cycle approach to systems development is required. Previous programming management experience is a must.

In addition to a creative environment, we offer the on-going educational support that ensures growth to achievers; excellent salaries and complete benefits. Our new headquarters in Bloomingdale provides easy access to major Chicagoland expressways. Send resumes or call Trudy Norman, 312/893-8066, Dept. 6539, ADVANCED SYSTEM APPLICATIONS, INC., One ASA Plaza, P.O. Box 395, Bloomingdale, IL 60108. An Equal Opportunity Employer M/F/H.

Join us at the beginning of an exciting new future.

ADVANCED SYSTEM APPLICATIONS, INC. ASA SM

Challenging the best in you.



UNIX* and Telecommunications Professionals

Computer Horizons Corp., the nation's leading growth company specializing in data processing and telecommunication services and ranked number 6 overall by Business Week Magazine, is seeking to hire outstanding "UNIX 'C' and Telecommunication Professionals for our expanding Mini/Micro Consulting Division.

With a client list that includes numerous Fortune 500 corporation and communications conglomerates throughout the country, there exists the opportunity for talented "UNIX and Telecommunication Professionals to excell in some of the most challenging, rewarding and diversified projects available today.

Current openings exist in several of our offices including New York, New Jersey, Chicago, Denver, Cincinnati, Orlando and Dallas requiring "UNIX 'C' and Telecommunications Professionals to have at least 2 years of experience in the following areas:

"UNIX 'C'
- Applications Programming
- Systems Testing
- Systems Administration
- Internals
- Documentation
- Microprocessors
- Relational Databases

TELECOMMUNICATIONS
- X.25 Protocol Development under "UNIX 'C'
- Network Protocol Design including X.25, Ethernet
- SNA/SDLC, HDCL, ASYNC, SYSNC and 3270
- Data Communications and/or Voice Analysis and Planning
- PBX Design through Implementation
- Local Area Networking

As a member of the CHC team, you'll enjoy a salary that is above industry standards, superior benefits that include major medical/dental, life insurance, in-house training programs, deferred income savings plan and relocation assistance plus the opportunity to grow to the fullest of your potential.

Make your move to success by calling (COLLECT) or submitting your resume to the Computer Horizons Corp. office of your choice mentioned below:

747 Third Avenue
New York, N.Y. 10017
Att: Richard Rauchbach
212-371-9600 or
1-800-847-4097

4 Century Drive
Parsippany, N.J. 07054
Att: Steven Schloss
201-539-7800

55 West Monroe Street
Suite 980
Chicago, Illinois 60603
Att: Steve Armintrout
312-332-4747

7505 Sussex Drive
Suite 12
Florence, Kentucky 41042
Att: Tom Hall
606-525-0429

1726 Cole Boulevard
Suite 327
Golden, CO 80401
Att: Linda Berry
303-278-8383

1220 Douglas Avenue
Suite 107
Longwood, Fla 32779
Att: Jim Sanders
305-862-0666

8585 N. Stemmons Freeway
N. Tower, Suite 525
Dallas, Texas 75247
Att: Pat Schmitz
214-631-8500

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COMPUTER HORIZONS CORP.

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LAI is a growing systems software development and consulting firm that can use your talents in UNIX, C, UTS, and Networking! We have over 100 professionals and have been leaders in UNIX related software development for the past 7 years. We promote the professional growth and fulfillment of our staff by providing a wide range of high quality technical services for our clients.

Opportunities in Supercomputer operating systems, network protocol development, advanced Unix terminal processing, and technical systems support in Chicago, Columbus, New Jersey, Denver and worldwide. For further information, please contact:

Lachman Associates, Inc.
Attn: Staffing-CW
645 Blackhawk Drive
Westmont, IL 60559
(312) 986-8840 or (800) LAI•UNIX

UNIX is a trademark of AT&T Bell Laboratories UTS is a trademark of Amdahl

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DATA PROCESSING PROFESSIONALS

DATA RESOURCE CORPORATION, headquartered in Atlanta, is seeking individuals who desire to work in various stimulating Data Processing environments: IMS and CICS skills are of special interest, as is the ability to travel or relocate.

Consulting and Contract Programming throughout the Southeast for nine years, DRC offers competitive salaries including bonuses and overtime pay. If you are searching for a growth opportunity with a dynamic and progressive company that "puts people first" DRC is your answer. Send resume to:
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Atlanta, GA 30341, or call: BECKY FINLEY or IVA WALLS at:
404-455-7260 or toll free
1-800-241-6082

DRC

EOE

Accounting

EDP STAFF AUDITOR

Southern California

American Honda has an unsurpassed reputation for excellence in the automobile, motorcycle and power equipment industries.

Our location in the Los Angeles area can offer you the utmost in recreational opportunities, in addition to the professional benefits of working with a thriving industry leader.

Currently, we are seeking an EDP Staff Auditor. In this position, you will conduct audit reviews and will recommend improvements of our information systems. Through the use of automated audit procedures, you will provide technical support to our internal audit staff.

Requirements include experience in an IBM mainframe environment and technical knowledge of applications planning, design, review and implementation. Excellent communication and interpersonal skills are required as well as a degree in Business or Computer Science.

American Honda can offer you an excellent salary and benefits package which includes relocation assistance. For immediate consideration, please send resume and salary history to: Wendy Wells Cline and refer to Dept. 28W

H O N D A

AMERICAN HONDA MOTOR CO., INC.
100 West Alondra Blvd.
Gardena, CA 90247

Equal Opportunity Employer M/F

DATA PROCESSING

Northrop Advanced Systems Division in Southern California

Northrop Advanced Systems Division is advancing aviation into the 21st century by successfully interfacing human creativity and ingenuity with the most sophisticated computer systems. Utilizing the latest equipment and techniques, our innovative Information Resource Management (IRM) organization attracts the nation's finest computer professionals.

Our Pico Rivera location is ideally situated midway between Los Angeles and Orange County in Southern California. And while our modern facilities are an ideal setting for your professional growth and development, our exceptional climate and nearby beaches, mountains and deserts offer you unlimited opportunities for recreational, cultural and personal fulfillment.

We have the following immediate opportunities:

IMS Database Administrators
IMS Systems Programmers
MVS Systems Programmers
IBM Equipment Configuration Specialists
Performance Specialists
Change Management
Network Design Specialists

Sr. Communications Analysts
Network Control Analysts
Scientific Programmers/Analysts
- Engineering
- Manufacturing
- Logistics

Computer Aided Design (CAD) Specialists
Data Control Systems Specialists

Relocation assistance is available.

For more detailed information see our ad in Computerworld's special NCC DAILY issues, July 15-18.

Northrop provides our employees a competitive, comprehensive benefits package. Please send your resume to: Bill Hargan, Computer Systems Employment Office, Dept. CW 661, P.O. Box 1138, Pico Rivera, CA 90660-0677.

PROOF OF U.S. CITIZENSHIP REQUIRED. Northrop is an Equal Opportunity Employer M/F/H/V.

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NORTHROP

Advanced Systems Division
Aircraft Group

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TALK DIRECTLY WITH A HIRING MANAGER FROM THE CONVENIENCE OF YOUR HOME

CALL US (Collect) TUESDAY OR THURSDAY THIS WEEK FROM 5 to 8 p.m. (EDT)

and, if you appear qualified for one of the position openings below, we'll connect you with the appropriate technical manager for an immediate and confidential discussion.

We serve over 1,000 users with data processing services. We have enjoyed an annual growth rate of over 20% during the past 5 years and we project continued growth. We invite you to grow with us.

We can offer you an excellent salary, an outstanding benefit program which includes tuition reimbursement, company paid health and dental insurance for you and your family, and the opportunity to join our staff of over 1,000 very talented people.

We presently have openings for:

TELECOMMUNICATIONS SPECIALIST
with experience on either COMTEN 3690 or IBM 3725 and familiarity with various modems and multiplexers.

PROGRAMMER ANALYSTS
with COBOL, JCL experience in an IMS environment.

SYSTEMS PROGRAMMERS
with MVS/XA, VM, CICS or IMS experience.

DATA SECURITY MANAGER
with experience in managing data security in support of an IBM Host Center with knowledge of RACF.

If you feel you are qualified for any of these positions, we invite you to call us (collect) Tuesday or Thursday evening this week. If you would like a "no resume required instant interview" and can't call one of these evenings, please call during the business day and we'll make an appointment for another evening convenient to you. We will also, of course, respond to resumes.

LET US HEAR FROM YOU THIS WEEK. OUR NUMBER IS (305) 826-7417.

Professional Employment
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Post Office Box 13355-A, MP-357
Orlando, Florida 32859-0355

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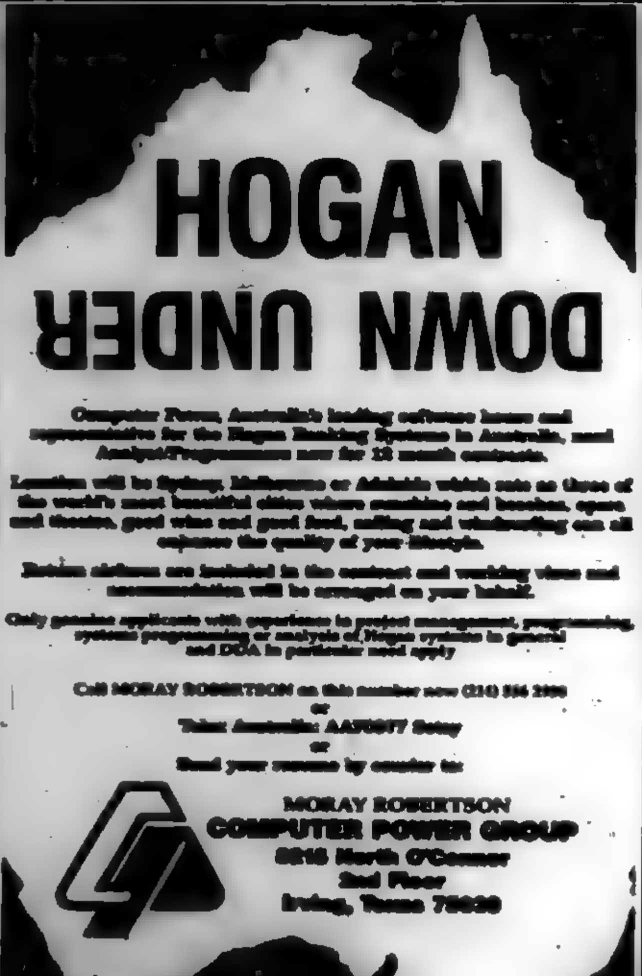
MARTIN MARIETTA



HOGAN DOWN UNDER

Computer Power, Australia's leading software house and representative for the Hogan Banking Systems in Australia, need Analyst/Programmers now for 12 month contracts.

Location will be Sydney, Melbourne or Adelaide which rate as three of the world's most beautiful cities where sunshine and beaches, opera and theatre, good wine and good food, sailing and windsurfing can all enhance the quality of your lifestyle.

Return airfares are included in the contract and working visas and accommodation will be arranged on your behalf.

Only genuine applicants with experience in project management, programming, systems programming or analysis of Hogan systems in general and DDA in particular need apply

Call MORAY ROBERTSON on this number now (214) 556 2190
or
Telex Australia: AA70077 Sydney
or
Send your resume by courier to:

MORAY ROBERTSON
COMPUTER POWER GROUP
5215 North O'Connor
2nd Floor
Irving, Texas 75039

HEALTHCARE M.I.S.
St. Luke's Hospitals, a progressive 484 bed acute medical center located in Fargo, ND, has two openings in Computer Services. The individuals selected will be in on the ground floor of the selection and implementation of a Hospital Information System.
SYSTEM ANALYST: Individual will plan and coordinate the design of software projects and the implementation of application software. Requires a bachelor's degree in Computer Science or related technical field, plus 3-5 years healthcare experience.
CLIENT SUPPORT COORDINATOR: Individual will provide training, consulting and implementation assistance to micro and software users within the hospital complex. Prefer experience with micro computers in networking, communications, hardware and applications software; plus user support experience in an interactive mainframe environment. 3-5 years data processing experience. Please submit resume and salary requirements to Human Resources Department, St. Luke's Hospitals, [illegible] Avenue, Fargo, ND [illegible]. An Equal Opportunity Employer.

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Several S. Florida major corp's experiencing financial and mfg industry are expanding their development staff. [illegible] IBM, COBOL, CICS. Opportunity to expand your design skills and make a real impact within the corp. Excellent upward mobility. FEE PAID.

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Sys. Programmers	$35k

[illegible]
(615) 292-6831
[illegible] Personnel
Suite 310
3401 W. End Ave.
Nashville, TN 37203

SR. SYSTEMS ANALYST/ SUPERVISOR

Responsible for the support and maintenance of a Sperry Univac System environment. [illegible]

BA in Computer Science or Data Processing. [illegible] Job Order #: [illegible] DOT Code: 012.167-[illegible]. Apply to Job Service, [illegible], NC or to the Job Service nearest you.

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COMMONWEALTH OF VIRGINIA

[illegible]

Computer Systems Engineer [illegible]

[illegible] Degree in Computer Science, Information Systems, Mathematics, Engineering or a related field preferred.

Data Base Administrator [illegible]

[illegible]

Submit completed State of Virginia application form to: Personnel Office, Virginia Department of Agriculture and Consumer Services, Suite [illegible], 1100 Bank Street, Washington Building, Richmond, VA 23219. [illegible] Applications must be received by 5:00 July 31, 1985.

Equal Opportunity Employer M/F

DATA PROCESSING

The Circuit Court of Jackson County Missouri is seeking qualified individuals for career positions in Data Processing. Openings are currently available for the following positions:

Senior Programmer

[illegible]

Systems Analyst

[illegible]

Circuit Court of Jackson County
Department of Personnel
[illegible]
Kansas City, MO [illegible]

CONTRACTORS

$35-$50/Hr.
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(213) [illegible]

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...capable of directing teams of 10-20 P/A's and project leaders in the development of efficient application systems. Backgrounds should include at least 3 yrs. of supervisory/management experience directing a team of P/A's. Past experience with Life Insurance systems and/or Lifecomm-Life/70 software is highly desired.

Sr. Programmer Analysts

...who have 3+ yrs. experience in a large IBM environment and are interested in extensive user interface with analysis and design duties and are capable of accepting major project responsibilities. Languages should include either Cobol, Assembler, or both.

Located just 30 minutes from Philadelphia on a 100+ acre wooded campus, our IBM 3081, 3033 shop is one of the largest in the Philadelphia metro area. Along with our excellent location, we offer an outstanding compensation program and the commitment to employee career development. If you too would like to accept the challenge, send resume today to:

National Liberty Corp.
Liberty Park, Frazer, PA 19355
Attn: Kevin Hudson

Equal Opportunity Employer, M/F/H/V

Innovation

TANDEM APPLICATIONS PROGRAMMER

Lockheed-Georgia Company, the acknowledged leader in airlifter technology, is seeking a TANDEM Computer Professional to join its expanding MIS Staff. The person selected will have three years of COBOL applications programming experience, a sound working knowledge of TANDEM COBOL, SCOBOL, INSPECT, TMF, and the PATHWAY Operating Environment.

Applications supported include Time and Attendance, Labor Recording, and Fabrication Shop Activities.

HARDWARE: (5) TANDEM-TXP's
(2) TANDEM NON-STOP 11's

The Lockheed-Georgia Company, located in Marietta, Georgia, an attractive Atlanta suburb, offers excellent salaries and a comprehensive benefit program. For immediate confidential consideration, please forward your resume with salary history to:

Lockheed-Georgia Company
Professional Employment
Dept. 90-31- 432
Marietta, Georgia 30063

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Lockheed-Georgia Company
Giving shape to imagination.

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Sperry's all-out commitment to our new Software Technology Center in Atlanta requires that we bring together "Software Craftmasters" to work in a one-of-a-kind facility equipped with every resource they'll require. These high-powered professionals will be taking on the biggest challenge the industry can offer — to create a new world of operating systems software for Sperry's most advanced computers. The finest creative talent will have the opportunity to work in this technology-transfer organization that will bring together research advancements in software — from engineering through product development.

At Sperry's new Atlanta Software Technology Center, you will be working in a "pure" and flexible R & D environment that is highly conducive to original conceptual thinking and future career development. You will also enjoy all the cultural, recreational, professional and social advantages of living and working in the South's most exciting city: ATLANTA. We invite you to join and grow with us in one of the following areas:

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Join a team of recognized achievers performing key creative work in design and implementation of state-of-the-art operating systems for Sperry's premier computer line. These positions require 6-7 years of experience in operating systems design and development. Working knowledge of IBM-MVS, VM or XA is preferred. Message-base systems and operating system security knowledge would be a definite plus.

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A thorough background in software and software development is a prerequisite for working in the technology-transfer organization that brings together research advancement in software engineering for product deployment. An advanced degree in computer science or a related field is preferred.

Our rewards will back up our commitment — Sperry's career packages will exceed your expectations for every aspect of your future, both personal and professional. To discuss these unique opportunities at the Atlanta Software Technology Center, call Michael Wiest TOLL FREE at 1-800-328-0236, or send your resume to: Professional Staffing, Department MDW4B, Sperry Corporation, P.O. Box 64942, MS 4973, St. Paul, MN 55164. An Equal Opportunity Employer M/F/H/V.

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Contact: Mary Beth Walsh
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212/766-4400

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UNITED AIRLINES

PROJECT MANAGER —

LARGE-SCALE COMPUTER APPLICATIONS DEVELOPMENT PROJECTS

Recognized as a leader in the integration of computer technology and business systems, United Airlines is now forming a key Project Management team to lead major, multi-million dollar computer applications development efforts. United Airlines has made a commitment to the development of strategic computer systems for enhanced utilization of emerging technologies. These positions will play a critical role in the fulfillment of that commitment. The individuals we seek will have prior computer system development project management experience directing multi-disciplined teams of computer and business professionals. Previous experience in the management of high volume real-time application development in the airline industry or with a large financial institution would be considered a plus. The successful candidate will have a strong business orientation. Knowledge of advanced project management methodologies and planning tools will be essential. An MBA or equivalent and prior consulting experience preferred.

Based at our northwest suburban Chicago Headquarters Complex, we offer exceptional salary and benefits package including relocation assistance. Pass/reduced fare air travel privileges also available. Send a resume including salary history in strictest confidence to: Professional Employment/EXOPT-PM1, United Airlines, P.O. Box 66100, Chicago, IL 60666. *Equal Opportunity Employer M/F*

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With An Imagination Like Ours, Creative Talent Won't Take A Back Seat!

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SENIOR SYSTEMS DESIGNER: Requires 6 years in data processing with at least 4 years in systems development and background with airline business applications systems in a maintenance and engineering environment. Complex systems experience on IBM/Wang equipment and a BS in Computer Science, Math, Engineering, or Business are preferred. Excellent human relation skills are essential.

This individual will be responsible for designing and transforming user requirements. Will also provide technical advice and expertise to Line Haul Operation management on all aspects of user application systems, including state-of-the-art information of related industry data processing application systems. (Code #: SD7/8)

ENGINEER/SENIOR ENGINEER/INFORMATION SYSTEMS: Requires a BS degree in Computer Science, Math or Engineering and 2-4 years experience in systems hardware/ software support. Experience in the following areas is preferred: design of system hardware configurations and installation of Local Area Networks (LAN); design of hardware configurations; exposure to mainframe, mini and micro computers; telecommunications; exposure to broadband (voice, video, data, text) networks; and project leadership. Excellent oral/written communication skills are essential.

These individuals will perform the design testing activities relevant to computer hardware, software and communication implementation for Line Haul operation. (Code #: SE7/8)

Along with an attractive salary, excellent benefits and ongoing opportunities for career advancement, you'll enjoy an ideal lifestyle in Memphis, a city known as a growing center for commerce, with many cultural, recreational and personal advantages.

For prompt, confidential consideration, send resume with salary requirements to: FEDERAL EXPRESS CORPORATION, P.O. Box 727, Dept. 2411-180, Memphis, TN 38194. (On your envelope, please include the corresponding code number of the position for which you are applying.) An Equal Opportunity Employer, M/F.

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- Software Development Mgr.
- Technical MVS Specialist
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COMPUTER PARK, P.O. Box [illegible]
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Programmers/Analysts
Miami and Northern New Jersey Locations

Pan Am is seeking a number of qualified IPARS/PARS applications and ACP/TPF system programmer/analysts to support an aggressive development plan. Projects include fare quotation and pricing, departure control, schedules/availability and others. Application openings exist at both locations. Systems Programmers will join a team implementing the most recent version of TPF at our Northern New Jersey location.

Applicants must have a MINIMUM of 2 years programming experience in ACP/TPF systems or in IPARS/PARS reservations/departure control/cargo applications. 4 year college degree essential. Excellent benefits, including travel. Send your resume to:

MANAGER, EMPLOYEE SERVICES
PAN AM
8 King Road
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We Are An Equal Opportunity Employer M/F

ACP
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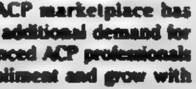
Rapid, but controlled expansion in the ACP marketplace has created additional demand for experienced ACP professionals to compliment and grow with our existing staff in this specialized area of data processing.

High level challenging development will be only one of the many rewards to this exceptional opportunity. You will also enjoy an excellent salary and comprehensive benefits package, generous bonus programs, paid overtime, company paid relocation, career stability and upward mobility.

If you have at least two years experience in an ACP environment and would like to learn more about one of the fastest growing computer consulting companies in the U.S. and how you can become a part of this growth, call us collect at (214) 788-4100, or send your resume in total confidence to:

Robert F. Waring
MERIT COMPUTER
SYSTEMS, INC.
12201 Merit Drive
Suite [illegible]
Dallas, Texas 75251

Merit Computer Systems, Inc.
DATA PROCESSING PROFESSIONAL SERVICES



Equal Opportunity Employer

Systems Programmer/Analyst

Computer operating Systems Programmer/Analyst to support [illegible] on [illegible] 3081. Experience and four year college degree required. For further information, contact [illegible], The University Of Alabama, Tuscaloosa, AL. [illegible]

Remote Site Supervisor/Consultant

The University Of Alabama is seeking applications for two remote site Supervisor/Consultant positions. [illegible]

Applicants should submit their resumes to The University Of Alabama, Employment Office, P.O. Box [illegible], University, AL [illegible].

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Design, develop and implement systems using RPG II on system 34's and 36. Minimum of 4 years experience. Ability to work independently and willingness to travel. We offer an excellent starting salary and a comprehensive benefits plan. For prompt consideration, please forward resume with salary history to:

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We are a Major Maryland Commercial Bank seeking a qualified candidate who has 3-5 years experience as a Systems Analyst in an IBM, on-line environment. [illegible] call collect at [illegible] or send resume with salary requirements to:

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Attention: [illegible]
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[illegible] Street
Baltimore, MD [illegible]

EOE

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EDP AUDITORS	Mfg, Ins	to $[illegible]
HP COBOL		to $[illegible]
CICS	Mfg, Ins, Banking	to $[illegible]
[illegible]	Software Eng.	to $[illegible]+

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- Real time software systems architecture, design, development, programming and maintenance
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- Structured programming and configuration control
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- Signalling processing/packet switching
- CCITT signal system 5, 6, 7
- Intel 8086
- Large application software experience

Individuals with BS/MS/Ph.D. degrees in Electrical Engineering and/or Computer Science preferred.

APR provides an excellent salary (commensurate with years of experience and education), along with fully paid company benefits. If you feel you want to join the leader, please call and/or send your resume, in confidence, to: Corporate Recruiter, ADVANCED PROGRAMMING RESOURCES, INC., 2715 Tuller Parkway Drive, Dublin, Ohio 43017, 614-766-6901. An equal opportunity employer, m/f.

APR
ADVANCED PROGRAMMING RESOURCES, INC.

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ADR software speaks the language of tomorrow.

Right now, ADR software professionals are developing the standards our industry will follow into the 1990s and beyond. We have positions available for individuals who would rather create tomorrow's standards than follow them. These openings are at our World Headquarters in Princeton, NJ and our DBMS Development Center in Dallas, TX.

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- PC / Mainframe Communications
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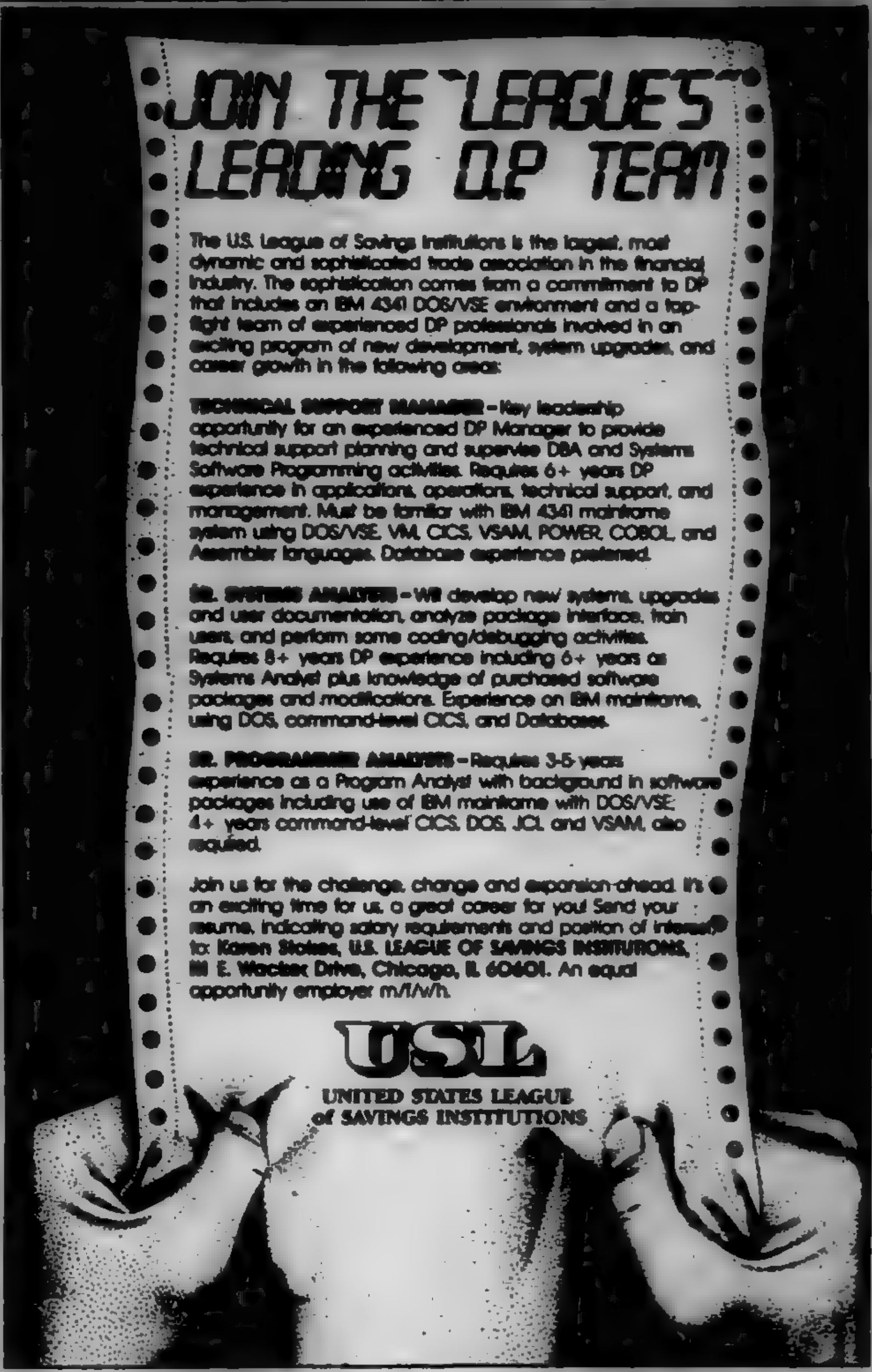

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TECHNICAL SUPPORT MANAGER – Key leadership opportunity for an experienced DP Manager to provide technical support planning and supervise DBA and Systems Software Programming activities. Requires 6+ years DP experience in applications, operations, technical support, and management. Must be familiar with IBM 4341 mainframe system using DOS/VSE, VM, CICS, VSAM, POWER, COBOL, and Assembler languages. Database experience preferred.

SR. SYSTEMS ANALYSTS – Will develop new systems, upgrades and user documentation, analyze package interface, train users, and perform some coding/debugging activities. Requires 8+ years DP experience including 6+ years as Systems Analyst plus knowledge of purchased software packages and modifications. Experience on IBM mainframe, using DOS, command-level CICS, and Databases.

SR. PROGRAMMER ANALYSTS – Requires 3-5 years experience as a Program Analyst with background in software packages including use of IBM mainframe with DOS/VSE; 4+ years command-level CICS, DOS, JCL and VSAM, also required.

Join us for the challenge, change and expansion ahead. It's an exciting time for us, a great career for you! Send your resume, indicating salary requirements and position of interest, to: **Karen Stokes, U.S. LEAGUE OF SAVINGS INSTITUTIONS, 111 E. Wacker Drive, Chicago, IL 60601.** An equal opportunity employer m/f/v/h.

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ROBERT HALF

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Programmer Analysts

Progressive and respected national firm with regional headquarters in Orlando requires several Programmer Analysts with strong COBOL, Command Level CICS, DOS/VSE IBM 4300 series. Experience in loan development desired, but individuals with strong technical background will be considered. Salary to mid-30's.

Data Base Administrator

Orlando client requires DBA with 5+ years of experience; heavy COBOL under IMS. Financial background preferred. Salary to high-30's.

Programmer Analyst

Jacksonville Fortune 500 client needs IMS DB/DC COBOL Programmers. Growth centered company with excellent career opportunities. Salary to high-30's.

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IBM S/38 DP Manager

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by assuming take-charge control of a department that sets the standard in the mail order industry.

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To qualify for the position, you must:

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If you qualify, send your resume and salary history to:

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•Programmer/Analyst Positions Also Available•

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Our creative application of systems that can be used from design through manufacturing has solved problems for businesses, large and small. It's been INTERGRAPH's ability to respond with leading edge products for an ever-changing workplace that has spearheaded our leadership role. If you have an interest in being with the trendsetter in interactive computer graphics, join us now in one of the following opportunities:

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Individuals will be involved with the marketing of applications for multi-axis NC machines to various industries. Must have knowledge of APT or COMPACT II, and we prefer a B.S. in Engineering with applicable experience.

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A minimum of 2 years experience in the maintenance of computer systems and peripherals; disk drive and VAX experience a plus. Training in the field of interactive graphics provided at our Huntsville headquarters. Positions available nationwide.

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An excellent opportunity for a key professional in R&D with a background in applied mathematics and experience in solids modeling from a software development point-of-view. Knowledge of B Rep Representation is preferred over CSG. Along with a minimum of 2-3 years experience, applicants should have an M.S. or PhD in Applied Mathematics.

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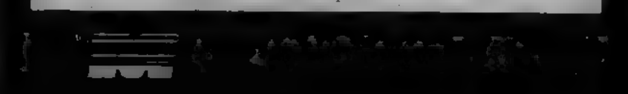

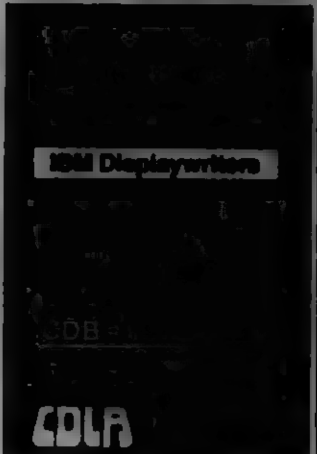

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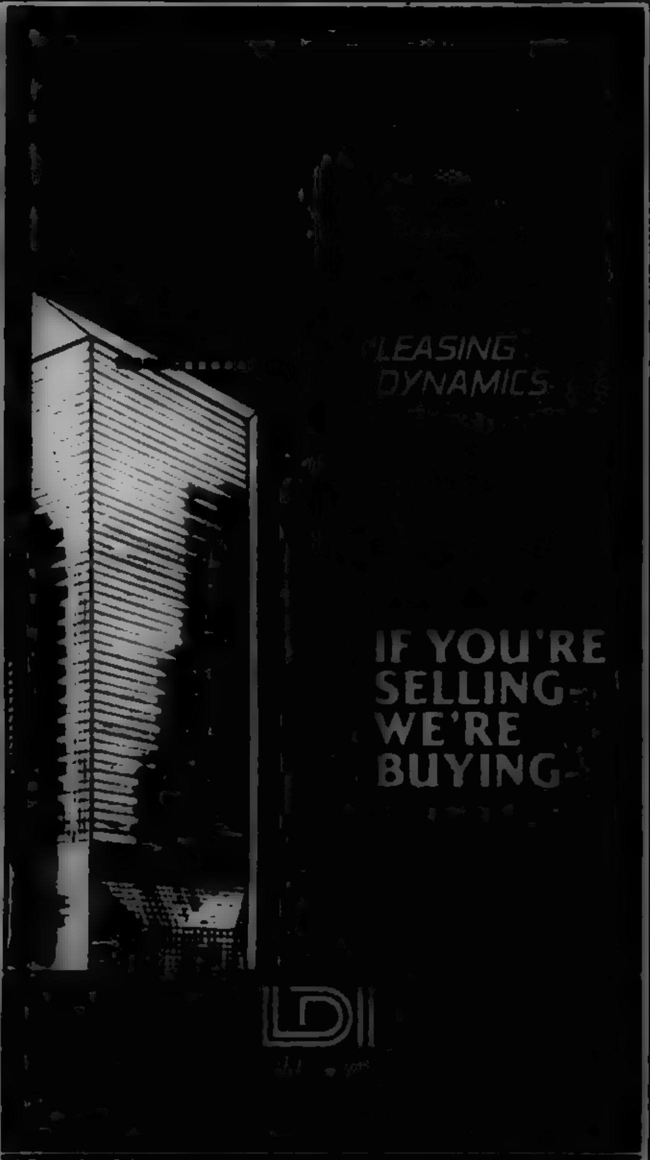

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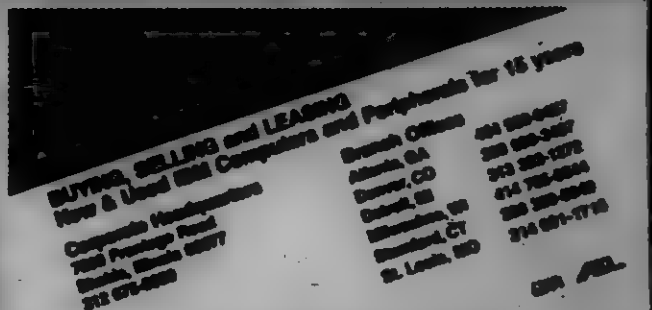

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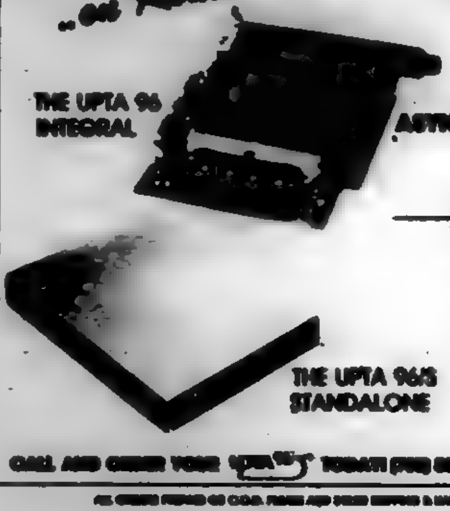

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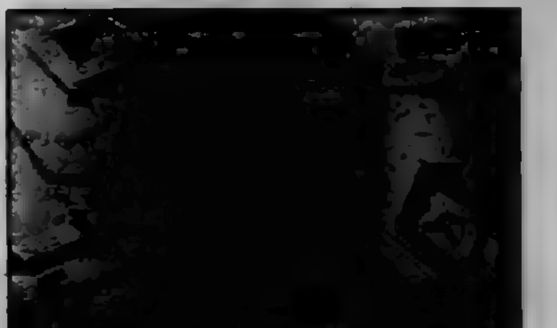

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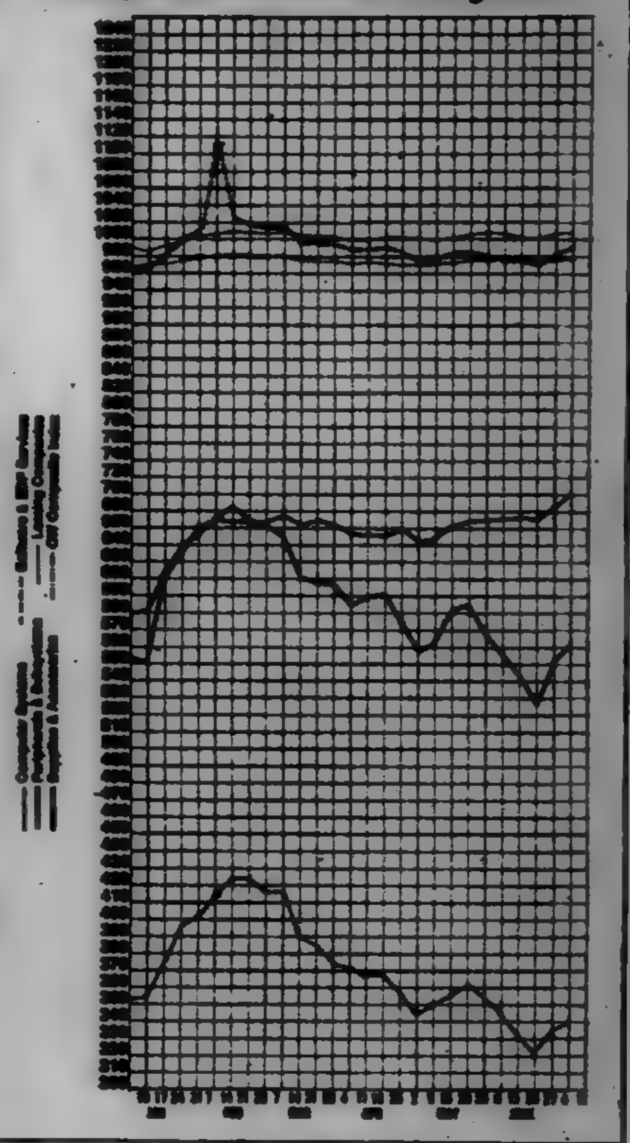

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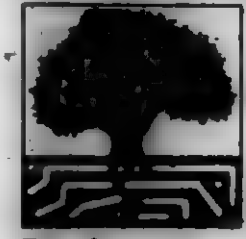

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NEWSPAPER

Datapro survey: Strong demand for mainframes

By Tom Henkel
CW Staff

DELRAN, N.J. — For mainframe users, last year was time to replace aging processors with newer technology systems.

A recent survey of 937 mainframe users, conducted by Datapro Research Corp. here, revealed that most respondents had installed new mainframes in the past year. The survey asked users how long their current mainframes had been installed. On the average, the users' responses indicated that time period to be less than 10 months.

[redacted]

Of the group polled, users of National Advanced Systems Corp. mainframes made the most recent additions to their shops; NAS' systems were an average of 6.2 months old. Sperry Corp. mainframes ranked as veterans, with an average system age of 10.7 months. Users of other vendors' systems had similar responses, with Burroughs Corp. users responding 9.6 months, Honeywell, Inc. users 9.7 months, IBM users 9.3 months and NCR Corp. users 9.9 months. A catchall group of other mainframes posted an average system age of 12.9 months, Datapro said.

Missing from the survey were Control Data Corp. and IPL Systems, Inc. A Datapro spokeswoman said that of the 6,000 mainframe users who were sent questionnaires, CDC and IPL users failed to submit the five required responses. Furthermore, she said, Digital Equipment Corp.'s Decsystem line and the now-defunct firm, Magnuson Computer Systems, Inc., were eliminated from the 1985 survey.

Highlights of the Datapro survey include the following:

■ On the average, more users chose to

See DATAPRO page 23

TOP OF THE NEWS

Editorial change. Terry Catchpole is named editor in chief of *Computerworld*. Page 2.

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Boeing Computer Services is creating an office net architecture that is modeled after standards and is aimed at facilitating communications. Page 11.

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Never again. The IRS is taking steps to correct the snafus that plagued computerized tax return processing this year. Page 11.

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Cincom will expand its applications line with a new release of its manufacturing system and other tools. Page 12.

■

The men who miniaturized DEC's VAX architecture relate the agonies and the ecstasies of their three-year effort. Page 105.

DEC enhances link to Disoss

By John Dix
CW Staff

MERRIMACK, N.H. — Digital Equipment Corp. last week enhanced its compatibility with IBM's Distributed Office Support System by adding the ability to exchange revisable documents with IBM environments.

The External Document Exchange with Disoss software runs under VMS on systems ranging from the VAX-11/725 to the VAX 8600. It complements DEC's Disoss Document Exchange Facility, announced last October, which enables users on a Decnet network to read but not revise Disoss documents.

Together the products enable DEC users

See DISOSS page 8

Software vendors now feel pinch

By John Gallant
CW Staff

Last week, Applied Data Research, Inc. announced that it expects to report a loss for the second quarter of 1985, its first quarterly loss in two years.

For Martin Goetz, president of the Princeton, N.J.-based systems software company, ADR's flagging midyear performance came as something of a surprise. Just three months earlier, ADR had reported first-quarter revenue up nearly 60% and an increase in profits of more than 70%, compared with the first quarter of 1984.

Goetz, like many industry observers, thought the slump that slammed hardware makers spared large systems software vendors. But the software sector is finally beginning to feel the effect of that slowdown. While the news coming from the software industry front is not as grim as recent tidings from the hardware arena, the coming months are likely to bring reduced profit and revenue growth. The need for drastic cost-cutting measures is not yet evident, but such moves may be necessary if the impact of the slowdown is amplified.

"We thought the software industry was going to remain unaffected until about a

See SLUMP page 4

PRODUCT SPOTLIGHT

Power of AT, clones wooing initial users

By Edward Warner
CW Staff

Ten years ago, a desktop computer operating at 1 million instructions per second would have crushed the desk on which it rested. Such a machine, a mainframe like IBM's 370/168 Model 3, would also have cost more than $1 million.

Today, that same raw power is available with an IBM Personal Computer AT, weighing less than 40 lb and priced at $3,999 in its basic version.

Nearly 10 years after the birth of personal computing, the IBM Personal Computer AT and compatible machines mark how far computer technology has come. Running a 16-bit, 6-MHz microprocessor — the Intel Corp. 80286 — and offering optional 20M-byte internal hard disks, these machines are roughly three times as fast as the IBM Personal Computer yet run most Personal Computer software. The AT and compatibles can support several users, turn their hard disks into local-area net file servers and, with the right operating system, potentially address 16M bytes of random-access memory.

Although some pioneering users are breaking ground with the AT as a multiuser machine or as a local-area network server, most users are being drawn to the AT and its clones because the machines are speed demons offering high-capacity storage.

As a result, the AT and compatibles have remained single-user, stand-alone micros running the same business software as their predecessors. Developers said software that exploits this new-generation hardware is lacking because of the limits of IBM's PC-DOS (see story page 16). Industry analysts, meanwhile, said the dearth of multiuser systems arises from the lack of software to run under IBM's PC Xenix, the AT's multiuser operating system.

The biggest reason is likely that users want nothing more than a faster Personal Computer. At the New York headquarters of Merrill Lynch, Pierce, Fenner and Smith, Inc., for instance, 100 ATs are meeting the needs of "a lot of people who use heavy spreadsheets [and who] were complaining [about] how long it took to compile them," reported Carol Bass, manager of personal computer support. "They zip through their spreadsheets now," she added.

Elsewhere in Manhattan, at the headquarters of Home Insurance Co., Anthony S. Graffeo, senior vice-president of information systems, reported that the firm's personal computer users

See AT page 15

Credit card scam laid to DP workers

By Mitch Betts
CW Washington Bureau

DENVER — Two computer operators at a firm here that issues credit cards last week agreed to plead guilty to participating in a crime ring that created about 40 fraudulent credit cards and ran up charges of $50,000, U.S. prosecutors said.

Assistant U.S. Attorney Frederic S. Stephens said that Ella L. Johnson and Carol L. Pena, data entry operators at Consumer Retail Services, Inc., agreed to plead guilty to computer crime and credit card fraud charges after discussions with federal authorities. The defendants could not be reached for comment.

A federal grand jury here recently indicted seven people in the alleged credit card scheme, which operated from November 1984 to April 1985, according to the indictments. The computer center issues Citibank Goodyear Silver Card credit cards for use in Goodyear Tire & Rubber Co. retail stores, prosecutors said.

Prosecutors alleged that the computer operators repeatedly assigned new account numbers to themselves and associates and issued credit cards. They allegedly used the credit cards to purchase merchandise up to the credit limit and then altered the computer records to send the bills to fictitious addresses.

"This went on for several months before it was discovered," one prosecutor involved in the case said, adding that the center has since tightened its security. At the time of the alleged offenses, this prosecutor said, the center did not check whether each account created in the computer had matching credit applications and approval forms.

The indictments, filed in U.S. District Court here, contain charges based on the Computer Fraud and Abuse Act and a credit card fraud law, both enacted by the U.S. Congress last year. Under the Computer Fraud and Abuse Act, it is a misdemeanor crime to gain unauthorized access to data bases containing financial data protected by the Right to Financial Privacy Act.

Johnson, Pena and James R. Murray were charged with the computer crime, as well as with distributing and using fraudulent credit cards. The other defendants, Daris Espy, Daniel E. James, Stephen Bien and Michael D. Huntington, were charged with credit card offenses and, most have agreed to plead guilty, Stephens said.

Editorial leadership changes at CW

Terry Catchpole has been named editor in chief and Sharon Frederick executive editor of *Computerworld* newspaper.

Catchpole succeeds John Whitmarsh, who has served as editor in chief since 1981 and who resigned July 12 for personal reasons. Frederick replaces Rita Sheor who left the company after five years to pursue new business opportunities.

Catchpole has 12 years of editorial experience at a variety of publications. Since 1983, he has been editorial director of *Business Computer Systems*, a monthly magazine for corporate computer managers published by Cahners Publishing Co. He also was responsible for the start-up of another Cahners publication, *PC Products*, and served briefly as editorial director of that magazine.

Before his entrance into computer publishing, Catchpole was editor in chief of *Boston Magazine*, an award-winning city monthly, and held a number of editorial staff positions with Playboy Enterprises, Inc. in Chicago. His articles have appeared in periodicals from *National Lampoon* to *National Review*, and he has both written and edited books on subjects ranging from the political activities of organized labor to a forthcoming history of sports at Harvard University.

Catchpole's computer-related activities also include election to the board of directors of the Boston Computer Society, the nation's largest computer-user organization, and volunteer publisher of the society's bimonthly magazine, *Computer Update*.

Executive Editor Frederick is also joining *Computerworld* from the staff of Cahners' *Business Computer Systems*, where she has served as managing editor since 1983. Previously, she was a senior editor at *Inc.* magazine and associate editor at *Electronic Business*. At the latter publication, she won the prestigious Jesse H. Neal award for feature writing.

NEWS SUMMARY

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Software execs weigh slump's impact on their firms

It is sometimes said that where you stand on an issue depends on where you sit.

That aphorism holds true for the top executives at three of the leading large systems software firms. Whether the executives believe the computer industry slump has affected software makers in general depends in large measure on their perceptions of how it has affected their particular firm.

Management Science America, Inc. (MSA), the Atlanta-based applications software leader, announced in April a first-quarter loss of nearly $3 million. But Dennis Vohs, MSA's executive vice-president, said the loss is typical of the firm's first-quarter performances and is not related to the slowdown.

"We are the largest vendor of applications. But even with our size, the level of activity in the software market today exceeds our capability to keep up," Vohs said. "The slowdown in hardware deliveries has not affected us. If a potential customer has cut back on capital spending, we will go after someone else who has not slowed spending. There is still a tremendous demand for software."

But at Applied Data Research, Inc., which expects its first quarterly loss in two years (see story page 1), the outlook is different. President Martin Goetz said he believes the long arm of the slump has finally reached the software industry.

'There has been a general belt-tightening'

"We will make up for the loss in the second half [of 1985]," Goetz said. "But delayed sales and price cutting by our competitors are both signs that the slowdown has reached software companies. There has been a general belt-tightening. Customers are being more careful in justifying a purchase."

Robert Goldman, president of Cullinet Software, Inc., which recently trimmed its first-quarter growth projections, said the slowdown has impacted vendors. But Goldman feels a variety of profit and growth opportunities still exists.

"I would have to agree that there has been some impact," Goldman said. "But certainly less than in the hardware area. Capital expenditures have slowed, and buyers are somewhat more careful. The sales cycles are longer, there is more caution, and, in some cases, purchases require higher approvals. But users are really looking for a good return [on investments], and software can still provide that."

— John Gallant

SLUMP

from page 1

month ago," Goetz told *Computerworld* last week. "We had forecast a small profit for the second quarter. But our June sales were significantly less than expected. We now believe that the general decline is starting to hit the software industry. [Cullinet Software, Inc.] said that earlier, but we did not see it. We are seeing that impact now."

What Cullinet said about a month ago, according to President Robert Goldman, was that its first-quarter growth would be lower than initially forecast. Rather than falling within the 40% to 50% growth range predicted for the entire fiscal year, first-quarter growth was slated to be between 30% and 40%.

Westwood, Mass.-based Cullinet's previous fiscal year ended with profits and revenue up 50%, although the fourth-quarter profit dipped below 50% for the first time in several quarters.

Stephen McClellan, vice-president of New York-based Merrill Lynch, Pierce, Fenner and Smith, Inc., said Cullinet's revised growth prediction was the first indication that the industry slowdown was beginning to affect vendors.

Selling cycle is lengthening

"The impression that the slump is not affecting software companies is changing," McClellan said. "It is not just affecting Cullinet and ADR. Other companies are sending signals that the selling cycle, especially for bigger ticket items, is lengthening. Over the next 12 months, we will see growth slowing."

But where the slowdown has meant layoffs and losses for hardware vendors, software companies may only have to adjust to reduced revenue and profit growth, most analysts said.

"Users are not buying as aggressively as they did in 1983 and 1984," said Peter Cunningham, president of the Mountain View, Calif.-based market research firm Input, Inc. But he said Input has predicted that the software and services sector will still grow at a rate between 25% and 30% this year.

"You have to remember that 1983 and 1984 were absolutely incredible years," Cunningham said. "You had this massive rebound from the major slowdown that had started in 1980. What is happening is that growth rates are getting more realistic. That is not a slowdown but an adjustment to a more normal rate of increase. Unfortunately, a lot of these companies do their forecasting using their sales force as an indicator. They are overly optimistic."

Scott Smith, vice-president of Stamford, Conn.-based Gartner Group, Inc., agreed. "Overall, the outlook is very healthy. If deals get pushed out a little bit, it is not the end of the world. Users are still looking at new applications, and in-house development is tremendously more expensive than buying a package. The growth in the business is there. It may be 25% and not 35%, but that is still a very healthy rate."

Smith and other analysts said that those vendors marketing high price tag products, such as data base management systems, will be affected more severely by the capital spending belt-tightening and lengthened sales cycles that accompany the slowdown. Cullinet and ADR, both of which have made large gains in the DBMS marketplace, have already felt the impact.

Thus, said Damian Rinaldi, director of International Data Corp.'s Software and Services Information Program, the large systems software market will become more competitive, and vendors will begin eyeing each other's turf.

'Could be a nasty period'

"The next year will be a time of consolidation," Rinaldi said. "If the vendors are not effective in positioning themselves for this slump, it could be a nasty period. Things are tougher than usual, and it will require a greater management effort to come out whole."

But Input's Cunningham said software vendors must be cautious in trimming hiring, training and development costs in reaction to the slump. "Those costs will have a negative impact on profitability in the short run because the revenue growth will not be quite as strong as it has been.

"But hiring and development plans cannot be turned on and off. If the vendors try to yo-yo around with development right now based on quarterly fluctuations in orders, they could be in pretty deep trouble."

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William McGowan

The telecommunications industry was stunned late last month when MCI Communications Corp. acquired Satellite Business Systems (SBS) from IBM and Aetna Life & Casualty Co. in exchange for IBM acquiring a 16% equity interest in MCI. The pending agreement appears to be one more giant step forward for MCI's colorful chairman, William G. McGowan, in his 17-year battle to untangle AT&T's hold on the long-distance carrier business.

The alliance has provided MCI with the immediate benefits of prestige among potential corporate clients and the financial backing of one of the world's largest and most profitable corporations. IBM has the option to acquire 30% of MCI, and some analysts speculate IBM may someday swallow MCI totally, as it did Rolm Corp. In a recent interview with Computerworld *staff writer Clinton Wilder, McGowan explored the immediate and potential benefits of association with IBM and the impact on his firm's long-time adversary, AT&T.*

With the IBM-SBS partnership, what can MCI now offer to large corporate MIS departments that you could not before?

We actually started in 1981 to plan to offer the larger, more sophisticated user digital networks — such as sophisticated packet switching networks. [We knew] it would take us a while to put it in place, but we started back then.

It was clear in 1982, with the divestiture announcement, that the time to do it was now. So we started putting in digital overbuilds on all of our microwave systems, and we started putting in fiber-optic systems. We said in 1981, "no more analog switches; only digital switches." Eighty-five percent of our ports now are digital.

So we put in place a system that we're just now starting to offer — a high-speed packet-switch network for corporate use — which we'll customize and put in place. We did it for ourselves last year and for [Security Pacific National Bank] so far this year. We offer [Security Pacific] a virtual private-line network — voice and data.

So we're in a position to [offer these types of networks]. I think the advantage we have right now with the combination is that [IBM has] — more than we have — a technical engineering capability to support that kind of thing for many, many more customers. So [IBM] gives us a lot more depth . . . maybe doubling or tripling or quadrupling the technical competence and capability we have.

Is the idea of "cradle-to-grave" data and communications services from IBM a realistic concept for the future?

It's less probable than it was before. [IBM] did have a subsidiary that they had full control of with 60% [ownership], and now they've backed away from that. I don't think [IBM feels] the need . . . to offer [these services] . . . for those customers who wish to have them. I don't think [things have] changed.

With SBS, IBM could serve someone who said, "I want to have someone come in and do this whole thing. I don't know how you guys are going to do it, but I want it done and handed to me on a platter." [MCI] will be there to do that, but we'd be there to do it anyway. If those customers say they have something for bid, a Rolm or IBM or [Northern Telecom, Inc.] will say, "Who am I going to do it with as a partner?" Well, that won't really change. Basically, we'll do our share, [AT&T] will do their share; we'll charge our rates, and they'll charge theirs.

But I don't think [the demand for single-vendor service] will ever be the case for most users. Our industry is clearly moving away from the experienced buyer/inexperienced management situation because communications managers are experienced. It's taken data processing 30 years to do it, where it will take [the communications field] five — it takes everything five now instead of 30 — to move from the experienced manager/inexperienced boss over to the experienced organization. A Security Pacific, [Westinghouse Corp.] or [Citibank N.A.] . . . really doesn't need that hand-holding, education, support that the inexperienced buyer does. They do need absolute assurances that you know what the hell you're doing. And they need to have proof that your commitments are fulfilled, that your plate isn't overfilled and they won't get slipped over to the side of it.

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MCGOWAN

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I think this [MCI-IBM partnership] will help them in that regard. For all of the large users that we've had — really, at the beginning of the company, we were selling to large users — for all those years, we maintained them and supported them, but we really didn't go out and try to expand that. We had other things that were more directly attributable to our life.

But you will be doing that now?
We started about a year or so ago. We've added now several hundred people [to do that] . . . and gave all of our divisions two criteria for structuring themselves. They all have completely separate national account marketing, because it is an entirely different sale. And the second thing was an entirely separate customer service group, separate from sales. [That's because] if you tell a salesman he's got a quota, he'll put all his resources there and customer service suffers. So all seven of [MCI's divisions] have those separate entities, and we've done very well — a tremendous amount of orders.

I think this [IBM partnership] will improve the process, but I also think it will bring us more quickly over to the more sophisticated networks.

What new technologies can you now pitch to those large corporate accounts?

The first phase is that we'll see the typical corporation going into a digital environment — mixed voice/data, predominantly voice, some of them exclusively [voice]; they'll talk about 1.544 megabits [per second], but you'll find if you ever look into that, you really have a voice network.

Once you start moving into the digital world, we're talking about bit streams of 405 megabits with fiber. We'll be fully converted to 810 [megabits] before the end of 1986, and I know that we're moving to 1,620 megabits.

It's going to get to the point where a lot of the tricky stuff, such as bandwidth compression, is not going to be needed for a long time. The sheer pipe size is getting so enormous; why should you go through those shenanigans when you've got such massive quantities? Increased value in communication breeds more communication breeds more communication.

You see more and more articles about [corporations] using these disciplines as a competitive weapon and as a way to differentiate between [you and] your competitor and as a way to make a profit. Once you start seeing articles like that, you know you're really going to see [the telecommunications market] go. As that starts, you're going to truly get mixed networks.

Right now, we've been fairly well limited to the long-distance segment, completing our switches and so on. But the local phone companies know they have to get in on the act or they're going to lose out. So now they're starting to say, "Sure, we'll install fiber, we'll give you T1, we'll do this." We're interfacing now with damn near every one of those companies.

Now the customer, back through us to the local phone company, is starting to put together a PBX or front-end processor or whatever you want to call it. I try to tell everyone this is not a phone (pointing to a telephone). It's no more a phone than the man in the moon. It's a terminal. I don't do anything here, I just instruct something else down there to do something. The "phone" doesn't exist anymore.

As you start moving into that environment — and that's going to happen very quickly — all of a sudden it really becomes the digital world. I don't really care if you digitize it in my mouthpiece or on my seventh floor. Once you're there, you're into a completely intermixed, heterogeneous world of communication where it all is digitized. We digitize everything. When you think about it, it's kind of crazy — we've been digitizing everybody's communication now for eight years, and on both ends of it we convert it back to analog, just to get you through the switch.

The thing that's going to be interesting is, internationally, what is going to happen to the position of the MIS guy. Once an organization starts saying, "With all the data processing, computing capabilities I have, why don't I do like other people and use them as a way to make money?" Once that happens, then the world changes. It really does.

Where is MCI positioned to take advantage of these fundamental changes?

We're not going into an information age or an information economy; we're bringing in the information technologies now as a vital part of the way we do everything. Of the top 100 organizations that we've identified as our potential biggest buyers, 80 were industrial . . . as we've seen with [General Motors Corp.] That's how you become more efficient in manufacturing. You have to use the information technologies.

What we are is just like the transportation system. Instead of goods, we are the transportation system for all the information in the country. And just like the transportation system, all the dirt roads had to be replaced with a new infrastructure. Well, we have to do that.

[The old Bell system network] was only satisfactory for voice conversation. But for every other application, it's either way too big or way too small. If I'm working here (pointing to microcomputer) — it's terrible, the company standard is an IBM [Personal Computer] and I'm on a [Kaypro Corp. micro] up here — [I'm transmitting at 1,200 bit/sec.], but most of the time when I travel, I'm on a workstation with 300 [bit/sec.]. So what the

See MCGOWAN page 8

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DISOSS from page 1

to search for documents filed in an IBM host-based Disoss library and access them to read or edit. Conversely, DEC users can now create documents using DEC word processing programs — such as WPS-Plus and DECDX — and file them in a Disoss library to be read or revised by other DEC or IBM users.

Gives DEC the lead

This capability "gives DEC a significant lead over competitors like [Data General Corp.] and [Wang Laboratories, Inc.] in delivering meaningful bridges to IBM mainframes," according to William F. Rosenberger, director of strategic planning with the Yankee Group, a Boston-based research and consulting firm.

EDE with Disoss builds on DDXF, which, as part of Digital's Decnet/SNA gateway product set, is said to provide for the two-way transfer of data between DEC machines and systems within IBM's Systems Network Architecture (SNA).

DDXF provides DEC environments with Disoss library functions — analogous to a real library of documents — and distribution services, which pass documents among different machine types. DDXF performs, among other things, the format conversions needed to exchange final-form documents between DEC and IBM environments.

EDE with Disoss enhances this capability by enabling users to revise documents created or accessed from a DEC environment. This software is said to conform to IBM's Document Interchange Architecture and Document Content Architecture using LU6.2, an SNA convention for peer-to-peer communications capabilities.

Documents within an IBM Disoss library can now be transformed into DEC WPS-Plus or DECDX documents that can be read or revised. Similarly, documents created under these DEC word processing programs can be sent into Disoss as revisable or final-form documents.

The Disoss implementation "looks very clean," Rosenberger said of the product. "The degree of compatibility is extensive."

One advantage of the DEC implementation is that "DEC added their own Disoss menus and user interfaces so DEC users would feel comfortable and familiar with what they are seeing," according to Andria Rossi, associate editor of Seybold Publications, Inc.'s "Seybold Report on Office Systems," a monthly industry report. "That's not always the case and certainly not the case with IBM."

Both final-form and revisable-form IBM documents are accessed through EDE menus. For simplicity these menus can be further integrated into the company's All-In-One office information system. Using All-In-One commands, "EDE with Disoss lets users search for, retrieve, file, edit or delete documents residing in an IBM host document library," DEC reported.

Future acceptance

Although the installed base of IBM's Disoss is small, according to Rosenberger, he said he believes Disoss compatibility is critical for companies selling departmental systems because its future acceptance is expected to be high.

"It's quite important that DEC show and deliver this type of bridge to IBM mainframe Disoss environments," he said.

Beside Decnet/SNA DDXF, users who want to implement EDE with Disoss must have Decnet VAX and the firm's Decnet/SNA Gateway and Gateway Access Routines. The gateway appears to the IBM Disoss host as a Type 2 Physical Unit within SNA. It can reportedly support multiple simultaneous Disoss sessions.

EDE with Disoss, which is available now, costs $3,000 to $4,500, depending on the VAX configuration.

When bundled with the other components required, the implementation will cost between $27,000 and $45,000.

DEC is headquartered in Maynard, Mass. 01754.

MCGOWAN from page 7

hell am I doing on a 4-KHz circuit?

So what we are going to be is the provider of the transportation system for that [data communication]. We have more customized services — the MCI Mail system, packet switching — we'll have all of those bells and whistles. It's going to be a good combination together [with IBM], because [AT&T] has one basic technology, and we have them all. And you really need a mixture. So we'll be very much helped in that regard.

How do you continue to argue for regulation of AT&T, given IBM's presence?

The day before we made the announcement, IBM had 60% control of a long-distance carrier. The day after, they had 16% control. So they've always been here. But I think a more relevant point is that we believe that [AT&T] should be deregulated — but they should be when there is viable and sufficient competition in there to truly say that the customers do have some choice, and that [AT&T] can't use their monopoly power as a monopolist.

For example, if they were deregulated, and they said the rates from Boston to anywhere else are going to be quadrupled tomorrow, our Northeast division would really smile a lot because we know we'd get a lot of calls and a lot of customers. But we also know that after three or four days of calls, we'd have to say, "No more." Because we couldn't handle them. A few other guys, I guess, have some capacity and they'd be carrying some, but they couldn't handle very much. Now what happens to the 85% or whatever that's left? They'd have to pay four times as much.

The proof of it is that there isn't sufficient capacity out there. [AT&T says] they have 400 competitors. That's not true; 396 of them are using their service. You call that a competitor? It's who has the capacity, what sufficient share is there of the market — I think the [Federal Communications Commission] should start gradually deregulating. I don't see a problem with that, but you've got to recognize realistically that the time is not now.

Will equal access meet the September 1986 target date?

It will, I think, for two main reasons. The [U.S. Department of Justice] has made clear and explicit instructions to each of the [former] Bell operating companies about their failure to do what they should have done to date, and about the requirements that they do it, and to come out very quickly with the information.

They also have been investigating AT&T about some of their conduct and appear willing to act on that. I don't think I should say any more that they're crooks, but they misappropriated our customers in the hundreds of thousands. So I think that [equal access will meet the target], and these next couple of years are clearly the most important in the life of this industry.

In places where there is true equal access now, how have you done in terms of market share?

We get somewhere between 10% and 15% of the market; we get more in customers, perhaps, but in dollars, which is more significant, 10% to 15%. Since we're at five [percent of the overall market], it's not that tough.

Does IBM's affiliation help you in that market share battle?

Not in the short term. But you have to succeed in our industry in two things. One has to succeed in the large fiscal arena. Not only is [IBM] a very big customer in terms of dollars, but it is the leading edge of what you have to constantly be, which is better and better. And you also have to be successful in mass merchandising, because you still have the system which doesn't wear out by usage, and you like people [calling] at night and on weekends, for example.

Clearly, we've done fairly well in mass merchandising. We started to do all right with large users, and it's going to accelerate that. Obviously the affiliation has a rub-off, a cachet. There are people out there who are saying, "There's a whole bunch of people out there. Which ones can I have confidence in?"

But I don't find that any different from our affiliation with [American Express Co.] and with [Sears Roebuck & Co.] For a certain group of people, American Express is just fine. And even with Sears, they have a fabulous reputation with an enormous number of people, maybe not hugging the East or West Coast, but in the rest of this country. Our affiliation with them, I think, helps too. And this [IBM] affiliation will help. There are certainly a number of people who have strong feelings there too.

After the $400 million IBM funding for the first three years, how do you see the IBM fiscal stream proceeding? Is there a chance of the funding stream drying up?

We specified $400 million just so we had some number; [IBM hasn't] said that there's a limitation on it, nor have they said there are any guarantees beyond that. But one of the reasons we did it — and they didn't resist it at all — was that I wanted to have forward funding. We've always been that way. I guess living through a period when we had a negative net worth of $6 or $7 million, and we owed the banks $100 million, made us more conservative than most companies.

Ever since then, we've always funded ourselves in advance. We've never used short-term borrowing to fund long term. We have $800 million in cash in the bank today. I saw where we were listed in *Dun's Review* as the 84th in the U.S. of any corporation for positive cash flow.

The ownership maximum was not at all resisted by [IBM]. They're free to go out in the marketplace and purchase, but how much they own is certainly going to depend upon the equity attached to the $400 million; and that's a floating percentage based on the market at that time. I calculated it at [an MCI stock price of] $12.50. If they converted at that price, it was 26.1%.

I don't see this place changing. [IBM's] not interested in any affiliation that the other people aren't interested in.

You have to understand, I need stockholders. Preferably wealthy, preferably understanding of what we're doing here — not in three-month or six-month programs but longer term. Preferably capable of staying power, preferably capable of giving us more money when we need it and preferably, if possible, helping us in other aspects of our business. And they fit all of those.

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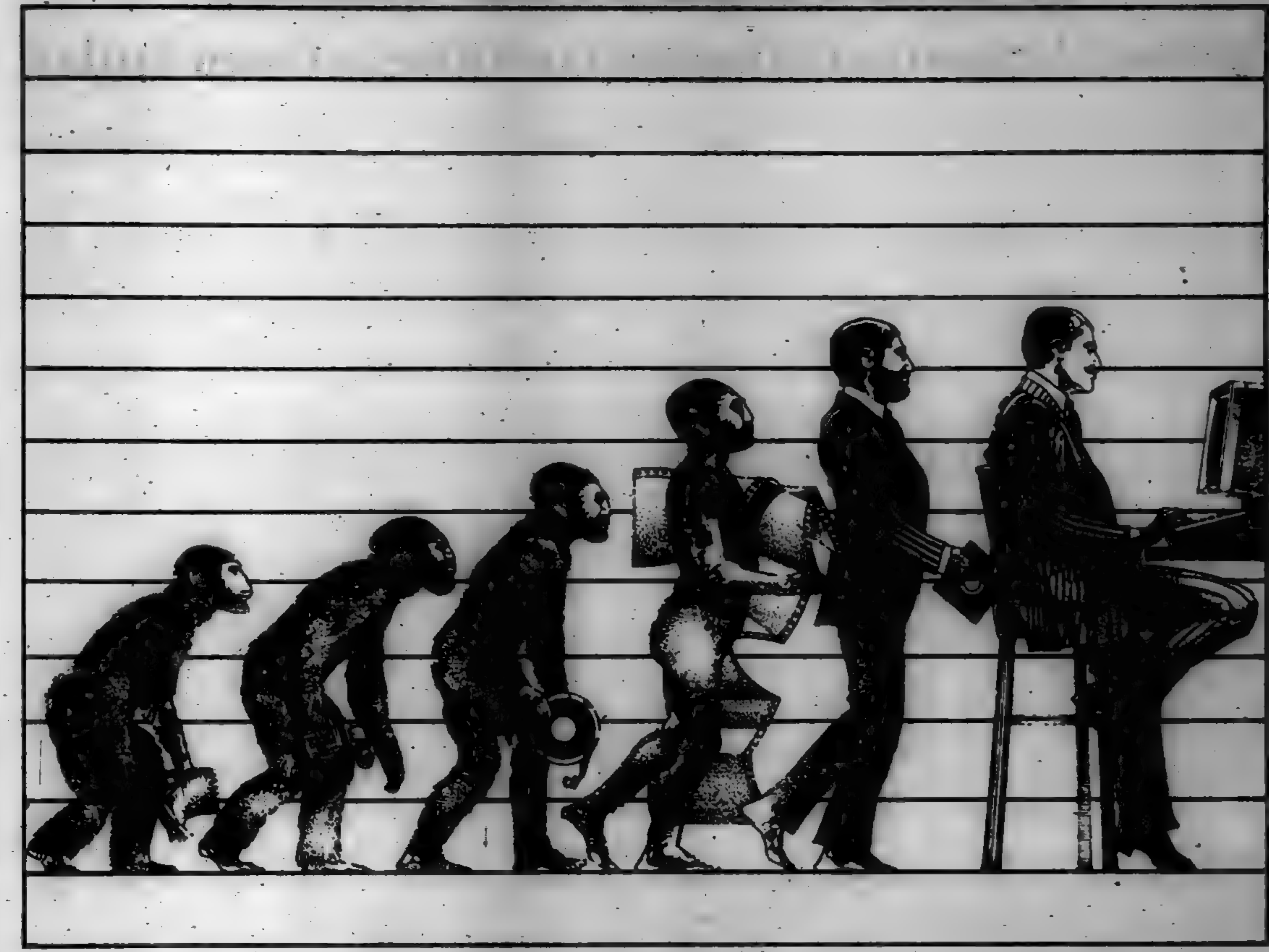

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Boeing Computer taking lead in office net standards

SEATTLE — Boeing Computer Services Co. is trying to do for office networks what General Motors Corp. is attempting in the factory: forge a set of specifications out of international standards that equipment suppliers can incorporate to ensure compatibility with other vendors' machines.

Although this would seem to be the goal of standards, fully specified standards do not yet exist. Even those subsets that are specified offer options that can render various implementations incompatible.

It was this fact that encouraged GM to create the Manufacturers Automation Protocol (MAP), a set of specifications that suppliers of factory automation equipment must conform to if they want to sell to GM. Other manufacturers can specify MAP compatibility to ensure that the systems they procure can communicate.

Boeing Computer wants to do the same thing for local networks in the office through the development of its Technical Office Protocol (TOP), according to Sheldon Blauman, Boeing Computer's manager of network architecture planning.

Boeing Computer and GM have been working together on these specifications since their joint demonstration at last year's National Computer Conference (see story below). The companies have formed a joint steering committee and will cosponsor a similar demonstration in November at the Society of Manufacturing Engineer's Autofact factory automation show in Detroit.

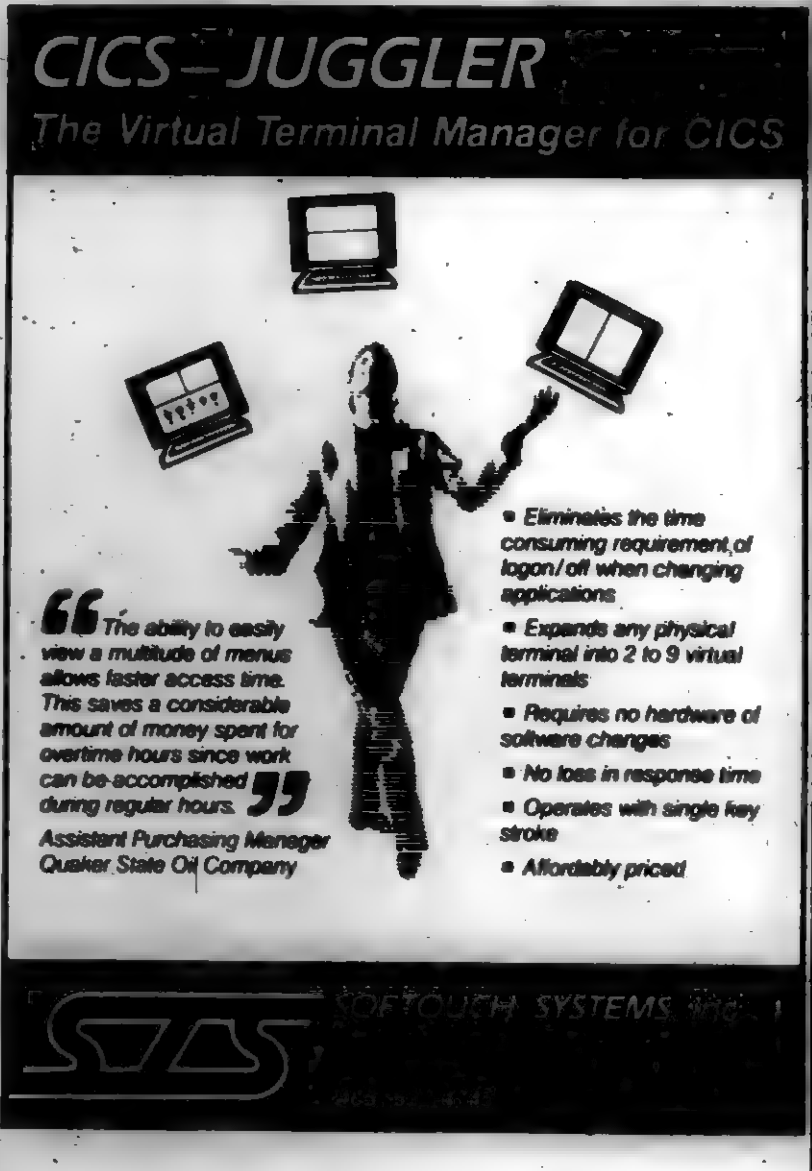
Like MAP, TOP incorporates, where possible, the ratified portions of the International Standards Organization's seven-layer Open Systems Interconnect (OSI) network reference model.

TOP and MAP are similar in their conformance to the fourth, or transport, layer of the OSI model. This layer is used to create virtual circuits between devices and ensures that data is delivered in order and uncorrupted. The specifications differ, however, above and below this common mid-layer, Blauman said.

Differences below the transport

See TOP page 11

[redacted]



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Happy returns: IRS heads off computer fiasco rerun

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The Internal Revenue Service is taking steps to ensure that this year's computer fiascoes, which delayed the processing of tax returns for several weeks, will not happen again next year.

According to IRS Commissioner Roscoe L. Egger, the IRS plans to acquire additional computer capacity at IRS service centers, provide additional training for programmers and conduct a complete review of computer operations.

"Taken together, these efforts are the start of what will be a continuing process to make certain we avoid the problems faced by taxpayers this year," Egger said at a recent congressional hearing.

The processing delays occurred because of problems with a modernization program that replaced aging computers with newer Sperry Corp. 1100/84 multiprocessors and converted 1,600 IRS programs from assembly language to structured Cobol [CW, April 15].

Specifically, the computer problems included slow Cobol programs, bugs in applications and operations software and numerous glitches in 48 heavily used tape drives, according to Thomas Laycock, assistant IRS commissioner for computer services.

The result of the processing problems was a multitude of reports about angry taxpayers and legislators and demoralized IRS workers. Also, the IRS had to pay 13% interest on late refunds.

IRS caught up to 1984 processing rate

At the latest congressional hearing on the episode, held June 21, Egger reported that the IRS had caught up to its 1984 pace of processing tax returns. "This achievement has been reached only through the effort and dedication of literally thousands of IRS employees who have worked nights, weekends and holidays to reduce and finally eliminate the backlog we faced early this year," he testified.

Egger said the most important lesson the IRS learned from the experience is that "despite careful planning and scale-model testing, you cannot know how a high-volume data processing system will work until you actually place the high volume on the system."

IRS officials stressed that the antiquated IRS hardware — 10 to 16 years old — had to be replaced. "We expected problems from the conversion, and we experienced somewhat more problems than we anticipated," Egger said. "But, there simply was no alternative to the replacement of the aging equipment," he said.

Egger apologized to U.S. taxpayers for the frustration they experienced and added, "Frankly, this year has been frustrating for us as well."

One legacy of the 1985 tax season may be skepticism about IRS computer capabilities, at a time when the IRS supports greater reliance on computers for tax processing. At a recent hearing on the Reagan administration's tax reform proposal, one legislator questioned whether the IRS could handle the proposed return-free tax system, in which the IRS would use its computers to calculate income taxes for more than half the nation's taxpayers.

"I am concerned that if we add additional burdens [to the IRS computers] we are going to blow a fuse somewhere," commented Rep. Richard T. Schulze (R-Pa.).

Egger explained that the return-free system would require a big investment in new equipment, including document scanners, to compute income taxes based on data supplied by employers and other parties.

TOP

from page 10

layer include the type of local network specified.

The first document outlining TOP — to be followed by a second Boeing Computer document giving actual TOP specifications — will show the intended use of IEEE 802.3 Ethernet-type local networks, as well as 802.4 broadband token-passing bus networks, probably used in a backbone capacity, Blauman said. MAP uses only the latter type.

Other differences

Above the transport layer, the network architectures differ in the applications supported, reflecting the different needs of factory and office networks.

Boeing Computer, for example, supports the OSI file transfer protocol, which is still under development.

While GM is also said to support that protocol, it has developed another protocol that is optimized for process control environments — streamlined to provide the needed speed — which the company is pushing to get standardized.

Case facilitates development

Applications development in either environment will be facilitated with the Common Application Service Element (Case), an OSI tool. Blauman said Case is a set of common subroutines that can be incorporated into an application to give it the proper hooks into a network architecture.

After TOP basics are aired and understood, Blauman said, Boeing Computer will address controversial areas where problems need further defining.

The first TOP document will, for example, talk about the CCITT's X.400 messaging standard. That recommendation, according to Blauman, needs to be upgraded to incorporate better management.

Other needs that must be addressed by standards, he added, include graphics, revisable text, data base management and operating systems for certain applications.

TOP's clout

The clout behind TOP is Boeing Computer's purchasing power. The company has, by rough count, 25 to 30 IBM processors running the size gamut from 4300s to 3084s.

Other machines include Control Data Corp. and Cray Research, Inc. processors and a slew of minicomputers.

To date, the company has used this clout to encourage equipment suppliers to provide it with machines that are compatible with IBM's Systems Network Architecture (SNA). SNA, Blauman said, is a fact of life.

In the future, Boeing Computer will require office systems to be compatible with TOP and will require suppliers of factory devices to conform to MAP.

OSI protocols

MAP and TOP will eventually be interconnected with internet protocols specified within OSI, a capability that will be demonstrated for the first time at the Autofact show.

Both specifications come under a grand strategic plan called the Boeing Network Architecture (BNA). Started in 1979, BNA is based on SNA and charts all of the company's communications efforts, was started in 1979.

Aside from the office and factory automation, part of the goal of BNA is to provide common data access that will require all of the company's data base management systems to talk together, according to Martin Ritchie, Boeing Computer's manager of network applications development.

Boeing Computer is one and a half years into this five-year project.

Another BNA goal is to provide for distributed applications where an application can, through the network, find the resources it needs to complete a task, Ritchie said.

Within BNA, TOP will point to the segments of standards Boeing will use in office communications, Blauman said.

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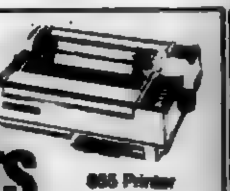

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Cincom announcements stretch applications software

By John Gallant
CW Staff

CHICAGO — Cincom Systems, Inc. today is expected to unveil a major release of its manufacturing system, three additional packages for its manufacturing and financial software series plus other enhancements to packages in its Business Control System series.

Cincom is slated to announce the new and enhanced applications at a news conference during the 1985 National Computer Conference (NCC) here.

The Cincinnati-based vendor has built a reputation on the strength of its systems software offerings, but the announcements will continue the company's expansion of its applications software line. The product launchings will include the following:

- Release 5 of Control:Manufacturing, Cincom's closed-loop manufacturing control system.
- Cost Management and Lot/Serial Number Traceability modules for Control:Manufacturing.
- An enhanced version of the Purchasing module of Control:Manufacturing.
- An Accounts Payable module for Control:Financial, Cincom's financial information system.
- An enhanced version of the Accounts Receivable module of Control:Financial.

According to a Cincom spokeswoman, Release 5 of Control:Manufacturing, which is available for IBM mainframes and Digital Equipment Corp. VAX processors, includes enhancements that make it a foundation for the added Cost Management, Lot/Serial Number Traceability and Accounts Payable modules. The system is integrated with Cincom's data base management system, fourth-generation language and decision support products.

In addition, Release 5 allows displays and updates developed with Cincom's Mantis applications development system to be added to user menus and accessed through transactions or programmed function key activity. The capability allows Mantis to be used to customize displays and updates or to add others.

The spokeswoman said the text management facilities incorporated in the system's Purchasing module have been repackaged as part of the basic system control component. The enhancement allows users to maintain internal and external related text and associate text data with any key or record within the data base.

The Shop Floor Control component of Control:Manufacturing has been enhanced to support tasks including production scheduling based upon an operation-level yield/scrap factor, definition and reporting of rework operations, definition and reporting against secondary resources and optional percentage-complete reporting. Control:Manufacturing costs between $100,000 and $400,000.

The Cost Management module of Control:Manufacturing is integrated with related Control:Financial modules and is made up of three components that provide cost control by tracking, accumulating and reporting standard and actual costs and detailed variances. The components include Cost Roll-Up and Audit Process, Inventory Accounting and Production Accounting. The module costs between $25,000 and $65,000.

According to the spokeswoman, the Lot/Serial Number Traceability module is designed to aid users in meeting material and procedures record-keeping requirements. It will be available in October and will cost between $12,500 and $30,000.

The added Accounts Payable module for Cincom's Control:Financial system reportedly gives users the ability to process payments quickly and accurately with reduced clerical effort. It costs between $30,000 and $80,000.

Enhancements to Control:Manufacturing's Purchasing module are said to improve support for blanket purchase orders and requisition approval. It costs between $25,000 and $65,000. The enhanced Accounts Receivable module of Control:Financial now provides multiple organization support, real-time credit management, flexible cash application, customer grouping and cash forecasting and aging capabilities. It costs between $30,000 and $80,000.

Cincom Systems can be reached through P.O. Box 11189, 2300 Montana Ave., Cincinnati, Ohio 45211.

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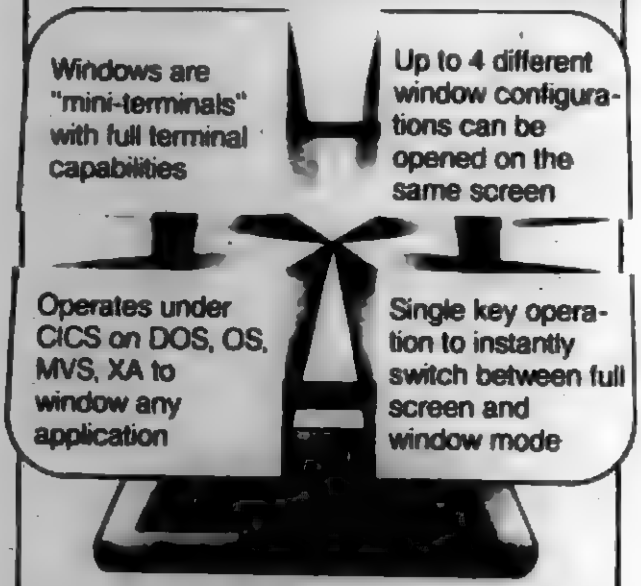

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FCC denies building occupants right to access spare cabling

WASHINGTON, D.C. — The Federal Communications Commission said last week that local telephone companies are not required to let building occupants use spare wire pairs found in many buildings.

The International Communications Association (ICA), which represents large users of telecommunications systems, requested that the FCC grant users the right to use spare cable pairs, as well as the right to see telephone company wiring plans. Wire installed before the FCC deregulated customer premises equipment two years ago is owned by local telephone companies.

The FCC said it will not require a telephone company to make spare cables available in a building, declaring that the issue was similar to a previous attempt by users who wanted access to conduit space.

In an earlier ruling, the FCC refused to require AT&T and the regional holding companies to make conduit space available to users, saying that it would be impossible to write a tariff that avoided discrimination if there was not enough space in the conduit.

However, the FCC last week said users of large telecommunications systems who are in sole possession of buildings have the right to obtain from local telephone companies the complete wiring plans that serve telephone, voice and data equipment.

The ICA request refers to the large amount of existing wiring that is currently under an FCC plan to remove it from the rate base by accelerated depreciation. All new wiring is currently paid for by the telephone company and recovered from users through installation fees.

An FCC spokeswoman pointed out that telephone companies could provide the information on spare cable pairs in a building by their own volition. The spokeswoman said the FCC was concerned that use of the wire would harm other building services.

The FCC said it agreed with ICA that the telephone company must establish a clear distinction point between a customer's equipment and wiring and the telephone network when a single customer is the sole possessor of a building containing complex intrasystem wiring.

The FCC found that giving users rights to access existing wiring is not useful unless telephone company records and plans are made available. The telephone companies opposed the effort by ICA to be given access to wiring plans, noting additional record keeping and privacy concerns would be raised.

Sytek to introduce PC Network-compatible interface

MOUNTAIN VIEW, Calif. — Sytek, Inc. today will announce a local-area network headend that is compatible with IBM's PC Network and is designed to support very large personal computer nets. The product handles up to 1,000 nodes at distances of up to three miles in any direction, Sytek said.

Designed as an enhanced functional replacement for the PC Network's Translator Unit, the Sytek 6050 Network Translator is the first in the Sytek 6000 family of PC Network-compatible products for large microcomputer networks, according to Executive Vice-President Ken Biba. The family reportedly will extend Sytek's Localnet architecture, allowing broadband micro nets to coexist on a Sytek cabling system with Localnet 20 terminal-to-host networks.

Localnet 20 is Sytek's main product, and the company has installed more than 800 of them, some of which support more than 3,000 nodes. Co-developer of the IBM PC Network, Sytek also supplies IBM with network interface cards for that network.

Future Sytek 6000 family products will "enhance the PC Network in other ways," Biba said. Among these, he listed "interfacing to other networks, common shared services, common file systems and perhaps distributed applications."

Biba noted that the IBM net was designed for customer installation and is limited to 72 nodes and 1,000 feet. Sytek will offer a turnkey service for large microcomputer networks based on the 6000 family, handling all aspects of network design and installation, the company said.

The IBM/Sytek broadband personal computer net is a carrier-sense multiple access with collision detection system operating at 2M bit/sec. Net performance should not degrade unacceptably on a 1,000-node net seeing typical usage, Biba said. "In most applications, we find, the load on these nets is very small," he added.

The Sytek 6050 reportedly can coexist on a cable system that supports other services such as voice, video and data. The product offers adjustable gain, permitting micro networks to operate on non-Sytek broadband systems, according to the company.

The 6050 is said to work with single- and dual-cable systems and to connect to a branching-tree topology so that a single node can fail without affecting the entire network. The product is said to support industry-standard IEEE channel spacing.

One 6050 headend is required per network. It costs $4,100 and is scheduled for shipment in September.

More information is available from Sytek at 1225 Charleston Road, Mountain View, Calif. 94039.

Firm drops IBM charge

ENGLEWOOD CLIFFS, N.J. — Syncsort, Inc. announced last week it will not pursue the deceptive practices complaint against IBM that it lodged earlier this year [CW, April 22] with the Federal Trade Commission (FTC). Syncsort said IBM's June release of an updated version of DFSort [CW, July 1] resolved performance claims that Syncsort had alleged were deceptive.

IBM disputed Syncsort's interpretation of the June release.

Syncsort President Aso Tavitian said the company did not formally withdraw its complaint, but informed the FTC that "the benefits of further action, in [Syncsort's] judgment, will be relatively marginal."

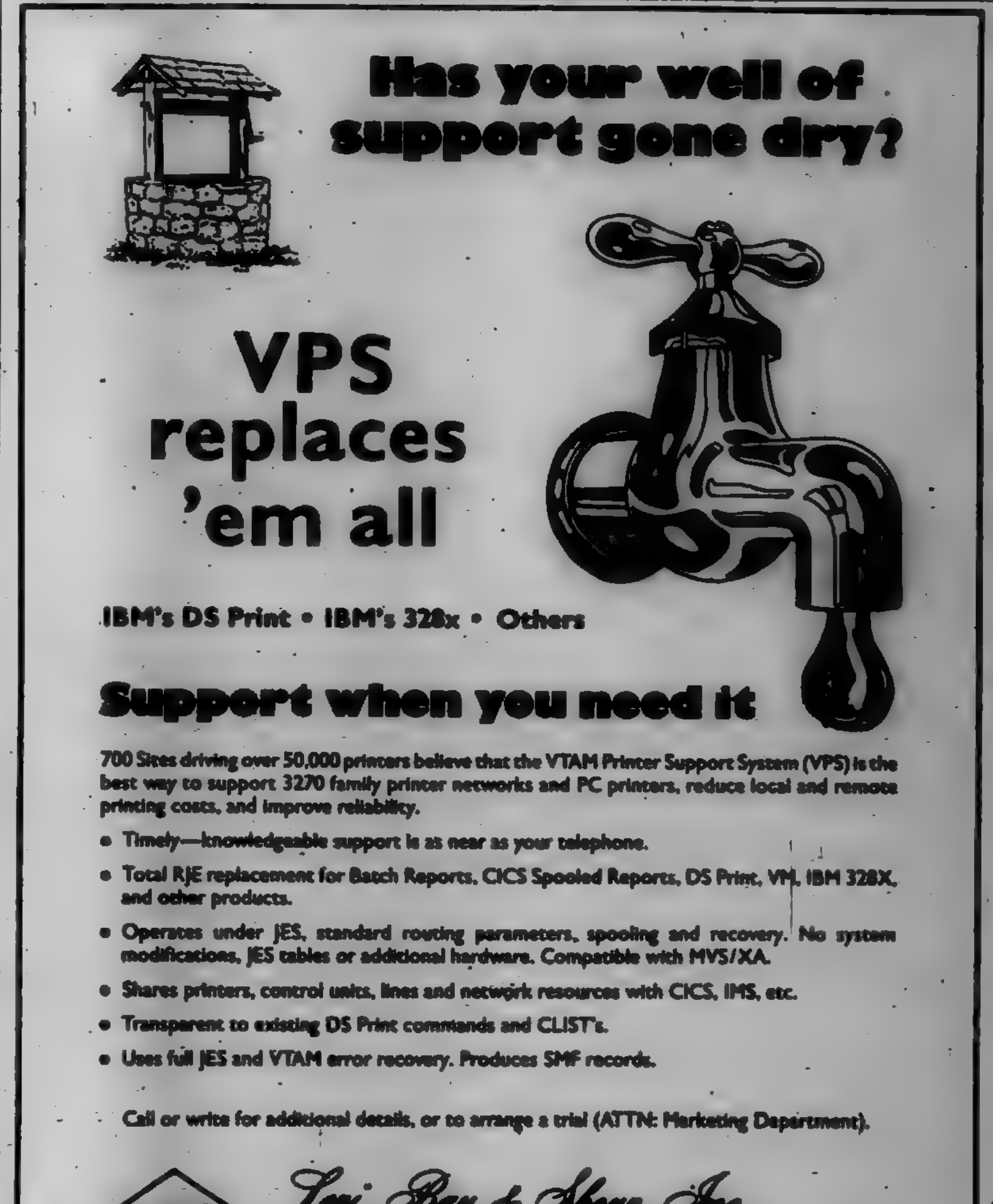
The company developed and markets a sort utility for use on IBM mainframes built on the IBM 370 architecture and claims that 70% of users running IBM's MVS and MVS/XA operating systems have installed its product in preference to IBM's DFSort Release 6..

In February, IBM announced DFSort Release 7 and, Syncsort charged, attributed "significant performance improvements over Release 6" to microcoded 370/XA instructions called Sorting Assists. Syncsort charged in its April 16 complaint to the FTC that the performance upgrades were due to the allocation of up to eight times the additional memory space to operate Release 7 as had been used for Release 6.

In mid-June, IBM released a large number of product announcements, including DFSort Release 7.1, a maintenance version of Release 7. In the latest announcement, IBM said Release 7 performance improvement "is realized through the automatic acquisition of additional virtual storage." Regarding microcoded instructions, IBM said in June, "Release 7 offers further potential performance benefits . . . through the use of the 370/XA sorting instructions."

Syncsort's Tavitian called the June announcement "a thinly veiled retraction" of the February claims.

An IBM spokesman said the June announcement unveiled additional performance improvements and expanded function and was not a response to Syncsort's charges.



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Who will emerge alive from the AT-compatible jungle?

Analysts predict the survivors

By Edward Warner
CW Staff

First there was the IBM Personal Computer AT with its high-speed microprocessor, optional 20M-byte hard disk and a lock built into its case. Then came the Kaypro Corp. 286I, introduced in March, and later that month, the Texas Instruments, Inc. Business-Pro. Soon after, like the jungle at dawn, the personal computer market was alive with the cries of at least a dozen AT-compatibles, all screeching "buy me!"

But the jungle is ruled by the laws of Darwin, and if IBM is expected to sell 175,000 ATs in 1985, a figure which is three times more than all the AT-compatible vendors combined, who else will survive?

Analyst Norm Dewitt, director of the Personal Computer Industry Service for Dataquest, Inc., a San Jose, Calif.-based research firm, picked three products to make it — two offerings from Compaq Computer Corp., both reportedly faster than the AT itself, and the highly expandable Business-Pro, which he said "will give end users quite a bit of confidence that [their machines] can grow."

The majority of those prowling the AT-compatible jungle were already manufacturers of IBM Personal Computer compatibles; they were forced into the AT market when IBM slashed prices on its low-end machines.

Now, the very survival of some compatible vendors is tied to their AT clones, according to analyst George Colony, president of Forrester Research, Inc. in Cambridge, Mass.

Kaypro, in particular, "bet the company on [the 286I]," Colony said.

As in the Personal Computer-compatible market, the AT work-alikes will have to offer IBM compatibility and added value, in that order, according to Colony.

Compatibility is important, he said, because IBM is shifting gears to emphasize Intel Corp. 80286-based Personal Computers, the next of which will be the PC2.

Next year, 55% of all IBM Personal Computers sold, he predicted, will incorporate the 80286, and the clone makers had better be compatible or they will not survive.

For reasons of compatibility, as well as speed, Colony, Dewitt and other observers have picked the two Compaq 80286-based machines, the Deskpro 286 and the Portable 286, as likely winners. Colony noted, however, that the TI Business-Pro will likely fail for its lack of compatibility.

As for added value, there is no question that the compatible vendors think they have it. Three vendors, Compaq, Corona Data Systems, Inc. and Televideo Systems, Inc., boast machines that can run at both the AT-standard 6 MHz speed and at 8 MHz, which reportedly offers up to 30% greater processing speed.

> "
>
> *Now, the very survival of some compatible vendors is tied to their AT clones.*

Another vendor, ITT, offers two different speeds, that of the AT and the 4.77 MHz of the Personal Computer line. The latter feature reportedly would give the ITT Xtra XT full compatibility with the Personal Computer's software base, something even the AT cannot claim.

For expandability, the Business-Pro holds the edge with a whopping 14 expansion slots in its chassis. On pricing, it is Kaypro's 286I, retailing for roughly $1,000 less than the AT.

Ultimately, though, the Big Blue cat that stalks this market jungle may have the last growl — IBM could repeat its price cutting, this time at the high end.

That is, in fact, what some AT dealers say they have done in the face of growing stocks of ATs. Computertown, of Salem, N.H., for example, now offers a hard disk-equipped AT for $900 less than the suggested retail price.

The clone makers' other concern, though a bit more farfetched, is that IBM will kill the AT in order to avoid cannibalizing sales of other Personal Computers.

Adherents of this scenario include Corona Data Systems President Robert Harp, who is reported to have said in an interview that the AT is destined to be "wiped out" by the PC2, a machine that other analysts in addition to Colony expect to be based on the Intel 80286 chip.

Replacing the AT

Another believer is analyst Amy Wohl, president of Wohl Associates, Bala-Cynwyd, Pa., who has said she believes "IBM may bring out a product that replaces [the AT] before IBM's friends [the clone makers] are able to take hold in the market."

Colony disagreed. IBM, he said, is likely to introduce a high-end 80286-based Personal Computer, one more powerful than the AT. But, he added, the AT itself is no flash in the pan.

Meanwhile, back in the jungle, the makers of AT compatibles are waiting for a chance to pounce on the share of the AT market that IBM fails to gobble up. But, they wait uneasily.

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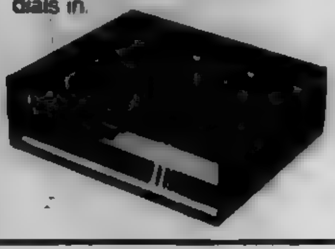

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Intel's 80286 chip: A cut above

While it may run most of the software written for its older brother, the Intel Corp. 80286 microprocessor is a world apart from the Intel 8088 microprocessor that powered the IBM Personal Computer to market dominance.

For one thing, the 80286, upon which the Personal Computer AT and compatibles are based, contains over 100,000 transistors, the basic building blocks of a microprocessor. The Personal Computer's 8088 contains 29,000 transistors.

The 80286 also features a faster timing speed, a 16-bit data bus — the Personal Computer has an 8-bit bus — and handles data by pipelining it. In pipelining, the 80286 handles data retrieval, decoding and execution in separate chambers arrayed sequentially.

As the next instruction is retrieved from memory, the instruction previously retrieved is decoded in the pipeline's midsection, and the instruction just decoded is executed at the pipeline's end.

All together, these features spell speed; the AT reportedly is two to three times faster than the Personal Computer.

Beyond speed, the 80286 chip includes such other features as the ability to operate as a true multiuser processor and the ability to address up to 16M bytes of memory.

It can also partition some of that additional memory into a virtual disk, from which data can be retrieved almost instantly.

The 80286 is not without its problems, however.

Digital Research, Inc. has said that it found an incompatibility between its forthcoming Concurrent DOS-286, an operating system for the 80286, and the chip on which it will run.

According to a Digital Research spokesman, Intel has acknowledged the problem and will begin deliveries of a corrected version of the chip, perhaps as early as this year.

Intel is otherwise understandably proud of the microprocessor. In the company's annual report, the 80286 is referred to as "a stunning technological and financial success."

— **Edward Warner**

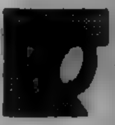
AT from page 1

have found their prayers for more storage answered by the enhanced version of the AT, which includes a 20M-byte disk. Of the roughly 200 Personal Computer ATs that his department has placed with users, 95% of them have been enhanced ATs.

Graffeo said Home Insurance is using Personal Computer ATs, rather than any of the AT compatibles announced in recent months, simply because IBM was the first to offer such a machine. The AT debuted in August 1984, and it was not until March 1985 that the first of the compatibles, the Kaypro Corp. 286i, arrived. Since then, at least a dozen others have premiered.

The compatible makers know from the history of the IBM Personal Computer that being a simple look-alike, without added value, will get them nowhere. Compaq Computer Corp., the most successful Personal Computer-compatible maker, is seen by analysts to have ensured the success of two AT compatibles by offering greater speed than the AT and optional built-in tape backup. Other AT compatibles, such as Texas Instruments, Inc.'s Business-Pro, have emphasized expandability, and still others, such as the 286i, push their prices (see story page 14).

The stark reality facing the clone makers, however, is that corporate users who once braved reports of faulty AT hard disks and waits of up to several months still want to get their hands on a Personal Computer AT [CW, Dec. 17]. According to a survey by Newton-Evans Research Co., an Ellicott City, Md., research firm specializing in the computer industry, 85 out of 91 businesses using personal computers planned to buy additional micros this year — from IBM — and four out of five wanted at least one AT.



Although most ATs are in use as fast, high-storage stand-alones, some pioneers are taking the machine into new territory, a region where the distinction between micro and mini blurs.

For example, New York Commodity, a small New York import/export firm, acquired its sole AT specifically for multiuser operation, according to Marcia Kaufman, the secretary who oversees the computer's use. The machine will be used to support two additional users on terminals, the maximum that PC Xenix allows on the AT. Kaufman said the company had hoped to have the machine running six months ago but that projection was stymied by a lack of off-the-shelf Xenix software. A part-time programmer has been hired to develop software specifically for the firm.

The AT's 20M-byte disk also makes the machine attractive for another use often served by a mini — acting as file server to a local-area network. The headquarters of both Merrill Lynch in New York and Manufacturers Life Insurance in Toronto are testing ATs as part of their shakedown tests of an IBM PC Network-based local-area network. The Manufacturers Life local-area network supports two ATs, four Personal Computer XTs, a Hewlett-Packard Co. Laserprinter and an HP plotter. The Merrill Lynch local-area network uses the AT as its central server, accompanied by a 10M-byte Bernoulli Box cartridge disk drive system from Iomega Corp.

One way in which the AT and its brethren have yet to rub elbows with minis, though, is in internal memory. Although the chip can address up to 16M bytes of memory, IBM's PC-DOS limits the AT to addressing directly no more than 640K bytes. PC Xenix can support more than 1M byte of RAM, but users have not rushed to use it.

Those who develop software for PC-DOS, meanwhile, are awaiting the release of PC-DOS 4, reportedly planned for next year. Expected somewhat earlier is Digital Research, Inc.'s Concurrent DOS 286. Both operating systems reportedly will support multitasking and multiuser capability for PC-DOS applications — as well as a breakthrough of the 640K-byte barrier. When that barrier falls, developers, such as Richard Rabins, president of Alpha Software Corp., said they expect to see 80286-based machines with hard disks running futuristic software packages using artificial intelligence technology.

Until then, much of the power inherent in the AT and its compatibles will remain untapped.

Standard Version

Compaq Computer Corp.	Deskpro 286	8/6	256K	One 1.2M	5	One parallel, one serial	Available now	$4,244
	Portable 286	8/6	256K	One 1.2M	3	One parallel, one serial	Available now	$4,499
IBM	Personal Computer AT	6	256K	One 1.2M	7	None included	Available now	$3,995
Kaypro Corp.	286i	6	512K	One 1.2M	7	None included	Available now	$2,995
Televideo Systems, Inc.	Televideo AT	8/6	256K	One 1.2M	8	One parallel, one serial	July	$3,295

Model	Memory (in bytes)	Diskette Drives (in bytes)	Hard Disk Capacity (in bytes)	Open Slots	Ports	Additional Users Supported	Shipping Date	Price	Comments
Portable 286	640K	One 1.2M	20M (unformatted)	2	One parallel, one serial	None	Available now	$5,299	Transportable; 9-in. monitor
Personal Computer AT	512K	One 1.2M	20M (formatted)	6	One parallel, one serial	2	Available now	$5,795	Top of the Personal Computer line; introduced in November 1984
286i	640K	One 1.2M	20M (unformatted)	7	One parallel, one serial	8	Available now	$4,795	First of the AT compatibles
Televideo AT	512K	One 1.2M	20M (formatted)	7	One parallel, one serial	None	July	$4,795	Monochrome monitor included

CONTROL.

AT compatibility hinges on hardware

Compatibility with the IBM Personal Computer AT is not just a question of the read-only memory (ROM) Basic I/O System (Bios), according to a spokesman for a supplier of compatible systems software.

In addition to Bios, which acts as an assistant to the operating system, a compatible maker needs to copy the basic layout of the Personal Computer AT's internal hardware, including the motherboard, according to Richard Levandov, marketing vice-president at Phoenix Software Associates Ltd. Systems software compatibility can be obtained through porting Microsoft Corp.'s MS-DOS operating system and other systems software, he continued.

A Norwood, Mass., firm, Phoenix Software has made a business of what Levandov called "emulating the IBM [Personal Computer] environment," and 15 of the AT-compatible makers have licensed the Phoenix ROM Bios alone.

Systems software modifications are essential, Levandov explained, because compatible makers receive only an OEM adaptation kit without the machine-dependent portions of the operating system when they buy an MS-DOS license from Microsoft.

For hardware compatibility, Phoenix licenses designs for a motherboard and advises clients on how to complete a basic hardware layout — which is harder than it sounds.

Levandov likes to tell of how the president of a personal computer manufacturer called recently to say that his company had just run off 500 AT-type motherboards and now wanted to pick up Bios to cinch their compatibility.

"I said, by the way, did you use the [National Semiconducter Corp.] 80250 communications controller?" Levandov recalled. "That gets them every time. He said, 'Oh, no, we used the [Signetics Corp.] 8251.' I said, 'That means that [Lotus Development Corp.'s] Symphony's not going to run, [Microstuf, Inc.'s] Crosstalk's not going to run, [Hayes Computer Products, Inc.'s] Micromodem software's not going to run.' "

The best-known issue of compatibility, however, remains Bios. IBM defends Bios well, as evidenced by the successful copyright infringement suits it brought against Eagle Computer, Inc. and Corona Data Systems, Inc., both makers of Personal Computer compatibles.

As Levandov explained it, Phoenix had a head start on development of its AT ROM Bios because it was able to use a lot of the code from the Bios it had developed for the Personal Computer.

As with the development of its Personal Computer-compatible Bios, Levandov said, the AT-type Bios was written by four programmers who had not seen IBM's published Bios specifications. The programmers were given a list of what Phoenix Bios should do, and when they finished, their work was compared with the IBM specifications to make sure it was sufficiently different, he said.

In the end, the pursuit of compatibility turns upon itself: The AT is not totally compatible with the Personal Computer line. The microprocessors used in the Personal Computer and in the AT operate at differing clock speeds and their architectures use 8-bit and 16-bit data buses, respectively. Only two of the card slots in the AT's expansion chassis support the 8-bit bus of the Personal Computer, thus limiting the number of Personal Computer cards that can be inserted into the AT.

The greater compatibility question, though, is one of software. Early in the AT's life, there were several popular programs, including Ashton-Tate's Framework, that did not run on the machine. Since then, most software developers have issued AT-compatible versions of their programs as necessary.

Other programs, such as Datasheet from Interactive Data Corp. of Waltham, Mass., lose some functionality when running on the AT. Datasheet user George Mellman, a Merrill Lynch Pierce Fenner & Smith, Inc. executive in Boston, said he relied on Datasheet for analyzing stocks on the Personal Computer. He said he found that on the AT the software will not transfer files to his Lotus 1-2-3 spreadsheet. Datasheet, he said, is "really useless on the AT."

— Edward Warner

Software developers steer clear of IBM AT

Although the IBM Personal Computer AT was greeted by the cheers of corporate users craving speed for their spreadsheets, the machine holds other potential, particularly the ability to run programs in up to 16M bytes of random-access memory (RAM).

That potential remains largely untapped, and the situation may not change anytime soon because many important software firms have held off on developing packages specifically for the AT.

According to developers, the lion's share of the problem stems from the AT's operating system, IBM's PC-DOS 3.1, which will not work in the AT's protected address mode, the machine's gateway to what can become up to 16M bytes of RAM.

PC-DOS is limited to addressing directly no more than 640K bytes of RAM. In addition, according to consultant Alan Finger, president of Cytek, Inc. of Andover, Mass., PC-DOS "takes advantage of nothing in the [Intel Corp. 80286]" chip on which the AT is based, including the ability to support multitasking and multiuser operation at the chip level.

Developers could still write PC-DOS applications that use the protected address mode, but the applications would run so sluggishly on the AT that they would be useless, said Mike Loftus, systems software marketing manager for Digital Research, Inc. The sluggishness, he elaborated, would arise because "the [PC-DOS] calls would have to be handled by an exception handler" that would spend considerable time routing calls to the proper location.

Developers who write applications that run slowly on the AT but address its larger memory would encounter an additional problem. The AT, in their view, is not selling well enough to warrant going out on such a limb.

IBM, as always, is releasing no sales figures, but analyst George Colony, president of Forrester Research, Inc., estimates that between 200,000 and 230,000 ATs will be sold this year. Colony, however, predicts that all Personal Computers to come out of IBM in the next year will use the Intel chip.

Until that actually happens, Richard Rabins, president of Alpha Software Corp., said he believes it "could be dangerous" for developers to write programs that only run on the AT. At Bellevue, Wash.-based Microrim, Inc., President Wayne Erickson agreed, saying, "We really try to avoid things that, from a hardware standpoint, limit our market."

Neither Microrim, the developer of the Rbase 5000 data base management package, nor Alpha Software Corp., publisher of the Electric Desk integrated package, nor Forefront Corp., author of Ashton-Tate's Framework integrated package, are doing development work for the AT-class machines, the companies said.

That could all change, however, with the release of a new version of PC-DOS, expected to be called Version 4, or with the arrival of Digital Research, Inc.'s (DRI) forthcoming Concurrent DOS-286 operating system. Both operating systems reportedly will debut in the next 12 months and are expected to support the additional addressable memory on the AT in addition to such functions as multitasking, according to DRI's Loftus.

Concurrent DOS-286, he said, will let users run PC-DOS applications in the AT's protected mode. Concurrent DOS-286 will ship to OEMs, such as AT-compatible makers and software developers, in the fourth quarter. Microsoft, meanwhile, declined comment on any products it might have under development.

Were the 640K-barrier to fall and high-memory, high-speed applications to become possible, developers might begin using such memory-hungry technologies as artificial intelligence, according to Robert Firmin, president of Javelin Software Corp. Such AI-based software, the Cambridge, Mass., software developer said, could include expert systems and a new generation of easy-to-use software that adjusts to the skill level of the user.

For an idea of what that future would be like, consultant Finger suggested that one "picture [Lotus Development Corp.'s] 1-2-3 with 1G byte of address space [in virtual memory]."

— Edward Warner

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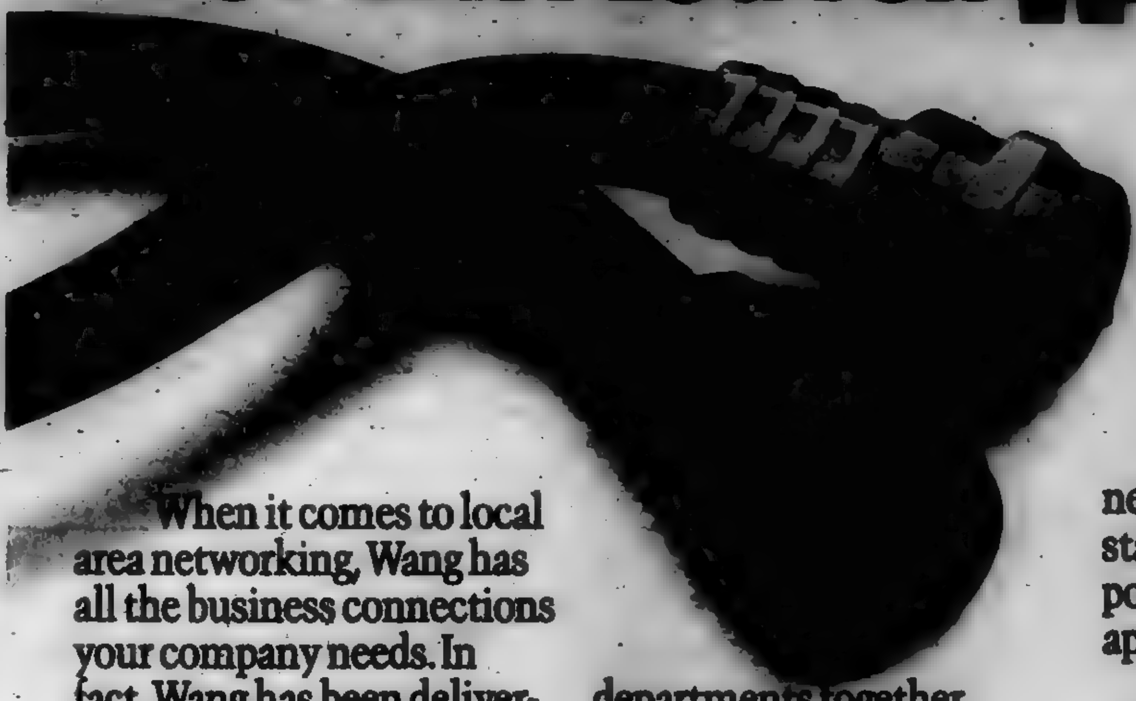

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NBS releases standards for managing password security

By Mitch Betts
CW Washington Bureau

GAITHERSBURG, Md. — Horror stories about security problems with computer passwords abound, from anecdotes about passwords taped to terminals to a case where a computer had the same password (test) that it had when it was uncrated years before.

But government researchers say that, despite the horror stories, passwords can provide ample security if managed and handled properly.

The National Bureau of Standards (NBS), through its Institute for Computer Science and Technology, recently completed a two-part publication that provides guidance on password systems. One part is a mandatory standard for federal agencies — the Federal Information Processing Standard 112 — which sets minimum requirements; the appendix provides guidance for additional security.

> ”
>
> ***Government researchers say that passwords can provide ample security if managed and handled properly.***

"While the effectiveness of passwords has often been questioned, primarily because they can be easily forgotten or given to another person, they can provide reasonable deterrence to unauthorized access if properly handled by [users] and if properly stored and processed in the password verification system," the NBS document said.

The NBS recommended that the computer security officer develop a comprehensive program that covers 10 components of a password system:

- Composition.
- Length.
- Lifetime.
- Source.
- Ownership.
- Distribution.
- Storage.
- Entry.
- Transmission.
- Authentication period.

The federal standard provides only a bare minimum of security, the NBS document indicated. For example, it requires the following:

- Passwords must be at least four characters long and composed from a set of at least 10 characters — such as the digits 0 through 9.
- Passwords must have the shortest practicable lifetime, with a maximum lifetime of one year.
- Any passwords included in a new system when it is delivered, transferred or installed must immediately be changed.
- Users who create or select their own passwords must be instructed to select a randomly generated password or to select one that is not related to their personal identity, history or environment.
- Personal passwords must be distributed in such a way that only the intended owner may see or obtain it.

The stringency of the requirements in each category should match the sensitivity of the computer system's data, the NBS document stressed.

The standard accommodates the use of four-digit personal identification numbers (PIN) for financial transactions, but the NBS document warned that a PIN "can be found in a few minutes" by a hacker. A better composition, the NBS said, has the letters A, B, C, D, E, F and the 10 digits. Passwords made of all letters encourage users to select names, nicknames or other common words.

In theory, the longer the password, the better. But the NBS acknowledged that longer passwords take longer to enter, have more chance of error when being entered and may be more difficult to remember.

"The length range should include a number of lengths, probably five to eight characters, and the composition should be a large set so that a high level of security can be provided easily," the NBS concluded.

The NBS warned that the security officer should not require that the password for each user be unique.

The guidelines also advised against the use of random-number generators commonly available in statistical software, because the sequence of the random numbers they generate is predictable.

When passwords are distributed to users in writing, the user should be instructed to memorize it and then destroy it or return the written password to the security officer with a signed receipt, the NBS said.

Preventing someone from seeing a password as the user types it is a difficult task, the NBS conceded. The NBS suggested several remedies, from masking the password on the screen to having the user shield the keyboard from view.

Copies of the NBS document, "Federal Information Processing Standards Publication 112, Password Usage," can be ordered from the National Technical Information Service, Springfield, Va. 22161.

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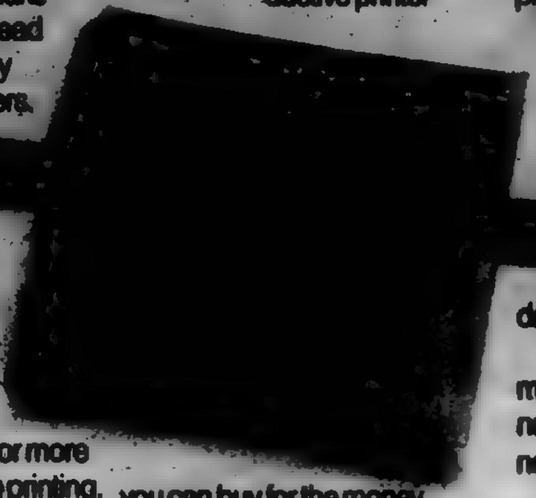

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DATAPRO

from page 1

buy, as opposed to rent or lease, their systems. That trend was a slight increase for some groups of users, but a more dramatic increase for others. For example, in Datapro's 1984 survey, 50.54% of IBM users polled said they purchased their systems, while 49.46% either rented or leased systems. In 1985, 52.22% said they purchased their systems, while 47.51% either rented or leased. Users of NCR mainframes marked a more dramatic switch to purchasing hardware. In 1984, 53.19% purchased CPUs and 46.81% rented or leased. This year, 71.97% said they purchased their mainframes and 28.03% rented or leased them.

■ Nearly all the users polled were generally pleased with their systems. Asked whether their system did what they expected, an average of 96% of the users said it did. Furthermore, a strong majority said they would recommend their systems to others. In fact, some vendors seemed to make significant progress in improving users' opinions of their systems. For example, in 1984, 89.87% of Sperry mainframe users said they would recommend their system to others. This year, 98.33% were willing to make that recommendation.

> ***IBM's aging 3030 line of mainframes increasingly is being viewed as obsolete by users.***

■ IBM's aging 3030 line of mainframes increasingly is being viewed as obsolete by users. In 1984, 91.67% of users were willing to recommend 3030 series systems to others. This year, in the wake of IBM's newly announced 3090 series processors, only 71.43% of 3030 users were willing to recommend 3030s to others — the largest decline of any system line listed in the survey. Furthermore, in 1984, none of the users polled said they would not recommend the 3030 line. This year, 28.57% gave the 3030s a "no" vote — the most resounding "no" vote in the survey.

But while many IBM users appear to have written off the 3030 series, the 3090 announcement does not appear to have shaken users' confidence in IBM 3080 series processors.

The 3080 line, which many industry watchers believe will be severely affected by the 3090 line, still rated high marks. For example, 95% of 3081 users said they would recommend the system to others. Likewise, 96.73% of 3083 users and all 3084 users would recommend their systems.

■ Based on Datapro's overall satisfaction rating — a combination of categories including such factors as reliability, service, software and technical support — the major mainframe vendors are in a dead heat for keeping users satisfied. On the average, all the users polled rated their overall satisfaction with their systems as above average.

The Datapro report, titled "User Ratings of Computer Systems," costs $29.

The report is available from Datapro, located at 1805 Underwood Ave., Delran, N.J. 08075.

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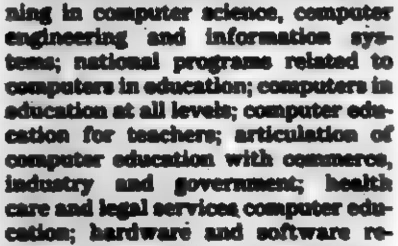
Papers should be typed, double-spaced and are not to exceed 15 pages. Each paper should begin with an abstract of one page or less. Submit all program proposals and papers by Nov. 1, to Necc '86, University of San Diego, School of Education, Alcala Park, San Diego, Calif. 92110.



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DIEBOLD QUALITY CARE

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DIEBOLD®

Users rate the vendors . . .

Survey Item	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Number of User Responses	11	106	[illegible]	581	[illegible]	132	[illegible]	17
Average Life of System (in months)	[illegible]	9.6	[illegible]	9.3	[illegible]	9.9	[illegible]	12.9
Acquisition Method (%)								
Purchase	[illegible]	62.26	[illegible]	52.32	[illegible]	71.97	[illegible]	58.82
Rental or Lease from Manufacturer	[illegible]	18.87	[illegible]	12.02	[illegible]	12.12	[illegible]	29.41
Lease from Third Party	[illegible]	18.87	[illegible]	36.40	[illegible]	15.91	[illegible]	5.88
System Ratings[1]								
Ease of Operation	[illegible]	3.63	[illegible]	3.21	[illegible]	3.24	[illegible]	2.94
Reliability of Mainframe	[illegible]	3.51	[illegible]	3.70	[illegible]	3.39	[illegible]	2.71
Reliability of Peripherals	[illegible]	3.09	[illegible]	3.46	[illegible]	3.39	[illegible]	2.71
Manufacturer's Maintenance Service								
Responsiveness	[illegible]	3.38	[illegible]	3.47	[illegible]	3.31	[illegible]	2.71
Effectiveness	[illegible]	3.10	[illegible]	3.47	[illegible]	3.19	[illegible]	2.41
Manufacturer's Technical Support								
Troubleshooting	[illegible]	2.77	[illegible]	3.14	[illegible]	2.85	2.77	2.65
Education	[illegible]	2.78	[illegible]	3.05	[illegible]	2.95	[illegible]	2.44
Documentation	[illegible]	2.46	[illegible]	2.94	[illegible]	2.68	[illegible]	2.24
Manufacturer's Software								
Operating Systems	[illegible]	3.75	[illegible]	3.25	[illegible]	3.20	[illegible]	2.76
Compilers and Assemblers	[illegible]	3.35	[illegible]	3.29	[illegible]	3.15	[illegible]	2.71
Applications Programs	[illegible]	2.58	[illegible]	2.81	[illegible]	2.56	[illegible]	2.46
Ease of Programming	[illegible]	3.33	[illegible]	2.94	[illegible]	2.92	[illegible]	2.59
Ease of Conversion	[illegible]	3.22	2.84	2.83	[illegible]	3.09	[illegible]	2.50
Overall Satisfaction	[illegible]	3.35	[illegible]	3.19	[illegible]	3.05	3.17	2.41
Additional Ratings[2]								
Ease of Expansion	[illegible]	3.53	[illegible]	3.30	[illegible]	3.60	[illegible]	2.35
Compatibility of Hardware Carried Over from Other Systems	[illegible]	3.23	[illegible]	3.30	[illegible]	3.22	[illegible]	2.57
Compatibility of Programs Data Carried Over from Other Systems	[illegible]	3.22	[illegible]	3.23	[illegible]	3.36	[illegible]	2.35
Power and Energy Efficiency	[illegible]	3.26	[illegible]	3.28	[illegible]	3.02	[illegible]	2.43
Productivity Aids Helps Keep Programming Costs Low	[illegible]	2.83	[illegible]	2.68	[illegible]	2.71	[illegible]	2.18
Software Support Delivered by Vendor	[illegible]	2.83	[illegible]	2.88	[illegible]	2.55	2.77	2.31
Keeping Up with and Implementing Vendor Changes to Hardware and Software[2]	[illegible]	3.13	[illegible]	2.76	[illegible]	2.96	[illegible]	2.60
Delivery and Installation of Equipment[3]	[illegible]	2.92	[illegible]	3.06	[illegible]	2.95	3.17	2.94
Delivery of Required Software[3]	[illegible]	3.00	[illegible]	3.00	[illegible]	2.82	[illegible]	2.75
Did the system do what you expected it to do? (%)								
Yes	100.00	95.28	92.73	97.93	100.00	93.94	[illegible]	88.24
No	0.00	3.77	[illegible]	0.52	0.00	4.55	[illegible]	5.88
Undecided	0.00	0.94	1.82	1.55	0.00	1.52	[illegible]	5.88
Would you recommend the system to another user? (%)								
Yes	[illegible]	89.62	[illegible]	95.87	[illegible]	84.09	[illegible]	41.18
No	[illegible]	3.77	7.27	1.72	[illegible]	9.85	[illegible]	23.53
Undecided	[illegible]	6.60	[illegible]	2.24	[illegible]	6.06	[illegible]	35.29

[1] Ratings are from 4.0 to 1.0, with 4.0 high.

[2] Ratings are from 4.0 to 1.0, with 4.0 = very easy and 1.0 = very difficult.

[3] Ratings are from 4.0 to 1.0, with 4.0 = ahead of schedule and 1.0 = very late.

DATAPRO RESEARCH CORP. CHART

. . . and their mainframes

Survey Item	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Number of User Responses	[illegible]	5	[illegible]	16	[illegible]	17	[illegible]	21
Average Life of System (in months)	[illegible]	5.8	[illegible]	9.8	[illegible]	8.9	[illegible]	9.4
Acquisition Method (%)								
Purchase	[illegible]	80.00	[illegible]	68.75	[illegible]	64.17	[illegible]	61.90
Rental or Lease from Manufacturer	[illegible]	0.00	[illegible]	12.50	[illegible]	5.88	[illegible]	14.29
Lease from Third Party	[illegible]	20.00	[illegible]	18.75	[illegible]	29.41	[illegible]	23.81
System Ratings[a]								
Ease of Operation	[illegible]	3.80	[illegible]	3.81	[illegible]	3.38	[illegible]	3.47
Reliability of Mainframe	[illegible]	3.60	[illegible]	3.81	[illegible]	3.25	[illegible]	3.42
Reliability of Peripherals	[illegible]	3.00	[illegible]	3.31	[illegible]	3.06	[illegible]	3.26
Manufacturer's Maintenance Service								
Responsiveness	[illegible]	3.20	[illegible]	3.50	[illegible]	3.29	[illegible]	3.24
Effectiveness	[illegible]	3.00	[illegible]	3.25	[illegible]	3.00	[illegible]	3.05
Manufacturer's Technical Support								
Troubleshooting	[illegible]	2.80	2.71	3.00	[illegible]	2.76	[illegible]	3.05
Education	[illegible]	3.00	[illegible]	2.75	[illegible]	2.71	[illegible]	2.71
Documentation	[illegible]	2.20	[illegible]	2.73	[illegible]	2.18	[illegible]	2.71
Manufacturer's Software								
Operating System	[illegible]	3.80	[illegible]	3.94	[illegible]	3.53	[illegible]	3.43
Compilers and Assemblers	[illegible]	3.80	[illegible]	3.38	[illegible]	3.24	[illegible]	3.43
Applications Programs	[illegible]	2.50	[illegible]	2.67	[illegible]	2.46	[illegible]	2.44
Ease of Programming	[illegible]	3.60	[illegible]	3.38	[illegible]	3.18	[illegible]	3.14
Ease of Conversion	[illegible]	3.20	[illegible]	3.27	[illegible]	3.12	[illegible]	2.95
Overall Satisfaction	[illegible]	3.40	[illegible]	3.50	[illegible]	3.18	[illegible]	3.33
Additional Ratings								
Ease of Expansion	[illegible]	3.80	[illegible]	3.44	[illegible]	3.47	[illegible]	3.62
Compatibility of Hardware Carried Over from Other Systems	[illegible]	3.20	3.47	3.31	2.71	3.06	[illegible]	2.81
Compatibility of Programs/Data Carried Over from Other Systems	[illegible]	3.20	[illegible]	3.25	[illegible]	2.94	[illegible]	3.00
Power and Energy Efficiency	[illegible]	3.60	[illegible]	3.56	[illegible]	3.06	[illegible]	3.20
Productivity Aids Helps Keep Programming Costs Low	[illegible]	3.20	[illegible]	2.69	[illegible]	2.71	[illegible]	2.76
Software Support Delivered by Vendor	[illegible]	2.60	[illegible]	2.63	[illegible]	2.59	[illegible]	2.60
Keeping Up with and Implementing Vendor Changes to Hardware and Software[b]	[illegible]	3.20	3.17	3.19	[illegible]	3.00	[illegible]	3.05
Delivery and Installation of Equipment[c]	[illegible]	3.40	[illegible]	2.94	[illegible]	2.94	[illegible]	3.10
Delivery of Required Software[c]	[illegible]	3.20	[illegible]	3.25	[illegible]	3.06	[illegible]	3.05
Did the system do what you expected it to do? (%)								
Yes	[illegible]	100.00	[illegible]	93.75	[illegible]	94.12	[illegible]	100.00
No	[illegible]	0.00	2.17	6.25	[illegible]	5.88	[illegible]	0.00
Undecided	[illegible]	0.00	[illegible]	0.00	[illegible]	0.00	[illegible]	0.00
Would you recommend the system to another user? (%)								
Yes	[illegible]	100.00	[illegible]	93.75	[illegible]	88.24	[illegible]	80.95
No	[illegible]	0.00	[illegible]	6.25	[illegible]	0.00	[illegible]	4.76
Undecided	[illegible]	0.00	[illegible]	0.00	[illegible]	11.76	[illegible]	14.29

[a] Ratings are from 4.0 to 1.0, with 4.0 high.

[b] Ratings are from 4.0 to 1.0, with 4.0 = very easy and 1.0 = very difficult.

[c] Ratings are from 4.0 to 1.0, with 4.0 = [illegible] and 1.0 = [illegible].

Users rate their mainframes

Survey Item	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Number of User Responses	9	[illegible]	61	[illegible]	14	[illegible]	79	[illegible]
Average Life of System (in months)	11.4	[illegible]	8.3	[illegible]	8.8	[illegible]	8.3	[illegible]
Acquisition Method (%)								
Purchase	66.67	[illegible]	67.21	[illegible]	35.71	[illegible]	48.10	[illegible]
Rental or Lease from Manufacturer	11.11	[illegible]	4.92	[illegible]	0.00	[illegible]	10.13	[illegible]
Lease from Third Party	22.22	[illegible]	27.87	[illegible]	64.29	[illegible]	41.77	[illegible]
System Ratings:								
Ease of Operation	3.00	[illegible]	3.12	[illegible]	3.25	[illegible]	3.31	[illegible]
Reliability of Mainframe	3.67	[illegible]	3.78	[illegible]	3.50	[illegible]	3.68	[illegible]
Reliability of Peripherals	3.56	[illegible]	3.62	[illegible]	3.25	[illegible]	3.49	[illegible]
Manufacturer's Maintenance Service								
Responsiveness	3.33	[illegible]	3.53	[illegible]	3.29	[illegible]	3.46	[illegible]
Effectiveness	3.22	[illegible]	3.49	[illegible]	3.29	[illegible]	3.56	[illegible]
Manufacturer's Technical Support								
Troubleshooting	2.83	[illegible]	3.15	[illegible]	3.08	[illegible]	3.17	[illegible]
Education	2.75	[illegible]	2.95	[illegible]	3.00	[illegible]	3.18	[illegible]
Documentation	2.80	[illegible]	2.91	[illegible]	3.08	[illegible]	3.01	[illegible]
Manufacturer's Software								
Operating System	2.89	[illegible]	3.17	[illegible]	3.43	[illegible]	3.39	[illegible]
Compilers and Assemblers	3.22	[illegible]	3.21	[illegible]	3.57	[illegible]	3.37	[illegible]
Applications Programs	2.71	[illegible]	2.70	[illegible]	3.00	[illegible]	2.84	[illegible]
Ease of Programming	3.00	[illegible]	2.84	[illegible]	3.00	[illegible]	2.99	[illegible]
Ease of Conversion	2.67	[illegible]	2.78	[illegible]	3.18	[illegible]	2.93	[illegible]
Overall Satisfaction	3.00	[illegible]	3.10	[illegible]	3.29	[illegible]	3.31	[illegible]
Additional Ratings:								
Ease of Expansion	3.00	[illegible]	3.20	[illegible]	2.80	[illegible]	3.64	[illegible]
Compatibility of Hardware Carried Over from Other Systems	3.00	[illegible]	3.16	[illegible]	3.29	[illegible]	3.43	[illegible]
Compatibility of Programs/Data Carried Over from Other Systems	2.88	[illegible]	3.12	[illegible]	3.23	[illegible]	3.35	[illegible]
Power and Energy Efficiency	2.89	[illegible]	3.22	[illegible]	2.14	[illegible]	3.34	[illegible]
Productivity Aids Helps Keep Programming Costs Low	2.56	[illegible]	2.55	[illegible]	2.92	[illegible]	2.72	[illegible]
Software Support Delivered by Vendor	2.11	[illegible]	2.83	[illegible]	2.93	[illegible]	2.97	[illegible]
Keeping Up with and Implementing Vendor Changes to Hardware and Software*	2.67	[illegible]	2.75	[illegible]	2.62	[illegible]	2.76	[illegible]
Delivery and Installation of Equipment*	2.89	[illegible]	3.03	[illegible]	3.00	[illegible]	3.05	[illegible]
Delivery of Required Software*	2.78	[illegible]	3.00	[illegible]	2.93	[illegible]	3.00	[illegible]
Did the system do what you expected it to do? (%)								
Yes	100.00	[illegible]	100.00	[illegible]	92.86	[illegible]	100.00	[illegible]
No	0.00	[illegible]	0.00	[illegible]	0.00	[illegible]	0.00	[illegible]
Undecided	0.00	[illegible]	0.00	[illegible]	7.14	[illegible]	0.00	[illegible]
Would you recommend the system to another user? (%)								
Yes	88.89	[illegible]	96.72	[illegible]	71.43	[illegible]	98.73	[illegible]
No	0.00	[illegible]	1.64	[illegible]	28.57	[illegible]	0.00	[illegible]
Undecided	11.11	[illegible]	1.64	[illegible]	0.00	[illegible]	1.27	[illegible]

5		16		17
6.2	[illegible]	9.3	[illegible]	12.9
40.00	[illegible]	50.00	[illegible]	58.82
0.00	[illegible]	31.25	[illegible]	29.41
60.00	[illegible]	18.75	[illegible]	5.88
3.80	[illegible]	3.25	[illegible]	2.94
3.80	[illegible]	3.44	[illegible]	2.71
3.80	[illegible]	3.07	[illegible]	2.71
3.60	[illegible]	3.50	[illegible]	2.71
3.40	[illegible]	3.44	[illegible]	2.41
3.20	[illegible]	2.88	[illegible]	2.65
3.50	[illegible]	2.63	[illegible]	2.44
2.25	[illegible]	2.44	[illegible]	2.24
3.80	[illegible]	3.44	[illegible]	2.76
3.00	[illegible]	3.31	[illegible]	2.71
0.00	[illegible]	2.62	[illegible]	2.46
3.00	[illegible]	3.13	[illegible]	2.59
3.50	[illegible]	2.93	[illegible]	2.50
3.50	[illegible]	3.25	[illegible]	2.41
3.60	[illegible]	3.80	[illegible]	2.35
3.80	[illegible]	2.73	[illegible]	2.57
3.80	[illegible]	2.38	[illegible]	2.35
3.40	[illegible]	2.81	[illegible]	2.43
3.33	[illegible]	2.81	[illegible]	2.18
2.80	[illegible]	2.88	[illegible]	2.31
3.00	[illegible]	2.88	[illegible]	2.60
3.00	[illegible]	3.25	[illegible]	2.94
3.00	[illegible]	3.13	[illegible]	2.76
100.00	[illegible]	100.00	[illegible]	88.24
0.00	[illegible]	0.00	[illegible]	5.88
0.00	[illegible]	0.00	[illegible]	5.88
80.00	[illegible]	100.00	[illegible]	41.18
0.00	[illegible]	0.00	[illegible]	23.53
20.00	[illegible]	0.00	[illegible]	35.29

DATAPRO RESEARCH CORP. CHARTS

E-X

Software AG Users
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Urisa announces six winners of 1985 Esig awards

By [illegible]
CW Staff

MCLEAN, Va. — The Urban and Regional Information Systems Association (Urisa) has granted six Exemplary Systems in Government (Esig) Awards for 1985.

Winners of this year's awards include the following:

■ New York, for its Street Lighting Interactive Maintenance system, which identifies and consolidates multiple complaints from the same location; determines the contractor responsible for the repair; and groups work orders by geographic proximity. The system, which was said to have increased the efficiency of work crew dispatching and resulted in significant annual savings to the city, was a joint development by the city's departments of General Services and City Planning.

> *The awards were based on a system's benefits to both government and citizens and its sophistication.*

■ San Diego's Water Utilities Department, for an automated Work Assignment Order system that was said to have streamlined the work of the water department, which is responsible for operating, maintaining and repairing mains, valves, pump stations and other facilities.

■ Ottawa's Lands Directorate, for the 20-year-old Canada Land Data Systems geographic information processing system, which, according to Urisa, was designed with such foresight that it has prospered under the direction of a number of different agencies and ministries over the years. The system is said to improve continually and evolve to meet a broad range of data analysis and resource management applications well beyond the original expectations.

■ Dallas — a city that issues more than 60,000 building permits per year — for a building inspection system that allows home owners or contractors to use their tone-generating telephones as data entry terminals to request a building inspection any time of the day or night. The system, developed by the city's Department of Data Services, links the city's mainframe computer with the public telephone network.

■ Fort Collins, Colo., for using handheld meter reading devices to reduce reading-to-billing time and to produce management reports. At the end of the workday, the reading device is brought to the computer department and electronically attached to the computer system to transfer the information to a computer file. This is a special award given in recognition of the efforts of a small city in the use and application of computer technology in the workplace.

■ Toronto, for a Central Property Register that contains 12 files ranging in scope from information describing taxes and ownership to information on the number and species of city-owned trees.

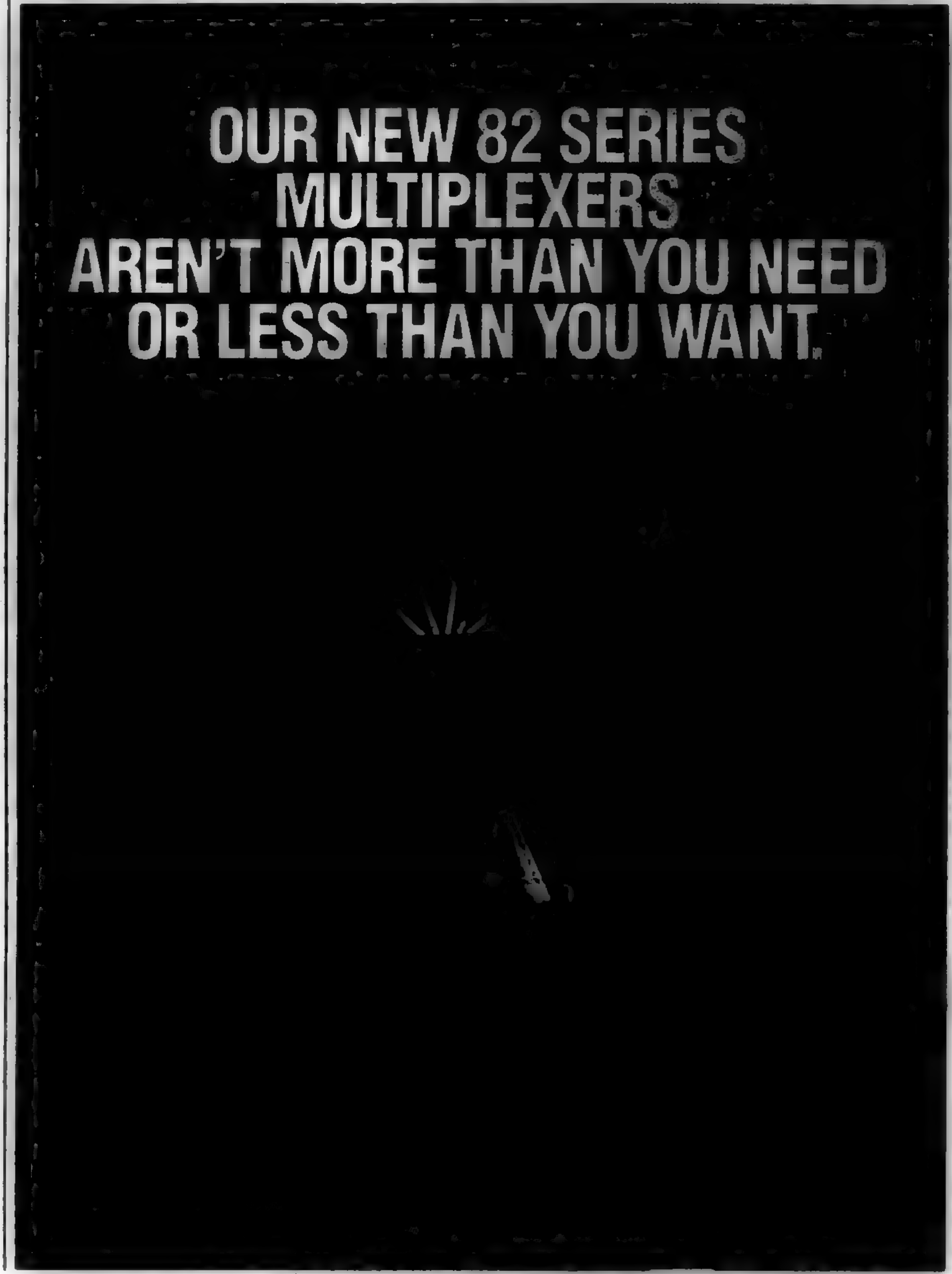
All of the information files are accessible on-line through the use of the street or municipal address.

The awards — given out annually by Urisa — were based on a system's benefits to both government and citizens and a system's sophistication in light of previous accomplishments in the field, according to a Urisa spokesman.

The winners were chosen from a group of 28 submissions from the U.S. and Canada, according to the spokesman.

The awards will be presented July 31 at Urisa's annual conference to be held in Ottawa.

Additional information can be obtained from Urisa, Suite 300, 1340 Old Chain Bridge Road, McLean, Va. 22101.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MCI rate restructuring cuts cost of calls over 200 miles

WASHINGTON, D.C. — MCI Communications Corp. recently announced that it will restructure its analog private-line rates, effective Sept. 1. The new rates will mean price reductions for users of the service where distances exceed 200 miles. The reductions will apply to the portion of service supplied by MCI.

The reductions range from 2% on a 220-mile circuit to 34% on a 2,000-mile circuit. Rates on circuits less than 200 miles will rise an average of 4%, MCI said. Overall, the company said, its private-line analog service rates will drop by 12%.

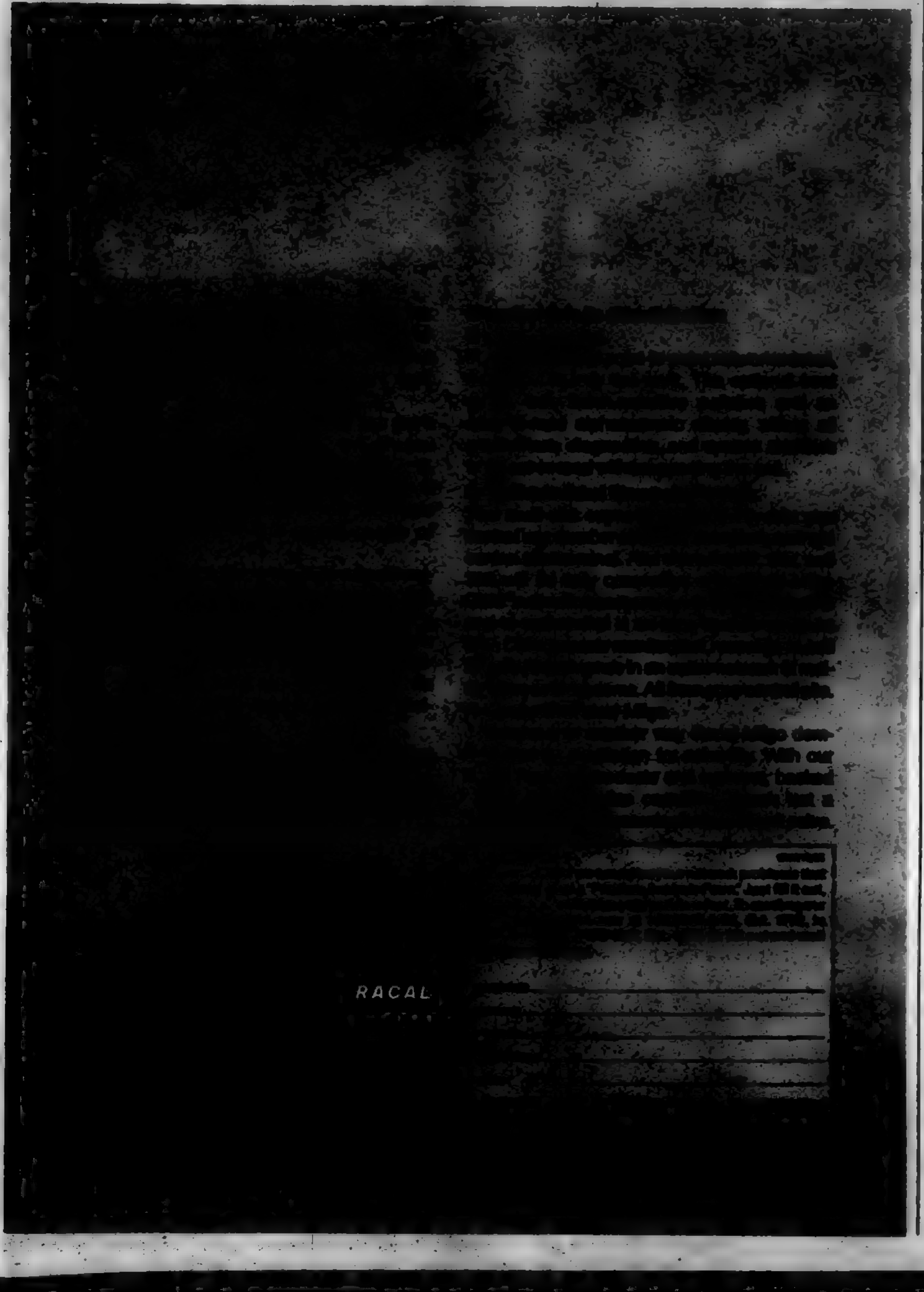
At the same time, MCI said, it will itemize price components to show the cost of local connections. MCI said this change will permit users to choose between arranging for their own local access to MCI's private line or having MCI arrange it.

MCI said that it will price its private-line rates an average of 10% less than the rates of its major competitor, AT&T Communications, for circuits of more than 250 miles. MCI said it has 1,500 users of its private-line service.

MCI also announced that users of its electronic mail service — MCI Mail — will now be able to access the service through Tymnet, the public packet-switching subsidiary of McDonnell Douglas Corp., at a rate of 5 cents per minute of connect time.

According to J. Robert Harcharik, MCI Mail's president, the Tymnet access feature will be available in 550 cities and will also offer users a 2,400 bit/sec. transmission speed in 50 cities.

He said that most MCI Mail users now access MCI Mail through the 800 Wats service, which costs 15 cents per minute.



VDT draft standards released

By Mitch Betts
CW Washington Bureau

SANTA MONICA, Calif. — A draft standard for VDT workstations was recently drawn up by an organization of ergonomics professionals here for eventual consideration as an official American National Standards Institute (Ansi) standard. The standard was released for a three-month public comment period by the Human Factors Society here.

The draft Ansi standard for "Human Factors Engineering of Visual Display Terminal Workstations," which is now subject to three months of public review and comment, covers the working environment of the VDT operator and the design of the workstation, the keyboard and the screen display.

For example, the 72-page draft standard would require the following:

- Adequate screen resolution and luminance and nonjittery displays.
- A contrast ratio between characters and background of at least 3:1 and characters that appear solid to the viewer.
- A minimum viewing distance of 12 inches and an angle between the line of sight and a line perpendicular to the screen less than or equal to 40 degrees.
- Chairs with back rests with lumbar support.
- A keyboard slope between zero and 25 degrees.

A copy of the draft can be obtained for $15 from the Human Factors Society, Box 1369, Santa Monica, Calif. 90406.

Public comments, due Oct. 1, should be accompanied by technical documents supporting the comments.

The Computer and Business Equipment Manufacturers Association (Cbema) has published a nontechnical guide to the draft standard, which can be obtained for $10 from Cheryl Bush at Cbema, 311 First St. NW, Washington, D.C. 20001.

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INFOTRON SYSTEMS

WORLD DIGEST

CW International News Network

TOKYO — Toshiba Corp. unveiled three mid-size and small office computers reportedly featuring enhanced image processing and a greater capacity for networking.

The models are known as Tosbac Q-600, Q-200 and Q-100 and offer integrated numeric, character and image data processing. They also feature accounting, spreadsheet and Japanese document applications that are simple enough for end users with no prior programming knowledge, the vendor said.

TOKYO — Memorex Japan Ltd. has announced its intent to enter the IBM System/38 plug-compatible business. According to a spokesman, the market — associated with data bases, Japanese Kanji character processing and distributed processing capability — is growing at a rate of 25% to 30% annually here. Memorex will market its 3680/3680-2 magnetic disk system, 3240 magnetic tape system and 1503/1511 line printers and terminals with shipments to begin in the third quarter.

BEIJING, China — The largest computer in Hewlett-Packard Co.'s current range of systems, the HP 3000 Series 68 minicomputer, will be assembled in China beginning in the fourth quarter. This was one item to emerge at the official opening of China Hewlett-Packard June 20, a $10 million joint venture between HP, China Electronic Import and Export Corp. and the Beijing Computer Industrial Corp.

BEIJING, China — "How to Succeed in Doing Business and Invest in the Chinese Electronics and Computer Industry" is the theme of a conference to be held in Hong Kong Sept. 12-13. The conference will be cosponsored by China Electronics Import and Export Corp., the Chinese Ministry of Electronics Industry, and International Data Corp. Asia Ltd.

[illegible] — One-third of this city's installed microcomputers are not being used, according to a recent survey conducted by the Industry and Commercial Bank of China here. The survey revealed that annual micro sales are dropping by 48% because of a shortage of application software, a shortage of maintenance and training services and poor management.

MELBOURNE, Australia — Australian users went on a frantic buying spree during the last days of the federal government's 18% investment allowance, which ended June 30. Those companies reporting 300% sales increases for the month included Nixdorf Computer Corp.; Wicat Systems, Inc.; Wang Laboratories, Inc.; Ultimate Computer Services Corp.; National Advanced Systems Corp.; and Amdahl Corp.

Orders were taken up to the last minute Sunday night. Other firms also reported booming sales, with the exception of Control Data Australia, which claimed it had done little added business.

CARACAS, Venezuela — On June 21, the Finance Ministry of Venezuela abolished the requirement for import licenses on some computer equipment here. The requirement, in effect since December, resulted in a decrease in data processing activity in this country.

At the same time, import duties on units up to 640K bytes have been increased to 15%, compared with 1% paid by any other type of computer equipment. The latter move is thought to be in support of Venezuela's domestic development and production of microprocessors.

MUNICH, West Germany — The software and consulting industry here enjoyed double-digit growth percentages last year. The 15 largest firms' revenues grew an average of 17%, with 9% more employees than in 1983. Total revenue for the top 15 firms was $211 million.

Topping the list is Scientific Control Systems GmbH (SCS) of Hamburg, West Germany, with 700 employees. SCS was the only German company to pass "the 100 million Deutschmark mark."

STUTTGART, West Germany — The most important investment in the future is educating and retraining employees in the work force of today's world.

So concluded the recent "Human Factors in Manufacturing" conference held here, where the need for and consequences of automation were discussed.

International conference attendees argued that work performed in offices and factories can be accomplished more efficiently with new technology, but displacement of workers must also be expected.

FREISING, West Germany — Like its U.S. parent, Texas Instruments GmbH is anticipating a decline in revenue for 1985. During a recent press conference here, Norm Neureiter, TI vice-president, blamed the drop on a "panic situation" during which many firms tried to adjust quickly to an explosive demand by dropping prices.

The effect on the German subsidiary was the implementation of shorter workdays but no layoffs. In fact, the past year has seen more than 200 employees added to TI's Freising facility, bringing the total number of German employees to 1,400.

FRANKFURT — Although Wang Deutschland GmbH expects to post losses for the fourth quarter of this business year, the company will not post losses for the entire year.

According to Dieter Benninsta, Wang Deutschland's general manager, the European computer market enjoyed a growth rate of 30% during the past business year, unlike in the U.S., where the market is relatively flat.

Given the U.S. high-tech slump, Benninsta suggested that European subsidiaries should be exercising greater clout with their American parents. With their present success rates, he contended, it might be an opportune time for foreign subsidiaries to push through some European ideas.

Wang's own European subsidiaries reportedly account for 15% to 20% of the U.S. company's total revenue, he said, with firms in France, Germany and England making up 60% of that business.

Benninsta also noted that Wang Deutschland was exercising caution in hiring to avoid the layoffs now plaguing its American parent.

PARIS — A European cooperative to develop strategic military components is part of a high-tech program launched recently by France's President Francois Mitterand. Four companies will take part in the project: Siemens AG, Thomson, General Electric Co. and N. V. Philips Gloeilampenfabrieken. Their work will focus on advanced microprocessors, gallium arsenide components, microwave components, high-density memory chips, flat panel displays and sensors.

STOCKHOLM — According to research conducted by market research firm International Data Corp., Telefonaktiebolaget L. M. Ericsson has squeezed past Luxor Computers for the No. 2 spot in the race for personal computer sales here. The study projects continued growth for the personal computer market here, which is presently being dominated by IBM.

FRANKFURT — Commodore Business Machines GmbH warned consumers of imitation Commodore 64 computers and peripherals. The machines are appearing with increasing frequency here at less expensive prices than authentic Commodore equipment.

The disadvantage to the consumer, Commodore maintained, is that the imitation, primarily imported machines do not conform to Commodore standards and do not include the needed authorization from the German Postal Telephone and Telegraph authorities for communications expansion.

SYDNEY, Australia — During a time when Australia is experiencing a severe DP manpower shortage, Sydney University here has slashed its admissions of computer science students due to an administrative bungle. The computer science department admitted that demand for courses had been growing at 10% annually over the past several years, but resources had not been allocated properly and have fallen steadily. The university has recognized the problem but is unable to divert funds quickly to the department, the spokesman said.

STOCKHOLM — Three "tele-cottages" will be opened in remote regions of northern Sweden. The four-year project is intended to familiarize Sweden's population with computer technology. The centers are completely funded by the Swedish Postal Telephone and Telegraph agency.

CANBERRA, Australia — The Australian Tax Office has refused to pay $2 million for equipment from Time Office Computers Pty. Ltd. The commissioner for taxation reportedly ordered that no invoices be paid to Time due to the unsatisfactory ergonomic design of Time's 6000 series terminal.

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Congress steps up role in federal automation projects

Legislation grants more budgetary power

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Committees of the U.S. Congress have started to exercise more control over the electronic filing and automation projects that are sprouting up in many U.S. government agencies.

In the last few weeks, congressional committees have passed legislation providing themselves with more budgetary power over the automation projects and have held hearings to explore the broader public policy issues surrounding the projects. For example, committees have done the following:

- The U.S. House Judiciary Committee required the U.S. Patent and Trademark Office (PTO) to fund the office's automation project from regular congressional appropriations rather than from off-budget methods, such as through user fees and barters.
- Likewise, the House Energy and Commerce Committee required the Securities and Exchange Commission (SEC) to use on-budget financing for its electronic filing pilot project and warned that congressional approval will be required for full-scale operation of the system.
- The House Subcommittee on Government Information, Justice and Agriculture held hearings on automation projects at the SEC, the Federal Maritime Administration, the Food and Drug Administration, the Department of Agriculture and the Bureau of the Census.

The automation projects vary considerably, ranging from the SEC's so-called Edgar system for electronic filing and retrieval of business documents to systems that put news releases and statistics on electronic bulletin boards.

Supports automation projects

Rep. Glenn English (D-Okla.), chairman of the House Subcommittee on Government Information, said he generally supports automation projects because they have "great potential to make government more efficient and government data more widely available."

But English and other members of Congress have expressed concern about how the automation projects will be operated, who will control the data, who will pay the bill and how private sector information vendors will be treated.

"I don't expect to be told that automation is so wonderful that the details are not important," English said.

Competition with existing vendors

For example, at a hearing on June 26, English explored the prospect that the Federal Maritime Commission's (FMC) proposed electronic filing system could compete with existing information vendors, such as the electronic tariff services run by the Journal of Commerce, Inc. of New York, and Transax Data Corp. of Falls Church, Va.

James J. Carey, vice-chairman of the maritime commission, said a forthcoming feasibility study will determine whether the commission will build its own automated tariff system or will contract with an existing vendor.

Carey and the vendors agreed that automation is inevitable.

Many shippers prepare their rate tariffs on word processing equipment and send paper copies to the FMC; then, information vendors return it to computer format for sale, Carey explained.

"We're the paper roadblock in the middle of this whole chain," Carey said.

Task force review

The maritime commission vice-chairman said a task force is carefully considering the issues English has raised about electronic filing systems [CW, Oct. 8].

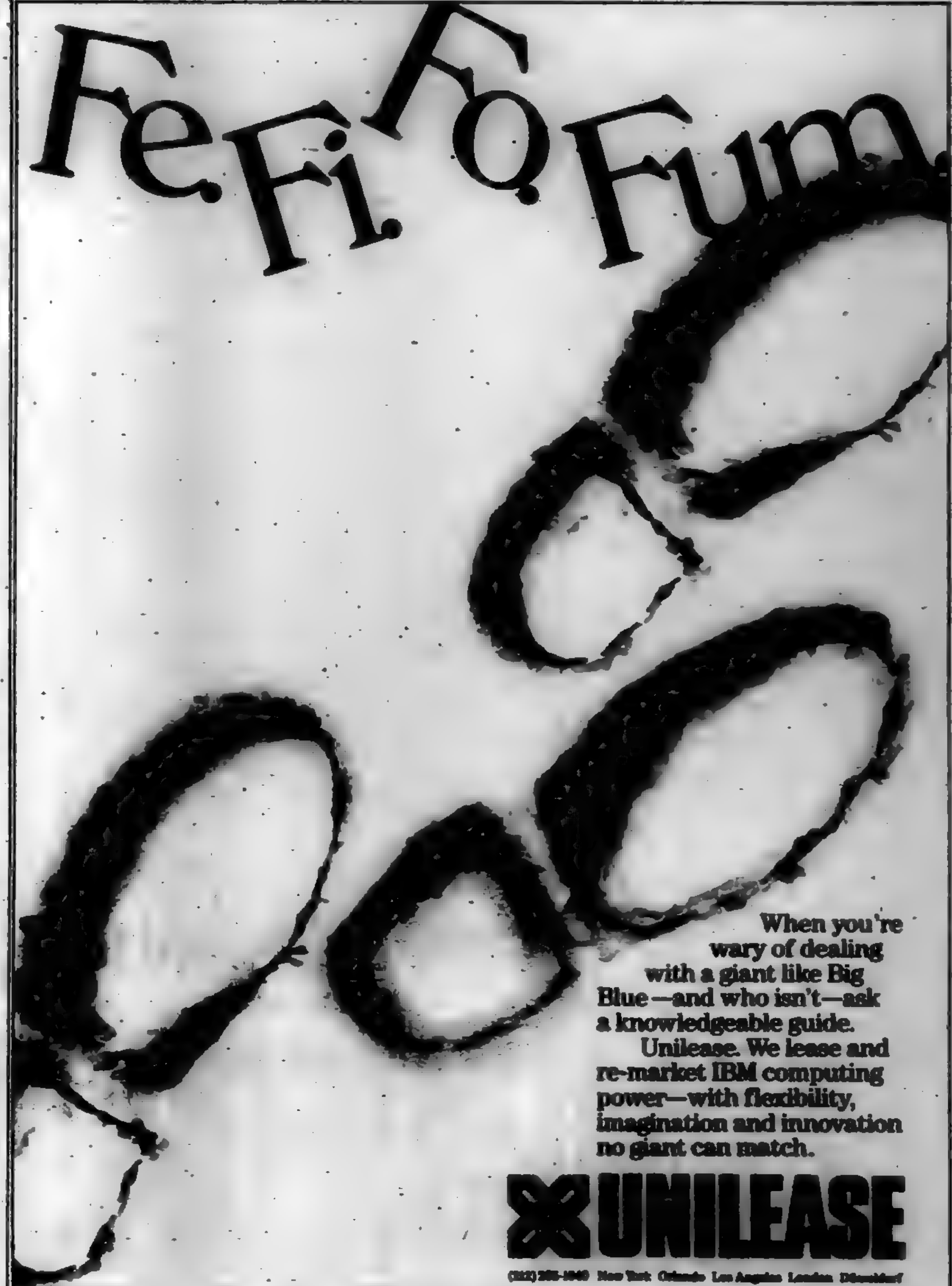
The House Energy and Commerce Committee cast a more critical eye on the SEC's Edgar system after two subcommittees found that the agency had made significant management and procurement mistakes [CW, March 25].

In its SEC authorization bill, the energy committee said the SEC failed to get adequate public participation in development of the project, failed to consider all relevant policy issues and made questionable procurement decisions.

Similar to the energy committee's assessment, the House Judiciary Committee's PTO authorization bill said the General Accounting Office had criticized the management of the project to automate the PTO's massive files of patents [CW, Dec. 3].

The report asserted that the PTO had failed to analyze user needs thoroughly or assess the project's cost-effectiveness and had circumvented congressional oversight by using off-budget financing techniques.

In requiring on-budget financing, the report said, the panel acted on "the theory that unless the [PTO] has to justify fully the obtaining of appropriated monies for development of an automation plan, the automation activities will not receive adequate congressional review."



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TURNAROUND TIME

Larry Long

Q *I hold a second-level DP management position in a Fortune 500 company. Marginal people in our department are being released, and the good people have already left or are looking for jobs. The company has not been profitable for several years, and the outlook for the future is bleak.*

My family is encouraging me to find another job. The headhunters tell me that they could place me in an equal or better position within three months. I would appreciate any insight you might have on my situation.

If others around you, especially top management, are trying to make a go of it, you might consider staying on. If your company emerges from the current difficulties as a leaner, stronger company, and you are an active participant in the turnaround, then you may be rewarded with a quantum career leap.

On the other hand, if top management appears more concerned with their pension benefits than a turnaround, as is so often the case, bail out.

Q *How significant is the Certificate in Data Processing (CDP) within the computer industry? Is this the "industry standard?" Do you feel there will be state certifications in the near future that will override this title?*

How does a person study for this exam in order to pass it the first time? I took all five parts of the exam and failed all five, four of them by one wrong answer. I have six years of experience as an applications and systems programmer/analyst, worked through two study manuals and learned and memorized 700 example questions.

I've addressed various facets of the CDP and its merit on several occasions in the past. During the intervening period, it is my perception that the CDP has neither gained nor lost in acceptance or recognition.

All things being equal, most MIS managers will give the edge to a holder of the CDP. However, more than a few see the CDP as silly and a waste of time.

There is no industry standard, nor do I expect there to be one in the near future. It will take a series of publicly visible, catastrophic events before states begin to consider certifying MIS professionals.

When someone with six years of experience who undertakes a concerted study effort fails five out of five exams, this confirms what I have said in the past — something is wrong with the exams. People who have taken the exams have told me that the questions are often ambiguous and that the choice of answers can boil down to a matter of opinion where there may be no truly correct answer. I also found this to be the case.

When you take the exam again, use your experience and your analytical ability to select the response that you feel the exam sponsors want. The best strategy may be to combine your experience with common sense. Don't evaluate the alternatives too literally. Remember, there is not enough space in a multiple-choice format for the list of possible answers to include all of the exceptions.

Q *My problem is headhunters. They have done me more harm than good. Some headhunters send resumes to every company they know. When the company finds that it has received the same resume from more than one headhunter, that firm automatically rejects the candidate to avoid headhunter disputes.*

I had asked the two headhunters with whom I had been working not to send a resume to a certain company because I had approached that company myself. Both headhunters sent resumes to that company, and the company told me to reapply after a year.

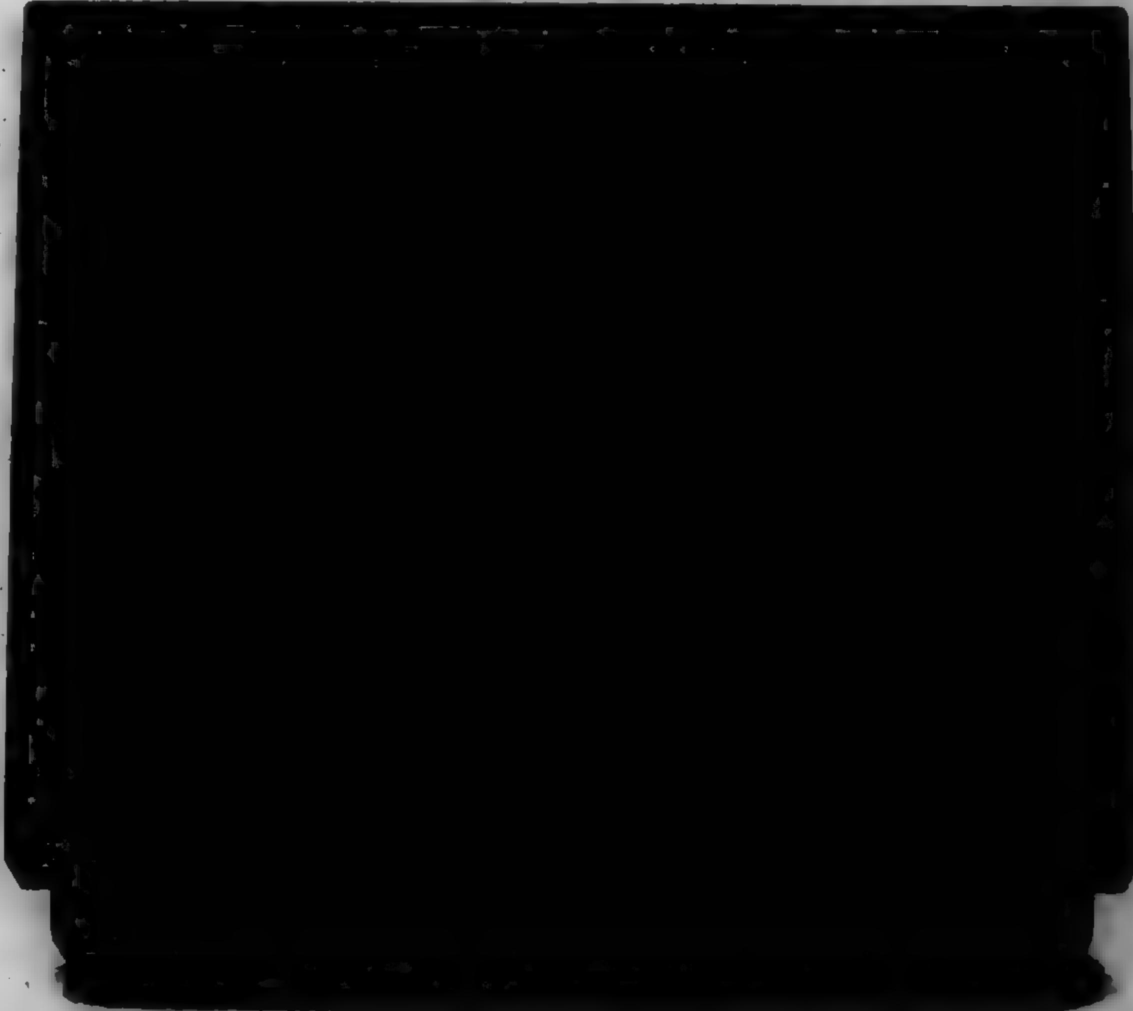
Eventually, I had to postpone my job search for a year. I did not use a headhunter when I resumed my search.

Is it reasonable to insist that a headhunter supply a list of companies contacted? I don't want one headhunter's letter to nullify one sent by another.

What you can request is a function of your relationship with the search firm. That relationship is negotiable, and it is up to you to lay out the ground rules. If you cannot agree, look elsewhere for a search firm. If you give them carte blanche to distribute your resume as they see fit, you should request a list of companies to which your resume has been sent. Certainly, if there are companies that you wish to be off limits, supply the search firm with the list and update it as needed.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you would like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

"Oh, you'll recognize me — I'll be a-smokin' on a big cigar."



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Combining the 32-bit MC68020, multiple auxiliary processors, and a tuned version of UNIX™ System V, the 30-user 3068 "is capable of a performance that rivals large mini-computers." (Computerworld, April 1985). And it does it for a micro computer price—from $7,000 for OEM quantities.

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"Using plug-in boards the way a personal computer does really sets Altos apart." (research firm Creative Strategies, Computerworld, April 1985). OEM's can choose from a wide range of modules: 10 to 40 serial ports; 1 to 16 MB of memory; 17 to 200 MB (formatted) hard disk storage.

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MANAGERS ON THE MOVE

FRANK M. PILUSO has been promoted to senior vice-president of computing and communications at California Federal Savings and Loan Association at the institution's service center in Rosemead, Calif. Piluso will be responsible for California Federal's nationwide computer processing and data communications.

Piluso

Piluso had previously been vice-president and division manager of computing and communications. He joined California Federal in 1983 from Carter Hawley Hale, Inc., where he had been director of information processing.

He is a 1971 graduate of California State University in Northridge, Calif.

■

JACK FUEHR has been appointed vice-president of MIS for Lotus Development Corp. Fuehr will be responsible for worldwide data processing activities at Lotus and will provide added input for the marketing and development of Lotus products to end users in the MIS field.

Fuehr

Prior to joining Lotus, Fuehr managed the marketing and development of the Cashman Personal Finance Manager software at Verisoft in Dallas. Fuehr founded that company in 1984.

Earlier, he served as vice-president of data processing at Mostek Corp. in Carrollton, Texas.

He graduated from the Case Institute of Technology in 1964 with a B.S. in electrical engineering and from Carnegie Institute of Technology in 1966 with an M.S. in industrial administration.

■

JAMES A. DECKER has been named director of insurance systems and **JOHN I. WOOLERY** has been named director of Management Decision Systems for Security Pacific Information Systems, Inc.

Decker is responsible for new product development and applications support for insurance. He has more than 15 years of experience in the insurance data processing field.

He graduated from Indiana State University with a B.S. degree.

Woolery is responsible for financial systems and decision support product development. He has 13 years of experience in providing data processing services.

Woolery attended California's Los Angeles Valley College, where he studied general programming.

Security Pacific Information Systems provides data processing and telecommunications services to financial institutions including commercial banks, savings and loan institutions, insurance companies and mortgage banking companies. It also provides financial services and disaster recovery services to the financial industry and other industries. It is a subsidiary of Security Pacific Corp. of Los Angeles.

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NEWS

CALENDAR

WEEK OF AUG. 11

AUGUST 12-13, CHICAGO — **Integrating Voice and Data in the Private Branch Exchange.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ariz. 60521.

AUGUST 12-13, TORONTO — **Principles of Prototyping.** Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Aug. 19-20 in Portland, Ore., and Aug. 22-23 in Calgary, Alta.

AUGUST 12-13, TORONTO — **SAS Programming for New Computer Users.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511. Also being held Aug. 19-20 in Portland, Ore.; Aug. 22-23 in Calgary, Alta.; Sept. 9-10 in Atlanta; and Sept. 12-13 in Fort Worth, Texas.

AUGUST 12-14, LOS ANGELES — **Data Communications: Network Design Integration and Applications.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

AUGUST 12-14, MILWAUKEE — **The IBM Personal Computer.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 14-16 in Baltimore and Seattle; Aug. 19-21 in Baton Rouge, La., and St. Louis; and Aug. 26-28 in Cherry Hill, N.J., and San Diego.

AUGUST 12-14, SEATTLE — **The IBM Personal Computer.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015. Also being held Aug. 21-23 in Chicago and Aug. 26-28 in New York.

AUGUST 12-14, SOMERSET, N.J. — **Data Communications Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 21-23 in San Diego and Aug. 26-28 in Memphis.

AUGUST 12-15, CHICAGO — **IMS/DC (Data Communications) Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 12-15, LOS ANGELES — **CICS/VS Logic and Debugging.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 19-22 in Atlanta and San Francisco.

AUGUST 12-15, SAN ANTONIO — **Vsam From Start to Finish.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 19-22 in Fort Lee and Los Angeles.

AUGUST 12-16, CHICAGO — **Logical Data Base Design.** Contact: Cathy Chatfield-Taylor, Ken Orr & Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

AUGUST 12-16, FORT LEE, N.J. — **CICS/VS Application Programming — Macro Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 26-30 in Los Angeles.

AUGUST 12-16, FORT LEE, N.J. — **CICS/VS Application Programming — Command Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held in Boston and San Francisco; Aug. 19, 21, 23, 26 and 28 in New York; Aug. 19-23 in Denver; and Aug. 26-30 in Atlanta.

AUGUST 12-23, PARSIPPANY, N.J. — **Ans Cobol.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

AUGUST 13-16, DALLAS — **SAS Processing Course.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 14-16, DENVER — **Office Automation.** Contact: Center for Advanced Professional Education, Suite 110, 1820 East Garry St., Santa Ana, Calif. 92705. Also being held Aug. 26-28 in Hartford, Conn.

AUGUST 14-16, SCOTTSDALE, ARIZ. — **PBX/CBX.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 26-28 in Long Island, N.Y.

AUGUST 15-16, SAN JOSE, CALIF. — **Network-**

See Aug., page 49

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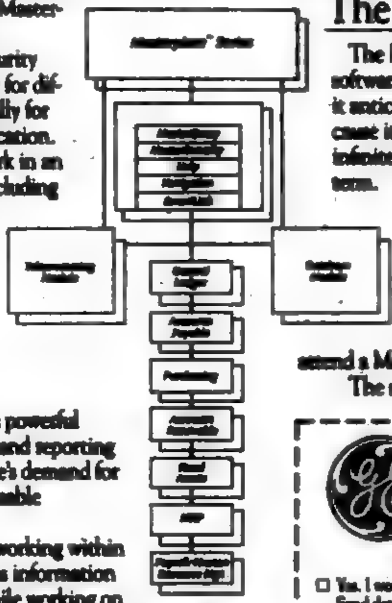

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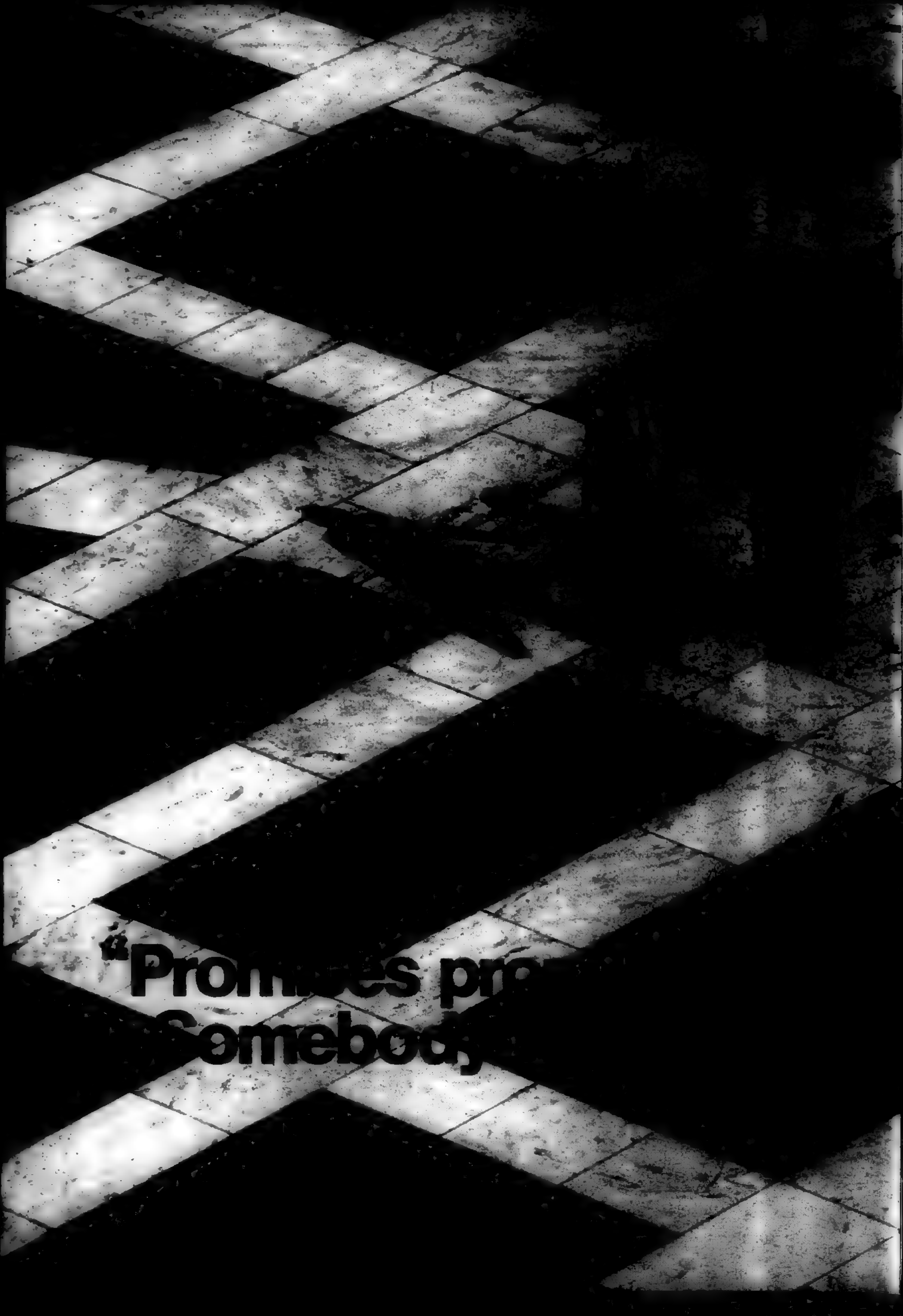

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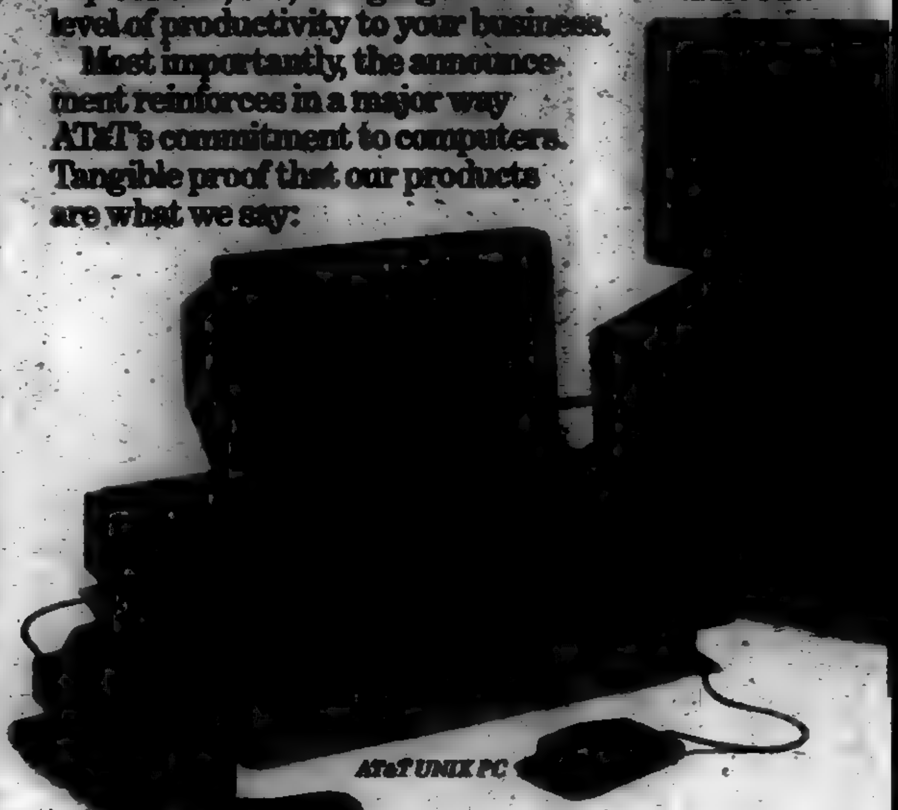
What's more, they can be connected easily to each other and to your mainframes. They're readily expandable, too, bringing a new level of productivity to your business.

Most importantly, the announcement reinforces in a major way AT&T's commitment to computers. Tangible proof that our products are what we say:



The Computers With The Future Built In. Our computer line now includes the following:

Computers: To serve an entire office, our recently enhanced line of AT&T 3B Computers puts the flexibility and power of the UNIX™ Operating System to work for you.

There are five models. Our new 3B2/400 can accommodate up to 46 different peripherals (terminals, printers, modems, etc.). The new 3B15 up to 128.

new computer products AT&T is now fully equipped to offer to your computer needs.

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THE COMPUTERS WITH THE FUTURE BUILT IN

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Those with a major investment in mainframe computers can rest easy. Now you can enjoy complete end-to-end connectivity. We now support popular SNA and BSC protocols, which means our computers and systems can communicate and work with your mainframes. Your investment is protected.

Peripherals: We offer a full line of high-performance, highly reliable synchronous and asynchronous terminals and printers. They're highly compatible, too, with our own and other computers.

Software: Choose from a large and growing list of applications software based on UNIX System V. Some handle general business, such as word processing, financial spreadsheets, and business graphics. And some tackle specific needs of specific industries, including, accounting, automotive and retailing.

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The Future Looks Even Brighter

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You know that when you buy an AT&T Computer product, you're making the right choice—and you're giving yourself more choice. Our flexibility gives you more options when the time comes to expand.

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Our service options are another way we're working to help you pull the pieces together in a logical, coherent way.

In every way, we're working to make The Computers With The Future Built In work best for you.

For a more detailed look at what AT&T Computer products can do for you, just turn the page.

See how AT&T Computer products can make your system work as a system.

AT&T 4410 Terminal
AT&T 3B2/400 Computer

It's easy to get started putting AT&T to work for your business—in small easy steps or a complete system. These communications-based computer products are designed to work with each other, and with your existing system.

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AT&T 4410 Terminal
AT&T Model 4000 MODEM

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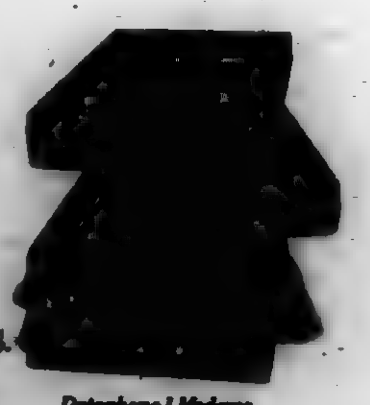
To over 500 tested software packages already listed in the AT&T Computer Software Guide, we're adding more applications programs, such as UltraCalc** and CrystalWriter.*** For systems developers, high level languages for 3B Computers such as UX-Basic† and Micro Focus Level II Cobol†† open the world to thousands of additional software applications running in the UNIX System V environment. And AT&T can address unique business needs with software solutions specifically for vertical markets such as accounting, real estate, and automotive industries. IBM††† mainframe VM users now have UNIX System V development capabilities through our System V-VM software.



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AUG. from page 43

ing the IBM Personal Computer. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 15-16, TORONTO — **The Information Center.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015. Also being held Aug. 22-23 in Philadelphia.

WEEK OF AUG. 18

AUGUST 18-23, DALLAS — **Systems Development: Information Modeling.** Contact: Arthur Young & Co., Arthur Young Education Center, 1950 Roland Clarke Place, Reston, Va. 22091.

AUGUST 18-23, LOS ANGELES — **The International Joint Conference on Artificial Intelligence.** Contact: Claudia Mazzetti, American Association for Artificial Intelligence, 445 Burgess Drive, Menlo Park, Calif. 94025.

AUGUST 19-20, BOSTON — **Data Communications II: Digital Communications Systems.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

AUGUST 19-20, DETROIT — **Information Centers: End User Computing.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held September 26-27 in Atlanta.

AUGUST 19-20, HASBROUCK HEIGHTS, N.J. — **Unix/Xenix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 21-22 in Hartford, Conn.; Aug. 26-27 in St. Louis; and Aug. 28-29 in Philadelphia.

AUGUST 19-21, NEW YORK — **SAS Computer Performance Evaluation Course.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 19-21, NEW YORK — **Telecommunications Management.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

AUGUST 19-22, SAN ANTONIO — **Vsam: Its Structure and How to Use It.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 26-29 in Fort Lee and Los Angeles.

AUGUST 19-22, SAN FRANCISCO — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

AUGUST 19-23, PHILADELPHIA — **Advanced Systems Analysis.** Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Sept. 23-27 in Hartford, Conn.

AUGUST 20, NEW YORK — **CICS/VS Application Design.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 22, 27 and 29 in New York; and Aug. 26-29 in Denver.

AUGUST 20-22, NEW YORK — **SAS Processing Course.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 21-23, ARLINGTON, VA. — **Local Area Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 26-28 in Montreal.

AUGUST 21-23, BOSTON — **Data Base Administration and Data Resource Development.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Sept. 11-13 in Dallas.

AUGUST 21-23, CARY, N.C. — **SAS Operations Research Course.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 22-23, NEW YORK — **SAS Report Writing Course.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

WEEK OF AUG. 25

AUGUST 25-30, DALLAS — **Systems Development: Design Phase.** Contact: Arthur Young & Co., Arthur Young Education Center, 1950 Roland Clarke Place, Reston, Va. 22091.

AUGUST 26-27, SAN ANTONIO — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 26-28, PARSIPPANY, N.J. — **Vsam in Cobol.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

AUGUST 26-29, FORT LEE, N.J. — **IMS/DB (DL/1) Application Programming.** Contact: On-Line Software International, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 26-29, SAN FRANCISCO — **Integrated Information Technology Conference and Exposition (Intech '85).** Contact: Jill Nieman, National Trade Productions, Inc., 2111 Eisenhower Ave., Alexandria, Va. 22134.

AUGUST 26-30, HOUSTON — **Analysts' Skills Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

AUGUST 27-29, HOUSTON — **SAS Basics Course.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 27-29, CARY, N.C. — **SAS Applied Time Series Analysis and Forecasting.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 28-29, SAN ANTONIO — **Recovery/Restart.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

WEEK OF SEPT. 1

Sept. 4-6, LOS ANGELES — **Information Systems Architecture.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

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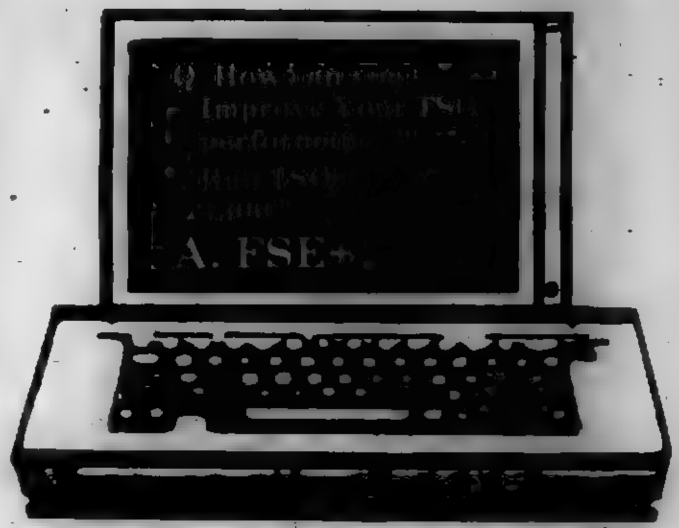

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EDITORIAL

Sitting out the show

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Apple Computer, Inc.
Tandem Computers, Inc.
Compaq Computer Corp.
McCormack & Dodge Corp.
Management Science America, Inc.
Software International Corp.
Lotus Development Corp.

The list of vendors that will not attend the 1985 National Computer Conference this week is almost as interesting as the list of those that will attend. What interests us more than the question of who is sitting out the show is the matter of why they are sitting out.

There will, of course, be plenty to see and do at NCC. The American Federation of Information Processing Societies, Inc., the show's sponsor, said more than 600 exhibitors from 330 product and service categories will blanket the McCormick Place convention center. NCC Program Director Anthony S. Wojcik has assembled an impressive roster of 84 technical and 27 professional development sessions. And Afips estimates that the show will draw 80,000 attendees.

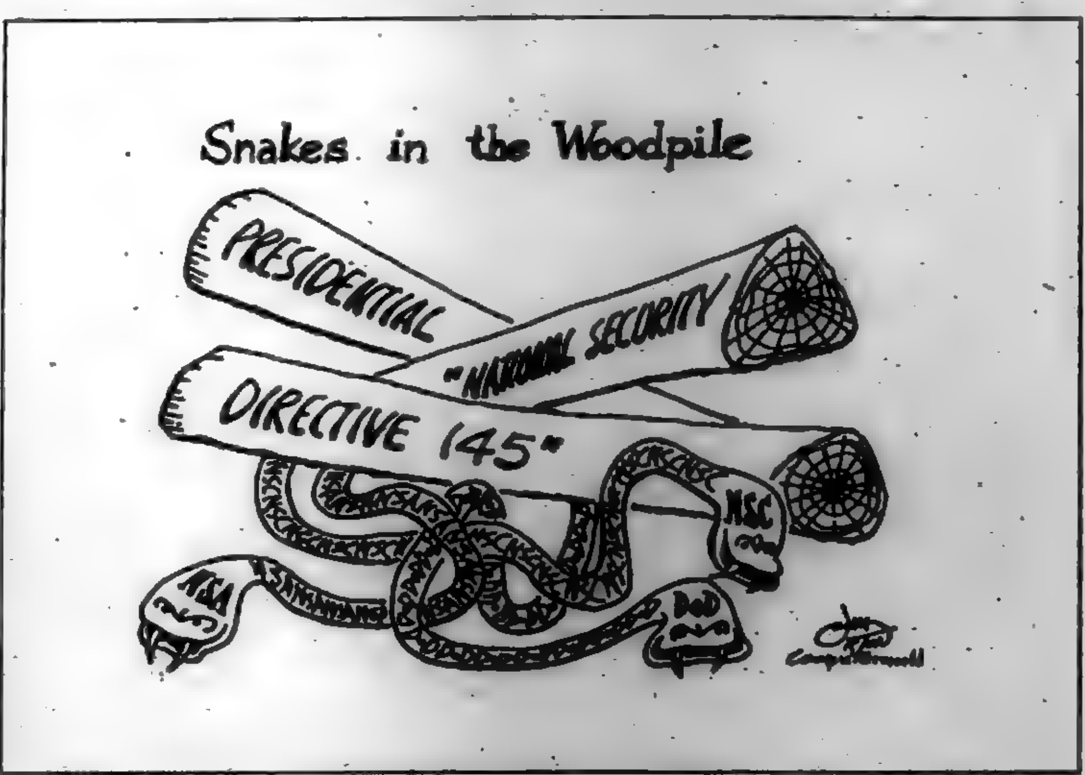
There is, however, a rising chorus of vendors, such as those listed above, that find NCC no longer delivers enough bang for the buck. Some, like McCormack & Dodge and Computer Associates International, Inc., prefer more focused trade shows where they can accomplish serious educational selling to decision makers. Others, like Wang and Apple, have had to cancel because of financial difficulties.

Approximately 50 vendors from last year's show will not be in Chicago this year. And the 600 exhibitors who will be on the floor are fewer than the 664 who exhibited at NCC '82 in Houston. Afips has also reduced its attendance estimates from 100,000 in 1982 to 80,000 this year.

But attendance and exhibitor figures at this or any other trade show merely hint at some deeper forces affecting computer vendors and computer users at the midpoint of this decade. Among them are the following:

- NCC is one of hundreds of shows in this business. With so many trade shows confronting them, vendors are resorting to more cost-effective marketing strategies.
- There is a glut of products on the market — thousands of them with new ones released every day.
- Big corporations have been computerized, and the easy bucks have been made. Vertical markets and small businesses are the new frontiers.
- Stiff foreign competition and the strength of the dollar overseas hamper the domestic computer industry and will continue to do so in the near future.
- Deregulation of AT&T has confused end users, nurtured the communications bypass industry and spawned new telecommunications alliances such as IBM-MCI.
- Financial fissures are showing up for the first time in stalwarts like IBM, DG and Wang. These, like the industry itself, were thought to be recession proof. The very technological leadership of the U.S. computer industry has been called into question.

Given the state of the industry right now, those companies sitting out NCC this year are doing so for good reasons. They have more important business to attend to.



Private sector data security control

LETTERS

Paying for specialized knowledge

I am writing to you in reference to the letter from a micro and OA consultant in Larry Long's column Turnaround Time [CW, June 10].

I, too, am a consultant. The most important thing a consultant must know is the state of the organization. We learned long ago that people cannot write computer programs to solve a problem unless they understand the problem. Certainly this consultant in the column was doing what most consultants would do — learning about the state of the organization and about the people involved.

Some of us will turn down consulting engagements when we learn of the state of the organization and its people. Perhaps I should phrase it that we will turn down engagements when we learn the *true* state of the organization; not what the person hiring us thinks it is.

It seems to me that the bill for consulting services might be correct for a month's work. The consultant could have worked 100 hours at $60 per hour, and that would be $6,000.

Many people don't realize that expertise is not cheap. But many times the person who calls in a consultant is cheap. I have many instances where people are simply shocked at what the job will cost.

Consultants are hired for their specialized knowledge. They must mesh their knowledge with the situation of the organization they are helping.

The best way for people to judge consultants is to talk with prior clients.

Ruth Hudson Lankford
Indianapolis

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VIEWPOINT

Early announcements: Let the buyer beware

THE DATA CENTER
John P. Murray

Last year, *Computerworld* paid considerable attention to the early announcement of products and features and the impact of those announcements on customers [CW, July 9, 1984]. The article raised the ethical aspects of this issue. There are, however, pragmatic issues involved here that should be considered.

Anyone who is responsible for an organization's funds — particularly those the magnitude of information processing purchases — and is not cautious and prudent when dealing with the vendor is simply remiss.

If an organization does find itself in a situation where the vendor fails to deliver what was promised but was never demonstrated, it produces difficulty. Then it would appear that those responsible for dealing with the vendor are the ones to blame.

How do such circumstances come about? Usually they result from the customer's desire to realize the benefits of the proposed enhancements. If that desire is strong, it can often seduce the customer into a false sense of security. We often hear what we want to hear. We want to believe that the enhancements will be delivered, as promised, on time.

Unfortunately, it is often the case that the failure to deliver whatever may have been promised has repercussions that range far beyond the information processing department. It may affect the plans of other departments or perhaps those of the entire organization.

Given that these enhancements represent considerable value to the organization, and that nondelivery can pose serious problems, how can customers protect themselves from such difficulties?

The most secure method is to see the new feature in actual use in a client's environment and to talk to that client about the performance of the feature. "If I can't see it, I don't believe it," will work over time to the benefit of the customer.

If the vendor cannot provide a working example of the enhancement, the safest and most sensible approach is simply to delay any consideration of the new product, at least until reasonable test results can be verified. Although that is the most prudent approach, it is often the case that pressure — often political pressure — will be exerted to accept the enhancement as though it were a fact rather than a concept.

Steps for protection

If that is indeed the case, there are still steps that information processing managers can take to provide at least some degree of protection for the organization.

The first step should be to provide many qualifiers and caveats to any proposal for information processing clients and the organization's senior management in their evaluation of the particular enhancement and its impact on the organization. Statements such as, "untested technology," "high degree of risk," "potential for failure" might be considered good attention-getting devices.

Another step is to write as much protection as possible for the organization into the agreement between the organization and the vendor. The delivery date specification and the performance of both the product and the vendor should be clearly determined and identified. Nothing significant should be left out of this document.

Relying on statements from sales representatives such as, "not to worry, that can all be worked out later, trust us," may indeed turn out to be something to worry about at a later date. In all cases, make certain your legal people are involved. Trust their judgment, and follow their advice.

There are numerous organizations that have suffered embarrassment or serious operational and financial distress even to the extent of going out of business because of imprudent anticipation of new features that were never fruitful or were so late when finally delivered, that they were of little value.

Selling solutions to problems

Competition is not likely to become any less fierce among those who want to sell solutions to our myriad problems. The nature of change is so strong and so rapid in our business, that expecting all vendors to wait to announce some dramatic new feature until it is fully tested and ready for the market appears to be unrealistic.

Those who deal with the issues involved in early announcements should understand sufficiently their inherent complexities and realize that a prudent approach is not only the best one but also the only one.

The admonition "let the buyer beware" is still valid and should be used when dealing with early announcements. If you don't heed that advice, you have no one to blame but yourself.

Murray is director of management and information services for American Breeders Service, a DeForest, Wis., division of W. R. Grace & Co. and is the author of Management Information Systems as a Corporate Resource.

Clever Hans and the data processing tool kit

MANAGEMENT MATRIX
Walter F. Cuirle

Back around the turn of the century there lived a computational phenomenon: a horse known as Clever Hans. He became quite a worldwide sensation in that Hans' trainer claimed to have taught the horse to solve arithmetic problems; what's more, the trainer could, and did, publicly demonstrate the horse's ability with numbers.

This wasn't a circus act. The trainer, a research psychologist, entirely attributed Hans' abilities to a new training method he had developed. This was a conceit that he was certainly entitled to if, in fact, the method worked. And, after all, it must be true because Hans did come up with the right answers.

Not always. A panel of psychologists looked into this data processing sensation and found that Hans got the right answer only when his trainer was visible and only when the trainer also knew the right answer. It wasn't a scam — the man honestly believed he had trained the horse to do arithmetic problems. But herein lies a message for the data processing manager of today.

Turn the clock forward 70 or 80 years, and change the setting to your own programming staff. Somewhere out on that workhorse they work with is undoubtedly a set of files known collectively as "the tool kit."

In it are dozens of subroutines and program stubs: a little something to set up a standard report format, another to import selected data from a master file, some routines that do common financial calculations, all of them frequently patched wholesale into new systems.

The tool kit files have two things in common: most were written by individual members of the staff for the specific needs of the company, and most were probably not documented by those individuals.

Typically, the tool kit is used in a specific fashion. For example, a junior programmer is assigned to modify a financial package and comes across a call to something named YLDCALC. The comment line, if there is any, says something like "Pass rate in R, yield returned in Y."

If not pressed for time, your junior staff member may ask someone about it. The answer may be, "It's OK. It's in the tool kit."

Generally, though, the programmer is too hurried to ask, and if the modification doesn't involve part of the code, then why bother with it? After all, it's in the tool kit so it must work, and if it works, don't fix it. Right?

Wrong. If it works, but your programmer doesn't know why, using the code is exactly like using Clever Hans to do calculations. The person using it assumes that clean input will yield correct output. But the person who created the code may well have done so for a completely different application under a whole array of assumptions that may or may not fit the current job.

It's the kind of thing that can go on for quite some time before anyone catches it. It's the kind of thing that makes accountants prematurely bald and wizened.

> *It's well worth your while to audit that tool kit. Find out what's in it, find out how each routine works, and document it. This is especially true if the creator of the code has long since left the company.*

Well worth your while

It's well worth your while to audit that tool kit. Find out what's in it, find out how each routine works, and document it. This is especially true if the creator of the code has long since left the company. Remember that Hans only gave the right answer when his trainer was present; we've all probably seen code with the same problem.

Have the code analyzed, or throw it out. Establish controls and set up an authorized tool kit — routines used from the authorized list of documented tools are the only ones for which the department takes responsibility. Set up a review mechanism to get a routine authorized. Hand out some kind of reward to people who create new tools that make the authorized list.

These routines are specific to your company's needs and are essential to its operation because they are used so widely. It is critical that the programming staff know how they work before they use them.

The moral of the story of Clever Hans is that clean output isn't everything. There's an interesting twist to it for you etymology fans: the trainer of Hans the horse was German, and the word "clever" is an English translation of the German "kluge." Seems like the more things change, the more they stay the same.

Cuirle is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

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SOFTWARE & SERVICES

NBS guide illustrates logical data base design

By Mitch Betts
CW Washington Bureau

GAITHERSBURG, Md. — A poorly designed data base structure can result in costly, time-consuming software revisions — frequently with poor results — as user needs change. On the other hand, a well-designed data base structure can ensure the modularity, efficiency, consistency and integrity of the data base.

To help data administrators and data base administrators achieve the latter, researchers at the National Bureau of Standards (NBS) here recently developed a guide for logical data base design.

Researchers at the agency's Center for Programming Science and Technology created a four-step methodology for logical data base design that applies to very large, complex information systems. "By providing a detailed and unambiguous description of the system's information requirements in relation to the end users' perspectives, [logical data base design] offers a bridge between the end users and the physical data base designers and applications programmers," the NBS guide stated.

"The methodology emphasizes both the need for speed, so that the design will be completed in time to be useful, and the need for quality control, to ensure that the design is consistent, complete and satisfies the eventual users," it added.

The NBS defined logical data base design as the process of determining the fundamental data structures needed to support an organization's information requirements.

The structure determines the way the data is collected, stored and protected from unauthorized access.

"If done correctly, logical data base design for a complex information system is a massive undertaking. The short-term cost of [logical data base design] is great, but the long-term benefits of better information and greater flexibility provide substantial savings over the system's life cycle," the NBS concluded.

A high-quality logical data base design, the researchers said, will be internally consistent to reduce the chances of contradictory results from the information system; complete, so that information queries can be satisfied; and robust enough so that the data base structure can be adapted in response to changes in information requirements.

To fulfill these goals, a good data base design should be independent of any particular application so that all applications can be satisfied, and independent of any particular hardware or software, so that

See NBS page 68

> *'Up to now, the key computer professional was someone who could learn enough about the needs of organizations to express them in computer language. In the future, as our society becomes irrevocably computerized, the key professional [will be] someone who can learn enough about computerized systems to express them in human language. Without that someone, we [will] have lost control of our society. That someone is the reverse engineer. Software maintainers are the reverse engineers of computing.'*
>
> *— Nicholas Zvegintzov, publisher*
> *Software Maintenance News*

SOFTLINE/DONALD ROTHSCHILD

Planning key in conversion

An unprecedented increase in acquisition and merger activity has prompted the consolidation of corporate DP operations and software applications. While such consolidation may decrease costs and provide greater operating control, achieving those results requires a structured approach to systems conversions.

The systems conversion process should begin with a formal conversion definition. The conversion team's charter should specify the scope of the conversion as well as the time allotted for it. The charter should also establish the authority to be vested in the conversion team manager and other team members. Personnel who are not used to working in a conversion project are likely to be involved, and it is essential that the team exercise full authority over all aspects of the conversion.

The team should be assembled as soon as the scope of the conversion has been determined. It should be headed by a project manager who will be responsible for all aspects of the conversion, including the management and support of team members. The project manager's qualifications should include industry-specific and data processing expertise as well as experience in the design, implementation and validation of applications.

In addition, the team needs one or more systems analysts, depending on the scope of the conversion project, to direct efforts for individual applications. Like the project manager, the systems analysts require both industry-specific and DP expertise. Programmers should be expert in the required language, although they need not have a strong industry-specific background.

User representatives should also be included in the team, to determine whether the functional system design meets their requirements and to pro-

See CONVERT page 70

- Burroughs offered an enhanced release of its Linc applications development tool/66
- A turnkey Ada software development system was introduced by Rational/66

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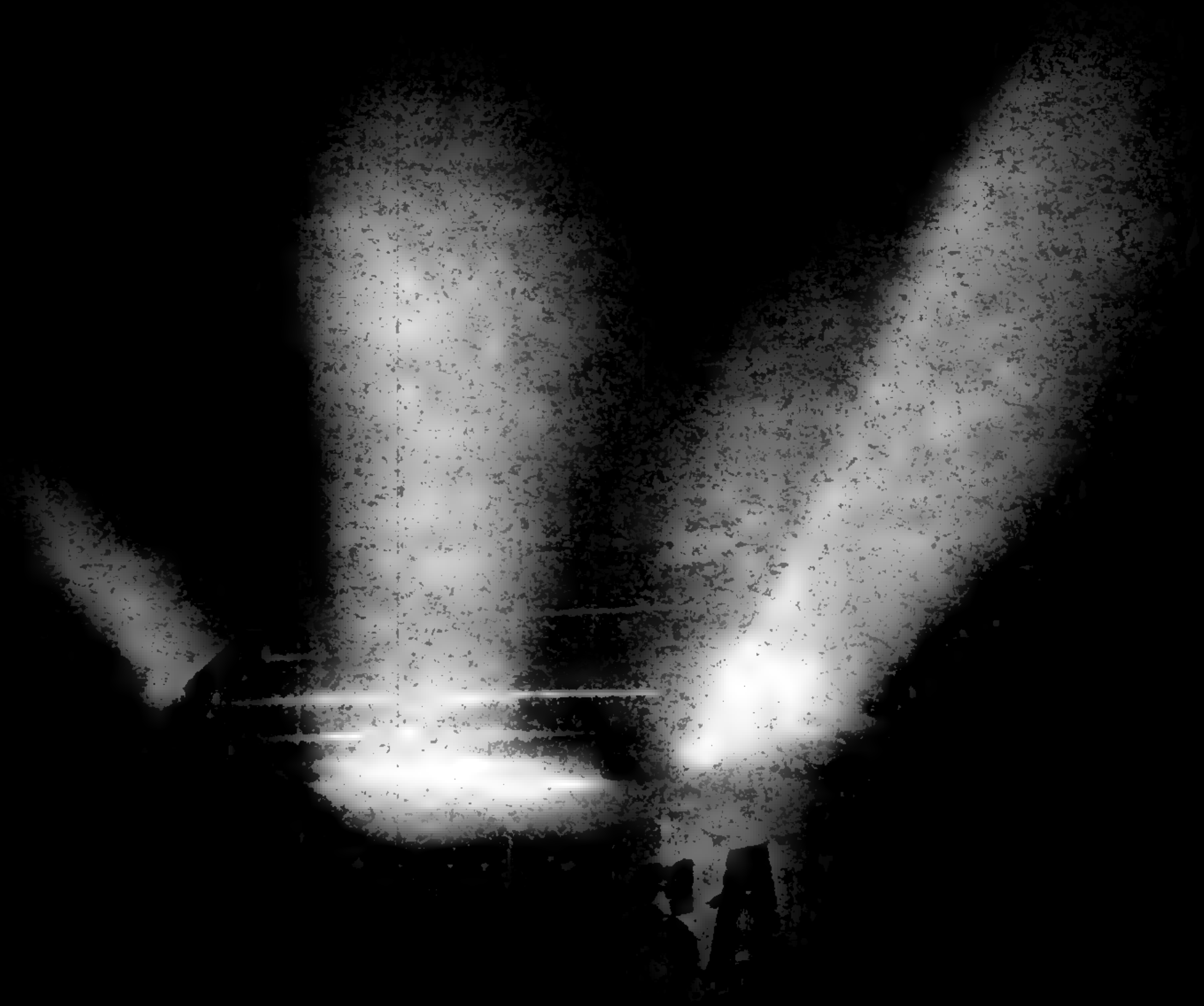

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Rational unveils development system for Ada projects

R1000 said to improve creation, maintenance

MOUNTAIN VIEW, Calif. — Rational has introduced the R1000 Development System, a combined hardware and software system that supports Ada language software development projects.

According to a spokesman, the R1000 Development System was designed to improve the production and maintenance of large Ada applications, including systems for computer-aided engineering, banking, industrial process control and defense and aerospace. The R1000 consists of the R1000 processor and the Rational Environment, which supports the design, implementation, test, integration and maintenance of Ada software.

The R1000 processor is said to provide the processing, storage and communications facilities required for Ada development projects. It is based on a proprietary architecture developed to support the Rational Environment and interactive, multiple-programmer software development. The processor provides up to 1.9G bytes of unformatted disk capacity and includes a streaming tape drive supporting densities of 1,600 or 6,250 bit/in. It also supports up to 64 asynchronous communications lines.

Rational also offers the Rational Terminal and Printer. The Rational Terminal was designed for Ada software development and provides a full-page, 66-line by 80-char. display and custom keyboard.

The Rational Environment is said to provide interactive support capabilities and replaces the operating system and tools of a general-purpose computer. It incrementally checks a programmer's code for syntactic and semantic errors and correction. It also completes the syntactic structure of program fragments. Users interact with the Rational Environment through the Rational Editor, a multiple-window, full screen editor through which users can enter data and commands, edit objects and receive program output.

The Rational Environment also includes an Ada compilation system validated by the U.S. Department of Defense. The system features an incremental compilation capability that allows developers to make changes without recompiling a module.

The Rational Environment offers a source-level debugger, configuration control facilities and project management and control capabilities.

Pricing for the R1000 Development System begins at $696,000, the vendor said.

Rational is located at 1501 Salado Drive, Mountain View, Calif. 94043.

Advertisement

informatics general corporation

application development report: MARK V

HARRISBURG MARATHON PROVIDES TRIAL RUN FOR MARK IV® AND MARK V® SOFTWARE

Within two hours after the last runner had crossed the finish line at the Harrisburg Marathon, Pennsylvania Blue Shield, chief sponsor of the annual event, had completed a computer-generated report on the run times and standings of the Marathon's 900 entrants and delivered it to the news media.

This was in sharp contrast to the previous year when it took approximately three days to get the Marathon results to the media. The greater responsiveness this year was largely the result of moving the Marathon application from an in-house Prime computer to Blue Shield's IBM 3081 system running in an IMS environment. The reprogramming of the Harrisburg Marathon application, completed in record time, was Blue Shield's initial test project for MARK V and MARK IV, Application Development Systems from Informatics General Corporation for generating online and batch applications respectively.

"We wanted to get acquainted with MARK V on a relatively simple and straightforward application like the Marathon before we began our full-scale pilot project, a new online claims processing system," Thomas M. Cline, Systems Development Supervisor, explained.

Programming the Marathon application consisted basically of creating and maintaining an online Entrant File including four screens to (1) maintain basic entrant information (name, address, phone number, and a "TAC" number to be used for Olympic identification in case the runner qualifies for the U.S. Olympics); (2) maintain control information (payment of fees, lunch and dinner reservations, etc.); (3) record the run time of each of the approximately 980 entrants; and (4) provide a menu for accessing the other three screens.

To produce reports in addition to the online portion of the Harrisburg Marathon application, Blue Shield used another Informatics Implementation System, MARK IV, to produce the required batch reports. A productivity tool designed for generation of batch applications, MARK IV also had its "trial run" for Blue Shield with the Marathon application.

Approximately 12 different reports were produced for the Marathon, including check-in sheets for use on the day of the race (cross-referencing the runners alphabetically and by runner number), three sets of mailing labels, and several types of reports listing the finishers by time, sex, and class of the runner. The reports on finishers were prepared for the news media, for internal use, and for the Athletic Congress listing any runners who qualified for the U.S. Olympics.

1983 was the eleventh year that the Harrisburg Marathon has been run. Unlike the famous Boston Marathon, which requires that entrants meet qualification standards, anyone can enter the Harrisburg event. The grueling course — 26 miles and 385 yards in length — begins near the Pennsylvania State Capitol building and winds through the streets of Harrisburg and the surrounding countryside.

Each year, large numbers of Pennsylvania Blue Shield employees volunteer their time to help with the race. "Probably 30 percent of our DP staff were involved in some kind of volunteer work for the Marathon," said Hugh Gallagher, also a Systems Development Supervisor, who coordinated the record-keeping for the Marathon. "This included registering entrants, manning water stations, keeping track of times, all sorts of things. For example, our Director of Systems Development, Karl Mundis, was in charge of one of the water stations, and I was in charge of the finish line."

Everything about the Marathon was done on a volunteer basis — including the programming for the new online Entrant File application, which was done primarily in evenings, lunch hours, and weekends, with Tom Cline doing most of the programming himself in MARK V and MARK IV.

"Our time for preparing this was so short that some of the software had never been tested prior to the day of the race," Gallagher recalled. "Fortunately, it worked like a charm."

"One of the things I found in implementing the Harrisburg Marathon application was that you don't need a lot of in-depth knowledge of IMS to use MARK V in a straightforward application like this, where you're just going in against a data base to update and add segments," Cline noted.

"I found that MARK IV and MARK V complemented each other very well," Cline added. "I found that with MARK IV, once I had established a set of reports, it was very easy to go back in and change a report, or set one up with a different set of selection criteria. I found I could make a change to a report in minutes. If I'd been working with COBOL, as I have in the past, this would not have been a matter of minutes."

"So far, we've only just gotten our feet wet with MARK IV and MARK V," Cline concluded. "But it looks quite promising in terms of potential productivity increases. I'm particularly impressed by the flexibility I've seen in setting up our initial application — the ability to make changes in a very short period of time."

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Burroughs provides Linc enhancements

DETROIT — Burroughs Corp. has announced the Logic and Information Network Controller II (Linc II), a successor to its Linc fourth-generation applications generator. The package runs on Burroughs mainframes, from the B1000 to the A 15.

Linc II enhancements include interactive systems development and screen and report painting capabilities, a data dictionary, synchronized recovery and real-time communications between multiple applications systems, a spokesman said.

With Linc II, users can generate design prototypes, screen and report formats, transaction processing logic and special report and inquiry functions.

Linc II provides multiple language support, in both the interactive system development process and in Linc II-generated applications. Linc II is integrated with Burroughs systems software and operates without conversion on Burroughs mainframes, the vendor said.

Linc II prices begin at $36,000. Shipments are scheduled to begin in the fourth quarter.

Burroughs is located at Burroughs Place, Detroit, Mich. 48232.

SYSTEMS SOFTWARE

■ Tone Software Corp. has announced TS-Dears, a data-entry and retrieval system intended to enhance the usability of IBM's CICS in DOS/VSE, VS1, MVS and MVS/XA environments. TS-Dears runs as a CICS transaction.

TS-Dears enables an installation to develop on-line interactive applications for data entry and retrieval without requiring any knowledge of CICS programming. The applications are developed with the aid of the TS-Dears screen-painting facility. Data can be stored in and retrieved from any Vsam data set.

TS-Dears incorporates a data-validation language said to ensure the integrity of data as it is entered. Data-entry features include automatic

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[illegible] light pen and display [illegible]

[illegible] matter how [illegible]

Continued from page 58

batch number assignment and a batch directory status display.

TS-Dears costs $15,000. Leases are available.

Tone Software, 1735 S. Brookhurst St., Anaheim, Calif. 92804.

■ Dias Corp. has released an enhanced version of its PCLink/1000, which provides file transfer capabilities from a number of microcomputers to Hewlett-Packard Co. HP 1000 minicomputers.

PCLink/1000 1.1 resides on an HP mini and runs under HP's RTE-VI/VM and RTE-A operating systems. Binary and text files can be transferred with the product. The package supports transmission rates up to 19.2K bit/sec.

PCLink/1000 costs $1,995 for a single CPU license or $4,995 for a site license.

Dias, 363 Cretin Ave. S., St. Paul, Minn. 55105.

■ Touch Technologies, Inc. has announced a high-performance sort package for Digital Equipment Corp. VAX processors under VMS Versions 4 and 4.1.

TTI Sort includes a transparent interface between user applications and the VAX-11 Sort. The package supports calls through DCL from both immediate mode commands and command files.

No command changes are necessary, so existing command files in DCL can be used without modification, according to vendor.

TTI Sort costs $1,295 for the first processor and $300 for each additional processor.

Touch Technologies, Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.

■ Western Computer Services, Inc. has announced Release 2.2 of Resource Executive (RX), an adjunct to IBM's RSX operating system that controls traffic flow and systems security for IBM's Series/1 minicomputer.

RX substitutes menu options for extended EDX command strings, allowing end users to use the system easily, a spokesman said. With RX, security ratings reportedly can be assigned to each menu option and to each user.

RX tracks and records system use and queues all batch jobs so that high-priority jobs are run first, according to the vendor.

RX searches for additional memory if insufficient memory is available for a job, and it broadcasts messages to any combination of terminals, a spokesman said.

To install RX, a user needs a minimum of 28K bytes of free memory, 2,500 records of free, contiguous disk space, EDX Version 3 or later, at least one installed IBM 4978, 4979 or 3101 block mode terminal, a diskette drive and IBM's Sort/Merge command or the equivalent.

RX costs $1,995 in single quantities.

Western Computer Services, Livery Sq., 33 Neill Ave., Helena, Mont. 59601.

■ Softouch Systems, Inc. has introduced a windowing facility for terminal users accessing IBM mainframes running OS under CICS.

CICS-Windows allows terminal users to access up to four windows and conduct concurrent sessions. CICS transactions can be initiated from and respond to any of the open windows while the concurrent sessions are active.

Single-keystroke operation, full panning functions and instant switching capabilities between full screen and window mode are included. Data can be transferred between applications in open windows, the vendor said.

CICS-Windows costs $7,500 for IBM DOS and $10,000 for OS operating systems.

Softouch Systems, 8265 S. Walker St., Oklahoma City, Okla. 73139.

PRODUCTIVITY AIDS

■ PAE, Inc. has announced a series of productivity aids for IBM's System/38.

Tuner/38 is a storage management system that works to allocate storage between System/38 subsystems. The product allows users to put a maximum and minimum storage capacity level on an S/38 subsystem. It costs $1,100.

Timer/38 is a job scheduling system that automatically powers down a system after all-night processing and brings the subsystems up in the morning.

The product can be used to control batch and maintenance processing. It costs $500.

Librarian/38 is a tape and diskette management system that includes a Spool Management System. The product gives users the ability to save output on tape or diskette by selecting a menu option. It costs $500.

The Qinbetween utility allows users to take print jobs out of either the System/38 Qbatch or Qinter files to improve job queue performance time. It costs $500.

Paegraph is a graphics display system for analyzing job responses. It costs $300.

PAE, 7 Riverway Road, Salem, Mass. 01970.

■ Pansophic Systems, Inc. has announced that Gener/Ol, its on-line program development system for IBM's CICS, now supports IBM's 3179 Model G graphics terminal.

Gener/Ol supports the use of the mouse pointer, graphics cursor and host-addressable plotter available with the 3179G, according to a spokesman.

Gener/Ol uses Release 4 of IBM's Graphic Data Display Manager software as a device driver to the IBM hardware.

Applications developed under Gener/Ol, including graphics and nongraphics applications, will run on the 3179G without modification. Ap-

plications developed using the 3179G can be run on other properly equipped IBM devices.

Gener/OI costs $35,000 for DOS and $48,000 for OS.

Pansophic Systems, 709 Enterprise Drive, Oak Brook, Ill. 60521.

■ MB & Associates has announced utilities for cross-referencing JCL and accessing partition data sets (PDS) in IBM OS environments.

VXREF is a cross-reference utility that produces reports on file, program and job relationships. A job report indicates procedures, programs and files used in selected jobs. A data set report identifies jobs, procedures and programs that use each of the files in the job run.

VSRCH allows users to search and print partition data sets. The product allows users to find and modify JCL statements affected by a change, print or copy selected members in a partition data set, generate new PDS members and perform global changes on partition data sets, according to the vendor.

VSRCH and VXREF are priced at $5,900 each.

MB & Associates, Suite 300, 97 S. Nome St., Aurora, Colo. 80012.

APPLICATION PACKAGES

■ National Business Systems, Inc. has announced that its Total Office Support System (Toss) now supports electronic mail for documents created on IBM Personal Computers or on word processors attached to Wang Laboratories, Inc.'s VS minicomputers.

According to a spokesman, the enhancements allow documents created on a VS word processor and IBM Personal Computers equipped with a Digital Communications Associates, Inc. Irma communications board to be transmitted to a mainframe and distributed to designated recipients by Toss. Documents initiated by Toss users can be transmitted to the Wang and IBM micros for formatting or inclusion into longer reports.

Toss is priced at $15,000 for the DOS version and $36,000 for MVS. Leasing is available for $500 per month for DOS and $1,200 per month for MVS. The Wang VS and IBM Personal Computer interface prices, based on configuration, begin at $3,700 for DOS and $7,200 for MVS.

National Business Systems, Avon Park S., 80 Tower Lane, Avon, Conn. 06001.

■ Calma Co. has announced Release 3.1 of its Tegastation computer-aided engineering software for integrated-circuit and printed-circuit board design performed on Apollo Computer, Inc. Domain workstations. The software now supports Apollo's Aegis 8 operating system and the Apollo Domain DN 320 model workstation, which is a DN 300 with a floating-point processor.

The Tegas schematic capture graphics function in Tegastation 3.1 now supports very large-scale integration circuit design. In addition, 1,400 system-level simulation models are said to be available.

Stand-alone models of the Apollo workstations with Release 3.1 of Tegastation cost from $24,500 to $44,000 for Apollo DN 300 and DN 320 models, $74,500 to $93,000 for Model DN 460s and $60,000 to $108,000 for Model DN 660s, depending on system configuration.

Calma, 501 Sycamore Drive, Milpitas, Calif. 95035.

■ RTC Systems, Inc. has announced RTC/38 Security and Help Text Control software. The package provides multiple layers of security and Help text on the IBM System/38.

Written in IBM's RPG-III, the product provides five levels of security control: password and user identification, organizations, menus, program fields and screen fields. Users can design and modify user access levels, the company's organization structure, menus, program levels and data field access.

Help Text is user defined, on-line and real-time, the vendor said. It assists users with step-by-step instructions.

Features include customized context and command keys and highlighted instructions.

The product costs $995, according to the vendor.

RTC, 609 West St., Mansfield, Mass. 02048.

■ Design Consultants, Inc. (DCI) has announced Release 5 of its Project Monitor project control software, which now runs on Hewlett-Packard Co.'s HP 3000 and Wang Laboratories, Inc.'s Wang VS series computers.

Also available for IBM mainframes, Project Monitor reportedly allows users to set up projects independently or from an established methodology. It facilitates data preparation for scenarios that test the impact of new projects on existing schedules, the vendor said. Project Monitor can also be used to update a centralized data base for tracking corporate projects.

The product costs $12,700.

DCI, Suite 225, 100 Progress Pkwy., St. Louis, Mo. 63043.

■ Polygon Associates, Inc. has introduced VAXFR, software that permits data sharing and file transfer between Digital Equipment Corp. VAX computers and a variety of microcomputers.

When used with Polygon's Poly-COM or Poly-XFR terminal emulation and file transfer products for microcomputers, VAXFR permits bidirectional file transfer and allows users to back up personal computer files on the DEC VAX. It also enables users to conduct direct transfer of personal computer files to and from VAX electronic mail systems and perform direct spooling of personal computer files to VAX printers, according to the vendor.

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Qume raises terminal standards. Again.

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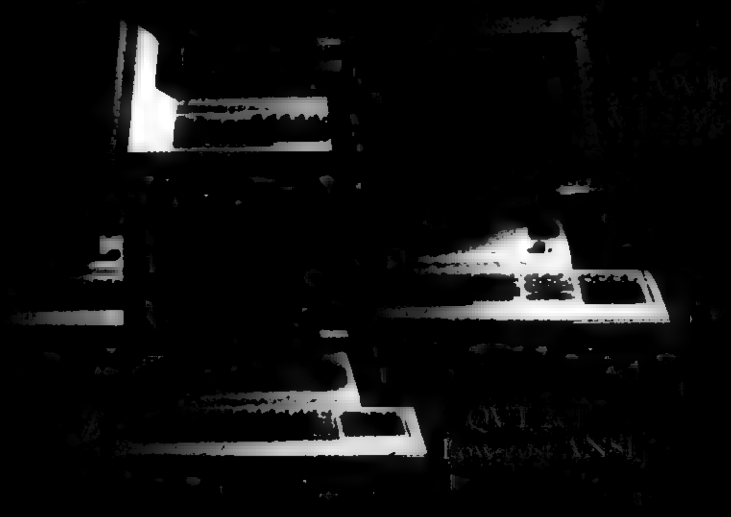

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SOFTWARE & SERVICES

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Poly-COM and Poly-XFR cost $586 each, run on HP 150 and HP 110 micros, the DEC Rainbow and the IBM Personal Computer line. VAXFR is free.

Polygon Associates, 1024 Executive Pkwy., St. Louis, Mo. 63141.

Calma Co. has introduced a computer-aided engineering and design system for heating, ventilation and air-conditioning (Hvac) applications.

Dimension III Hvac Design Package is a three-dimensional system for use with Calma's Dimension III system software that runs on 32-bit Digital Equipment Corp. VAX machines or Apollo Computer, Inc. systems. The Hvac package combines systems diagram, three-dimensional computer modeling, material selection and control and drawing production capabilities.

Other features of the system include a component library and display functions for drawing and editing.

The Dimension III Hvac system costs from $12,000 for Apollo systems to $60,000 for DEC VAX systems.

Calma, 501 Sycamore Drive, Milpitas, Calif. 95035.

DATA BASE MANAGEMENT SYSTEMS

Battelle Software Products Center has announced that its Basis data management system is now available for Digital Equipment Corp. VAX processors under AT&T Unix System V.

Basis also runs on a variety of minicomputer and mainframe systems, including Prime Computer, Inc. minis and IBM mainframes under IBM's VM and MVS operating systems. The product costs from $15,000 to $38,000 depending on hardware configuration.

Battelle Software Products Center, 505 King Ave., Columbus, Ohio 43201.

CRI, Inc. has announced Release 4.5 of Relate/3000, a relational data base management system and fourth-generation language for Hewlett-Packard Co. HP 3000 systems.

Enhancements to the product include optional crash-proof access; expanded index support that permits the definition of up to 30 indexes per file; improvements to concurrent, multiuser access functions; and the ability to add fields without reloading a file. Relate/3000 costs $18,500.

CRI, 5333 Betsy Ross Drive, Santa Clara, Calif., 95052.

LANGUAGES

Honeywell, Inc. has announced the Gcos 6 Ada Compiler System, validated by the U.S. government's Ada Validation Office, for use on its DPS 6 family of small computers.

Honeywell's Ada Compiler System conforms with Ansi/MIL/STD-1815A specifications. In addition to the compiler, the Gcos 6 Ada Compiler System includes Ada Linker, Ada Symbolic Debugger, Package Standard Builder, Program Library Manager and Program Library Utilities. The Gcos 6 Ada Compiler System costs $13,475.

Honeywell, 200 Smith St., Waltham, Mass. 02154.

EVB Software Engineering, Inc. has announced the Generic Reusable Ada Components for Engineering (Grace), which was designed to aid Ada users developing applications.

The software runs on any processor that supports a full implementation of the Department of Defense's Ada, including the Digital Equipment Corp. VAX series and the Data General Corp. MV/Eclipse series.

According to a spokesman, Grace software enhances the development effort of more experienced Ada users by removing the need to code low-level components. The Grace software license authorizes

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each customer site to copy the software and documentation without limitation, providing the copies are not transferred to other sites or resold.

Components are delivered with documented source code, design documentation, an example of the component's usage in larger applications and EVB's in-house coding style guide.

The cost per individual component is approximately $100.

EVB Software Engineering, Suite 701, 451 Hungerford Drive, Rockville, Md. 20850.

■ **Productivity Products International, Inc. has announced an enhanced version of its Objective-C compiler, which supports the C language, plus message and object extensions developed by Productivity Products.**

Objective-C is available for AT&T Unix-based processors.

Prices for Objective-C range from $400 for the IBM Personal Computer to $7,200 for the DEC VAX-11/730. Users receive a reference manual, executable code on floppy disks or magnetic tape, two libraries of reusable components to build a compiler or new products and an introductory course.

Productivity Products International, 27 Glen Road, Sandy Hook, Conn. 06482.

■ **Masscomp Co. has introduced Fortran 3.1 for its MC-500 series of minicomputers. According to the company, the Fortran release reportedly increases the floating-point performance of its Motorola, Inc. 68000/68010 microprocessor-based systems.**

The new version includes an enhanced symbolic debugger, access to window manager and access to the AT&T Unix profiler.

The product will be available in February and is standard on all Masscomp systems. Base price of a Masscomp system is $25,900 and can range up to $150,000 depending on the disk, tape and configuration.

Masscomp, Suite 200, 124 Mount Auburn St., Cambridge, Mass., 02138.

REMOTE COMPUTING SERVICES

■ **NL Baroid has introduced an expert system-based service designed to decrease the risk of problems in oil field drilling operations.**

Mudman is a computer-aided drilling diagnosis system that allows an NL Baroid representative at the well site to enter data about drilling fluids into a portable computer in the field.

The data is transmitted to a Digital Equipment Corp. VAX-11/780 computer at NL Baroid's Houston headquarters, where an expert system recommends solutions to the problem.

Cost of the Mudman service is $350/day.

NL Baroid, P.O. Box 1675, Houston, Texas 77251.

ON-LINE DATA BASES

■ **BRS Information Technologies (BRS) has introduced an on-line information retrieval service for word processing systems and microcomputers that use asynchronous 300 or 1,200 bit/sec. modems.**

BRKTHRU is a bibliographic search service that gives users access to more than 65 data bases stored in a BRS central computer. Subjects covered include business, finance, science, technology and medicine. The service is available for a one-time fee of $75, according to the vendor.

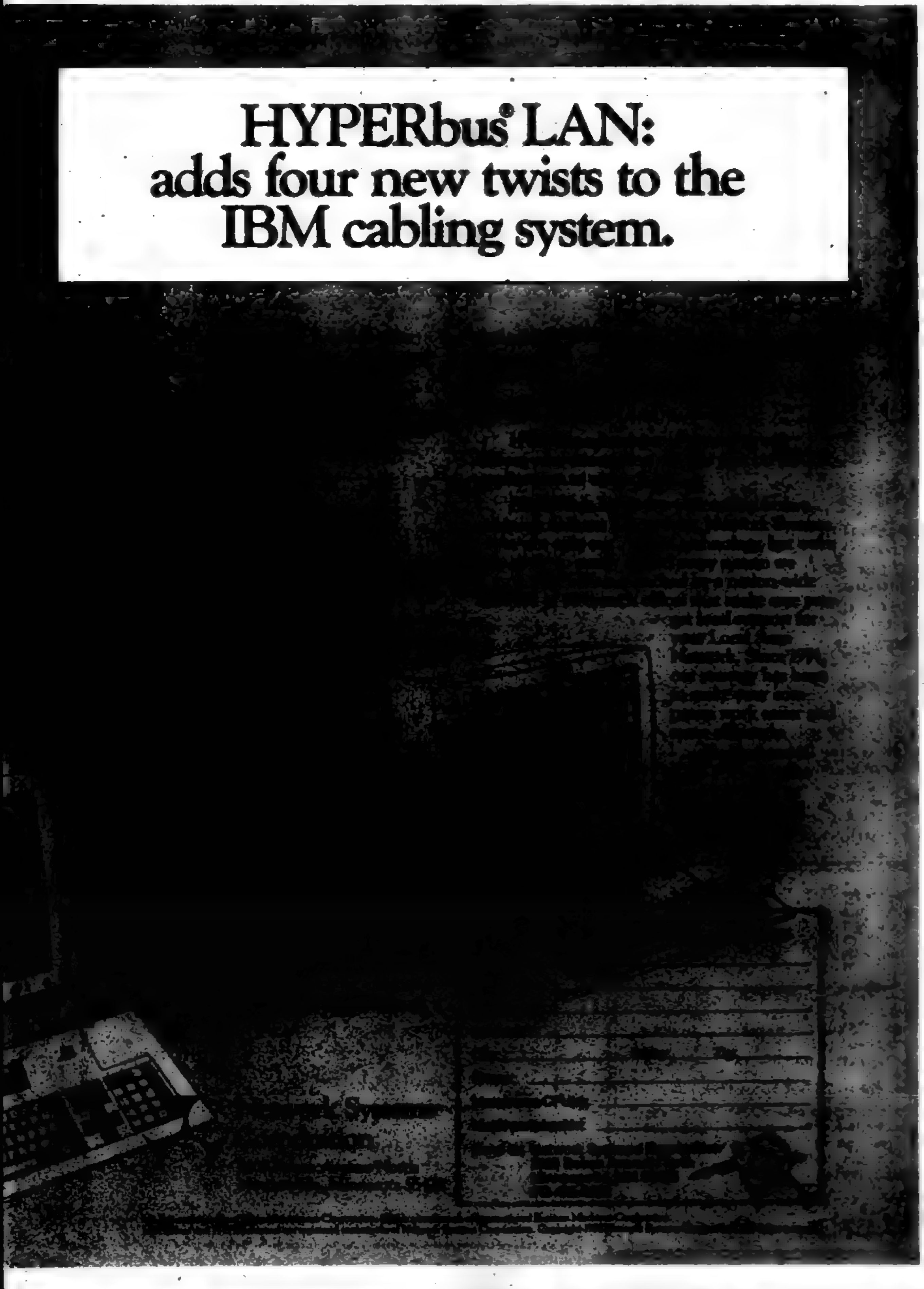
BRS Information Technologies, 1200 Rt. 7, Latham, N.Y. 12110.

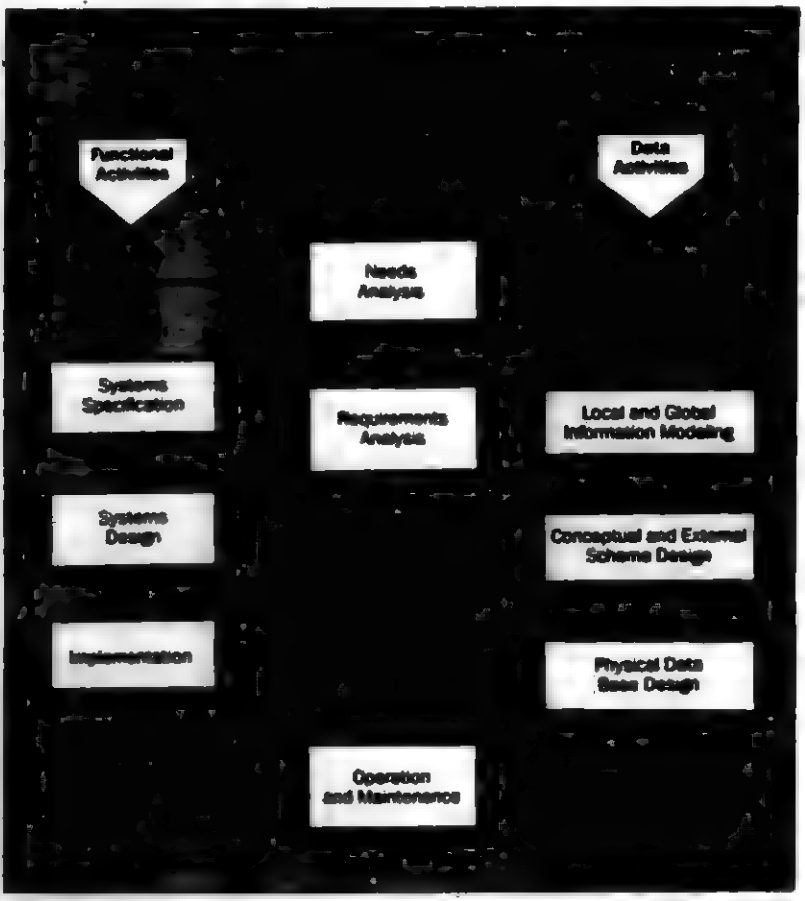
METHODOLOGIES

■ **Database Design, Inc. has announced Version 2 of its Information Planner package for automation of strategic data planning methods. The product runs under IBM's OS and MVS operating systems.**

A spokesman said Version 2 identifies specific data base components and related applications that should be implemented as a single development project and ranks all such projects by their contributions to corporate goals. Other enhancements in

Continued on page 68




Functional Activities
Data Activities
Needs Analysis
Systems Specification
Requirements Analysis
Local and Global Information Modeling
Systems Design
Conceptual and External Schema Design
Implementation
Physical Data Base Design
Operation and Maintenance

NBS

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the data structure can be supported in any environment, the NBS said.

According to the guide, the logical data base design should be an integral part of the life-cycle development of the information system. The NBS guide recommended that logical data base design work be performed concurrently with requirements analysis and system design and before the physical data base design.

> *The logical data base design should be an integral part of the life-cycle development.*

Specifically, the logical data base design methodology has four phases:

- Local information flow modeling, in which data flows are modeled for individual applications.
- Global information flow modeling, in which the individual data flows are modeled together for a view of the entire system.
- Conceptual schema design, where data within the data flows is defined in terms of its functional use.
- External schema modeling, where data is modeled from the point of view of the user.

The result is that all of the subsystems, data flows, data structures and user views of the data bases are described before the data base is physically designed, the guide said. Because the logical design process is done iteratively, there exists "a means for verifying the results of the different phases against one another," the guide said.

The NBS researchers also recommended the use of an automated data dictionary system to handle conveniently and accurately the volume and complexity of design documentation.

The NBS publication, "Guide on Logical Database Design," is available for $4.50 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Order by stock number 003-003-02631-0.

Continued from page 67

the release expand the software's reporting capabilities, increase tolerance of accidental interruptions and simplify data exchange with external software products, according to the vendor.

Information Planner 2 is priced at $35,000.

Database Design, 2020 Hogback Road, Ann Arbor, Mich. 48104.

■ Marium Management Corp. has introduced a methodology for generating end-user documentation on standard word processing systems.

The User Guide Generator (Uggen) provides document writers with a methodology that includes standards and a library of formats to design, administer and produce documentation for automated and nonautomated systems, a spokesman said.

Uggen identifies participant responsibilities, establishes standards and defines deliverables in a life-cycle methodology, the vendor said.

The product is priced at $35,000.

Marium Management, P.O. Box 66, 3072 Crompond Road, Yorktown Heights, N.Y. 10598.

TRAINING

■ Control Data Corp. has announced a microcomputer-based computer-aided design and drafting training course developed by the company's Computer-Integrated Manufacturing (CIM) Division using its Plato computer-based training methods.

The 22-hour Plato computer-based course trains a user to construct, manipulate, dimension, display, file and retrieve parts and production drawings. Titled Icem Design/Drafting, the course trains users in CDC's Integrated Computer-Aided Engineering and Manufacturing (Icem) software.

Users study material on an IBM Personal Computer or compatible. Exercises are completed using a computer-aided design workstation. A set of disks and laboratory workbooks are provided.

The price for the Icem Design/Drafting course is $500.

CDC, CIM Training Delivery, BTC331, 1450 Energy Park Drive, St. Paul, Minn. 55108.

■ Science Research Associates, Inc. (SRA) has introduced a tutorial for users of IBM's Displaywrite 3 word processing package.

"Using Displaywrite 3" is a 20-hour, two-volume course for use with the IBM Personal Computer. The first volume teaches users to create, print, revise, format and paginate documents. Volume two instructs users on revising complex documents, merging text, spelling checks, diskette formatting and using utilities and directories.

The tutorial costs $300 and includes two handbooks, an administrative guide and four training diskettes.

SRA, P.O. Box 5380, Chicago, Ill. 60680.

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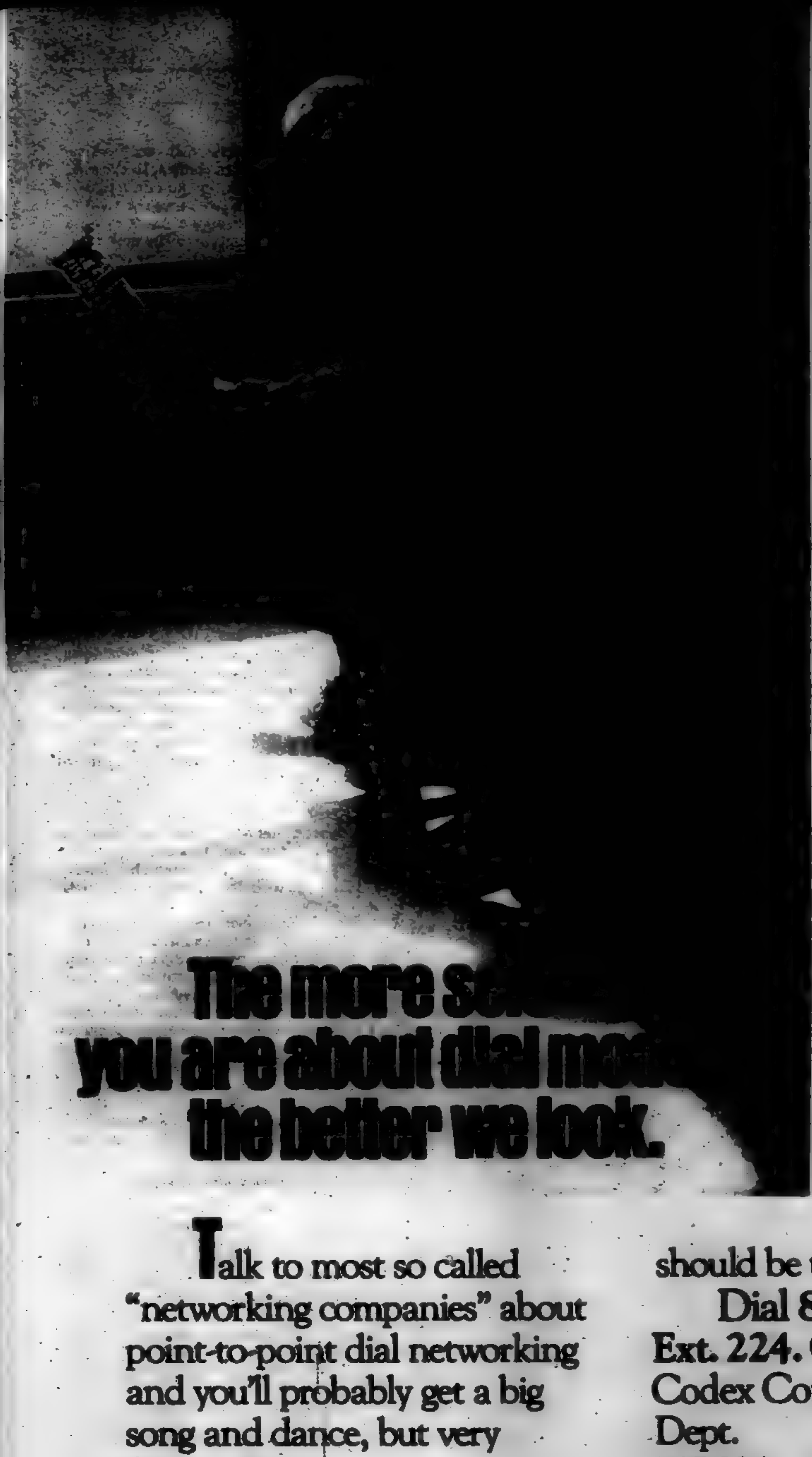

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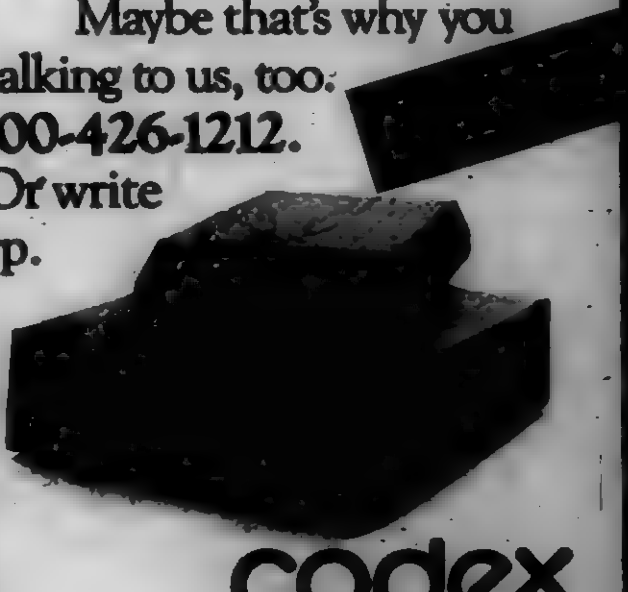

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MOTOROLA

*McGraw Hill's "Data Communications" magazine rated us as having the best technology and price/performance.

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At NCC, see us at the Motorola Information Systems booth #5541.

CONVERT

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vide information to assist the conversion.

The next phase of a conversion project involves collecting necessary conversion materials. These include a file layout, a partial file dump, systems documentation and, if possible, a data dictionary of the applications to be converted.

> *The systems conversion process should begin with a formal conversion definition. The conversion team's charter should specify the scope of the conversion as well as the time allotted for it.*

Programmer verification

A programmer should be assigned to verify that each field on the file layout corresponds to the test conversion tape, so that discrepancies can be resolved before testing begins.

At the same time, systems analysts can evaluate data element relationships between the old and new systems, evaluating each data element in the old system and finding its counterpart in the new one. It is important to weigh each data element on its own merits. Should it be converted? How?

Careful evaluation is particularly essential with financial data since field sizes vary from system to system. When a one-to-one correspondence between an old and new data element cannot be established, further analysis, and perhaps a policy decision on the part of the institution, may be required.

Lead analyst's documentation

Throughout the conversion, the lead analyst should be responsible for documenting the analysis in a functional system design format. One form of documentation could be a cross-reference functional system design incorporating four columns.

The first column shows the location of the data element in the old system by position and data name, while column two gives the field location of that data element by data name and position in the new data base. The third column provides users with the user-friendly, or common, name of the data element. It may also identify the screen or form used for entering the data. Column four describes the operation that will transfer data elements to the new system.

The functional system design should be completed in a building block fashion, and it is useful to take an incremental approach to its approval as well, with users reviewing each logical section of the design as it is finished.

Once approved, the requirements are then frozen.

To reduce problems resulting from altering requirements after review, set up a formal change-control procedure to consider and ratify any proposed revisions.

Once the functional system design is under way, programming can begin for the conversion process. Of course, a complete system cannot be written before requirements are fully defined. However, some features of the conversion are apparent before the design is complete. These include output, the format and content of the new data base; input, a partial list of incoming data from the old system; and data elements, such as a customer name, which can be moved as is from the old to the new system.

Programmers can set up a skeleton program to read data from the old system, process data for obvious "move as is" cases and format it for input into the new system.

Then, as each section of the system design is approved, the programmer can concentrate on fine-tuning programs instead of starting from scratch. This process makes for a more rapid conversion, since design and program development can progress concurrently rather than serially.

Test to ensure effectiveness

As soon as all conversion programs have been written, a test conversion should be performed. The test ensures that the programs are effective and verifies the accuracy of the test conversion materials.

For banking applications, for example, conversion materials should include data in a readable format for each account; totals by branch and instrument category, along with a grand total; and a dump of the first 50 records from the conversion tape, to allow the programmer to validate record formats.

Once dollars and number of accounts balance, a full-fledged test conversion can be tried. Validation of the test conversion is identical to any other test. Each data element of a random sample of converted accounts is checked, along with sub- and grand totals for dollars and number of accounts.

Once all these procedures check out, full conversion of the live data base can begin.

Rothschild is senior banking consultant for Computer Task Group, Inc. He recently directed the conversion of all commercial bank applications for a newly established bank.

[*KEYFAST* Online Data Entry System from H&M]

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KEYFAST, state-of-the-art online data capture [illegible] users control over all their data. Simply. From prompted format painting and edit check definition through data capture and offloading for further processing. This is made possible with optimum user guidance, menus, prompts, help screens (system-supplied and user-defined). Once created, formats are ready for immediate use (no CICS table entries required). Entry data can be checked or supplemented using the table features and multi-record and multi-format entry is possible on one screen. Automatic IF-THEN-ELSE logic.

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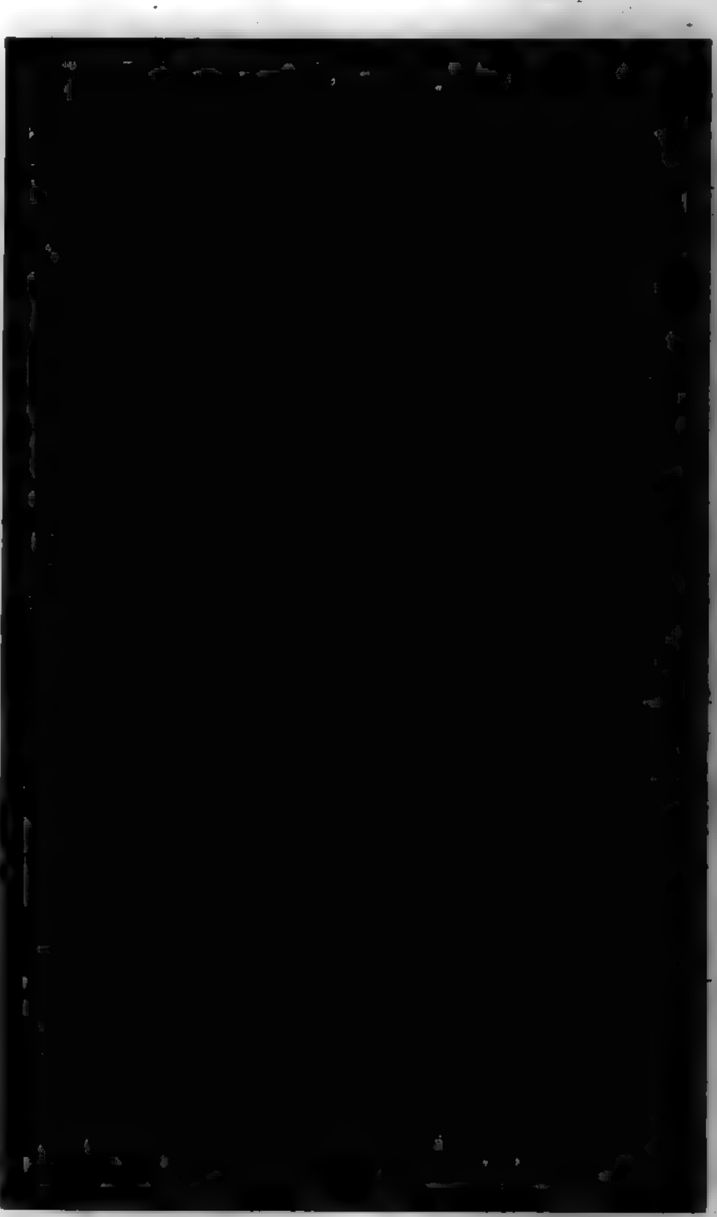
The time has come for straight talk about database management systems.

"The only reason to buy a database management system is to build better applications."



Throughout the history of the software industry, proponents of one database architecture after another have promoted their respective systems as the sole solution to a company's application backlog problem.

The early debate centered on hierarchical versus network architecture. Advocates of inverted file entered the argument in the 70's. And today, relational is the architecture of choice.

While this discussion about architecture is interesting, it's just not the issue.

Database management systems, beginning with the very first, were created to do one thing and one thing only—they were created to build better applications. *Building applications—efficient, online applications, faster, with fewer people—is the only real issue.*

Today corporations have a huge backlog to contend with. And the applications they need to develop have different characteristics. Some may be retrieval only. Some may be heavy on update. Some will run the company, and will require professional development. Some can be created by end users to satisfy their own needs.

It is extremely important to have a database management system that can handle all applications. *It is essential* that a database include tools rich and comprehensive enough to accommodate both the professional developer and the end user. It's the richness and power of these tools that's critical to the successful implementation of highly responsive fourth generation applications. What's demanded, in fact, is software that goes a *step beyond* today's conventional relational database systems.

With a comprehensive database management system and the appropriate tools like the kind I'm talking about, you'll make the data processing department a *strategic asset* instead of corporate overhead. You will make your company succeed in a highly competitive world.

In Cullinet's new Annual Report, Presidents and CEO's of major corporations speak about the positive impact Cullinet has had on their operations. For a copy that you might like to read and pass along to your company president, write to me. I'll see that you get one.

J. J. Cullinane

John J. Cullinane
Chairman of the Board

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The only database management system worth buying is one that meets these six requirements.

Stated simply, IDMS/R is a step beyond today's conventional relational DBMS because it meets these key requirements for building successful applications.

1. MIS Application Development Facilities

The application development system required to build high performance production applications requires more than a fourth generation language. Cullinet's ADS/OnLine is a comprehensive application development environment for the MIS professional combining fourth generation language with a menu-driven modular development approach. Integrated with the data dictionary, this minimizes not just the programming but the entire design, development and documentation of an application. Furthermore, this approach produces a dramatic reduction in maintenance and support.

2. End-User Application Development Facilities

Because Cullinet recognizes the difference between production and end-user applications, as well as the need for both to share common data, we provide an easy to use end-user oriented development and inquiry system. The Automatic System Facility of IDMS/R is a non-procedural, menu-driven tool designed for end-users. Once data tables are defined, an application is automatically generated. The query facility of IDMS/R provides menu-driven query capability and full online help, so end-users can build working applications in minutes and get reports easily and efficiently.

3. Relational Architecture

IDMS/R allows for the definition of databases using the relational data model. Data tables and associated user views are easily defined online. Additionally, any number of key fields may be defined. IDMS/R also supports advanced relational features including referential integrity and domain definition. This architecture provides the capability to address all application requirements.

4. High Performance Database and Application Tuning Facilities

IDMS/R is a full multi-tasking, multi-threaded system providing for concurrent processing of on-line and batch, update and retrieval applications. Additionally, tuning facilities provide efficient indexing techniques, space management, page management, and buffer management. No conventional relational DBMS has these capabilities.

5. Dictionary Driven DBMS

Data integrity and data independence are essential in a DBMS environment. The dictionary actively controls the source and use of all data. Data definitions, data validation criteria, data formats and security are all defined within the dictionary and exist only once, eliminating redundancy and ensuring integrity. This information is then automatically used throughout the system. Examples of the functionality of this facility include never needing to define output formats for query; never needing to define field attributes for screens; never needing to code validation and editing criteria when using ADS/OnLine. Only IDMS/R provides this level of dictionary integration.

6. Open System Architecture

With the unique Open System Architecture of IDMS/R you can maximize your investment in existing software. IDMS/R accepts data from outside the database environment with direct access to VSAM files. In addition, applications written to access other databases like IMS, DL/1, TOTAL, or VSAM can directly access IDMS/R without modification. IDMS/R is designed to work in virtually all IBM mainframe operating systems and teleprocessing monitor environments.

IDMS/R: More than a relational DBMS

Cullinet

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SAS Institute Inc. Announces

Lattice C Compilers for Your IBM Mainframe

Two years ago...

SAS Institute launched an effort to develop a subset of the SAS® Software System for the IBM Personal Computer. After careful study, we agreed that C was the programming language of choice. And that the Lattice® C compiler offered the quality, speed, and efficiency we needed.

One year ago...

Development had progressed so well that we expanded our efforts to include the entire SAS System on a PC, written in C. And to insure that the language, syntax, and commands would be identical across all operating systems, we decided that all future versions of the SAS System—regardless of hardware—would be derived from the same source code written in C. That meant that we needed a C compiler for IBM 370 mainframes. And it had to be good, since all our software products would depend on it.

So we approached Lattice, Inc. and asked if we could implement a version of the Lattice C compiler for IBM mainframes. With Lattice, Inc.'s agreement, development began and progressed rapidly.

Today...

Our efforts are complete—we have a first-rate IBM 370 C compiler. And we are pleased to offer this development tool to you. Now you can write in a single language that is source code compatible with your IBM mainframe and your IBM PC. We have faithfully implemented not only the language, but also the supporting library and environment.

Features of the Lattice C compiler for the 370 include:

- **Generation of reentrant object code.** Reentrancy allows many users to share the same code. Reentrancy is not an easy feature to achieve on the 370, especially if you use non-constant external variables, but we did it.
- **Optimization of the generated code.** We know the 370 instruction set and the various 370 operating environments. We have over 100 years of assembler language systems experience in our development staff.
- **Generated code executable in both 24-bit and 31-bit addressing modes.** You can run compiled programs above 16 megabytes in MVS/XA.
- **Generated code identical for OS and CMS operating systems.** You can move modules between MVS and CMS without even recompiling.
- **Complete libraries.** We have implemented all the library routines described by Kernighan and Ritchie (the informal C standard), and all the library routines supported by Lattice (except operating system dependent routines), plus extensions for dealing with 370 operating environments directly. Especially significant is our byte-addressable Unix®-style I/O access method.
- **Built-in functions.** Many of the traditional string handling functions are available as built-in functions, generating in-line machine code rather than function calls. Your call to move a string can result in just one MVC instruction rather than a function call and a loop.

In addition to mainframe software development, you can also use our new cross-compiler to develop PC software on your IBM mainframe. With our cross-compiler, you can compile Lattice C programs on your mainframe and generate object code ready to download to your PC.

With the cross-compiler, we also offer PLINK86™ and PLIB86™ by Phoenix Software Associates Ltd. The Phoenix link-editor and library management facility can bind several compiled programs on the mainframe and download immediately executable modules to your PC.

Tomorrow...

We believe that the C language offers the SAS System the path to true portability and maintainability. And we believe that other companies will make similar strategic decisions about C. Already, C is taught in most college computer science curriculums, and is replacing older languages in many. And almost every computer introduced to the market now has a C compiler.

C, the language of choice...

C supports structured programming with superior control features for conditionals, iteration, and case selection. C is good for data structures, with its elegant implementation of structures and pointers. C is conducive to portable coding. It is simple to adjust for the size differences of data elements on different machines.

Continuous support...

At SAS Institute, we support all our products. You license them annually; we support them continuously. You get updates at no additional charge. We have a continuing commitment to make our compiler better and better. We have the ultimate incentive—all our software products depend on it.

The competition...

If you would like to compare, the other vendors of 370 C compilers are: AT&T, Whitesmiths, Ltd., WATCOM Products Inc. (CMS only), Oracle Corp., Amdahl Corp. (UTS only), and IBM Corp. (VM/IX only). We think you will choose the Lattice C compiler from SAS Institute.

For more information...

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CW

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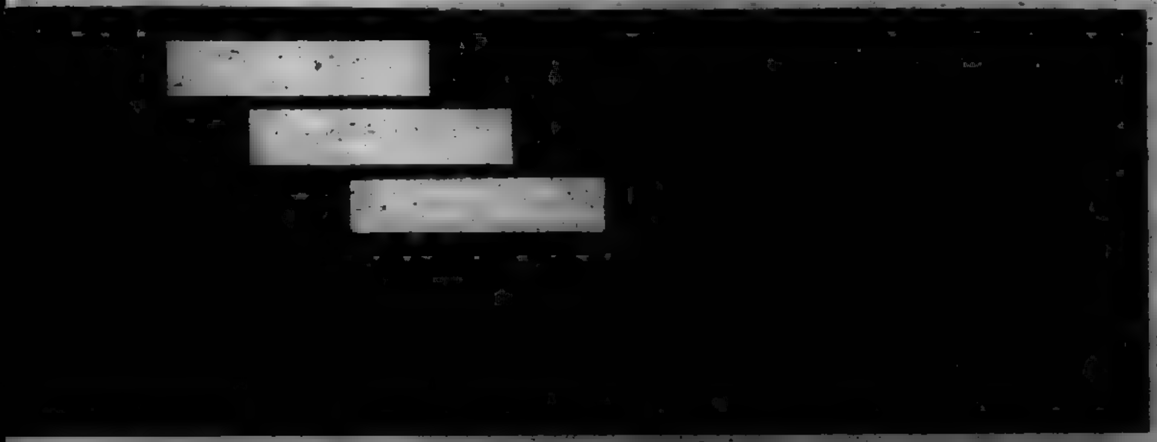
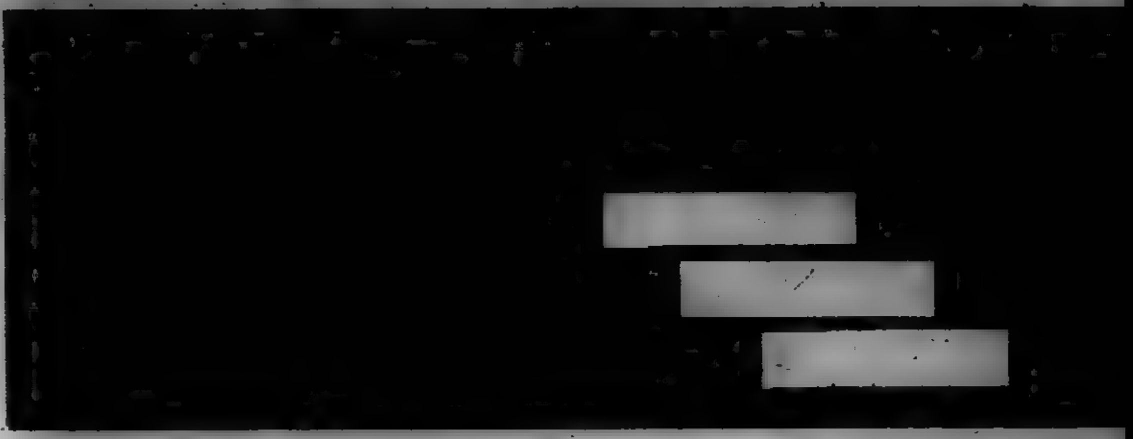
IN DEPTH



Part 1

By Ken Orr



Information systems managers today face four monumental problems: too much to do, too little time to do it in, too few good people and too many options. Industry experts say there's a software crisis, but in reality what exists is a software *management* crisis.

The pressures have created what appears to be an either/or choice: Cut the applications backlog by developing software faster or lift the maintenance burden by improving software quality. Presumably, the choice will dictate the action: To make better use of traditional systems development methodologies; to implement a more advanced, structured systems development methodology; or to take a fast-track approach with fourth-generation languages, prototyping and high-speed analysis. But these options aren't necessarily mutually exclusive.

This two-part series points the way to managing the software crisis. It is intended

IN DEPTH/SOFTWARE CRISIS

to provide a framework for the information systems manager to make intelligent decisions based on current trends and future directions in information technology. Part 1 defines the major trends in systems development methodologies over the last 15 years. Part 2 will look at three case studies and explore how organizations can take advantage of future advances in systems development methodologies and tools such as computer-aided software engineering.

Information systems managers today have enormous problems and opportunities. Their job is to harness the most important technology of the 1980s — information technology — and at the same time provide continuity with past investments that their organizations have made in information systems.

Clearly, there is no need to restate the impact that information systems technology has had upon modern business nor the potential that lies ahead. But in their enthusiasm, many people overlook the difficulties involved in managing this kind of technological change.

Because computers and software have become so powerful, top management has found more ways to employ computers for business purposes. That means an increasing amount of work for those involved. A recent survey found that application backlogs increased from 19 to 27 months in the last year.

Not only are there more new applications to program, but, unfortunately, there are still all the existing systems that have to be maintained. Industry estimates indicate that somewhere between 50% and 80% of software expenditures are tied up in maintenance of systems, a cost that is often higher than it should be because of the poor quality of existing software.

As the business environment becomes more volatile, the need for faster systems development increases. The competitive edge often hinges on time. As a consequence, the information systems manager is squeezed between his desire to produce quality systems and the needs of the business to bring systems on-line quickly.

The growing demand for information systems has also put a strain on the ready resource of skilled information systems professionals. I have yet to encounter a manager who would admit that he has enough good analysts or programmers. Department of Defense statistics show that there is currently a deficit of more than 100,000 software engineers, and that deficit may grow to 980,000 by 1990 unless new techniques are found to produce quality software more efficiently.

Finally, to complete our litany of management problems, the expansion of the information systems world has encouraged thousands of organizations to develop products for the information systems marketplace.

Francis Frank, vice-president of sales for Keane, Inc. of Boston, estimates that there are more than 40,000 applications packages available today.

Not only are there thousands of software packages for every imaginable need, but there are also hundreds of computers, operating systems, data bases and systems development methodologies — an overwhelming array of options.

It is possible to make a case that today's information systems technology is simply too much of a good thing. Improved technology is only valuable if it can be brought under effective management control, and a great many information systems managers today are having difficulty controlling the productive use of information technology.

Roots of growth

Quality and control are the roots of systems development methodologies. During the '70s, systems development methodologies became especially popular in organizations having trouble controlling the software development process. Software projects were getting larger, and many of the people involved were not trained or experienced in either project management or software development.

The defense community had developed a variety of tools and techniques for managing and controlling large hardware development projects, and the first commercial systems development methodologies translated many of these ideas

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directly into software terms.

Results were mixed, however, when traditional software techniques, such as interviewing, general design, detail design and flowcharting were coupled with large numbers of project management forms (Figure 1). Management believed that it had better control of the software process, but in many cases, systems development methodologies became synonymous with paperwork and antiquated software development techniques.

For the most part, the first systems development methodologies did not attempt to solve any serious technical problems involved in the development of the structured, distributed, online, data-based systems of the '70s and '80s. They assumed, wrongly as it turned out, that most large organizations had staffs of trained programmers, analysts and data base professionals who already knew how to design state-of-the-art systems. All that was needed was better project management.

Although many organizations, particularly large ones, installed traditional systems development methodologies, they were often abandoned in practice.

Structured revolution

In the early '70s, at about the same time that the first, or traditional, systems development methodologies were beginning to be marketed commercially, a number of new ideas about software development were introduced. The application of these new ideas led to what has been called the "structured revolution."

The structured revolution began innocently enough by proposing the use of structured programming, but it also introduced a number of new concepts. A radically different waterfall chart arose in which top-down development comprised design-a-little, code-a-little and test-a-little techniques. Over time, however, there was a return to a more traditional view, with analysis or requirements definition playing a more important role up front.

Where the traditional systems development methodologies had stressed management control, the structured systems development methodologies stressed software quality. Structured programs were better because they were easier to maintain — they placed an emphasis upon requirements definition and design. And where traditional systems development methodologies had emphasized the use of forms, structured systems development methodologies emphasized the use of tools, especially graphics tools.

Where traditional systems development methodologies were targeted largely at managers, structured systems development methodologies were aimed largely at technicians: analysts, programmers and others. And where traditional systems development methodologies had emphasized standards manuals, structured systems development methodologies emphasized training.

The experiences with structured systems development methodologies, although mixed, were largely favorable. In general, programming improved, along with requirements definition, but structured systems development methodologies required much more work on the front end of the project. This caused conflict with traditional management techniques that encouraged early coding and testing.

Indeed, many of the most severe problems of the structured revolution occurred between the professionals who began using and promoting

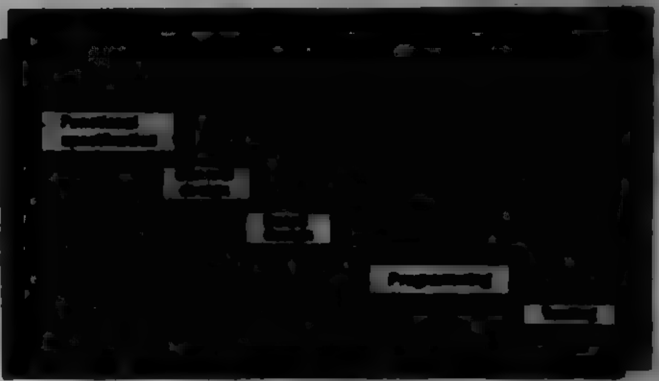

Figure 1

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PCs.

concept is that it is based on totally non-revolutionary technology: the Winchester hard disk.

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> ”
>
> ***Structured systems development methodologies are front-end loaded, and so a considerable amount of analysis and design are done before the user sees any results.***

structured programming and their managers who had been brought up using more informal techniques.

Process vs. data

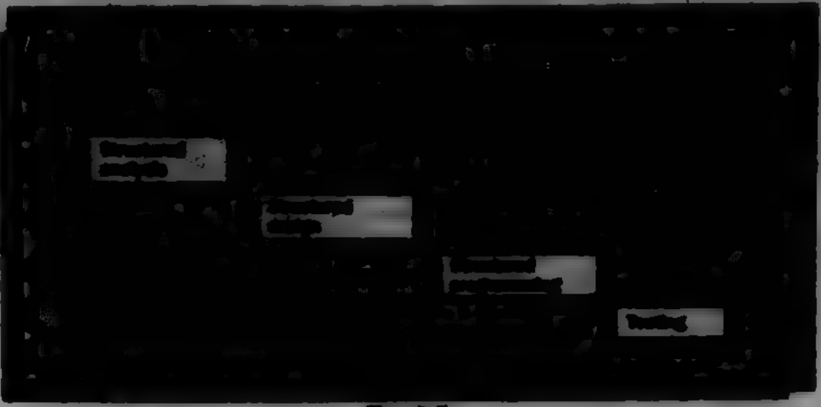
In the beginning of the structured revolution, there was more or less universal agreement over what constituted structured development: top-down development, goto-less programming, structured walk-throughs, chief programmer teams and documentation libraries. Those promoting structured systems development methodologies quickly broke into different camps, however, with one camp favoring the more traditional process-oriented analysis and design and another favoring data-oriented analysis and design.

The process-oriented structured systems development methodologies advocated studying the existing process in an organization and modeling the process in the design (Figure 2). They advocated modular design based on widely accepted principles. The process-oriented approach most widely used was the one advocated by DeMarco, based on the works of Ross, Constantine, Yourdon and others.

The data-oriented camp was highly influenced by data base theory and practice. Data, this camp advocated, was the key to everything. Data is stable, while process changes continually. The data-oriented structured systems development methodologies advocated studying the data of an application, especially the outputs and data base, as a means of modeling the system. Data structured design made it possible to derive the structure of the programs directly from the structure of the data (Figure 3).

Another feature of the data-oriented approach was the emphasis on defining the results (outputs) in the requirements definition phase and then designing back to front, from outputs to data base to inputs. Data-oriented systems development methodologies focused first on logical and then on physical design, on designing the data base first and then the processes to access that data base.

Over time, the process- and data-oriented methodologies began to converge as each approach matured. In general, the process-oriented structured methodologies were more widely adopted, but with the increasing popularity of data bases and fourth-generation languages,



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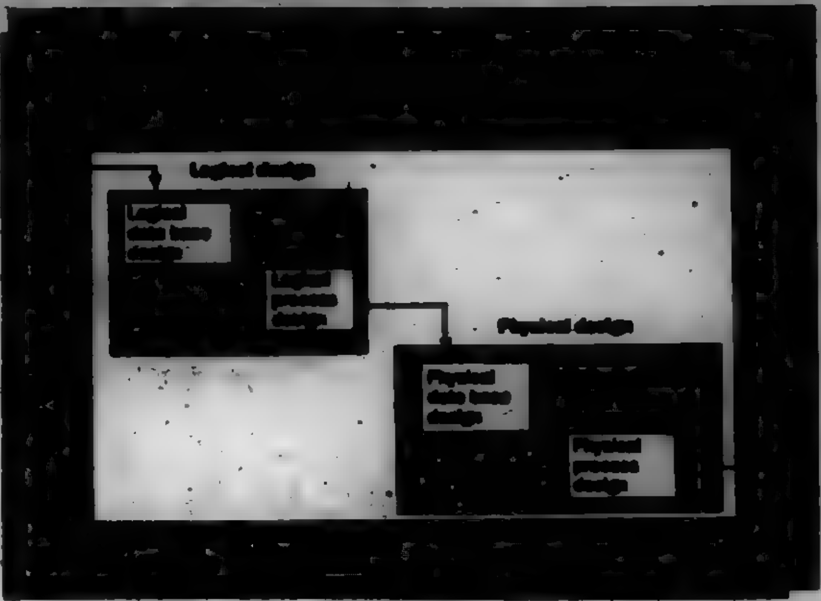

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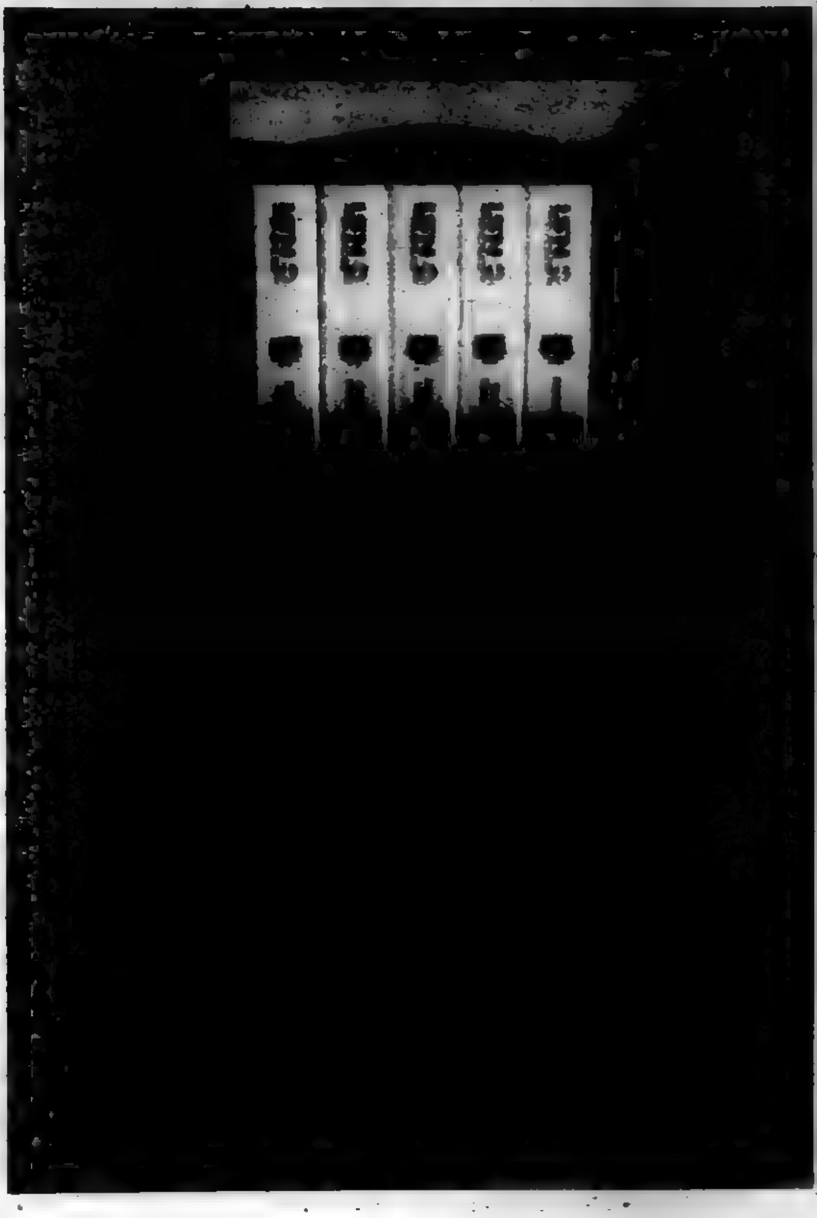

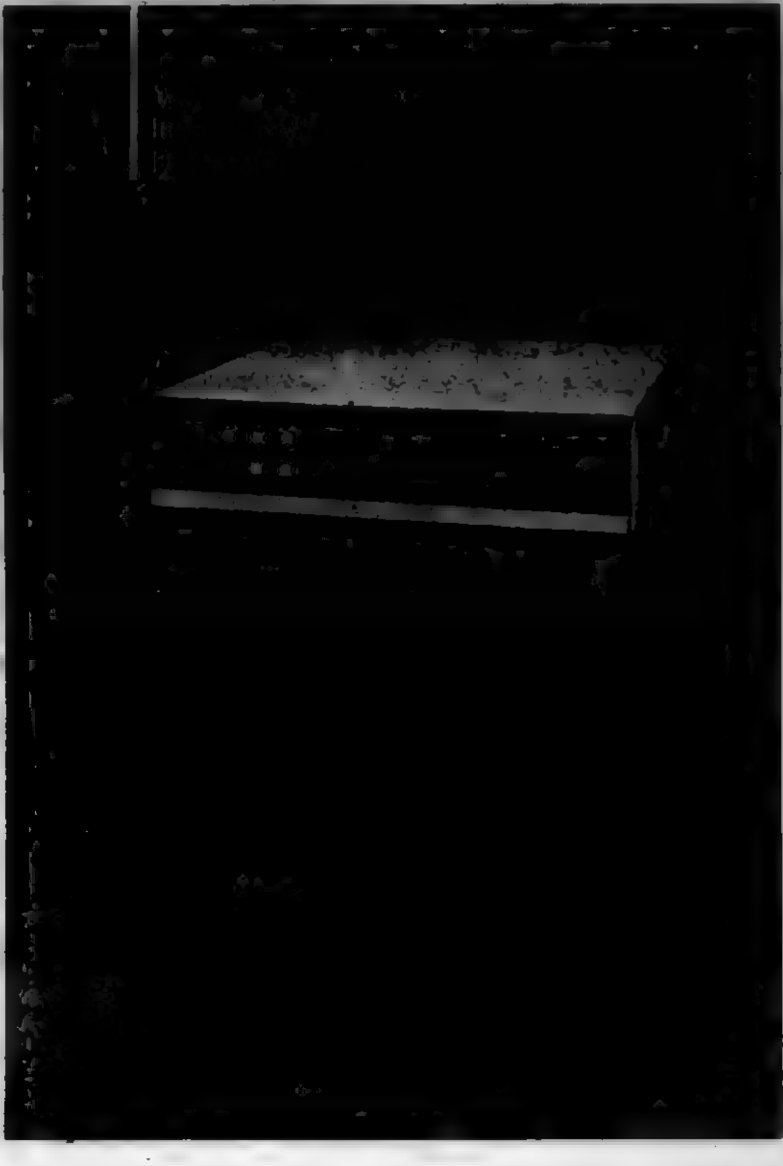

which are largely data-structured languages, more organizations are now moving to data-oriented systems development methodologies.

Some problems

Although the experience with structured systems development methodologies has been extremely positive, there are problems. Structured systems development methodologies are front-end loaded, and so a considerable amount of analysis and design are done before the user sees any results.

In many environments, it is difficult to get users and/or management to accept the time allocated for requirements and design, especially without a careful implementation plan that stresses training, consulting and the use of automated tools to support a new approach.

Another problem is that structured approaches use new tools, especially graphics tools, for defining and designing systems. These new tools make it much easier to capture user requirements, but until recently, they have not been able to capture the requirements in a machine-readable form so that they can be maintained.

The good news for structured systems development methodologies is that the systems developed using these techniques are usually considerably easier to code, test and maintain. Because of the time spent to get good requirements and develop a good design, testing, implementation and maintenance time is reduced, resulting in higher productivity. The new computer-aided software engineering tools make the process of structured development considerably easier.

During the period in which structured systems development methodologies were beginning to gain acceptance, a new set of fast-track development tools and techniques were becoming popular as well. These included fourth-generation languages, rapid prototyping and high-speed analysis.

Fourth-generation languages — the best known and most widely accepted of these techniques — evolved from the work done in the '60s and '70s on report generators, screen generators and data base management systems. These languages took advantage of the fact that a great many tasks in data processing are common.

By taking these standard functions and developing user-friendly languages to interface with standard data bases, fourth-generation languages could cut by a factor of four or five the amount of code required to do standard data processing applications, such as producing reports or filling out basic data entry screens.

Not only were fourth-generation languages more productive for certain classes of problems than traditional systems development methodologies, they were also aimed at a larger audience than traditional procedural languages.

In large part, fourth-generation languages grew out of the attempt to develop languages that could be used by managers and clerks without the assistance of programmers. As a consequence, many fourth-generation language systems have been developed by users.

Rapid prototyping

Because fourth-generation languages made it possible to develop systems, at least small systems, much more rapidly than was possible using traditional languages, the idea of rapid prototyping as a means of defining requirements was a natural consequence. Why not, fourth-generation language proponents asked, use these languages to work with users to develop prototypes of the systems to be developed? That way, the user would have a much better feel for the system that would be delivered.

Some proponents of rapid prototyping suggested that with fourth-generation languages, it was no longer necessary to go through the time-consuming process of developing formal requirement specifications.

Instead of the traditional waterfall process, a new operational life cycle emerged based on iterative development.

Iterative development usually means that the user develops a prototype of the desired system until he is satisfied with it; then the prototype is tuned until it performs satisfactorily or until the user identifies additional requirements. The danger lies in the possibility that the

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prototype never becomes a finished system.

Fast-track development emphasizes speed and early user involvement. When the user is brought into the process early on and given tools to see immediate results, he has much more control of the systems development process than was the case in the traditional life cycle. As a consequence, however, prototyping works best when restricted to small systems with one (or a small number) of users.

High-speed analysis

High-speed analysis, a slightly more advanced version of prototyping, is effective when applied to medium-size systems with several users. High-speed analysis involves a group approach. Users are brought together for an intense, three- to five-day session in which they define the system's primary inputs, outputs and data base. Normally, these sessions are conducted by an outside facilitator who structures the sessions and keeps things on track.

In high-speed analysis, prototypes (or at least mock-ups) ensure that users understand what they are getting (Figure 4). One of the advantages of this approach is that users have the opportunity to hear what other users of the system think the system should do. In these sessions, conflicts arising from differing user viewpoints are often identified and resolved before they become expensive mistakes.

Recently, various proponents of fast-track development tools have put them together as an alternative to the traditional systems development methodologies or structured systems development methodologies. Fast-track development eliminates many of the problems that users and managers have with more rigorous approaches.

Users and managers get almost immediate feedback on the nature of the system — there is no long lead time between the beginning of the project and when the user sees results — and the need for documentation is almost nonexistent.

There is a need to improve both the quality of information systems today and the speed with which they are developed. Unfortunately, many look at these goals as incompatible. They see fast-track development as a total replacement for structured systems development methodologies. In practice, the situation is not so clear.

About the author

Ken Orr, president of Ken Orr & Associates, Inc., is one of the principal developers of the data structured systems development methodology.

Orr has held various positions, including vice-president of Advanced Systems for Langston, Kitch and Associates, Inc.; director of information and communications for state government; vice-president of a management consulting firm and manager of software development for Service Bureau Corp.

He is the author of Structured Systems Development, Structured Requirements Definition *and* The One Minute Methodology.

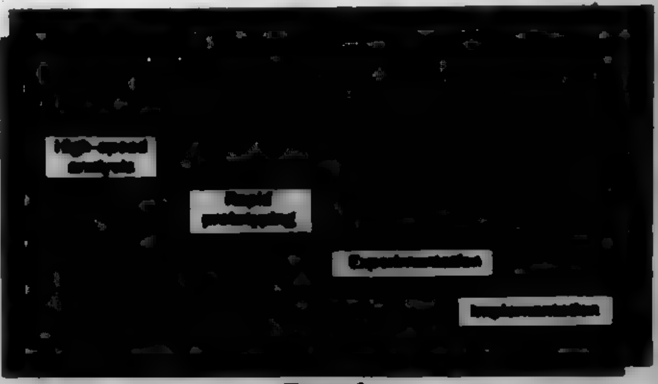
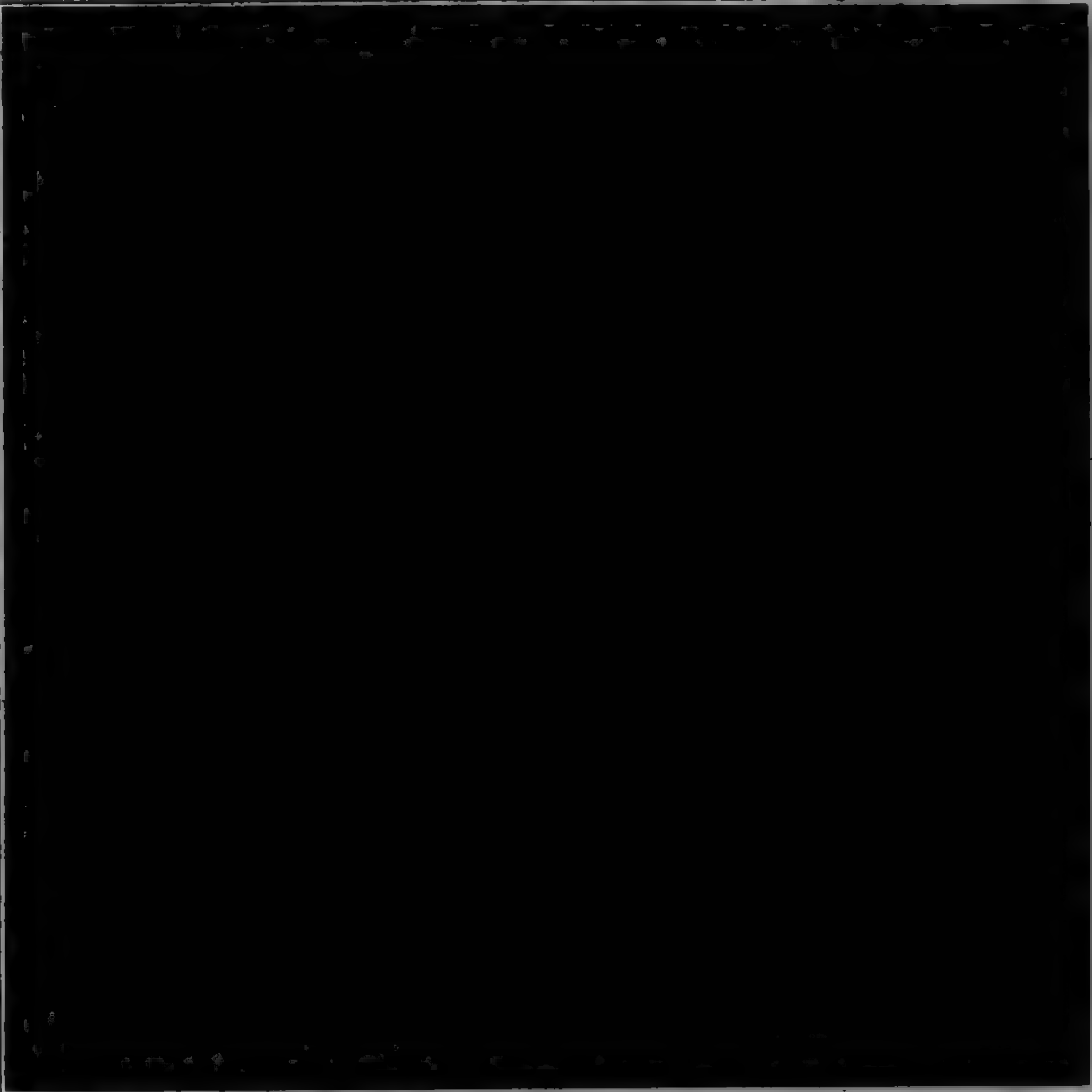


Figure 4



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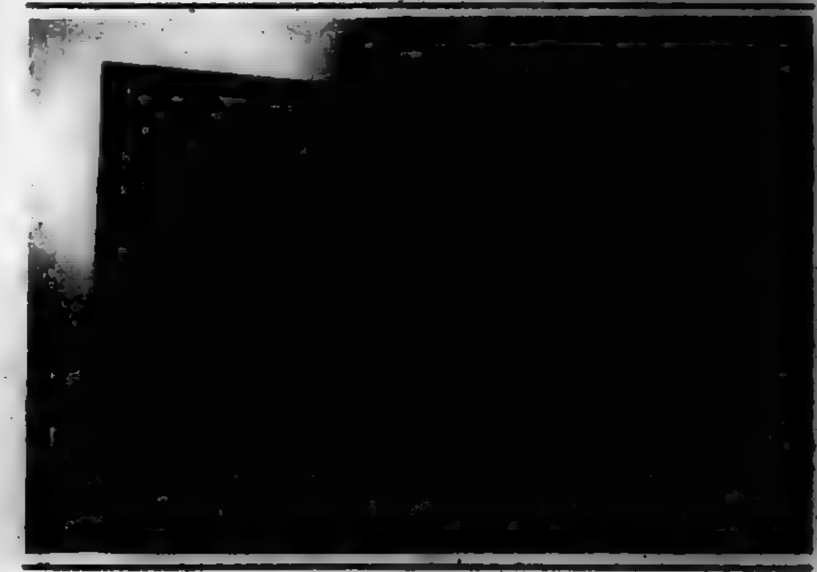

By Eric Bender
Senior Editor

Lotus Development Corp.'s millionth software package rolled off the assembly line and into the hands of the governor of Massachusetts. Television ads accompanied shipments of Jazz software. The company shifted its headquarters into the Lotus Development Building, a mammoth eight-story facility on the Charles River in Cambridge, Mass. And at a festive annual meeting, executives remarked that the company achieved $301,000 in revenue per employee in 1984.

In short, May was an average month at Lotus, which celebrated its third birthday in April and employs roughly 900 people worldwide.

Lotus' meteoric rise — from start-up to leading vendor of microcomputer business applications and then to world's largest independent software vendor — was fueled primarily by one star product, the 1-2-3 integrated analytical package.

Now 1-2-3 has been joined by two five-function applications — Symphony for IBM Personal Computers and Jazz for the Apple Computer, Inc. Macintosh — which are pulling in significant revenues. Many other packages are being readied for the market.

But just as important to Lotus' future is diversification. "We're broadening out of software into the information industry," President Jim Manzi emphasizes. "That's first and foremost on the list of objectives."

The pending acquisition of Dataspeed, Inc., whose equipment lets customers receive real-time stock quotes via FM broadcasts, is the prime example of this shift, Manzi says. "We want to be in the services business, which includes data provision and content analysis that you do with software," he says. "The diversification with Dataspeed is absolutely critical."

"We will continue to build our core business of productivity applications for personal computers," says Chairman and founder Mitchell Kapor. "We will continue to amplify the service components of that business, and we will selectively have new offerings that have service for a profit. That allows us to leverage our strengths, which are our customer base and our expertise in building applications."

(Continued on ID/13)

A conversation with Mitch Kapor

"In the applications arena, Lotus is clearly in a market leadership position, and our goal is to stay that way. We expect competition from a variety of sources that may include Microsoft, Cullinet, IBM, two guys in a garage. We can't afford to be complacent."

CW PHOTO BY [illegible] O'CONNELL

How has Lotus changed in the last year?

First of all, it's a lot larger in revenue and in head count. We have started divisionalizing the company, which is a very major organizational change. We are much more stable, partly because the micro software industry has shaken out to a large degree.

I think there is a perspective shift: How are we going to climb the next mountain? That's a question that we weren't asking ourselves a year ago. We had a one-product-at-a-time focus a year ago. Now we have a focus on growing entire new product lines while we protect the core business. It is a very major shift in perspective, sort of going from a local outlook to a more global outlook.

What's the focus that ties together the Dataspeed acquisition and the other recent corporate moves?

We are selectively expanding the role that we will play as a player in the information industry, which is to say we will build upon our base as a personal computer software company, in fact as the leading company, to leverage our assets. In other words, what are we good at, and what do we have?

First of all, we have about a million happy customers. So to the extent that we can identi needs they have that are not currently being served, we can create new applications or new classes of software applications for them. Part of what I'm doing are these textual productivity tools that have some artificial intelligence aspects to them. A number of the development alliances we have made with Jon Sachs, Ray Ozzie and Jerry Kaplan will come out as products.

At the same time, we are going to expand our markets selectively to segments that we're not serving directly but where our applications and service expertise can be brought to bear.

We identify the engineering and scientific market as a clear case where there is about a 20% overlap of customers today, of engineers, scientists and technical professionals who use 1-2-3 and Symphony. That still says that we are in the software and services business, but in an expanded fashion.

What kind of services will become important for Lotus?

Substantially all of the offerings we have today are software products. Although they are products, they come with a high degree of service of various kinds, whether it's the hot line or the courseware and so on. Our goal there is to have appropriately complete service that supports our products. The [Lotus] magazine is an excellent example of a service vehicle that, by the way, we expect to pay its own way.

I would contrast that with Dataspeed, where the business is a service business. There is a software component — the software that will go on the personal computer to interpret and allow you to manipulate the real-time stock quotes, and we are intending to use our expertise as an application company understanding the needs of end users — but what we are really selling is the service. That is a new kind of offering.

What are the top issues for your corporate customers?

The first thing is to recognize that a corporation that has hundreds or several thousand personal computers requires and deserves differentiated attention from us. Some of it just has to do with the scale of operation. There are logistical issues that need special attention — for instance, upgrades. If you have several hundred users out there and we are doing an upgrade, to force them to go through the same one-at-a-time procedure we would have for any other user doesn't make any sense. Or where they have an information center, that requires some differentiated treatment and support. So there is just a laundry list of attention to details.

The number two and three issues are protection and licensing, which go together.

We are hearing now a real attitude of extreme reasonableness coming from many individual large customers. I think it has been unfortunate that there have been some very strident voices that have not contributed to positive dialogue.

We are trying to understand how to strike the correct and mutually beneficial and productive bargain, which I think could take the following form — and I say "could" because we have not committed to this.

Protection could be partly contractual. Protection does not, in all cases, have to be encryption on the floppy disk or the equivalent. Large customers understand that in order for us to do business they have to be willing to shoulder some of the burden of responsibility for the usage of the product within their organization.

That comes down to some variant of "If you remove the copy protection, we will agree to be responsible to see that illegal copies are not made."

A bargain could be struck. But that ignores the subtleties and complexities of the issue, of which there are very, very many.

We are not inflexibly committed to copy protection as some sort of last stand, but we are committed to doing business in a way that we feel protects our economic interest.

We have gradually moved our position, as much as our customers have moved some of their positions. Nobody is going to be in business for a long time if they are not responsive.

There are two things that we won't do. We won't walk away from copy protection totally, and we won't enter into any agreement that allows for unlimited reproduction, which is just not realistic or reasonable.

It's also apparent to us that if a site license makes sense at all, it will only make sense if there are 500 or 1,000 or some fairly hefty threshold number of machines.

And there have to be adequate solutions in terms of copy protection in all of the other cases.

(Continued on ID/20)

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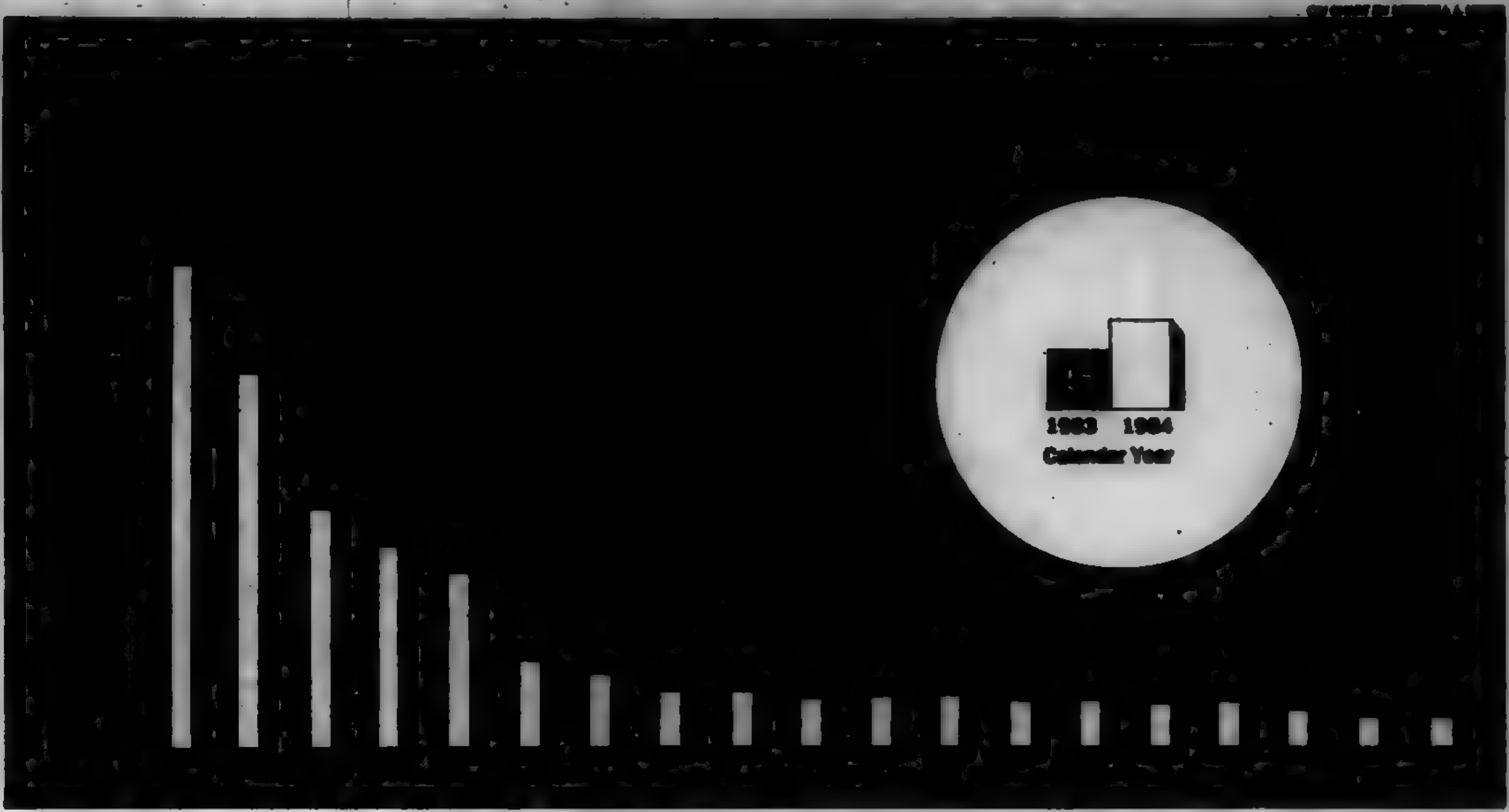


(Continued from ID/10)

Although a few recent moves, particularly the Dataspeed acquisition, have provoked some head-scratching among industry analysts, there is general approval.

"They've carefully mapped out a strategy to diversify their business," says Chris Christiansen of the Yankee Group.

"The only great danger I can see is that they're moving in so many directions they may lose their focus, but they know what they're doing," Christiansen adds. "They've gotten more flexible as they've gotten larger."

"They have a lot of good strategies in place," sums up International Data Corp.'s Aaron Goldberg. The biggest near-term danger, Goldberg says, is simply that "the personal computer market will go to hell and take them with it."

Getting started

When the personal computer explosion began in the late 1970s, Kapor, a Yale University psychology graduate who also studied at MIT's Sloan School of Management, worked at Personal Software, Inc. (the predecessor to Visicorp) as programmer and product manager. During that time, he developed two applications that he subsequently sold to Personal Software for $1.5 million.

Struggling to graph Visicalc spreadsheet results on an Apple II one day in 1981, Kapor hit on the idea of a package that would integrate multiple functions. He took the concept to software developer Jonathan Sachs, and they began working on what became 1-2-3, with Sachs acting as the lead developer. The two founded Lotus in April 1982.

Announced in October and shipped in January 1983, 1-2-3 was an instant success. Combining a fast and flexible spreadsheet with graphics and data base management functions, the package was one of the first really to take advantage of the IBM Personal Computer. Lotus' aggressive promotion efforts played a large role in its success, but word-of-mouth probably was more important, industry experts agree. And the timing was right.

"I don't think anyone is ever going to have a blockbuster like 1-2-3 again," Manzi says. "The timing was perfect, the product was perfect, IBM was just getting going, and the economy was going into an incredible upswing for three years. It was the greatest time in the history of the world to launch a product."

As 1-2-3 sales soared, Lotus also overcame the barriers that stopped many other promising software startups — carving various routes through the distribution channels, setting up manufacturing, establishing adequate customer support procedures, planning for follow-on products and dodging a host of other potential roadblocks. In 1983, its first full year of operation, Lotus reported sales of $53 million. In October of that year the company went public, raising more than $34 million.

Broadening product line

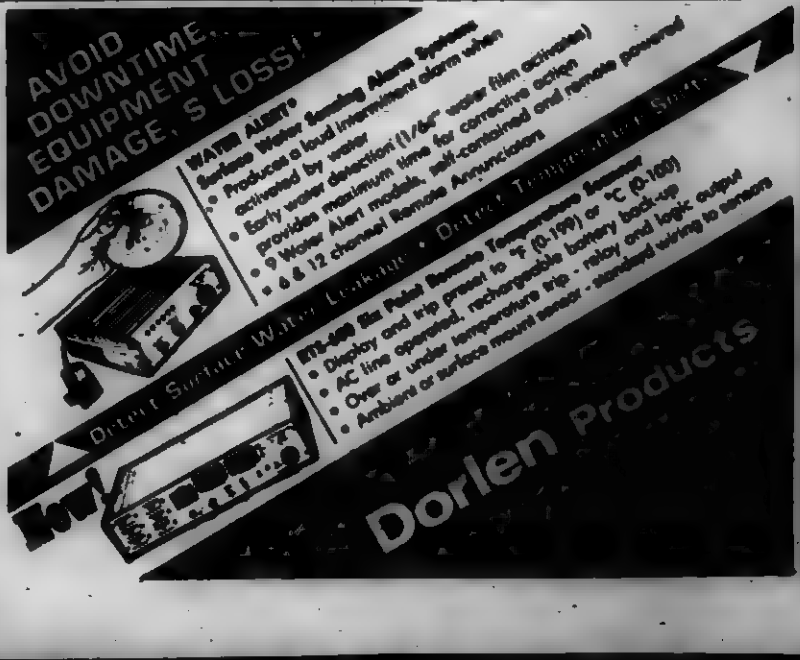
Announced in January 1984 and shipped the following July, the Symphony package pulled in more than $40 million in sales by this past April, Manzi says. The program was designed to accept add-in software modules (such as spelling checkers and Symphony Link, a micro-to-mainframe product), which also will bring in significant revenue, Manzi says. "Companies are buying large volumes of Symphony just on the strength of Symphony Link."

The 1-2-3 package is due for its first major revision this fall, and the upgrades will also pull in substantial sales, he says. "Companies would die for that revenue stream." Other announced products include a 1-2-3 report writer and the Spotlight desk organizer package Lotus received as part of its acquisition of Software Arts, Inc.

While acknowledging "that the rate of growth is fundamentally tied to new units of hardware going out the door," Manzi emphasizes the role of the new offerings. He also notes that he expects international sales, which accounted for 10% of sales in 1984, to grow faster than U.S. sales, perhaps pulling in 15% of revenue this year.

On the vertical market front, the new Engineering and Scientific Products Division, established in March, is beginning to target products toward the technical users who already account for approximately one-sixth of Lotus sales.

"We never asked these people to buy 1-2-3 and Symphony, but they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went ahead and bought them anyway," says Sandra Gunn, vice-president and general manager of the division. "Some of them used 1-2-3 and Symphony the same way a general business user would, and others tried to do some wild and wonderful things."

This market shows "very high growth, very high dollars in terms of computer tools, but the real reason to get excited is the shift in technology that's going on," she remarks. "Engineers and scientists, being released for the first time with intelligent workstations, are going nuts. They love it. And unlike general business users, they're not intimidated by the technology."

Lotus will stick to its knitting, offering "flexible, powerful, generic microcomputer software that has hooks in it to other things," Gunn says. The first step? "We're going to tell engineers and scientists all about Symphony," she says. "Nobody ever bothered to do that."

Another move is toward strategic alliances with other vendors, the prime example being the cooperative effort to integrate Symphony with Cullinet Software, Inc.'s Information Center Management System software. Similar deals are under discussion with other large mainframe software vendors.

The Dataspeed acquisition represents a new direction for Lotus and gives several important benefits, says E. C. "Mick" Prokopis, senior vice-president for finance and operations.

"First of all, it provides us with a recurring source of revenue in the form of annuities," he says. "We haven't had that type of income." The move also provides a good matchup of strengths, adding Lotus's marketing, financial and development resources to Dataspeed's technology, Prokopis says. And "it further enhances our ability to sell products that are purchased more for strategic reasons than for tactical reasons."

> ”
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> *Like its competitors, Lotus is picking its way through a mine field of touchy and closely linked distribution issues: site licensing, the gray market and copy protection.*

The Dataspeed acquisition also comes with tax breaks that make it a bargain for Lotus.

Lotus is pouring substantial resources into creating future products, spending about 12% of first-quarter sales on research and development, Manzi says. Kapor personally supervises development, overseeing a large in-house group and a number of outside developers (see sidebar on ID/18). The first major results are expected to crop up in 1986.

Leveraging market advantages

The company doesn't expect any major inroads from 1-2-3 clones, says marketing vice-president Charles Digate. "We'd be remiss in not paying attention to those, but we understand what it takes to remain the dominant leader in that category."

One key is "new releases of our products that constantly leapfrog whatever a clone maker may decide to introduce," Digate says. "Anyone who would have a clone sitting on the shelf today would be quite surprised when they see the second release of 1-2-3. There's absolutely no way they'd be able to match that in a short period of time."

Because of this, "we obviously don't see any pressure today for moving the price of 1-2-3," he says.

Aside from product strength, Lotus enjoys major advantages over most competitors, including "the Lotus name, the support, the franchise with the dealers and the strong installed base," Digate maintains. The firm also can throw large resources into product rollouts, as in the case of Jazz.

Like its competitors, however, the company is picking its way through a mine field of touchy and closely linked distribution issues: site licensing, the gray market and copy protection.

As Lotus feels increasing pressure from corporate customers, establishing site licensing policies is a top priority, Digate says. "We're doing a lot of research to see what the needs are. . . . We've got some basic statements internally that we're all buying into. We have to work out a lot of details, organizationally and operationally, and after all that's done we can go to market with it."

Cutting in dealers

One prime concern is to continue to cut dealers in on all sales. While Lotus sold direct to large customers in the early days, that created severe conflicts with dealers, and in May 1984 Lotus announced it would push everything through the dealer channel. Among Lotus's own sales force, "we have more people than ever that penetrate the Fortune 1000 every single day," but all orders are turned over to dealers, notes Stephen Crummey, vice-president of sales and service. The main argument for this arrangement is that dealers provide support, but the logic may be more compelling for dealers than for corporate customers, industry experts outside Lotus note. Crummey acknowledged that "a lot of corporate accounts don't need support after they buy their nine thousandth 1-2-3," but he points out that "all corporate customers use dealers to one extent or another."

Even sophisticated products such as Symphony Link will be handled through resellers, Crummey says. "We're installing 3274 controllers in each field location for training on Symphony Link."

"There are 2,200 A-rated Lotus dealers and on average each of them

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has five outbound salesmen," Manzi estimates. "So we're talking 10,000 reps out there as sales and fulfillment mechanisms. That's reason enough to go through dealers."

In April, Lotus intensified its efforts to shut down gray marketeers (who quietly buy products from authorized distributors or dealers and offer hefty discounts from the suggested retail price, often selling through the mail) by serializing products and watching where they end up.

> *Lotus consciously works to preserve the style of its early corporate life.*

This program has shown some good early results, Crummey says. "We will start policing the channels, and if necessary terminate people who are violating the rules."

Copy protection raises many other concerns and, sometimes, tempers. Lotus is studying a number of alternatives to its current software-based schemes, from the Adapso hardware key to potential contractual protection (see Kapor interview).

Mid-to-late adolescence

Manzi, who worked as a reporter and then as a McKinsey & Co. management consultant before joining Lotus two years ago as marketing director, describes Lotus as a company in "mid-to-late adolescence."

Lotus currently is being split into divisions, effectively establishing "smaller companies that are more comfortable and where the dynamics are more small-company-like," Manzi says. "The trick is to figure how to successfully run divisional structures, how to keep these alive and well, while maintaining the soundness of the company and not getting unfocused."

Lotus consciously works to preserve the style of its early corporate life. One example is the informal companywide meetings, still held biweekly, although these days 500 people may show up. Another is the company's continued presence in not-yet-fashionable areas of Cambridge.

"There's still an enormous amount of excitement," Manzi says, which comes partly from new initiatives and partly from Lotus's high profile among microcomputer users. "People are looking to us to solve lots of thorny issues in the industry, as much as they're looking to IBM."

In the short term, even those who approve Lotus's new directions worry that sales slowdowns may loom. "A number of factors will start to erode the base that 1-2-3 has built up," Christiansen says. "Lotus doesn't have a real follow-on product; Symphony adds too much." Products now in development may be two years or more from commercial acceptance, and Lotus may see a slump in the interim, he suggests.

And while Wall Street sees the excitement, it hasn't shown up lately in Lotus's stock price.

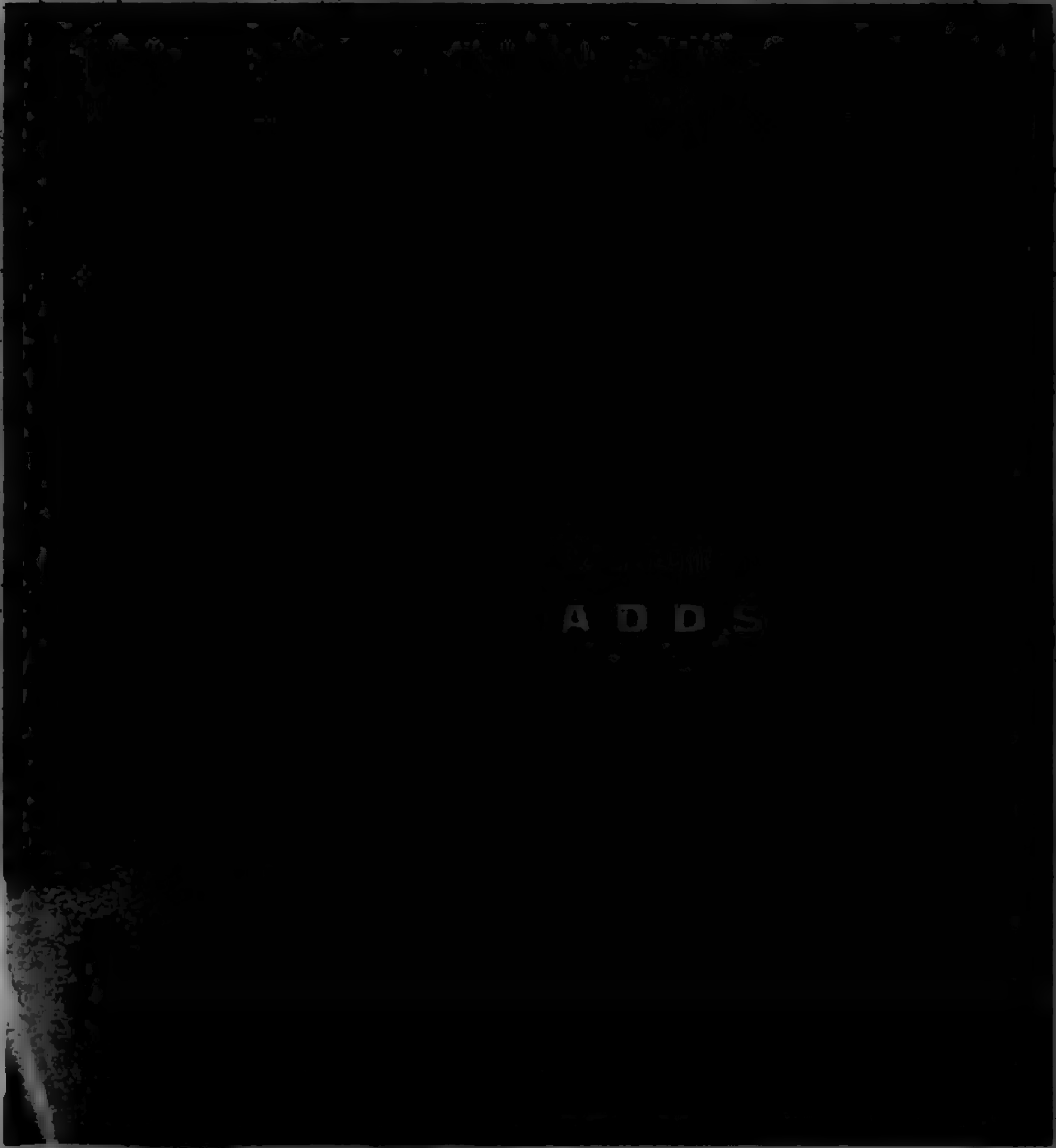
In first-quarter 1985, Lotus earned $9.6 million on $44.7 million revenue, showing increases of 28% and 58% respectively over first-quarter 1984 results. The company was sitting on $68.4 million in cash and temporary investments. But the current price/earning margin is hovering around 10.

"When you look at companies with price/earning ratios of 10, you don't expect to see Lotus there," Prokopis says. "The investment community needs to see another four to eight quarters of continued favorable earnings reports."

However, Michelle Preston, analyst with L. F. Rothschild, Unterberg, Towbin, calls the current margin "ridiculous."

"I don't think Wall Street is really focused on Lotus's future as much as on what Lotus is currently doing," she says. "I see this year as a year of consolidation, and I look at next year as a major new product year for Lotus. Lotus and Microsoft have moved ahead of the pack."

Jim Manzi looks on as Gov. Michael Dukakis accepts Lotus's one millionth product from Bradford Chatwynd, manager of materials and distribution.



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Kapor oversees unusual mix of R&D efforts

Stepping back from overseeing day-to-day operations, Lotus Chairman Mitchell Kapor "is now totally focused on managing development," analyst Michelle Preston notes.

Kapor acts as a hands-on manager for the company's far-flung software development effort, which supplements work by a large in-house staff with an unusual number of agreements with outside developers. "It would surprise people if they knew how much Mitch is personally responsible in some degree for Lotus products," remarks S. Jerrold Kaplan, Lotus's principal technologist.

Lotus's prime forum for product ideas is the "chairman's R&D group," which joins software luminaries such as Kaplan, Jonathan Sachs and Visicalc co-author Daniel Bricklin.

The group, which Kaplan describes as a cross between "a loose-knit group of gladiators" and a dinner society, typically meets with a rather short agenda. "The schedule is that they bring in food for dinner," he adds.

"Everyone in this company has got new ideas for products and new ideas for processes," comments Gabriel Baum, vice-president of product development.

"The chairman's R&D group is ideal for products to ferment and for acquiring new products from outside contacts.

"Lotus is not and never will be a totally formally structured place," Baum says. "It's likely that products will be taken all the way to the marketplace within the chairman's R&D group. Equally, we're all agreed that a number of products will be taken to a certain point and then the individual who championed one will turn and do something completely different.

"This company has grown hugely over the past three years, and to achieve that huge growth and put out product at the same time is a remarkable achievement," he points out. "But there's a price to pay for that achievement; you tend to get somewhat isolated groups, groups pursuing their own destiny. I'm anxious to eliminate those barriers."

In recent months, Lotus has announced a string of product development contracts with external developers, including several ex-employees such as Sachs. Among software vendors, signing up so much talent from outside the company is unique to Lotus, but the setup makes a lot of sense for both parties, Kaplan says.

Often, the best developers don't want to be employees, but they do want their creations to sell, he notes. And from Lotus's perspective, the moves neutralize some of the company's strongest potential competition.

At Lotus's annual meeting, Kapor listed four guidelines in the ticklish art of getting the most from these high-powered developers: give the developers autonomy, "let their products see the light of day," "let them share the fruits of their labor," and make sure "it's not just a great idea but it can turn into a great product."

Kapor's own software expertise is a major advantage in this role.

"Collaborating with him is just a pleasure," Kaplan says. "Give him half an hour with one of my programs and he understands it better than I do."

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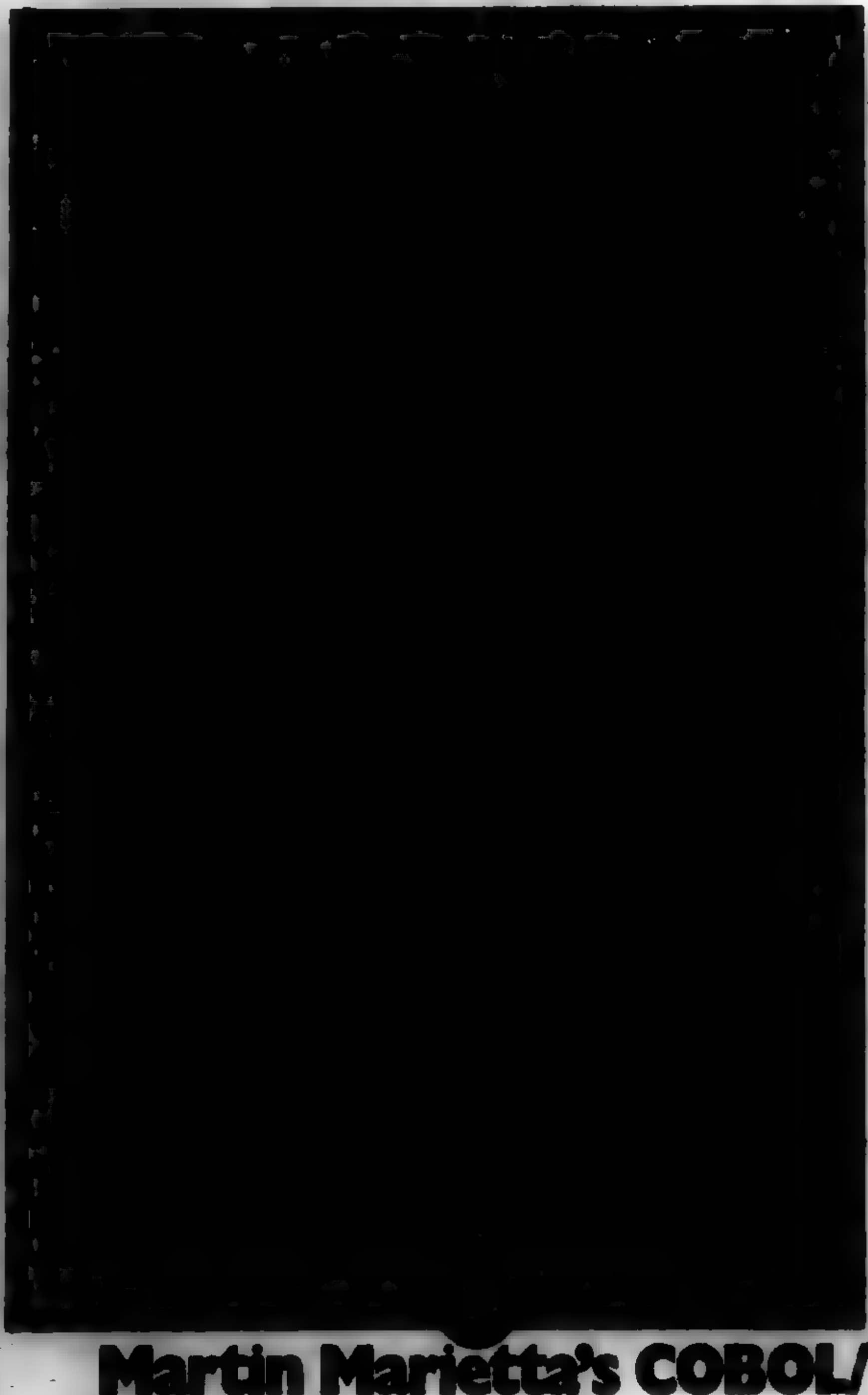

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How DP keeps up with Lotus' growth

Dorothy Hodges

Hired two years ago, DP manager Dorothy Hodges describes herself as an old-timer at Lotus.

"I was told 'there is no data processing here, so go do it,' " she jokes. Since then, she says, Lotus has been "taking a natural evolution of MIS departments and scrunching it into a two- to three-year period."

When Hodges joined the software firm in June 1983, after experience as an IBM sales representative and a computer consultant with Arthur Andersen & Co., internal DP was "an order processing system and one person who was running a small System/38," she says. Hodges was given a September deadline to get an inventory system up and running.

"Taking my Arthur Andersen methodology, I threw it out the window and went on," Hodges says. "The methodology says it takes a year to do a systems plan and then define what you need. We did that in a month.

"Because we needed to do things so quickly, we had to go with packaged solutions," she explains. That search ended up with an integrated financial/manufacturing package that runs on a Digital Equipment Corp. VAX, "so then we got a VAX."

By the time the original VAX/750 was installed, "it was too small, because of the amazing growth curve, so we immediately ordered a 780, and that's how we evolved," she says. "Right now, we have three 785s here in the building in a cluster." The Lotus R&D group at nearby First Street offices also has a VAX, and two other VAXs are running at UK facilities.

Over the years, the internal DP group has grown to 25 employees, and the charter has spread to cover systems used for software research and development and data communications. However, Hodges does not have responsibility for the 800-plus personal computers at Lotus.

"One of my big projects is to implement an information center here, and I think it's going to make sense to roll the personal computers into that," Hodges says. "Right now, we don't have anyone who really plans for personal computers except on a hardware basis. It's an evolutionary thing, and I think it's evolving into an information center."

On the data communications side, asynchronous communications are provided through a Sytek, Inc. broadband network, now being placed throughout the new Lotus Development Building, with 800 network drops installed so far. Most users can get to the VAX by taking advantage of Symphony's terminal-emulation functions on their Personal Computers. Microcomputer local-area networks also will be attached, "so you can sit in your office and be on a local-area network, or you can call out to Compuserve or call to the VAX or to First Street or to England. We've been concentrating on getting all the transaction systems up," Hodges notes. "Now we're concentrating on getting some more management information to people.

"The VAXs were an appropriate choice, because we're clustering them, and if we need more hardware, we can buy it without having to spend millions of dollars," Hodges says. "But there may be good strong reasons that we get an IBM mainframe in the next year.

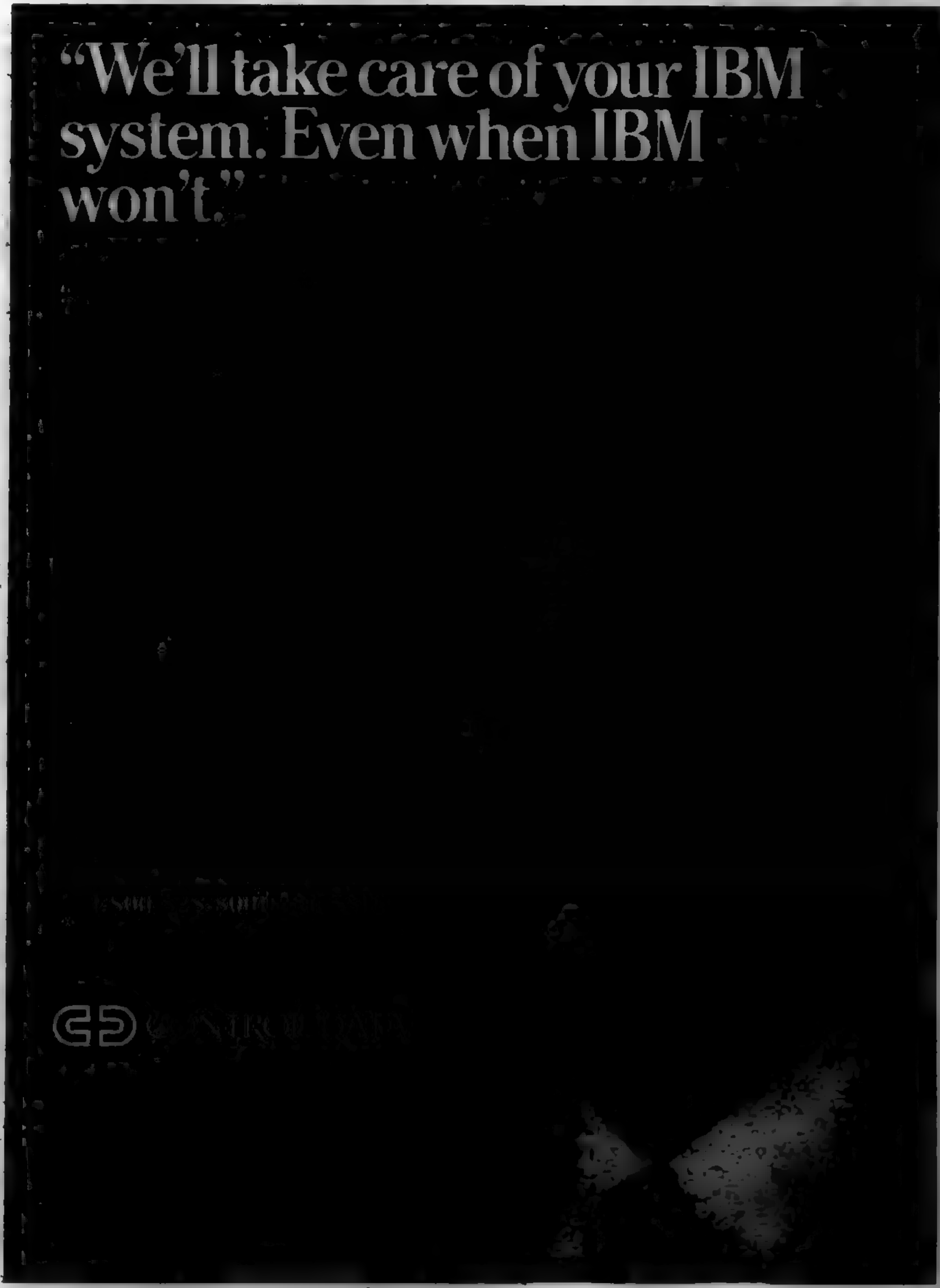
"We're facing some very large data bases," she points out. "Our end-user population is a couple of million people whom we want to be able to identify; we see that as a large competitive weapon."

Another reason for a mainframe purchase is that it would help to support Lotus' evolving micro-to-mainframe products for the company's R&D, field support and sales groups.

"So one potential scenario is having some large data base applications on an IBM mainframe and keeping the VAXs as workstations — the opposite of a traditional approach," she says. "The easy part is over. It was very clear what we had to do until now. Nobody questioned that we needed an accounts payable system."

The current challenge is determining priorities "and then, the traditional problem at Lotus, trying to predict the growth, because MIS can't react as quickly as some other groups," she says. "MIS has to be very close to the business strategy so we're there when we need to be."

Last month, Lotus took another step to boost MIS, appointing Jack Fuehr, who previously served as vice-president for data processing at Mostek Corp., to the new position of vice-president for MIS.



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How is the Adapso technical proposal proceeding?

It is getting closer to full publication. Some very impressive progress has been made in reducing the likely costs of manufacturing these devices. There's some very innovative technology that is being donated by Apple, which I think is very exciting. There is active involvement by hardware manufacturers of all kinds — Hewlett-Packard, Apple and others that I can't name. If a protection port or authentication port could be built into a machine that would essentially add zero cost, software vendors and users would have more flexibility.

What's in it for the hardware suppliers?

Two things. One is that all of those hardware companies are also in the software business, and they can see the effects of software piracy on their software business. Software revenues are going to grow faster than hardware revenues in all segments, including mainframes, and a hardware manufacturer doesn't want to see its own growth opportunities choked off. Every single manufacturer I have talked to, and that includes the world's five biggest, has privately expressed its concern with the problem and its commitment to do something about it.

[Another benefit is that] a significant segment, perhaps not a majority, of the large customers that I have talked to see something like the locking key as being potentially beneficial for a variety of reasons.

One is in providing a nonburdensome but more effective means of controlling and administering the use of personal computers and software within their own organizations. The second reason is security of data, which is a very pressing issue in the corporate environment. The Adapso standard itself doesn't provide that, but it has been very carefully designed to be extensible. For example, add-ons or custom microprocessors that work on the bus could provide data encryption and authentication.

One of the virtues of the [Adapso] lock-and-key schemes vis-a-vis everything that we have today is that it allows a single user to use software on multiple machines and allows a single piece of software potentially to be shared on multiple machines.

What kinds of problems will AI-based software help to solve?

One problem is that the amount of overhead and of thinking you have to go through to get nicely formatted business correspondence is actually too much, in my opinion. It could be greatly simplified.

Another issue: the management of loose bits of information, such as your appointments, a list of things to do, the notes that one may make at a meeting or something about who said he would do what and when — there is no effective organizing tool for coordinating the stray bits of information. There are some individual products like appointment calendars, but those sort of take a piece out of this integral web. They're very partial solutions.

A third problem is when you have groups of people working on projects over an extended period of time and they build up a heterogenous set of documents. For instance, in developing a software project there are specifications, design papers, weekly progress reports, schedules, correspondence, marketing plans, test site reports, bug reports and other kinds of status reports. These documents are originated by many different people. There is no effective way of coordinating, integrating and querying a heterogenous set of documents on related issues.

The more we look into it, the more firmly we believe that there are these distinct but overlapping problems with management of fundamentally textual as opposed to numeric information and that one wants to apply personal computer technology to those problems.

What do you think of Steve Job's statement at a Microsoft press conference in May that "there's a war brewing between Lotus and Microsoft?"

I think wars are fought between armies of nations.

There is no question that in the applications arena, Microsoft attempts to compete with Lotus. That is intentional phrasing, because in the applications arena, Lotus is clearly in a market leadership position, and our goal is to stay that way.

We expect there will be ongoing competition from a variety of sources that potentially include Microsoft, Cullinet Software, IBM, two guys in a garage. Competition can come from other micro software companies, from start-ups, from multibillion-dollar hardware companies. We simply can't afford to be complacent at all. It is really hard to say right now where the major threat is going to come from.

We have to maintain our own internal sense of balance and appropriateness. That means making good on the commitments we make to our customers, shipping the new products that are the ones that people want and logically continuing to build up our business.

When I get up in the morning and I ask what we are doing, my first thought is not how we are going to beat the competition; my first thought is what are we going to do for our customers. I know it sounds a bit like a homily, but it happens to be the way I think, and it's the way that Lotus thinks. It's a good corporate style. It is OK for [Atari's] Jack Tramiel to say that business is war, but I say business is making customers happy.

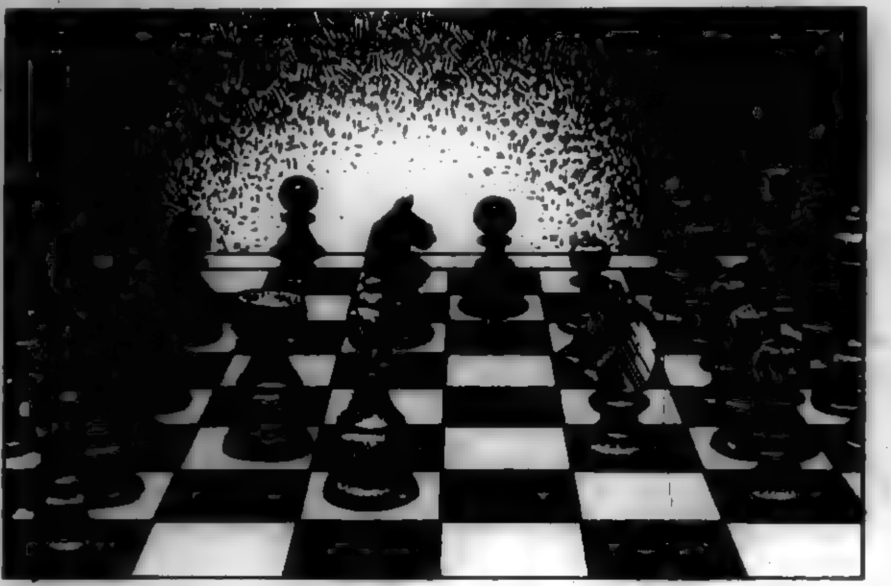
Is Lotus starting to move into systems software, for example in the Lotus/Intel expanded memory scheme?

In a strict sense, memory management being a function of the operating system, one could say the Lotus/Intel spec sort of crosses over into the operating systems arena. However, it is a major tactical move, not a strategic move, because it is intended to respond to a very particular set of customer needs, spreadsheet users who want to have more memory in their models. Because a more general solution was not forthcoming in the time frame the customers wanted it, we really felt it was incumbent to do something about it. The lack of generality of the spec is its strength, because it sends a very clear signal that it's for data, not for code. It really works well for spreadsheets but may not work for other things. It is also clean; it doesn't screw up the operating system. The nature of the specification itself says something about our intentions, which are not to go into the systems software business in a general fashion.

"

When I get up in the morning and I ask what we are doing, my first thought is not how we are going to beat the competition; my first thought is what are we going to do for our customers. . . . It is OK for [Atari's] Jack Tramiel to say that business is war, but I say business is making customers happy.

Strategy...



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IN DEPTH

Executive Interview

John Fralick
TRW, Inc.

CW PHOTO BY GEORGE HARRAR

By George Harrar
Features Director

John Fralick is manager of Technology Planning, Information Systems for TRW, Inc.'s corporate offices. TRW exceeded $6 billion in sales last year by providing products and services in three markets: electronics and space systems, automotive, and industrial and energy.

A few years back, TRW decided to build a new headquarters in Lyndhurst, Ohio. Fralick was assigned the job of figuring out what information systems should go into a building which management expects to occupy until the year 2035.

Fralick necessarily took a long view of how people will work in the computerized office. He had to plan for what he thought would happen as well as what might happen. He was interviewed a few weeks before TRW moved in June 1.

Management stipulated a life expectancy of 50 years for the new corporate headquarters. How do you begin to think of information systems anywhere near five decades out?

When they said the useful life of the building was to be 50 years, the first thing we tried to do was make an honest attempt to forecast where technology was going.

We tried to do the whole 50 years. You can make some assumptions, gross assumptions, on where technology is going for maybe 10 or 15 years. It's real hard to get to 15. We came to the conclusion quickly that it was silly to do it for 50 — absolutely silly. But we felt fairly confident we could make some pretty good projections on where technology would be 10 or 15 years from now. We felt we could make some very good projections on where it would be three to five years out.

You did this forecasting two years ago. How have your predictions held up so far?

I'd say for the short term we were right on. We hit the nail on the head as to what would be happening over the next three to five years. The things we said have actually come to pass — although not exactly when we said they'd come to pass.

There's a tendency to be overly optimistic about big developments. You think they're going to occur faster than they do. There's a tendency to miss the boat on some of the shorter term things. They don't come to pass quite as fast as we think they will.

On the other hand, some of the long-term things sneak up on you, things like fiber optics for communications and voice processing. They're probably going to come to pass before we thought they would.

I guess the important thing we got out of trying to forecast the technology wasn't a high level of confidence in the forecast as much as what we inferred from it and then used to design the building. We basically wound up concluding that we really can't estimate over 50 years what the technology is going to be like. Because we can't, we've got to build as much

"If you look at the amount of equipment going in, the building starts to look like a giant computer room."

IN DEPTH/INTERVIEW: JOHN FRALICK

flexibility into the building as possible to accommodate just about anything that would come down the road.

We took the technology forecast, talked about the generic styles of processing, talked about generic computer systems and what they might be like, talked in a general sense about what people might be using computers for and how much they'll be using them in their jobs. Then we tried to forecast the characteristics of the devices — again, in generic terms — and said, "Well, if that's what things are going to be like, how should we build the building to accommodate those kinds of devices?"

Some of the more important things that we decided on were how big the equipment is, how much is going to be in your office, what are you going to be doing with it, what are the wiring systems going to be like and will they change.

> ”
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> *We've tended to push more of the responsibility for computing out into the user areas rather than trying to operate a big, monolithic, controlled data center.*

It's an interesting situation, because you started planning two years ago, and you figured three to five years as the period when you thought you could make some pretty good guesses. You only have one more year before . . .

. . . before our good vision is up. Sure, we can see that. We selected a local-area network and a PBX for the building.

A single one for each?

Yes. And there have been an awful lot of new developments in the marketplace since then.

Which ones did you choose?

We chose the United Technologies Corp. 1001E PBX, a digital PBX, and we chose TRW's local-area network. Not a lot of people know about it, but TRW has been in the local-area networking business for a number of years. The primary customer has been the government, the defense agencies.

On Jan. 1, the division that manufactures the product went commercial with a charter to go after the commercial world — to provide a dual-cable, broadband coaxial, tree-structured bus topology local-area network. It does a very nice job of supporting personal computers and asynchronous devices. Because it's broadband, it does a fine job of supporting video; and because the topology's quite similar to that being used by Wang [Laboratories, Inc.], we are also going to be supporting most of the Wangnet services.

Your personal computers are what kind?

IBM Personal Computer XTs.

Any other vendors?

Not in the personal computer world. We set a policy that says that the IBM Personal Computer is the standard for corporate headquarters.

That was the standard even before deciding on the equipment for the new building?

Yes. Here's an example of how things have changed. When we chose the local-area network, we only had a couple of personal computers on the [corporate] staff. Now we've got about 60; we're moving into the building with about 75. The number has grown tremendously.

So we selected a local-area network. Now we have a new population of devices to support.

How many people will work in the new building?

About 450 will move in. The capacity is 750.

What are the basic functions of the people who work there?

We've got six functional departments — science and technology, communications, human relations, finance, law, planning and investment.

Let's go back to what people will be using computers for and the characteristics of the devices. What changes do you see in the styles of processing in 10 to 15 years? Are you talking about centralized vs. decentralized?

Yes. Five years ago, we were just starting in office automation. All of our applications were run on a centralized — essentially a single — mainframe computer.

Actually, about seven years ago, we started installing time-sharing systems, making computers and terminals more accessible to people for interactive processing, getting people to take the responsibility for initiating their own jobs rather than having them all processed by a large central batch processing facility. We were essentially trying to spread the responsibility for computing out to the user community. Also at that time, we were getting into office automation. We implemented shared logic, word processing clusters on a department-by-department basis.

So over the past seven years, we've tended to push more of the responsibility for computing out into the user areas rather than trying to operate a big, monolithic, controlled data center.

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It's interesting you used the words "push it out." It's not being pulled out?

Seven years ago, it was a push. Now it's a pull. I think the turning point was three years or so ago — then it was a tremendous pull from the users to take the responsibility for their systems and to get involved in the development process. Today, we have a lot of users who are doing their own applications development using some higher level language tools that we've made available to them.

What is the status of personal computing in the corporate headquarters?

At the secretarial levels, we've got word processing and some additional support tools. We tried to cover the needs of the manager and professional analyst, basically by providing personal computers. The big application there has been spreadsheets. Today, not many people have explored the other things you can do with personal computers. Once we're over the enthusiasm for spreadsheets, people will be looking for new things to do.

In terms of styles of processing, the way we see things going is that there will be intelligent personal workstations in almost everyone's office. They will be very much like today's personal computers but considerably more powerful. Those personal computers will be networked together through a local-area network, accessing a variety of shared resources, which may be allocated on a departmental basis or across the board for the staff to share.

The mainframe computer is still going to play a large role in our processing because we support a couple of key systems here that are supporting the management of the company as a whole. They're primarily involved in the collection and reporting and analysis of either financial or reporting information. So we're developing some large central systems, accessible to all the units and divisions of the company, that are repositories of financial or employee information. Then we're trying to provide analysis and modeling tools so people can access that data and work with it.

What do you see changing in how people use computers? Right now, your secretaries use word processors and your analysts primarily use spreadsheets.

There's more than just that. We have a number of people in the financial and planning areas doing financial modeling with tools like [Management Decision Systems, Inc.'s] Express and some large mainframe-based tools that can handle sizable problems and considerable amounts of data. Those are end-user tools. They are just like a spreadsheet in that the users develop their own applications and solve their own problems without a lot of support or direct involvement from the information systems group.

We've got data base tools that allow people to build their own applications and maintain personal data bases or data bases of departmental information to store, retrieve and report on the information that's of specific interest to their area of the company.

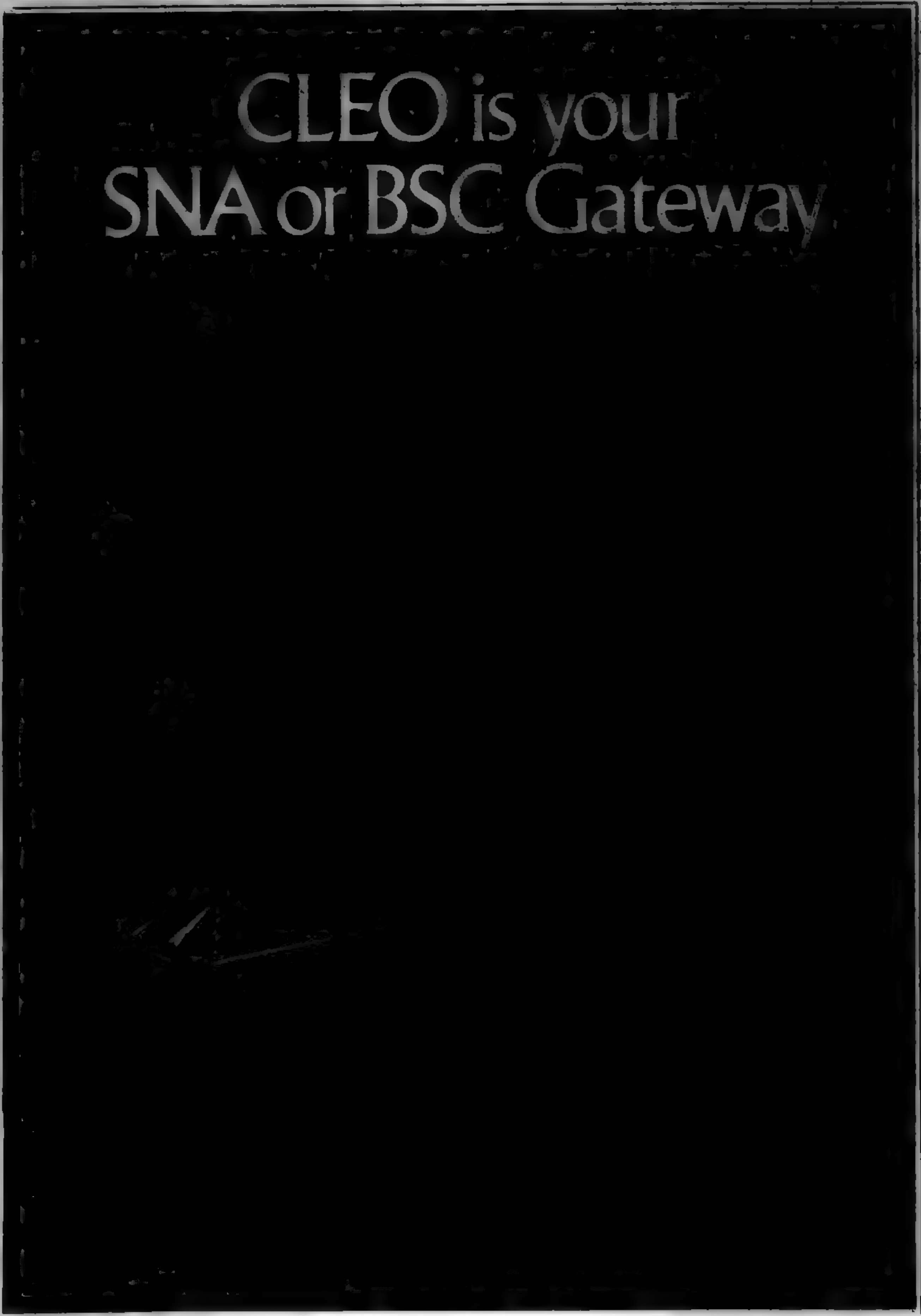
We've also got a range of traditional data processing applications, some of which have been developed as interactive applications for direct use by the end user and a few that are still operated in a traditional mode.

That's now. How about in 10 years? What do you see changing in how people use computers or what they use them for?

I think people are going to be more involved in developing their own applications. The tools that will be available will make it easier for end users to develop their own data bases — to store whatever information they're interested in working with in a data base. And then the tools will be available for them to analyze it and report on it in whatever form they need it.

Those things are becoming available now. They're not quite as easy to use as you'd like. The analysis tools that people really need don't usually work with the data bases that are available to store the information. So the whole process of end users maintaining their information and essentially being self-sufficient really isn't as easy as it needs to be before this thing becomes widespread.

I would say that in the future, people are going to be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using the computer to develop their own applications in a higher level language or a very powerful analysis kind of tool. They can satisfy their own needs and be self-sufficient without having to have a lot of day-to-day support from the information systems group.

How about the opposite — linking up to the mainframe? Your analysts need that connection.

I think information systems is still going to wind up getting involved in the larger applications and the applications shared by departments or divisions across the company. Information systems will be involved from the point of view of developing and maintaining the data base structures that hold the information these people need. People have their own tools to get at the information and work with the information, but you're going to see information systems or a central group needing to coordinate the access to the shared data bases to maintain control, integrity of the data base and security.

You were talking about ways data would be input — by voice, for instance. What do you see changing in terms of characteristics of the devices?

What we were interested in figuring out was how big the devices would be, how many you would have, what the power requirements would be and what kind of load they would place on the heating and air-conditioning systems. If you look at the amount of equipment going in, the building starts to look like a giant computer room.

How much of an investment is the building?

About $80 million.

What part of that amount relates to information systems?

About four and a half million — if you talk about the new things we're putting in. It doesn't include the investment in what we're carrying over.

Do you see one terminal or personal computer per person?

Right now, about two out of every three people have a terminal or a device of some sort. Our goal, like everyone else's, is the elusive multifunction workstation. Yes, to the extent that we can find the multifunction workstation that meets most people's needs, I suspect it will be about one to one.

Are you committed to looking to IBM for that workstation?

Not at all. Right now, IBM seems to have the best product for the manager/professional-level individual.

That being the Personal Computer XT?

It's certainly not the best product from the hardware point of view. But from the software point of view, people are developing software for the IBM first. The amount of software that will be available and the speed with which it will be brought to market and the extent to which it will be supported — today that says IBM's probably the best bet in the personal computer world.

How about the Personal Computer AT?

> ***"***
>
> ***We made a decision that we're not going to have a large mainframe-style data center inside the new building. You know, the very expensive floor space is better off being used for people than it is for machines.***

We've gone through the progression of hardware upgrades. As IBM introduces a new device that's faster and has a larger storage capacity, we start buying the larger device for those of our users who need the extra horsepower or storage. So when the AT was announced, we changed our ordering from XTs to ATs, but we backed off because of the problems in delivery and the quality-control problems on the hard disk. We're still ordering XTs, and we haven't gotten any ATs in yet. We're waiting for those problems to go away.

You made the decision not to put the data center in the building. Where is it located?

We're actually a service bureau customer of one of our divisions. We made a decision that we're not going to have a large mainframe-style data center inside the new building. You know, the very expensive floor space is better off being used for people than it is for machines.

If we should decide we want to staff and maintain our own data center, there is a provision in the site plan to build a separate, modular, low-cost data center building on the campus of the new headquarters.

How is your data center today connected to the new building?

By T1 carrier — a multiplexed T1 link to connect the 3270 terminals in the building to the computer-aided design equipment from the building to the mainframe here. The distance is about eight miles.

Because we made the decision not to have a large mainframe-based

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data center in the building doesn't mean we don't have computers there. We recognized there's going to be a need for not only the mainframe but also distributed file servers, print servers, time-sharing systems and departmental CPUs that are shared by groups of users.

So we've done two things. One is the network control center, which essentially houses all the communications gear and communications monitoring equipment.

We also left room there for any CPUs or servers that are shared across the board by all the people on the staff. In fact, there's one room in each wing on each floor of the building. We set aside space for essentially departmental or distributed CPUs, so that if the communications department needed its own CPU or if it made sense to put a file server close to the printers in the communications area, we have space set aside.

The problem we have today is that if we wanted to wheel in a new device, we'd have to either stick it in the hallway or in the closet. So a lot of what we've done for the new building is really space planning — setting aside areas of the building to house the communications controllers, the servers, the distributed CPUs that we'll likely be using, even though we're not using a lot of them today.

Going to a new building gives you the opportunity to change strategies, change your wiring, change vendors, if you want. Did you reassess your commitments to various vendors and strategies? You don't have to tear into the walls to change your wiring. You're starting fresh. What different directions, if any, is TRW taking with the new building?

Two things — let's talk about communications, and let's talk about processing strategies. We made a decision fairly early in the new headquarters project that what we were going to do was build a good base of communications systems but not change our overall processing strategies drastically. One reason is the investment in existing systems, not only in terms of dollars for hardware and software but the amount of training that has gone on for the people who are using it.

We felt that the systems we're using today were serving us pretty well. We didn't see anything that much better on the marketplace, so there was no great motivation to change our applications or our processing hardware or our software strategies.

What we decided was that our basic processing strategies would evolve whether or not we were going to move to the new building. And that we'd handle it through just our normal strategic planning and capital acquisition process.

So we're not changing everybody's device; we're not changing CPU vendors; we're not changing applications systems at this point. And one of the advantages, we hope, is that the users will make the transition more easily from the old building to the new one.

There's nothing you felt you were doing wrong?

We had the opportunity to change things, but we didn't see anything that was so much better than what we had that there was any great motivation to change.

For word processing, you're using what system?

We're using Wang at the secretarial level and primarily [Multimate International Corp.'s] Multimate on the Personal Computers for those professionals who choose to do their own word processing.

Can the secretaries communicate with the Personal Computer users?

Yes. We're finishing up a little software right now that will make it even easier to do, so that documents can be transferred between the Wang and the Personal Computer.

You're customizing it yourself? Wang isn't helping you?

Multimate provides the conversion from Multimate to Wang. It does a pretty good job. What we're doing is essentially setting up the communications — some software to assist the communications process.

Will you have an information center on the premises?

Yes. The information center is going to be a place where people can get training. It's a place where people can get information on what's new, what's coming down the road, a place where people can try out hardware or software that they may not have used before.

We're going to be using it for one-on-one training and group training, for consulting on the use of personal computer tools. And we'll also use the space and equipment for people who may not have a dedicated device of their own. They can walk into the information center and get access to the device.

Predominantly in an IBM environment?

No. It's predominantly geared toward personal computing, which to me means something that the user does himself. If the personal computing application turns out to be a spreadsheet, it will run on an IBM Personal Computer. But if it turns out to be Wang word processing, it will run on a Wang.

We've got some data base tools that we class as personal computing tools that run on a Prime Computer, Inc. time-sharing system, and we're looking into more user-friendly interfaces to our large data base management systems. Those, to me, are personal computing tools.

When the information center first came out, people thought of it as the

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IN DEPTH/INTERVIEW: JOHN FRALICK

place to go talk to the data administrator to get information. And then the personal computer revolution took off, and people started incorporating personal computer support in that area. For us, it's not personal computer support and it's not data administration. It's helping in the use of personal computing tools, regardless of what vehicle delivers them.

To whom do you report?

To the director of company staff information systems. He reports to the director of science and technology.

For two years now, you've been involved in technology planning for the information systems that go into the new building.

Actually, for about three and a half. My normal job is technology assessment, technology evaluation and strategic planning for how TRW company staff can and will use information systems.

By company staff you mean the corporate staff?

Yes. I used to be the manager of the data center. There was a real emphasis here at TRW, starting a couple of years back, on doing some good strategic planning. Our department created a planning unit that could focus on strategic planning issues.

How will the corporate headquarters be linked to the other divisions of TRW around the country and the world?

Primarily through an IBM Systems Network Architecture network for the applications that are IBM-based. We also have some companywide applications that run on Prime computers, and those applications are accessed through [GTE] Telenet. There is some direct-dial remote job entry back and forth. But in the future we will be depending more heavily on the IBM and the Telenet long-distance data networks.

What about electronic mail?

We have a companywide electronic mail system. There are about 3,000 active users worldwide. We're using GTE's Telemail system, which runs on Telenet. We've been into electronic mail for a little over two years now, and we've seen steady growth in the level of usage and the size of the user community. It's really caught on nicely.

Back to the building itself. You chose United Technologies, UTC, as your PBX vendor. So you decided to go with a separate digital PBX for voice and a single local-area network from TRW for the bulk of data.

Yes. One of the bigger decisions we had to make was: Do we have a PBX and a separate local-area network for data communications? Or were we going to try to get a PBX that did both voice and data? The problem is, state of the art is all relative — it's a point in time. There comes a point where you have to make a decision, and the state of the art moves on.

At the time that we had to make our decision, which was a little over a year and a half ago, we really didn't see any integrated voice/data PBXs that fully met our needs for data communications.

We also wanted to have video distribution throughout the building, and PBXs don't handle video. Now at the same time, we didn't find the local-area network that met all of our data communications requirements either. But we felt that we not only could do the best job of serving our current needs, but we'd also be building good basic capabilities for future expansion if we were to go with a PBX for voice and a local-area network for data — and video.

The basic decision was to buy a high-quality digital PBX. We selected UTC. Of the ones we looked at, its cost per handset was extremely attractive. It was a very cost-effective voice switch, and it had some reasonable data capabilities, but it wouldn't be considered a heavyweight in the data world. And that was OK, because we wanted a good voice switch. We didn't need a heavy-duty data switch, because we're going to put most of that on a local-area network.

And then we looked at local-area networks. We really did survey the entire marketplace. We were under absolutely no constraint to pick an in-house product. We picked TRW's product essentially on the strength of its systems engineering skills. It had a competitive product — competitive in price and capabilities.

The requirement we had for data communications included supporting the Wang systems, both terminal-to-CPU and CPU-to-CPU; IBM 3270 terminal-to-CPU; a host of asynchronous computers and time-sharing systems and asynchronous terminals; as well as this growing population of personal computers, both used as terminals to access CPUs and to transfer files from one to the next.

What we tried to do was find a solution to all these data communications problems that would be as integrated as possible. What we found on the marketplace was that there wasn't much integration you could buy. Wang didn't talk to IBM, and the whole idea of the virtual terminal concept and interoperability of devices and things like that was still a gleam in everybody's eye.

So we were faced with a decision of either installing traditional dedicated wiring to these systems or installing separate local-area networks for the systems — or trying to find a local-area network that could at least support, if not integrate, communications for a number of these different vendors. We didn't want to install multiple wiring systems if we didn't have to. What we wound up

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doing was choosing a broadband local-area networking approach, which said that we could run multiple logical local-area networks on a single cable plan.

So we've actually got a dual-cable local-area network, two cables running to essentially every office in the building. Because the broadband cable is divided into separate communications channels, we can run different local-area networks within the different channels of the cable.

We have one channel of information on a local-area network supporting the asynchronous devices — the VT100s that connect the time-sharing systems or electronic mail, the personal computers that are used as asynchronous terminals connected to host computers or time-sharing systems or the personal computers when they're transferring files between each other.

Within other channels on the cable, we're supporting parts of Wang's Wangnet local-area network, primarily the part that is used to connect Wang terminals to Wang CPUs. We also have reserved a number of channels that we can pipe traditional video signals over.

All these channels and all this information is available at every office in the building. If you moved into a new office, all you'd have to do is move your terminal and the device interface between your terminal and the local-area network. And since all those channels of information are coming into your office, there's no additional wiring that we'd have to run to attach you to the set of local-area network services that you need.

The problem is that the state of the art then, and still today, is these distinct logical local-area networks. There is an asynchronous local-area network, there is a Wang local-area network, and the two don't communicate with each other. The signals share the same physical piece of wire, but information doesn't move from one channel to the next.

So what we managed to achieve, really, is integrating a bunch of logical local-area networks onto a single physical cable plant. What we'd like to see is real integration — or at least good bridging — so that information can flow from one local-area network to the other.

If you were making the decision now and what you decided could be installed in this building today, would you make a different decision separating the PBX and local-area network?

Probably not. I've been wondering about this lately, because there have been some really neat announcements on PBXs lately.

What has caught your attention?

I'm not sure I want to mention brand names.

Our readers like to know.

Well, some of the things that we liked about Intecom's future plans have actually come to pass. Intecom had some attractive offerings when we looked at them, but they were all breadboards, prototypes, not something we could buy and install. Some of those things have actually come to pass. It's still an attractive product.

Northern Telecom has come out with some attractive data capabilities on its PBX, and some of AT&T's announcements in the local-area networking area look pretty good. The problem is, most of the stuff still can't be bought and installed today.

That's one of the big lessons we learned. You've got to be careful about selecting these systems, because if you read the trade publications or the vendor literature, you're led to believe that a lot of the stuff you want is available off-the-shelf, that it will plug in and work. When you really research it and get into these vendors and talk to the engineers, you find out that it's not quite ready yet.

Having watched the industry over the last few years, the stuff that was going to be six months away slipped to 12, maybe. So in a lot of ways, I don't think that much has changed in the market in the last couple of years in terms of solid, deliverable products that would change our decision to do anything much differently than what we did.

Two years ago I had a feeling, "I wish we could wait three years to make this decision, because there's going to be some really slick stuff available in the

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marketplace." You know, I still feel exactly the same way.

The other thing is that by taking the approach that we have — the fact that we have the broadband, dual-cable local-area network — we have maximum flexibility in the coaxial-based local-area networking world. We can run and support a variety of different styles of local-area networking devices on that cable plant.

We also have a good PBX and a good local-area networking ability. We have the best of both worlds, and now we have the option to add new services to whichever engine is most appropriate.

But you do have two worlds. You don't have the one integrated world.

We haven't integrated voice and data on the same set of wires; that's a fact. But what does voice and data integration mean? It means that voice and data are carried over the same pair of wires.

That's what the state of the art is today. The advantage is it saves you some cost, and it saves you some work in managing the wiring of the building. But voice and data still aren't really integrated as information media. They travel down the same set of wires.

Three years ago, when you were hoping or wishing that you could wait three years to make the decision, you may have been expecting a local-area network from IBM. Yet what they came out with was a cabling strategy.

And it's not even a completely defined cabling strategy. The specifications on the fiber-optic components of that are still not clear, and users' experiences in installing the IBM cable to date haven't been very good. We were very aware of IBM and what they were doing at the time we made our decision. We obviously couldn't wait for IBM to go public and disclose. We couldn't buy the product, because it wasn't available. We had to make a decision to go ahead without IBM.

Was that a painful decision?

No, it wasn't. We felt comfortable about the decision then, and at times I think it has turned out to be a pretty wise one. What have you seen? In the meantime, they have introduced a completely different networking scheme, and the token ring and its associated wiring scheme still isn't something with which you can do very much.

One of the real features of the building from an information systems point of view is the raised floor throughout the office areas. We talked about flexibility, we talked about wiring strategies and local-area networking strategies. We realized that over 50 years, the only thing we can be certain about is that things are going to change. We're probably going to want to install a new wiring system. We may want to install new physical local-area networks. We're certainly going to want to install new logical local-area networks.

The medium that we choose to use may change from coax to twisted pair or fiber optics. Knowing that, what we wanted to do was make sure the building was built in a way that wouldn't preclude us from taking advantage of these new things as they became available.

So we have installed a raised floor throughout all of the office areas, with a 6½-in. clear space underneath, so that not only is it going to be easier to make changes, but also, in the event that we decide to go a whole different route with local-area networking or take advantage of some new technology, we can install it in the building without any major disruption to the end users or any major cost for construction. And we can do it quickly.

So you don't feel locked out at all? You're still looking at Intecom and Northern Telecom and the AT&T in terms of PBXs and local-area networks?

We're not looking at them, no. We're actually looking at the useful life of this PBX to be in the neighborhood of five or seven years. We expect to have an opportunity to revisit our decision in the not-too-distant future.

What do you know already that you did wrong or did right with this new building?

In terms of assessing and forecasting the technology, I'd say that things that seemed like they were a long way off and vague often surprise you and happen sooner. On the other hand, things that you thought you knew pretty well, things that seemed like they would come to pass relatively quickly, sometimes surprise you by taking much longer.

In general, I'd say that people who are in the position of trying to assess technology or select equipment should do so with a healthy dose of skepticism and inquisitiveness. We found an awful lot of things that we thought we could buy off the shelf, but really, when we dug into it, we found that they were still on the drawing boards.

Did you follow a conservative approach then? Did you end up with a conservative building?

No, our approach to the applications and the things that people are doing today with computers is evolutionary — a little conservative, yes, but evolutionary, not revolutionary. With respect to the new communications systems, we're installing things that are pretty close to the state of the art as to what's deliverable off the shelf.

What we're installing is practical, but because these are still relatively new systems, there's an element of risk.

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MICROCOMPUTERS

Panasonic portable bows

IBM-compatible unit boasts plasma display

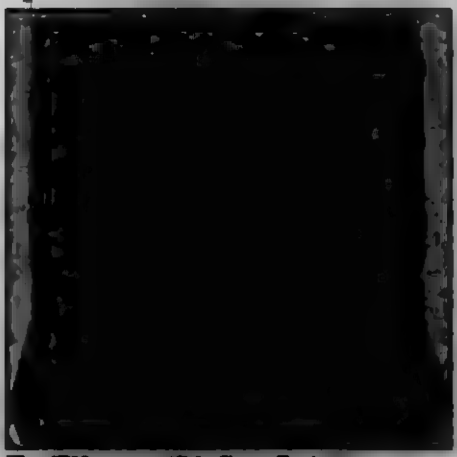
SECAUCUS, N.J. — Panasonic Industrial Co. has introduced the Exec-Partner, a $2,595 portable personal computer that features a gas plasma display and is said to be compatible with the IBM Personal Computer.

The Exec-Partner reportedly includes a 25-line by 80-col. orange gas plasma display that is flicker-free and offers faster refresh times and a longer lifespan than the LCD screens built into most laptop portables. The display also is brighter than the electroluminescent displays used in some more expensive laptop computers.

The Exec-Partner is 21 in. long, 16 in. wide and 5 in. tall and weighs 28 pounds.

The unit includes 256K bytes of internal memory and is based on the Intel Corp. 8086-2 microprocessor, the vendor said.

It is said to feature a built-in thermal printer offering correspondence and draft-quality output at 60 and 30 char./sec., respectively. Correspondence-quality printing, on regular paper, can be achieved through use of a ribbon cartridge, which is included, the vendor said.


The IBM-compatible Exec-Partner

The Exec-Partner's keyboard is said to be configured like that of the Personal Computer's and have 10 function keys. Four of the keyboard's special function keys are equipped with indicator lights.

Also included are twin 5¼-in., 360K-byte diskette drives, Microsoft Corp.'s MS-DOS operating system and GW Basic language and both serial and parallel ports.

The Exec-Partner will be available this month, the vendor said.

Panasonic Industrial is located at One Panasonic Way, Secaucus, N.J. 07094.

Word for Macintosh enhanced

BELLEVUE, Wash. — Microsoft Corp. has introduced an upgraded version of Microsoft Word for Apple Computer, Inc.'s Macintosh that improves performance with the Apple Laserwriter printer and permits users to convert Word files on the IBM Personal Computer to Word files on the Macintosh Word or vice versa, while retaining all formatting.

Microsoft Word for the Macintosh Version 1.05, priced at $195, reportedly increases Laserwriter output speed up to 400%, gives improved word and character spacing and supports manual feed and a print-cancel function.

Among other enhancements, a modified date and time stamp in the Get Info box reflects creation and modification dates; documents are returned to folders; character formats can be turned off from the keyboard and text; and formats can be moved across a horizontal window split.

An update kit with master and backup program disks and added documentation is available at no cost to customers who bought the software after April 1. Customers who bought the software before that date but paid $10 for a backup disk also are entitled to a free upgrade. Other customers with existing copies of Word for the Macintosh can buy the kit for $15.

More information is available from Microsoft through Box 97200, 10700 Northup Way, Bellevue, Wash. 98009.

SMALL TALK
Edward Warner
CW Senior Writer

IBM's variety swamps users

Maybe IBM should consider using family planning for its ever-growing line of Personal Computer models.

As things stand now, at least 15 different models of the Personal Computer exist. And while IBM may find this beneficial in some way, users are being left in a state of confusion.

Should they buy a Personal Computer AT or a Personal Computer AT 3270 Model G or go all the way for the AT 3270 Model GX? Or should they choose the Personal Computer XT or AT versions of the Desktop Series 1?

Such diversity is the mother of confusion, and that is just what befalls potential Personal Computer users in any corporation when they try to decide which Personal Computer is best for their needs.

According to Home Insurance Co.'s Vice-President of Information Systems Anthony Graffeo, "The choices and the products [from IBM] have confused a lot of people — the 3270 [Personal Computer], the Series 1 [Personal Computer] — there is much too much."

With so many different models of the Personal Computer to choose from, he observed, potential buyers are moving slowly through the selection process. This, he added, may be one reason why demand has "dried up" for the Personal Computer in corporations; the potential users are waiting until a machine comes out tailored specifically to their needs.

IBM has certainly tried to meet these needs in every variation. Consider this incomplete list of Personal Computer models: the Personal Computer; the Personal Computer XT; the Portable Personal Computer; the Personal Com-

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- Sorcim/IUS Micro Software enhanced its Superproject software for the IBM Personal Computer and announced a corporate licensing program/80

INSIDE

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Chart-Master, Sign-Master upgrades out

Graphics tools run on IBM micro line

WESTPORT, Conn. — Decision Resources, Inc. has announced enhancements of its Chart-Master and Sign-Master business graphics software for the IBM Personal Computer line.

Sign-Master 5.1, for use in creating signs and textual slides, reportedly offers type fonts called Swiss and Swiss Bold that are similar to the Helvetica type fonts.

It also is said to offer a Symbol font that contains 94 symbols or icons for such items as arrows, geometric shapes, people and transportation vehicles.

A scroll-through menu is said to guide the user through the step-by-step production of word charts such as outlines, tables, financial summaries and the like.

Chart-Master 6.1 offers a feature called Datagrabber, which reportedly gives access to spreadsheets such as Lotus Development Corp.'s 1-2-3. Chart-Master also incorporates both the Swiss type fonts and the Symbol font; symbols from the latter can be inserted into a chart or a graph, the vendor said.

Chart-Master's standard features are said to include context-sensitive Help screens. The software also includes 40 customizing options, including hatch and line patterns, exploding pies, text fonts, colors, axis control, floating legends and others.

It supports more than 80 devices, including the Hewlett-Packard Co. Laser Jet printer, the IBM Color Jetprinter and Proprinter and the IBM Enhanced and Professional Graphics displays.

The enhanced versions of both products are said to support the IBM PC Network.

Sign-Master is priced at $245. Updates for existing users cost $65. Chart-Master is priced at $375. Updates for current users are $75.

Decision Resources is located at 25 Sylvan Road S., Westport, Conn. 06880.

Epson adds printers to FX series

TORRANCE, Calif. — Epson America, Inc. has announced two dot matrix printers in its FX series.

The 80-col. FX-85 and wide-carriage 136-col. FX-185 are both said to offer high-speed printing and high-resolution, near-letter-quality copy, single-stroke-selectable print modes and built-in IBM character sets. Both include an 8K-byte print buffer.

Both printers reportedly operate at 160 char./sec. in draft mode and 32 char./sec. in near-letter-quality mode. The IBM character sets are said to allow both machines to emulate either Epson or IBM 5152 graphics printer control codes and to operate with software configured for the IBM Personal Computer, Personal Computer XT or AT.

The FX-85 and FX-185 include logic-seeking bidirectional printing, 96 Ascii and 11 international character sets, proportional-space printing, horizontal and vertical tabulation and short paper tear-off. The near-letter-quality mode offers the choice of pica, superscript or subscript and expanded pica character sets, while the draft mode allows users to choose pica, elite or characters formatted on the computer and downloaded into the printer memory, the vendor said.

The cost of the FX-85 is $499; the FX-185 is priced at $699.

Epson America is located at 2780 Lomita Blvd., Torrance, Calif. 90505.

Apple continues to post healthy Macintosh sales

SAN FRANCISCO — While Apple Computer, Inc. is having its troubles this year, the Macintosh personal computer is selling at the substantial rate of 25,000 to 30,000 per month, Future Computing, Inc. Chairman Egil Juliussen estimated late last month at the Macforum conference here.

The Dallas-based market research firm predicted that 350,000 Macintoshes will be sold this year in the U.S. and 90,000 will be sold overseas.

Roughly two-thirds of the Macintoshes sold through computer specialty stores are 512K-byte models, Juliussen said.

About 275,000 Macintoshes were sold in 1984, compared with 90,000 IBM Personal Computers purchased in that machine's first year, according to Future Computing figures.

"The computer is getting sarcastic. Listen to this: 'Here is the information you requested, O master.' "

In August, 128,000 MIS/DP executives can stop saying
"What we have here is a failure to communicate."

There's a world full of computers out there. And everyone's trying to make them talk to each other.

The trouble is, there are so many technologies, so many products, so many promises, MIS/DP management isn't sure which way to turn.

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So if you want to reach Computerworld's 128,000 paid subscribers, plus bonus distribution at important Fall '85 trade shows, the answer is simple. Get your ads in focus. *Computerworld Focus.* The August 28th issue. But hurry, closing is July 19th.

For more information, contact Ed Marecki, Vice President of Sales, *Computerworld Focus,*
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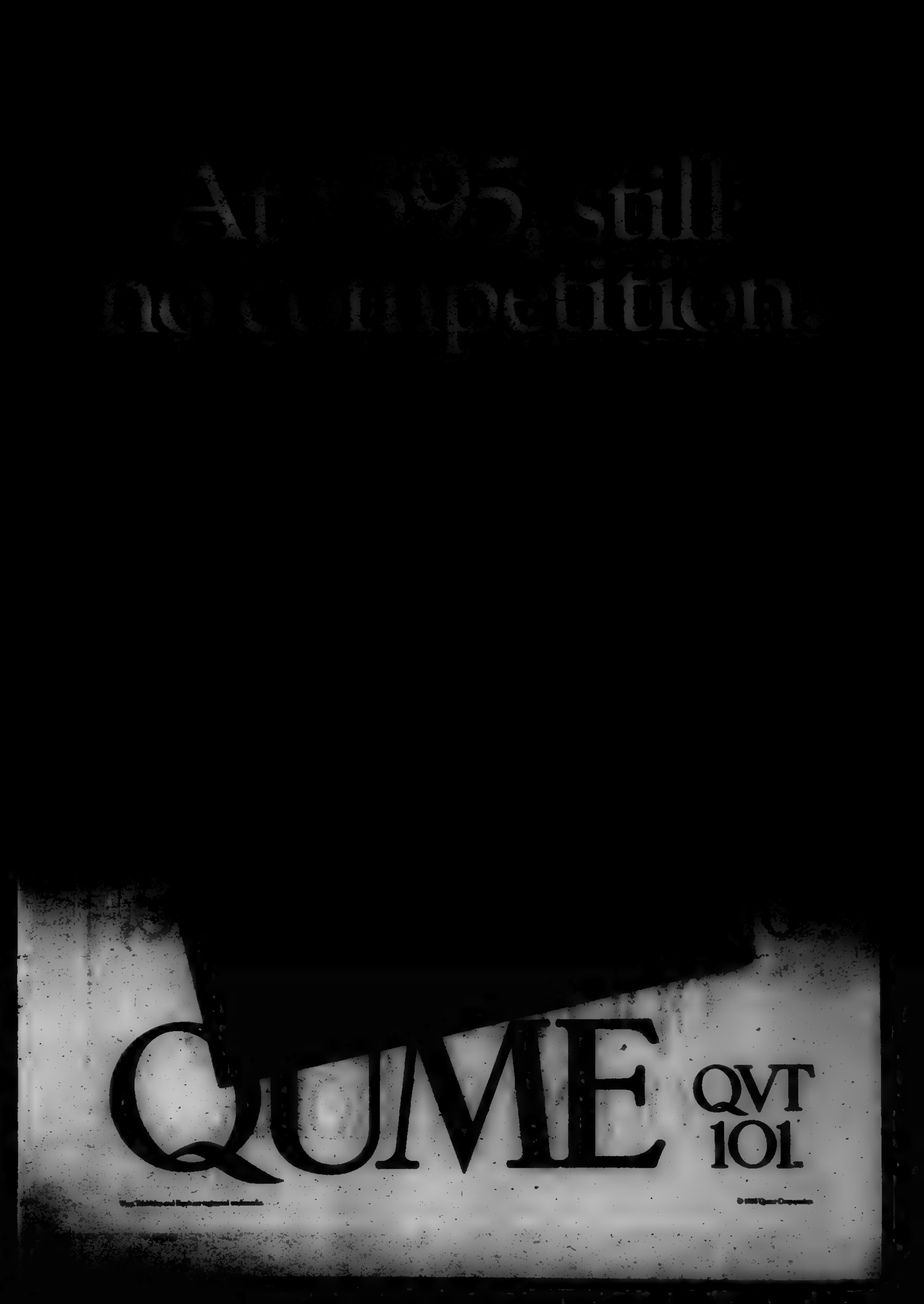

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Sun workstations are in the vanguard of the open rebellion against proprietary computer systems. And the closed minds that design them.

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Sun's Open Line

Sun's entire family of workstations is built around the same powerful "standard" features, including: A Motorola 68010 microprocessor. Ethernet 10 megabit/sec. local area network (LAN). An advanced UNIX™ operating system, supporting up to 16 megabytes of virtual memory space per process. 9-slot Multibus® (IEEE-796) or 15-slot VME cardcages. High resolution, 1152 x 900 pixels, display and 66Hz non-interlaced refresh. Two RS-423 serial ports with full modem control. Mouse pointing device. Latest Sun software release including: SunWindows,™ SunCore™ graphics library, Sun Network File System, C/Fortran/Pascal compilers, a 68010 assembler. And more.

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Distributed Computing Network

Lack of access to files stored throughout a heterogeneous network has always been the weak link in the team engineering chain. Until now.

Sun's Network File System (NFS) opens the lines of communication between multi-vendor computers, giving each user a window into a transparent information network. Via this network, large teams of professionals can cooperate on project work, accessing any specialized computing resources they need.

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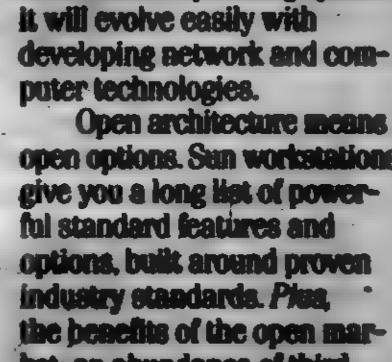
Open architecture means open options. Sun workstations give you a long list of powerful standard features and options, built around proven industry standards. *Plus*, the benefits of the open market: an abundance of third-party companies working to open new doors for you and your company.

To find out more about Sun's open attitude and the workstations that have evolved from it, write: Sun Microsystems, Inc., 2550 Garcia Avenue, Mountain View, CA 94043. Or, simply call (800) 821-4643. In California (800) 821-4642. Our lines are open.



Open Systems for Open Minds.

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Sorcim enhances management package

SAN JOSE, Calif. — Sorcim/IUS Micro Software, a division of Computer Associates International, Inc., has enhanced its Superproject project management software for the IBM Personal Computer line. Sorcim/IUS has also announced a new corporate licensing program that offers users quantity purchases, unlimited licenses and service support.

Superproject 1.1 reportedly includes a printing program called Sideways, from Funk Software, Inc. Sideways permits a report to be printed horizontally, eliminating the need to cut and paste.

Other printing enhancements are said to include the ability to send spreadsheet-style columnar reports directly to a printer or disk file, as well as to a Sorcim/IUS Supercalc data file. Also reportedly included is support for the Intel Corp. 8087 math coprocessor and output devices such as the IBM Proprinter and Color Jetprinter.

Superproject runs under IBM's PC-DOS 2 or higher and requires 256K bytes of memory, the vendor said. The package costs $395.

Software available under the new corporate licensing program includes Sorcim/IUS's Superproject, Supercalc series and Superwriter and Easywriter series. The minimum license quantity is 25 copies.

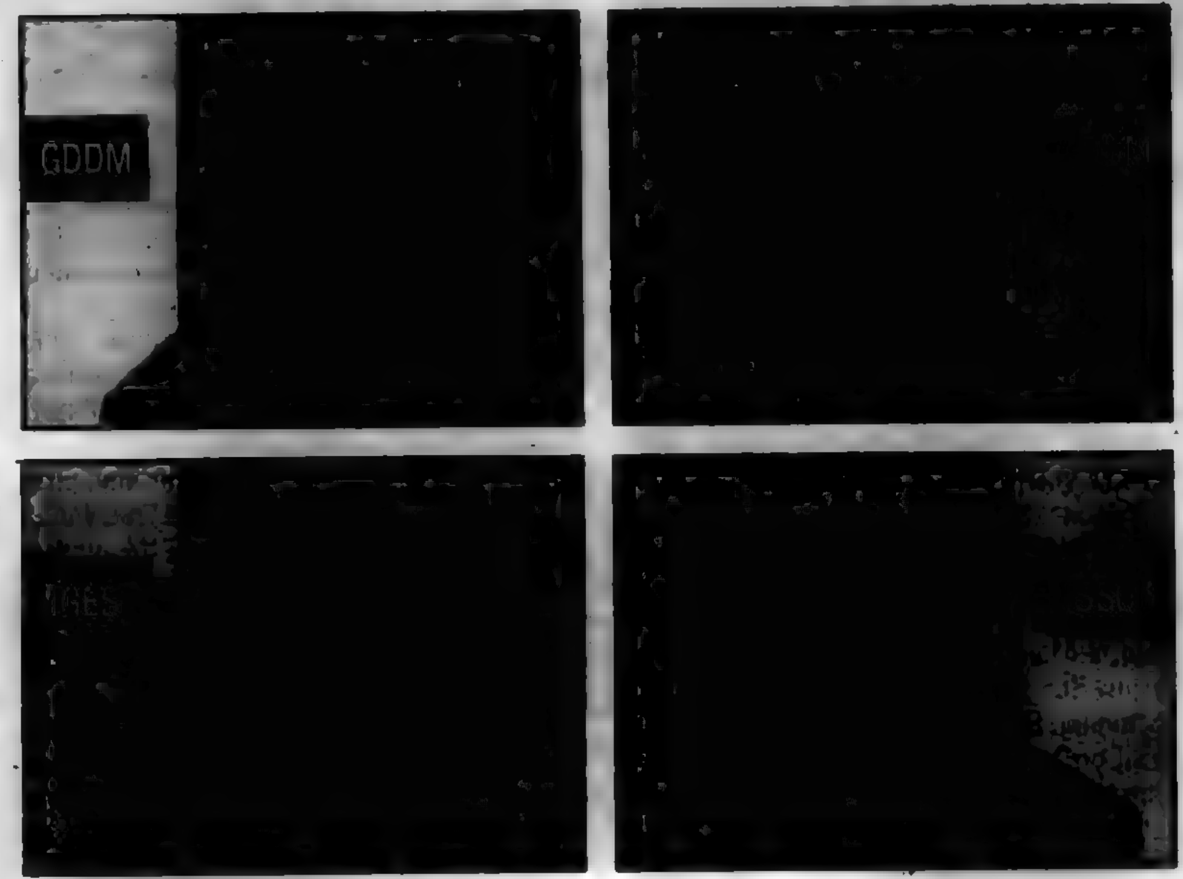
Prices for Superproject, Supercalc 3, Release 2 and Easywriter II range from $5,925 for 25 copies to $65,000 for an unlimited license. The cost of a license for Superwriter or Supercalc 2 ranges from $4,425 for 25 copies to $48,500 for an unlimited number of copies.

The corresponding price range for Easywriter I, Supercalc or Supercalc 3 is between $2,925 and $32,000.

Support material prices include $150 per hour plus expenses for applications development, $75 per hour plus expenses for user seminars and training, $25 per set of documentation materials and $1.50 for each 10-min user guide.

More information is available from Sorcim/IUS at 2195 Fortune Drive, San Jose, Calif. 95131.

See what EnerConnect can do with mainframe graphics on your PC.



EnerConnect™ is the first software package that puts mainframe graphics capability into the hands of anyone with an IBM PC/XT/AT or 3270 PC.

Now a PC user can have desktop access to business and technical graphics applications generated by GDDM, ISSCO's Tell-A-Graf® and DISSPLA,® SAS/GRAPH® and IGES datafiles.

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You can also use our PC-based graphics program, EnerGraphics, to interface with spreadsheet data from LOTUS 1-2-3, VISICALC and other packages, turn the data into easy-to-understand bar charts and then combine them with mainframe graphics.

EnerConnect. Your Mainframe-to-PC software link. Developed by the specialists in graphics applications software.

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SOFTWARE

■ **Hart Scientific, Inc. has announced data analysis and report generation software for the IBM Personal Computer, Personal Computer XT and Personal Computer AT.**

Q.E.D. reportedly allows users to acquire, graph, mathematically manipulate and store data for report generation. Users may create an unlimited number of windows for multiple data traces or display an individual data trace in multiple windows.

The product is said to allow data collection from multiple channels and data transmission to a variety of destinations. Functions such as mathematical analysis, tracing and archiving can be performed simultaneously. Q.E.D. is file compatible with software products including Lotus Development Corp.'s 1-2-3.

Q.E.D. resides in a minimum of 256K bytes of memory on the micro and can be used with the Intel Corp. 8087, 80187 and 80287 math coprocessors for high-speed analysis.

The cost of Q.E.D. software is $849.

Hart Scientific, 177 W. 300 South, Provo, Utah 84601.

■ **Viewlogic Systems, Inc. has announced three computer-aided engineering (CAE) software programs for the IBM Personal Computer XT and AT.**

The Workview series reportedly allows electronic design engineers to design and generate documentation on the micro and communicate with other micros, CAE/computer-aided design workstations, superminis and mainframes. Each program requires a minimum of 512K bytes of random-access memory and the IBM PC-DOS operating system.

Workview 100, the entry-level software series, includes schematic entry and waveform processing. Prices range from $3,500 to $5,500, the vendor said.

Workview 300 is a digital design system that includes all Workview 100 features as well as an interactive logic simulator. Prices range from $6,500 to $8,500.

Workview 500 is an analog design system that includes the above features plus a circuit simulator and simulator library for discrete components. The price of Workview 500 ranges from $5,500 to $8,500.

Viewlogic Systems, 33 Boston Post Road W., Marlboro, Mass. 01752.

■ **Data General Corp. has announced the availability of the Microsoft Corp. GW Basic Compiler for the DG/One portable computer.**

The compiler reportedly translates programs written in GW Basic into machine language. The software is compatible with Basic A, the standard Basic used on the IBM Personal Computer, to allow Basic A programs to be compiled and run on the DG/One.

The product reportedly gives DG/One users greater graphics software development capability as well as faster operation of long programs. The compiler requires a DG/One with a minimum of 256K bytes of memory and one diskette drive.

Cost of the compiler is $395.

DG, 4400 Computer Drive, Westboro, Mass. 01580.

MICROCOMPUTERS

■ R Systems, Inc. has announced a version of its integrated office automation software for the AT&T Unix Personal Computer Model 7300.

R Office reportedly integrates word processing, desktop management, data base management, table spreadsheet and report generation programs. The product can run on a single machine or on several micros operating on a network with the AT&T Unix System V operating system.

R Office requires a minimum of 320K bytes of memory, plus an additional 32K bytes for each additional micro in a network.

The price of the Unix version of R Office is $1,295.

R Systems, 11450 Pagemill Road, Dallas, Texas 75243.

■ Digital Equipment Corp. has announced a software package that allows a second terminal to be attached to DEC Professional series workstations.

The Pro/Associate package is reportedly invoked by the main terminal of a DEC Professional 350 or 380 system, which sends a Pro/Associate menu to the screen of the second terminal.

As the software runs on the associate terminal, the main terminal user may use the same or other Professional software programs simultaneously, according to the vendor.

Programs in the package are said to include Pro/Datatrieve data base management; communications software supporting Pro/Decnet and Pro/Communications; a login/logout facility; and file, disk/diskette and print services.

Pro/Associate runs under Version 2 of the DEC P/OS operating system. Hardware system requirements are a Professional 350 or 380 with 10M-byte hard disk and a VT200 series terminal.

Cost of the software is $400, the vendor said.

DEC, Maynard, Mass. 01754.

■ McDonnell Douglas Professional Services Co. has announced the first of a series of systems development software products for the IBM Personal Computer XT and Personal Computer AT.

Prokit Analyst is reportedly designed to help systems analysts prepare data flow diagrams while simultaneously creating the supporting documentation as a data dictionary. Analysts may draw and edit data flow diagrams while the system produces and updates an applications dictionary.

The product includes the functions of McDonnell Douglas DFDdraw data flow diagramming software for the IBM Personal Computer, according to the vendor.

Additional functions include full-integrity checking, a process that enforces standard data flow rules on the user's creation and updating of data flow diagrams, the vendor said.

Prokit Analyst requires the Personal Computer XT or AT with a minimum of 512K bytes of memory and a color graphics board and monitor.

Prokit Analyst will be available in August for $2,450, according to the vendor.

McDonnell Douglas Professional Services, St. Louis, Mo. 63166.

■ Control-C Software, Inc. has announced an enhanced version of its Starjet software that reportedly offers improved capabilities in printing Micropro International Corp. Wordstar files with the Hewlett-Packard Co. Laserjet printer.

Starjet Version 3 prints multiple columns of text per page with one command, right-justifies text in both proportional and fixed-pitch fonts and redirects formatted output of a Starjet file to a disk file, according to the vendor.

Other enhancements include global font assignment, microjustification of intercharacter spaces, typographic effects, proportional fonts and support of seven font cartridges and 21 symbol sets.

Starjet 3 resides in less than 45K bytes of memory and is available in versions for IBM PC-DOS 1.1, 2.1 and 3; Microsoft Corp. MS-DOS; and Digital Research, Inc. Concurrent CP/M 86, CP/M 86, MP/M 86, CP/M 80 and MP/M II.

The cost of Starjet Version 3 is $150. Upgrade cost for current Starjet users is $25.

Control-C Software, 6441 S.W. Canyon Court, Portland, Ore. 97221.

■ Cosmos, Inc. has announced a network version of its Revelation data base system and has upgraded its single-user package.

Network Revelation reportedly is compatible with IBM's PC Network, Nestar Systems, Inc.'s Plan 3000 and networks running under Novell, Inc.'s Netware. The network data base system locks data at the record level, allowing several stations on the network to share files simultaneously but allowing only one user at a time to update records.

Release G of single-user Revelation is said to include context-sensitive Help screens, menu-driven data input and a file structure called Link that speeds sorting of files larger than 200K bytes.

Object code generated with Release G is not compatible with earlier versions. Code generated with earlier versions is compatible with the release but will run more efficiently if recompiled, the spokesman added.

Revelation runs on most Microsoft Corp. MS-DOS and IBM PC-DOS systems.

Network Revelation prices start at $1,495 for a four-user system. Single-user Revelation Release G costs $950, the vendor said.

Cosmos, Suite 108, 19530 Pacific Highway S., Seattle, Wash. 98188.

You can reach over 50,000 computer professionals in Norway.

Advertise in CW Communications' Norwegian publications and sell your products directly to Norway's thriving computer market. According to International Data Corporation (IDC), the world's leading information industry research firm, Norway's total DP expenditures for 1983 were $1.6 billion. IDC forecasts that DP expenditures will reach $3 billion by 1989. The personal computer market is also a lucrative one with expenditures in 1983 of $58 million.

CW Communications has two publications covering the Norwegian market; *Computerworld Norge* and *PC Mikrodata*.

Twice a month, 20,000 MIS/DP executives read *Computerworld Norge*. Modeled after *Computerworld*, its sister publication in the United States, *Computerworld Norge* is written for the professional end-user and reports on the most timely news concerning new products, new software applications and market trends and opportunities.

And every month, 30,000 professional and home PC users read *PC Mikrodata*. The editorial focuses on a wide range of topics including the latest information on the PC market, new software, hardware, interviews, buyer's guides and instructions for the PC.

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MICROCOMPUTERS

SYSTEMS

■ **Tektronix, Inc.'s CAE Systems Division has announced a computer-aided engineering (CAE) workstation based on the IBM Personal Computer AT.**

The Tekstation AT is said to provide a complete stand-alone engineering design environment on the desktop. The system utilizes a National Semiconductor Corp. 32016 32-bit coprocessor, the University of California at Berkeley Unix 4.2 operating system and CAE Systems, Inc. CAE 2000 design software.

The system reportedly supports design tasks through the 32-bit Unix environment, while standard tasks such as word processing and project planning are performed in the Personal Computer AT's IBM PC-DOS operating environment. The system provides up to 16M bytes of virtual memory and up to 280M bytes of local disk storage.

The IBM-based workstation is compatible with other Tektronix and CAE Systems products based on Apollo Computer, Inc., Digital Equipment Corp. and Sun Microsystems, Inc. terminals. The Tekstation AT can act as a multiple-user system networked through Ethernet.

Tekstation AT prices start at $25,000. The cost of an Ethernet interface is $1,400, and a file server configuration costs $40,000.

Tektronix CAE Systems Division, 1333 Bordeaux Drive, Sunnyvale, Calif. 94089.

■ **Spectravideo, Inc. has announced two portable computers and two IBM-compatible desktop micros.**

The Bondwell 2 laptop machine is said to be a battery-rechargeable, 11-lb portable based on the Digital Research, Inc. CP/M operating system. The system includes an internal 3½-in., 360K-byte floppy disk drive; a 25-line by 80-col. LCD with 640-pixel by 200-pixel resolution; 64K-byte random access memory (RAM); and eight programmable function keys. It is bundled with six software programs from Micropro International Corp. The Bondwell 2 costs $999.

The Bondwell 16 transportable is said to include 128K bytes of RAM, a Winchester 10M-byte hard disk drive, a 5¼-in., 360K-byte floppy drive, an internal 300 bit/sec. modem and a built-in voice synthesizer. It is bundled with five Micropro business software programs for $2,195.

The Bondwell 34 reportedly is a 16-bit, Microsoft Corp. MS-DOS-based desktop micro. It features expandable 256K-byte RAM, two double-sided 5¼-in. floppy drives, a monochrome 80-col. monitor interface and a Centronics Data Computer Corp.-compatible printer interface. It costs $1,795.

The Bondwell 36 is a hard-disk version of the Bondwell 34, featuring an internal 10M-byte Winchester disk drive and 5¼-in. floppy drive. It costs $2,995.

Spectravideo, No. 10, 3300 Seldon Court, Fremont, Calif. 94539

COMMUNICATIONS

■ **Multi-Tech Systems, Inc. has announced an autodial/autoanswer internal modem card for the IBM Personal Computer line, including the Personal Computer AT and Personal Computer 3270.**

The Multimodem 224PC is said to support communications at 2,400, 1,200 or 300 bit/sec. It is reportedly compatible with the Hayes Microcomputer Products, Inc. Smartmodem 1200/1200B.

The Multimodem 224PC can automatically switch among its three speeds for incoming and outgoing calls, according to the vendor.

The price of the modem includes Multicom PC communications software that reportedly features automatic logon and upload/download, text diagnostics and error-protecting file transfer protocols.

The Multimodem 224PC package is priced at $795.

Multi-Tech Systems, 82 Second Ave. S.E., New Brighton, Minn. 55112.

■ **Fox Research, Inc. has announced enhancements to its 10-Net 3270 Systems Network Architecture (SNA) gateway for its Fox 10-Net local-area network system.**

The Fox 10-Net SNA Gateway now provides one to four simultaneous active SNA sessions from each 10-Net local-area network personal computer with the host IBM mainframe. Previously, only one active session was possible at each networked micro.

The enhanced version also features a hot key for keying between IBM's PC-DOS and any active SNA session, the vendor said.

The code size of the gateway software has been reduced so that the 16 logical unit version will run on any IBM Personal Computer or compatible with 256K bytes of random-access memory.

The Fox 10-Net SNA Gateway, including circuit board, software and documentation, costs $1,800 for eight logical units and $2,900 for 16 logical units.

Fox Research, 7005 Corporate Way, Dayton, Ohio 45459.

■ **Digisoft Computers, Inc. has introduced its Mail-Com software for electronic mail communications over the MCI Communications Corp. MCI Mail service using the IBM Personal Computer.**

Mail-Com is said to offer users the ability to prepare letters before connecting to MCI Mail and then, by pressing one button, to send, process, receive and file messages automatically.

The package simulates a desktop environment and enables users to organize and use electronic mail in a

Discover the most powerful

The IBM
Personal Computer AT.

Hold on to your hat.

The IBM Personal Computer AT (for Advanced Technology) is based on the advanced 80286 16-bit microprocessor. This remarkable computer will run many of the programs written for the IBM PC, up to three times faster. You'll be able to recalculate large spreadsheets in seconds and retrieve files in a flash. And it's ideal for IBM TopView, the new kind of software program that lets you run and "window" several other programs at once.

The IBM Personal Computer AT has got the power (and price) to surprise you. In many ways.

Compatibility, expandability,
networking too.

With the IBM Disk Operating System, the IBM Personal Computer AT can use many programs from the fastest-growing library in the personal computer software industry.

The IBM Personal Computer AT is also available with up to 3 million bytes of user memory to run multiuser, multitasking operating systems such as XENIX™. Volume upon volume of information is available at your fingertips. You can customize your system to store up to 20,000 pages of information at one time. And its keyboard helps you use all of this computing power more easily.

This member of the IBM PC Family is a powerful stand-alone computer that can also be both the primary file server and a station on your network. With the IBM PC Network (which is so easy to connect you can do it yourself), the IBM Personal Computer AT can share information with IBM PCs, PC/XTs and IBM *Portable* PCs.

IBM Personal Computer AT Specifications

User Memory
256KB-3MB*
Microprocessor
16/24-bit 80286*
Real and protected modes*
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84 keys
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RS-232-C interface
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MICROCOMPUTERS

manner similar to conventional mail communications. Mail-Com frees users from needing to wait for MCI Mail prompts or the need to remember MCI Mail commands.

The software reportedly permits users to send any type of information, including computer programs, Lotus Development Corp. 1-2-3 worksheets and binary files.

Mail-Com is priced at $189.95 and requires a minimum of 192K bytes of internal memory.

Digisoft Computers, 1501 Third Ave., New York, N.Y. 10028.

■ **U.S. Digital Corp. has announced a communications program that runs on an IBM Personal Computer with 256K bytes of random-access memory and IBM's PC-DOS operating system.**

Copylink-Plus features 32 user-definable function keys, 11 programmable automatic logon sequences and support for conditional programming of complex logon sequences.

Selected buffer read and write commands enable data to be received, processed and retransmitted. The package supports intercharacter delay, echo delay, programmable end of line, remote buffer control, true key breaking and automatic disk handling.

Copylink-Plus costs $129.95.

U.S. Digital, 5687-H S.E. International Way, Portland, Ore. 97222.

■ **Communications Resources has announced a communications link that allows IBM Personal Computers and compatible machines to emulate Honeywell, Inc. VIP 7200 or VIP 7800 standard terminals.**

Asynchronous Communications Emulations (ACE) is an integrated family of products that contains a set of menu options for terminal setup. Menus can be saved from session to session, the vendor said.

ACE uses a common keyboard arrangement and includes a Help facility. The product includes a file transmission facility for Honeywell's Gcos 6 Mod 400 systems. The facility transmits either Ascii or binary data files and supports all common fixed-length or variable-length sequential data structures. It accommodates records up to 1K bytes and uses a protocol handler to eliminate transmission errors.

Features also allow the user to interact with the personal computer while on line to the Honeywell systems. With ACE, users can transmit data from a personal computer file and capture data in the microcomputer file while it is being displayed or after the screen has been filled. ACE also can rename or delete personal computer files or list personal computer file names, the vendor said.

An IBM Personal Computer or compatible with one disk drive, 128K-byte memory, an 80-col. display and a communications port are required for use.

ACE is priced at $349.

Communications Resources, Suite 110, 31220 La Baya Drive, Westlake Village, Calif. 91362.

■ **Brilliant Image has announced two communications software programs for users of graphics on the IBM Personal Computer.**

Telewriter II PC is an interactive blackboard that reportedly allows multiple micros to transfer and edit graphics images over dial-up telephone lines. Graphics files that can be modified with the product include those created with Lotus Development Corp.'s 1-2-3 and Symphony software.

Telewriter II PC requires an IBM Personal Computer or Personal Computer XT with two RS-232 communications interface ports and a minimum of 256K bytes of memory, plus the memory requirement for the software environment in which the graphics files were created.

Data Reader is said to allow users to download graphics data from an IBM mainframe to an IBM Personal Computer, Personal Computer XT, AT, 3270 or PCjr. The software reportedly simplifies the process and reduces the cost of converting mainframe data into graphs and charts, which can be edited on the micro.

Data Reader requires 256K bytes of memory.

Telewriter II PC is priced between $3,500 and $5,000, depending on configuration. The cost of Data Reader is $150.

Brilliant Image, 141 West 28th St., New York, N.Y. 10001.

STORAGE

■ **Cipher Data Products, Inc. has introduced a version of its 5210 25M-byte tape backup system for the IBM Personal Computer AT and for machines compatible with the XT.**

The version for the AT, the 5210-AT, can also be used with the XT and includes software and a disk controller card.

The model for the XT compatibles, the 5210-C, reportedly does not require special interface electronics and can emulate a diskette drive. Software and a disk controller card are included.

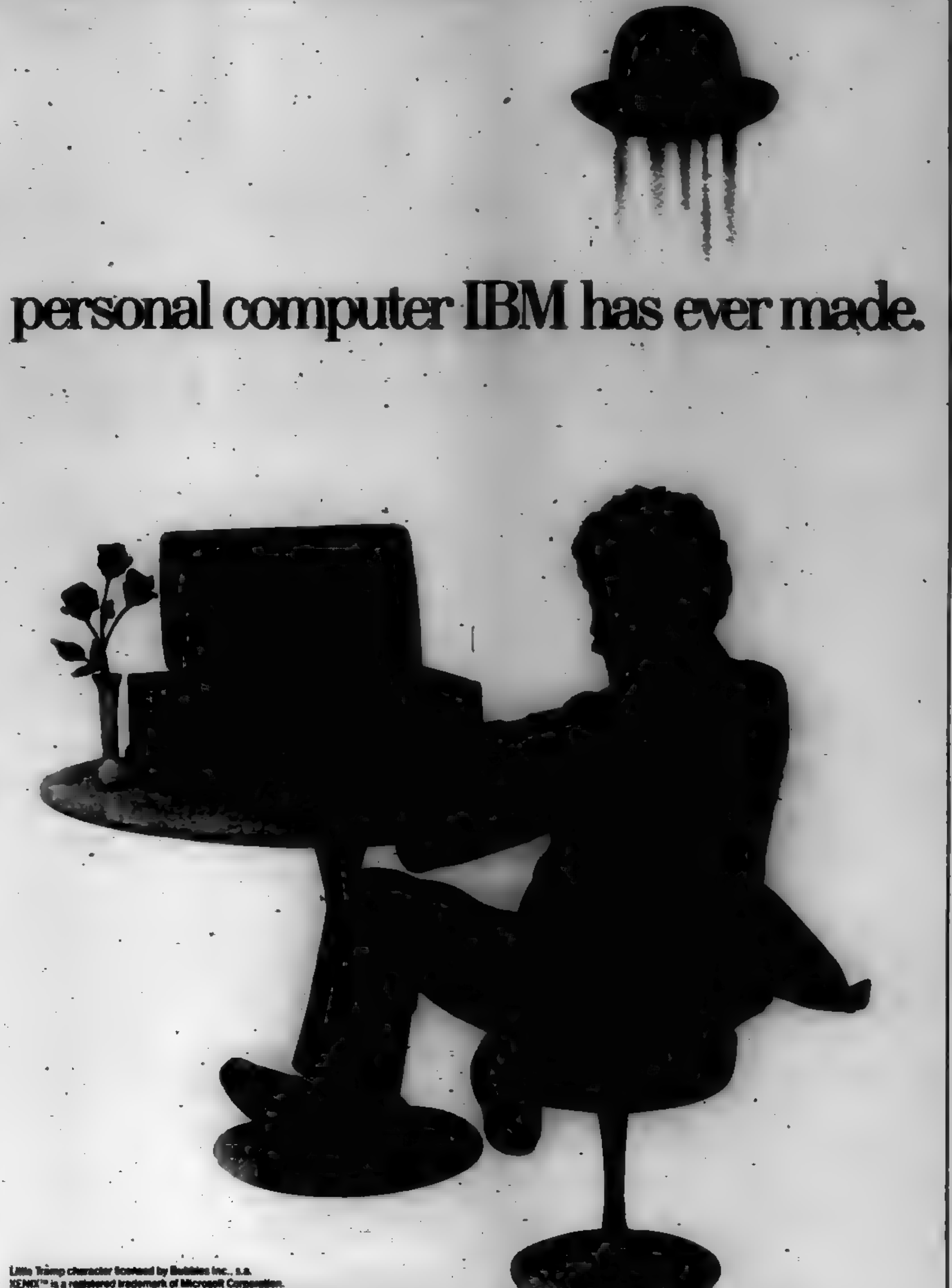
Each unit costs $1,195.

Cipher Data Products, P.O. Box 85170, 10101 Old Grove Road, San Diego, Calif. 92138.

■ **Alloy Computer Products, Inc. has announced Super Qicstor-Plus, a storage subsystem designed for the IBM Personal Computer line.**

The subsystem consists of a 130M-byte, 5¼-in. hard disk; five expansion slots; and a tape drive. The hard disk drive reportedly has a data access time of 18 msec and a data transfer rate of 10M bit/sec. The ¼-in. car-

Continued on page 26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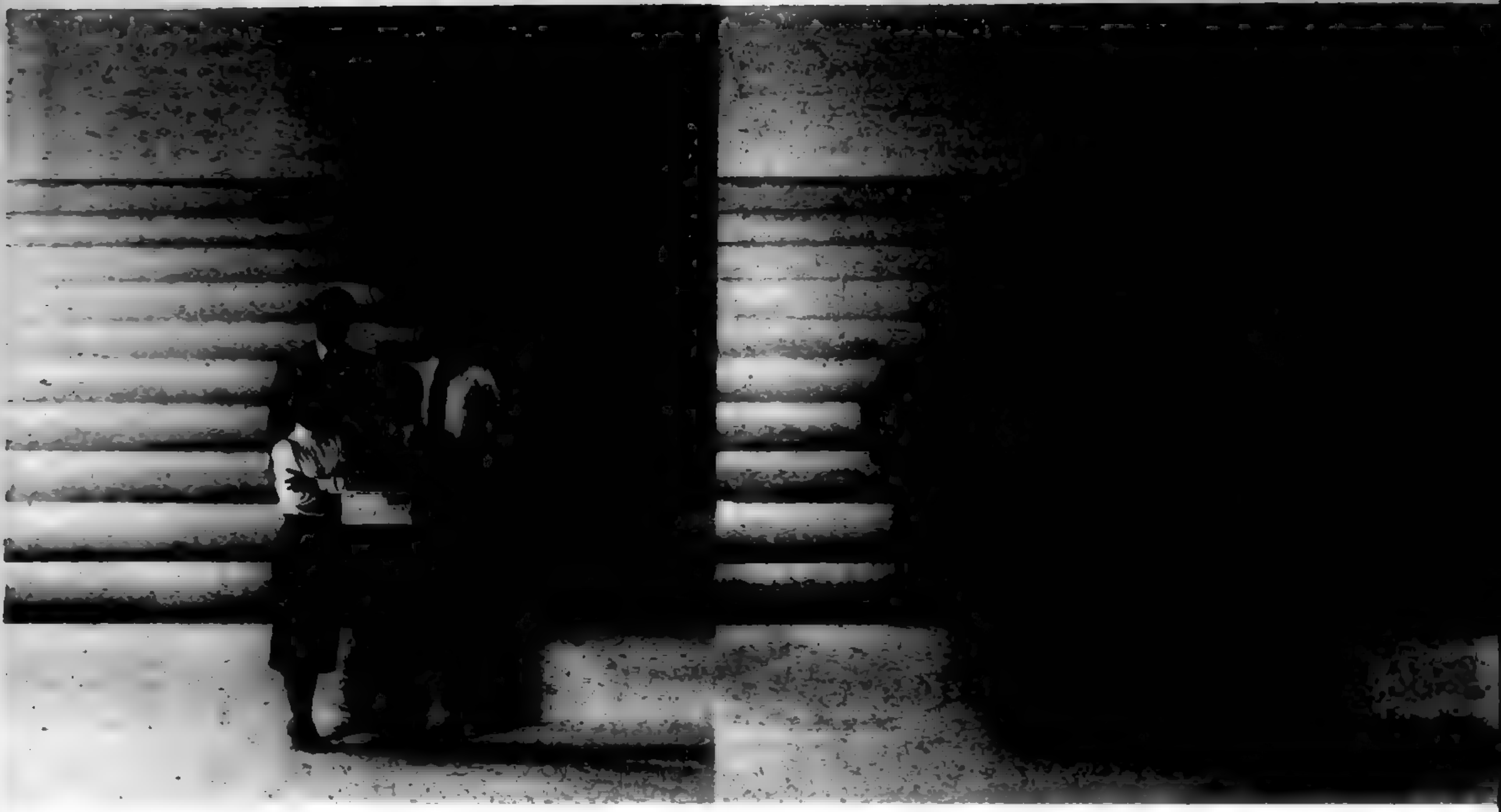

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However much you change, you're going to need both office automation *and* distributed data processing. Fortunately, one company gives you both in a single system.

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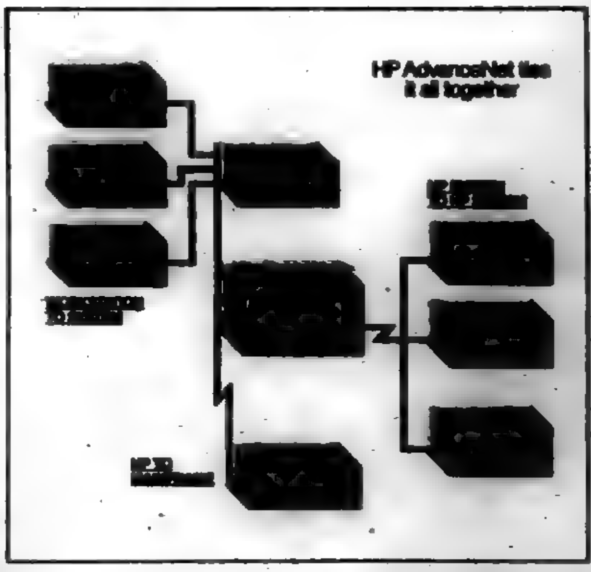

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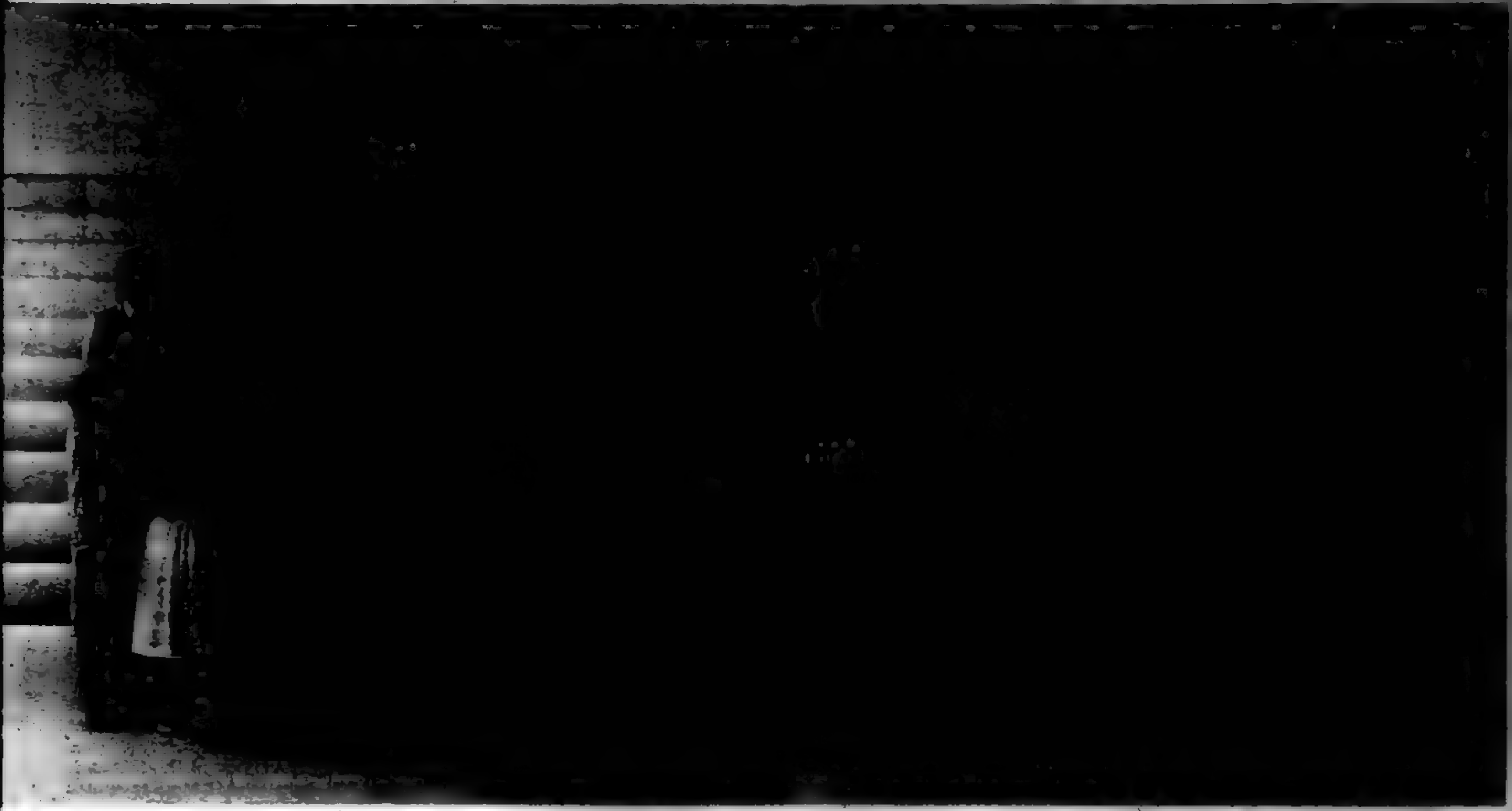

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Mail to: Bob Hall, Hewlett-Packard, Dept. 003218, 10520 Ridgeview Court, Cupertino, CA 95014.

HEWLETT PACKARD

IBO2500

MICROCOMPUTERS

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tridge tape drive has a formatted capacity of 60M bytes.

Super Qicstor-Plus reportedly can serve as a hub of a multiuser system with Alloy's PC Slave expansion cards or as a file server for the IBM PC Network, 3Com Corp. Ethernet series, Corvus Systems, Inc.'s Omninet and Proteon, Inc.'s Pronet.

Super Qicstor-Plus is priced at $10,595.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, Mass. 01701.

■ CMS, Inc. has announced expansion products for AT&T's Unix PC and Compaq Computer Corp.'s 286 Deskpro and Portable computer lines.

One expansion kit reportedly includes a 20M-byte hard disk, random-access memory (RAM) cards that supply up to 1.5M bytes of storage and parallel or serial ports. CMS is also offering 25M-byte, 45M-byte and 60M-byte tape backup systems that feature streaming, file-by-file and specific file backup capabilities.

An expansion package that consists of a 20M-byte hard disk, 384K bytes of RAM, serial and parallel ports costs $1,195. A 25M-byte hard disk sells for $695, a 40M-byte disk costs $950, and a 60M-byte disk is priced at $995.

CMS, 401-B W. Dyer Road, Santa Ana, Calif. 92707.

■ Reference Technology, Inc. has announced a laser-optic compact disk drive to provide read-only memory (ROM) data to users of the IBM Personal Computer, Personal Computer XT and AT.

The Clasix Data Drive Series 500 reportedly allows micro users access to 4¾-in. prerecorded compact disks storing up to 550M bytes of data. It is compatible with drives manufactured to the Philips Corp. and Sony Corp. compact-disk ROM standard.

The vendor also announced Sta/F File software for use with the drive. The software reportedly optimizes and standardizes the format of large data bases stored on ROM disks for the PC-DOS operating system. Also, Reference Technology introduced its Tridecc data preparation service, said to convert magnetic tape data to the Clasix optical compact disk.

Cost of the Clasix Data Drive Series 500 is $1,535. Sta/F File software is priced at $110 per user site. Tridecc data preparation services cost $3,000 per disk side plus $250 per additional reel of input data tape.

Reference Technology, 1832 N. 55th St., Boulder, Colo. 80301.

■ Digi-Data Corp. has introduced its 2000 PC, a ½-in. tape backup and media interchange system for the IBM Personal Computer line, including the Personal Computer AT.

The 2000 PC reportedly includes software to permit the exchange of Ascii, Ebcdic and binary files with mainframes and minicomputers that can run the ½-in. tapes it produces.

Included with the system reportedly are a tape controller board, interconnect cables and IBM PC-DOS-based software utilities.

The 2000 PC costs $3,995.

Digi-Data, 8580 Dorsey Run Road, Jessup, Md. 20794.

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FAMILY

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puter AT, AT 3270, AT 3270 Model G and AT 3270 Model GX; the 3270 Personal Computer series; the Personal Computer XT/370; the Personal Computer AT/370; the Desktop Series 1, in either AT or XT versions; the System/36 Personal Computer; the 4700 Personal Computer, a financial industry version of the XT; and the 5531 Industrial Computer, which is based on the Personal Computer.

And that's not even mentioning the System 9000 line of personal workstations based on the Motorola, Inc. 68000 microprocessor.

IBM, of course, believes that this diversity arises from a realization that "one size does not fit all," according to spokesman Rick Scott of IBM's Entry Systems Division. "A greater selection of choices," he said, "improves the likelihood that a customer can find the solutions for his particular need."

While that may be true, I suspect that IBM is uneasy about its plethora of diverse personal computers. Aaron Goldberg, director of microsystems services with International Data Corp. in Santa Clara, Calif., has suggested that IBM could save money by only manufacturing one basic Personal Computer chassis and motherboard, the latter based on the Intel Corp. 80286 microprocessor of the Personal Computer AT.

Big Blue is likely to do this in the next year or so, Goldberg predicted, and when that happens, the computer maker will be able to slap features into the chassis in response to market demand for specific functions.

Bring order to chaos

To bring order to all of this confusion, I recommend that potential Personal Computer buyers pretend there are only three IBM machines: the Personal Computer, the XT and the AT. They can gain any additional functions beyond those provided in the three machines by using expansion boards and software.

A certain amount of courage will be needed here, because much of the add-on functionality is available from third-party vendors. To use such vendors is no guarantee of IBM compatibility, but, as the Personal Computer AT has shown, neither is buying from IBM.

IBM, meanwhile, could hold in check its desire to add a new machine for every possible use — or to use every remaining letter in the alphabet.

COMMUNICATIONS

DATA STREAM
John Dix
CW Senior Editor

Voice mail: Boon or bane?

Modern, intelligent and feature-laden telephone switches — now typically referred to as communications processors — are supposed to increase office worker productivity, that fabled measure by which office automation systems are judged.

Some technological innovations, however, are implemented without thinking through all the implications.

Take voice mail systems, for instance. Ideally, voice mail facilitates the collection of messages so that the called party can return calls on a more timely basis. The calling party is greeted with a personalized recorded message saying the person sought is unable to answer the phone and inviting the caller to leave a message. So-called telephone "tag" is reduced and message handling is expedited.

Well and good.

But voice mail systems introduce a new concept to telephone etiquette: selective answering. Now people can forward all of their calls to their voice mail boxes, check their messages periodically and return the ones they wish. Or, if it suits them better, they can answer calls when they want and have the rest automatically routed to their voice mail box after a predetermined number of rings.

While selective answering is possible with the secretary-and-pink-paper-pad message system, few users would be able to get away with forwarding their calls in this manner all day, everyday. Secretarial staffs would have to be doubled to carry the load.

Selective answering is both good and bad. From the end user's perspective, call forwarding can end pesky calls and reduce work interruptions, a paradoxical productivity boost that designers of voice mail systems probably did not

See SELECTIVE page 92

Bank to replace digital net with analog lines

By John Dix
CW Staff

BOSTON — While conventional wisdom dictates the migration from analog to digital network links, a large New England bank headquartered here is preparing to buck convention and migrate half of its digital network back to analog facilities.

In the creation of a network structure designed to provide for resource sharing and vendor independence, the bank — which preferred to remain anonymous — concluded that, given state tariffs, it made better business sense to replace its digital facilities with analog lines.

The bank currently operates two major digital networks that support more than 150 branch locations. Each branch typically has two automatic teller machines and an IBM 4700 finance system.

The bank's headquarters serves as the hub for both star networks, which consist predominantly of multidrop digital facilities provided by New England Telephone & Telegraph Co. The network of more than 300 ATMs uses 2,400 bit/sec. digital links, each of which support eight to 10 teller machines. The 4700 network operates at 4.8K bit/sec. and typically supports five or six machine drops per line.

The bank wanted to evolve these networks into a single net that would be independent of proprietary vendor network schemes and enable users to access multiple host processors.

"The vendor neutrality design concept said you could segregate the physical aspects of a net — the lines, modems, protocols — from the logical aspects," according to the bank vice-president in charge of the project. Such a net would, for example, enable simultaneous support of IBM's System Network Architecture and Digital Equipment Corp.'s Digital Network Architecture.

To achieve the most efficient, least costly multiple access capability — from a CPU capacity perspective — the bank determined some switching must be built

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Report aims to ease complex task of selecting cabling, net schemes

MINNEAPOLIS — The proliferation of cabling and networking schemes has further complicated the job of telecommunications and MIS managers trying to evaluate available options.

A recent report from Architecture Technology Corp., a consulting firm here, outlines the decision-making process and methodology used by a large corporation in its evaluation of such systems and, as such, provides a road map other companies can use.

The report, "How to Evaluate and Select Local-Area Networks/Cabling Systems," was drawn from the American Express Co.'s experiences in picking a system to wire its new world headquarters, the Amex Tower in New York. The report was written by Mino F. Akhtar, manager of advanced technology group in the corporate systems and technology department at American Express, and Mark A. Lieberman, vice-president with Shearson/American Express, Inc., a subsidiary of American Express.

Although American Express chose the IBM Cabling System for its building, the report has reportedly been generalized as a case study that illustrates issues and decisions a company would probably face when choosing a network or cabling solution.

The report is divided into 10 chapters that outline from start to finish a project plan that other companies can use in their own evaluation and selection efforts. The authors stress that managerial rather than technical issues are the focal point of the report. Only one chapter deals with techni-

See NETWORK page 91

Racal-Vadic MDS-II allows local, remote net control

System can be reconfigured to meet traffic requirements

MILPITAS, Calif. — Racal-Vadic, Inc. has introduced a network management system said to enable users to control a network either locally or from a remote terminal.

MDS-II includes the VA1690 chassis, VA990 control card, VA2190 power supply card, VA4491E triple-speed modem and the VA9000 System Controller. The modem-based system can be used to gather statistical information on network performance and usage and enables reconfiguration to meet traffic needs, the company reported.

The VA1690 chassis can accommodate any combination of up to 32 modems — two per slot — within a standard 19-in. rack. The chassis has 16 slots and also supports the controller and an open slot for growth.

The chassis' front panel includes status line indicators, signal indicators, a two-line by 16-char. LCD and a keypad. The keypad and display can be used for alarm messages, modem status and call status. They also enable a user to enter operational commands, configure modems and perform diagnostic testing.

The VA4491E modem for use with the system is a V.22-, AT&T 212A- and AT&T 103-compatible modem that can be configured for use with dial-up or leased lines.

It reportedly provides full-duplex asynchronous and synchronous operation at 1,200 and 2,400 bit/sec. and asynchronous operation from 0 to 300 bit/sec. The modem automatically adjusts for speed and parity.

The VA9000 System Controller is a personal computer-based option that is said to provide supervision, monitoring, configuration and network testing. The device can control up to 256 chassis and more than 8,000 modems, the vendor reported. From a central site, more than 50 modem options can be selected and executed at a remote location. The controller can be used to compile event, summary and diagnostic statistics for any modem on the network.

The VA1690 chassis costs $3,260, and the VA4491E modem is priced at $1,095. The VA9000 System Controller, an interface board for an IBM Personal Computer or compatible and proprietary software, is priced at $3,500.

The MDS-II will be available in July, according to the vendor.

Racal-Vadic is located at 1525 McCarthey Blvd., Milpitas, Calif. 95035.

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NETWORK

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cal issues, such as the differences between token-ring and bus network topologies.

After the statement of the problem, the first step the report recommends is to inventory the company's computer systems and outline inventory procedures. It is not unusual to find even the largest companies lacking an inventory system, the report claims. A company can then determine its present communications patterns and estimate future equipment and connectivity needs.

After those items have been determined, possible system and architecture constraints and alternatives are presented. The next report item deals with issuing and evaluating a request for proposals. Lastly, the report presents a cost/benefit analysis.

While American Express ultimately selected the IBM Cabling System wiring scheme, the report is not intended to be an unequivocal endorsement of the IBM system, the research firm reported.

Some items discussed include issues related to the physical implementation of a network such as cable runs, furniture cabling, selection of network points, placement of processors and stationing of controllers. The report also addresses the question of staffing the implementation with company personnel or consultants, managing the final bidding process and scheduling the actual cutover and initiation of the system.

The report costs $355 in the U.S. and $415 in foreign countries.

Architecture Technology can be reached through P.O. Box 24344, Minneapolis, Minn. 55424.

Centigram introduces automated receptionist

SAN JOSE, Calif. — Centigram Corp. has added an automated telephone receptionist that supports 50 to 1,000 extensions to its voice-messaging product line.

The Receptionist can answer an incoming telephone call, provide a recorded company greeting, ask the name of the person calling and have the caller enter the extension sought, the company reported.

If the extension is busy or is unanswered, the package informs the caller and allows him to leave a voice message, try another extension or hang up.

A call screening feature tells the person called who is trying to reach him and gives him the choice of accepting the call or having a message taken. To accept a call, a user would press A and to reject it, he would press R.

If a caller does not know the proper extension, the system will route the caller to a receptionist.

A direct extension access enables callers to dial a number directly rather than going through a switchboard.

The system costs $4,995.

Centigram is located at 1869 Ringwood Ave., San Jose, Calif. 95131.

SOFTWARE

■ Unique Automation Products, Inc. has announced an enhanced version of its UAP-Link file transfer software that allows transfers among systems from Data General Corp.; Digital Equipment Corp.; Sun Microsystems, Inc.; Gould, Inc. and other vendors.

UAP-Link now reportedly can move text and binary files among systems running AT&T Unix, IBM VM/CMS, DG AOS/VS, S&H Computer Systems, Inc. TSX-Plus and DEC VAX/VMS operating systems. Other micro and mini systems supported are the IBM Personal Computer, DEC Rainbow, DEC PDP-11 and DEC Decpro. UAP-Link costs $250.

Unique Automation Products, Suite G, 15401 Red Hill Ave., Tustin, Calif. 92680.

VOICE/DATA COMMUNICATIONS

■ Ztel, Inc. has announced it is offering tenant support capability as part of its Private Network Exchange (PNX) software. The tenant support capability will enable a building developer to provide shared voice and data communications service on a single PNX system to multiple tenants.

The PNX software can support 1,048 ports, or approximately 800 lines, the vendor said. The PNX allows functions and capabilities to be offered on a tenant-by-tenant basis.

Prices for the PNX software range from $600 to $1,000 per line.

Ztel, 181 Ballardvale St., Wilmington, Mass. 01887.

AUXILIARY EQUIPMENT

■ Xerox Corp. has announced Xerox 871, a communications module that enables a Xerox 8700 laser printer to work in an IBM Systems Network Architecture (SNA) net.

The product supports Synchronous Data Link Control so a Xerox 8700 printer would appear to an SNA net as an IBM 3776 or 3777 Model 3 RJE workstation.

The product sells for $9,000.

Xerox, Xerox Centre, 101 Continental Blvd., El Segundo, Calif. 90245.

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ANALOG from page 87

into the network instead of having that provided strictly by attached hosts.

These requirements dictated the network structure. The new plan calls for the bank to establish three interconnected network hubs. Each hub will support local bank branches on a point-to-point basis, replacing the current multidrop lines. The point-to-point links will use time division multiplexing and support multiple protocols to provide vendor neutrality. The hub structure will provide the switching necessary for multiple access.

Once the network structure was determined, the bank began looking at the economics of implementing the communications facilities. "The network structure is the most important consideration," the vice-president explained. "The analog/digital issue is secondary because the network can use either."

The bank's analysis of analog and digital facilities led to the decision to migrate its digital network back to analog, a conclusion that the vice-president said is "counterintuitive."

The primary finding of the facilities analysis was that digital links in New England are two to three times more expensive than analog circuitry, according to the vice-president. After considering differences in the cost of the communications equipment required with either system and differences in performance, the bank decided it could not justify digital service.

High-speed 9.6K bit/sec. modems are two to three times more expensive than comparable digital service/customer service units (DSU/CSU) used with digital links, the vice-president said. But that cost differential evaporates when you add multiplexing options. The multiplexing option for digital DSU/CSUs is four to fives times as much as the same modem option, so the equipment ends up costing roughly the same.

The modem multiplexing option will enable a 9.6K bit/sec. link to be used as if it were three separate lines, one running at 4.8K bit/sec. for the IBM 4700 at each branch and two operating at 2,400 bit/sec. for the ATMs.

In terms of digital vs. analog performance, the bank weighed a number of considerations. The average time to repair digital links is shorter than with analog facilities, but the most time-consuming portion of fixing anything is dispatching maintenance personnel, a requirement common to either type of facility.

The higher reliability of digital facilities reduces the number of retransmissions required, but the overall difference in reliability is not that great, the bank found. The vice-president said that with digital links, 99.7% reliability might be typical, as opposed to 99.1% with analog facilities.

While the bank will migrate most of its branch office links to analog lines, it will retain digital service between its three network hubs.

Most important, the network structure will enable the bank to use either type of link. "We can take advantage of analog where it is feasible and the service is acceptable and digital where it makes sense," the vice-president said. "We'll stay with the market forces."

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SELECTIVE from page 87

anticipate. But on the down side, the question is whether it is in the corporate interest to have workers indiscriminately forwarding their phones. Will messages that would be forced to the fore without voice mail be delayed with the electronic system?

At the very least, the advent of selective answering requires telecommunications managers considering the technology to examine carefully the users who would be given voice mail boxes. Personnel in customer service-oriented jobs may, for example, benefit the most from voice mail. Conversely, they also have the potential of becoming the worst offenders of the system.

Ironically, both the proponents and the purveyors of voice mail systems are often blind to the down side of the technology. Faced with a deadline, this reporter recently tried to call the public relations bureau of Rolm Corp. for a comment regarding an upcoming conference. After waiting through the polite recorded Rolm Phonemail message saying the called party couldn't answer her phone, I pushed a few buttons as instructed by the message and reached the operator.

The operator forwarded me to another extension where, yes, I was greeted by another voice message. A third and fourth number elicited the same type of cheery recorded messages. No humans were available to point me in the right direction.

Client-intensive departments in other operations have made the same mistake. It is a good chance that, on any given day, five out of six people at the Yankee Group, a Boston-based research firm that specializes in communications, will have their phones forwarded to their mail boxes.

While the Yankee Group's researchers probably enjoy the peace and quiet and turn out more work — a plus for voice mail — is it smart for the firm to give voice mail boxes to everyone? Should its public relations personnel have a voice mail box? Its salesmen? What is the implication to the company of a potential client — or a newspaper reporter seeking a quote — becoming frustrated by the system and turning elsewhere?

While it is hard to quantify and balance the benefits against the drawbacks, it should be noted that voice mail is not a messaging panacea that can or should be implemented blindly.

SYSTEMS & PERIPHERALS

Firm unveils simulation engine

MENLO PARK, Calif. — Silicon Solutions has taken the wraps off a simulation engine that performs logic and fault simulation of integrated-circuit and printed-circuit board designs. The company also released an accelerator subsystem that is said to enhance the performance of its Fast-Mask Engine.

The Mach 1000 simulation engine, which uses the University of California at Berkeley's 4.2 version of AT&T's Unix operating system, is a hardware accelerator said to accommodate 65,000 gates for logic simulation on a single accelerator board. The unit reportedly uses customized very large-scale integration chips. Fault simulation requires an additional board. The engine's free-standing tower has room for eight additional boards for expansion capacity up to 500,000 gates. Towers can be coupled together to achieve a two-million gate capacity, the vendor said.

Logic and fault simulation at the gate level are implemented in special-purpose, proprietary chips that are said to simulate 1,000 times faster than software. The switch and behavioral-level simulations are handled in HHB-Softron's Computer-Aided Design and Testing (Cadat) software.

The Mach 1000 can function as a stand-alone dedicated processor or as a network server shared over Ethernet by any system in the computer-aided engineering and computer-aided test environments, including HHB-Softron's Computer-Aided Test System hardware modeling computer.

A logic simulator with a 65,000-gate capacity costs $85,000; a log and fault simulator with the same capacity costs $150,000. The engine includes a license to

See [illegible] page 103

TI Business System minis get memory enhancement

AUSTIN, Texas — Texas Instruments, Inc. has announced enhancements to its Business System 300A minicomputer line. The enhancements include a doubling of the main memory of the machines at no additional cost to users.

Other enhancements include the following: a one-year or optional three-year warranty plan, a switch to dynamic random-access memory (RAM) chips and the TI WD600A disk system. TI will also provide field service for a third-party multiplexer that allows a TI 300A system to support up to 15 terminals.

All Business System 300A models will now have a standard 512K-byte RAM instead of 256K-byte memories, the vendor said. The larger systems, the 373A, 374A and 375A, are said to be available with 1M byte of on-board memory.

The 256K-byte dynamic RAM chips incorporated in the systems are said to increase the maximum memory capacity from 1M byte up to 1.75M bytes to allow larger application programs to be run. The TI WD600 disk drives have been replaced with WD600A enhanced drives, the vendor said. The 43M-byte WD600 had an access time of approximately 75 to 80 msec., and the WD600A has an access time of 35 to 40 msec. The WD600A comes in three capacities — 36M, 69M and 114M bytes of formatted storage.

The warranty plan is said to change the previous 90-day on-site warranties that came with the system to a one-year carry-in service with an option to convert to on-site coverage. The middle of the 300 series line — Model 373A, for example —, previously came with free 90-day on-site warranty and now comes with a free carry-in

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- Planning to install hardware? Some tips/96
- Four Phase Systems unveiled a 32-bit Unix-based supermicro/96

INSIDE

Terminals/[illegible]
Power Supplies/[illegible]

HARDTALK

IBM 3080s may not be dead yet

By Tom Henkel
CW Staff

With sales of IBM 3080 mainframes in a slump and IBM users waiting for the newer IBM 3090 series mainframes, could IBM be thinking about giving users their cake and 3080s too?

There has been some speculation that IBM may be planning to extend the life of 3080 series mainframes by cooking up some alternate uses for the big boxes. The idea sounds a bit far fetched but not beyond the realm of possibility. There is nothing really wrong with 3080s, they have just been superceded by newer technology processors. If IBM could refocus the 3080, it could further capitalize on all that expensive 3080 R&D.

For example, IBM might consider the following:

- In the wake of Fujitsu Ltd. and Hitachi Ltd.'s plans to offer supercomputers through their domestic marketing arms, Amdahl Corp. and National Advanced Systems Corp., respectively, there is increased pressure on IBM to

See IBM page 103

From code busters to mainframes: the history of CDC

By [illegible]
CW Staff

Control Data Corp. was born in 1957, but the roots of the company date back to World War II.

At the end of the war, William C. Norris and his colleagues Cmdr. Howard Engstrom, engineers Seymour Cray, Bill Keye, Frank Mullaney and a handful of other associates from the U.S. Navy's intelligence units took advantage of the Navy's continuing interest in developing new devices that would become the forerunners of the digital computer. The group — enemy code breakers during the war — started a private company, Engineering Research Associates (ERA), which soon became known for its electronic data processing and storage devices.

ERA was sold by its major shareholder, investment banker John E. Parker, to Remington-Rand Corp. in 1952, against the wishes of Norris and the firm's other technical people. Norris, in a recent interview, said the sale taught him an important lesson: one person should not hold a majority position in the outstanding shares of a company.

"When Control Data was formed, I went to great lengths to ensure that that did not happen. In fact, I was the largest stockholder, and I never had over 15% of the company," he said.

By 1955, Remington-Rand had linked with Sperry Corp. to form Sperry-Rand, and Norris had become vice-president and general manager of the Univac division at Sperry. Norris urged Sperry-Rand to put all its efforts into computer operations, a move he saw as the wave of the future.

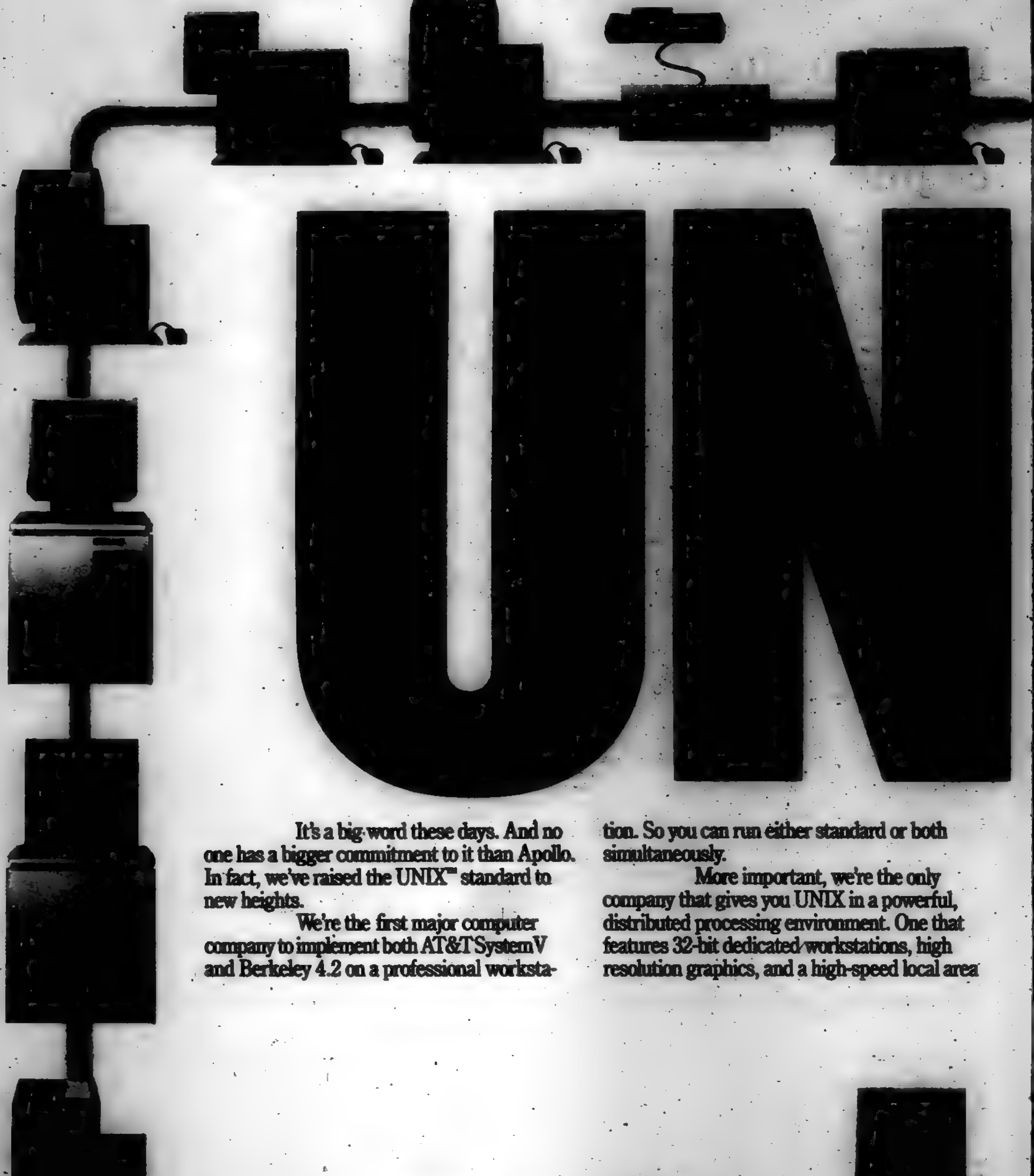
The Univac division soon found itself losing money because, in some corporate executives' opinions, Norris was spending too much money on research and development. Bad feelings resulted, Norris said, and despite the chief executive officer's pledge to support Norris, he decided that Univac would never be successful in that environment.

In the summer of 1957, Norris, frustrated at what he felt was Sperry's sluggish reaction to the burgeoning large-scale computer business of IBM and at his diminishing control in the huge company, quit his job with Sperry to form CDC. He took with him eight of his key associates at Univac.

Univac quickly retaliated by suing the group of former employees, charging they walked off with corporate trade secrets. The suit was settled in 1959 when CDC promised not to use classified material that Sperry said the engineers at CDC learned in their years at Univac.

By Oct. 1, 1957, 12 employees started laboratory work on the first fully transistorized computer, the CDC 1604, designed by Cray, who was wooed by Norris from the ERA part of Sperry's Univac division. The Navy purchased the first CDC 1604, a machine that was designed for scientific, simulation or control applications in which extensive computations were needed.

See CDC page [illegible]



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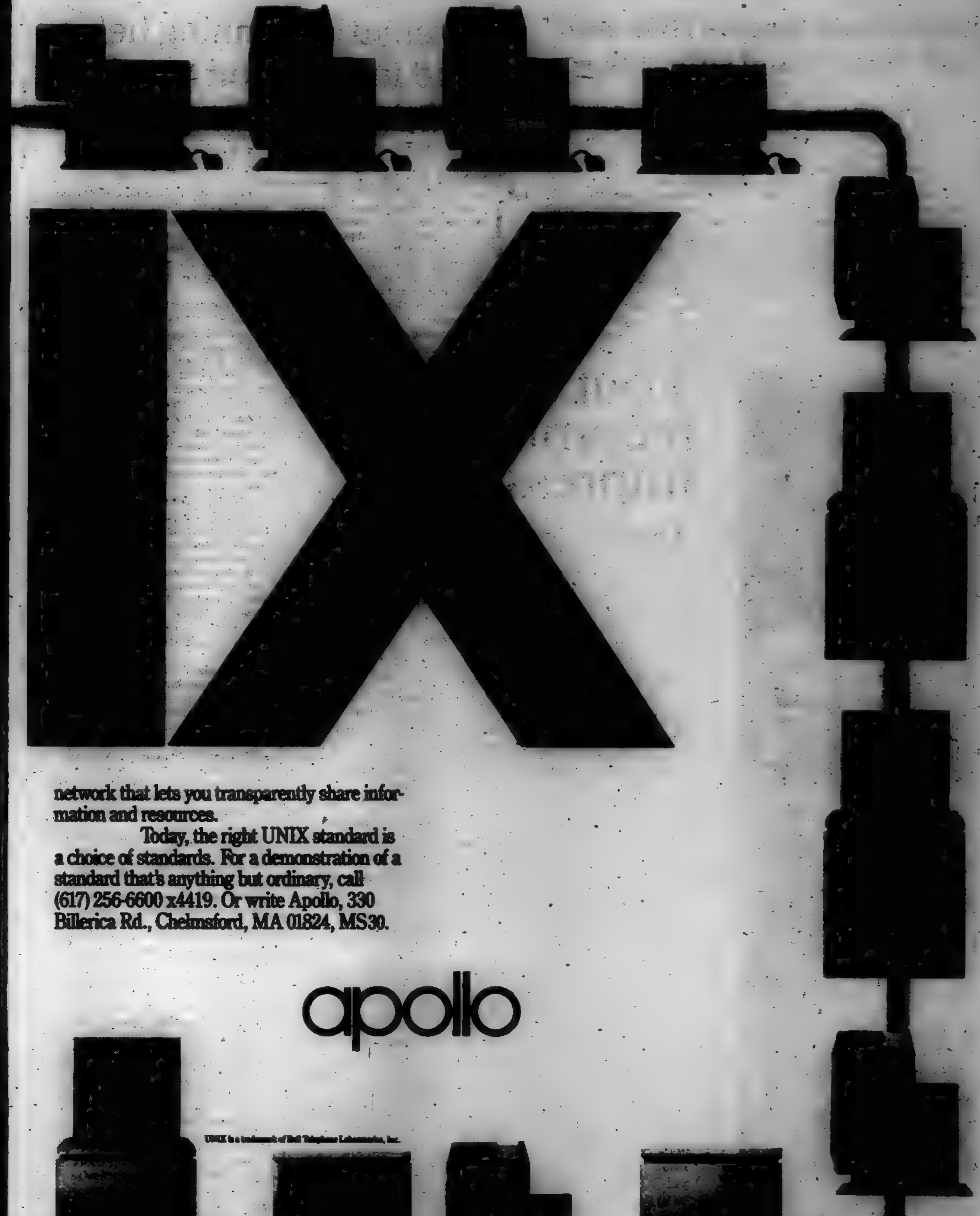

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Four Phase targets IBM nets with Unix-based supermicro

CUPERTINO, Calif. — Motorola/Four Phase Systems, Inc. has released a 32-bit AT&T Unix-based supermicrocomputer said to be targeted at distributed office locations operating IBM Systems Network Architecture (SNA) or Binary Synchronous Communications (BSC) networks.

The Model 290 — an addition to Motorola/Four Phase's Series 2000 family of computers — offers support for up to 12 users. It features a Motorola, Inc. 68010 processor with error-correcting memory and virtual memory support.

The unit, with 1M byte of memory, an intelligent communications processor, a 52M-byte Winchester drive and a removable 5M-byte disk for backup, costs $30,665. The system is said to support up to seven 52M-byte disks for a total of more than 350M bytes of storage.

The company's previous 240 and 260 models are said to be upgradable to 290s in the field with no reprogramming. All three of the Series 2000 models share common workstations, disks and system architectures, the vendor said.

More information can be obtained from Motorola/Four Phase Systems, 10700 N. De Anza Blvd., Cupertino, Calif. 95014.

Systematic planning helps avoid installation hassles

SHOP TALK
John Roncone

In order to install computer hardware successfully, one must develop a good plan and provide the necessary supervision to make sure the plan is followed.

The most important part of the plan is determining preinstallation requirements. Such an evaluation should include the following:

- Determining the location.
- Evaluating the building and the computer room.
- Seeking vendor consultation.
- Evaluating physical planning specifications.

The location of a computer system must meet the objectives of the company's long-range plan. Location depends on whether the computer being installed will be a centralized, decentralized or distributed system. Provisions should be made for expansion.

A building with a receiving dock is probably the most appropriate, because a building without one may require construction of a high lift or a ramp to get the computer in it.

Placement of the computer room in the building is also important. For example, basement floors are subject to water and flooding. The top floor of a building can also be subject to water problems, because the roof can leak. On the intermediate floors, there can be problems with weight capacity.

Also, be sure to plan for fire prevention devices, adequate power, an elevator with the proper weight capacity if applicable and doors that are wide enough to allow equipment to be moved around.

Select a room that allows at least 30% in additional space for growth. Be wary of direct sunlight and plan to provide separate air-conditioning and power systems for the computer room.

When planning the physical layout, pay attention to factors that could affect the system, such as static surfaces, vibration, temperature variations and humidity levels.

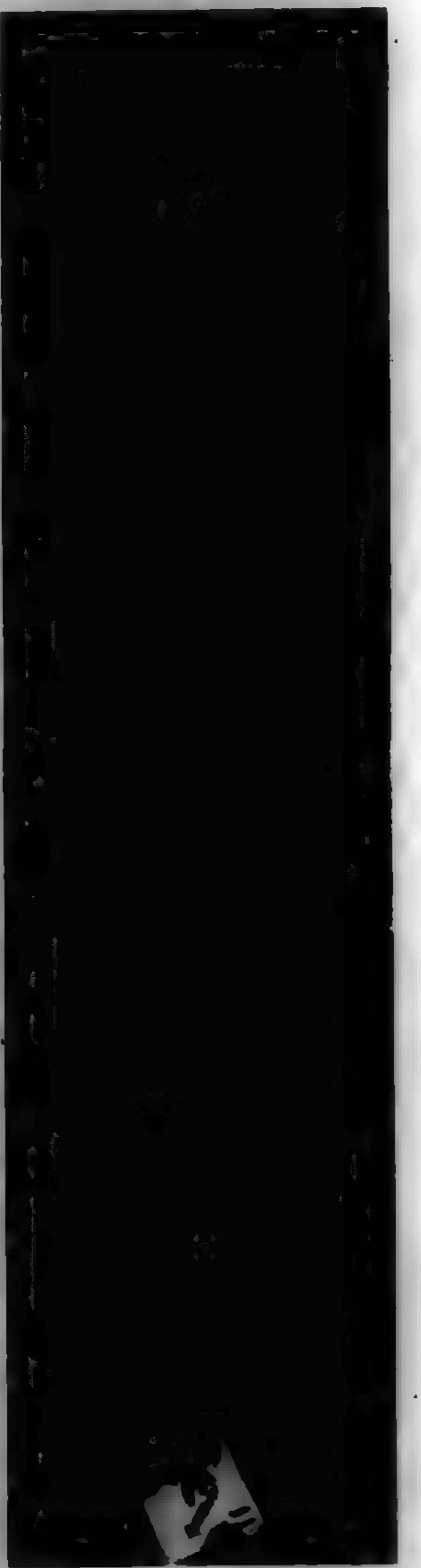
Be sure to include vendor representatives in the planning process. Think about whether you want to have a hardware and software planning committee that meets periodically to ensure the success of the project.

Vendor representatives may vary depending on the issues being addressed. Usually the vendor representatives will include a marketing representative, a hardware specialist and a software specialist.

Installation planning meetings should address the major milestones documented in the plan. For instance, the marketing representative should be at installation planning meetings when the features and the shipping dates of hardware components are discussed. When the physical layout of the computer room and equipment and service requirements are discussed, the hardware specialist should be present. Finally, when the operating system and system generation are discussed, the software specialist should be present.

When the system is installed, there should be enough room on each side of the unit to allow the doors to be opened freely for equipment repair. Ask the vendors in advance for specifications of all the equipment to be purchased, from the CPU down to the desks, chairs and cabinets.

Roncone is a professor in the Computer Science Department at Kent State University's East Liverpool regional campus in Ohio.



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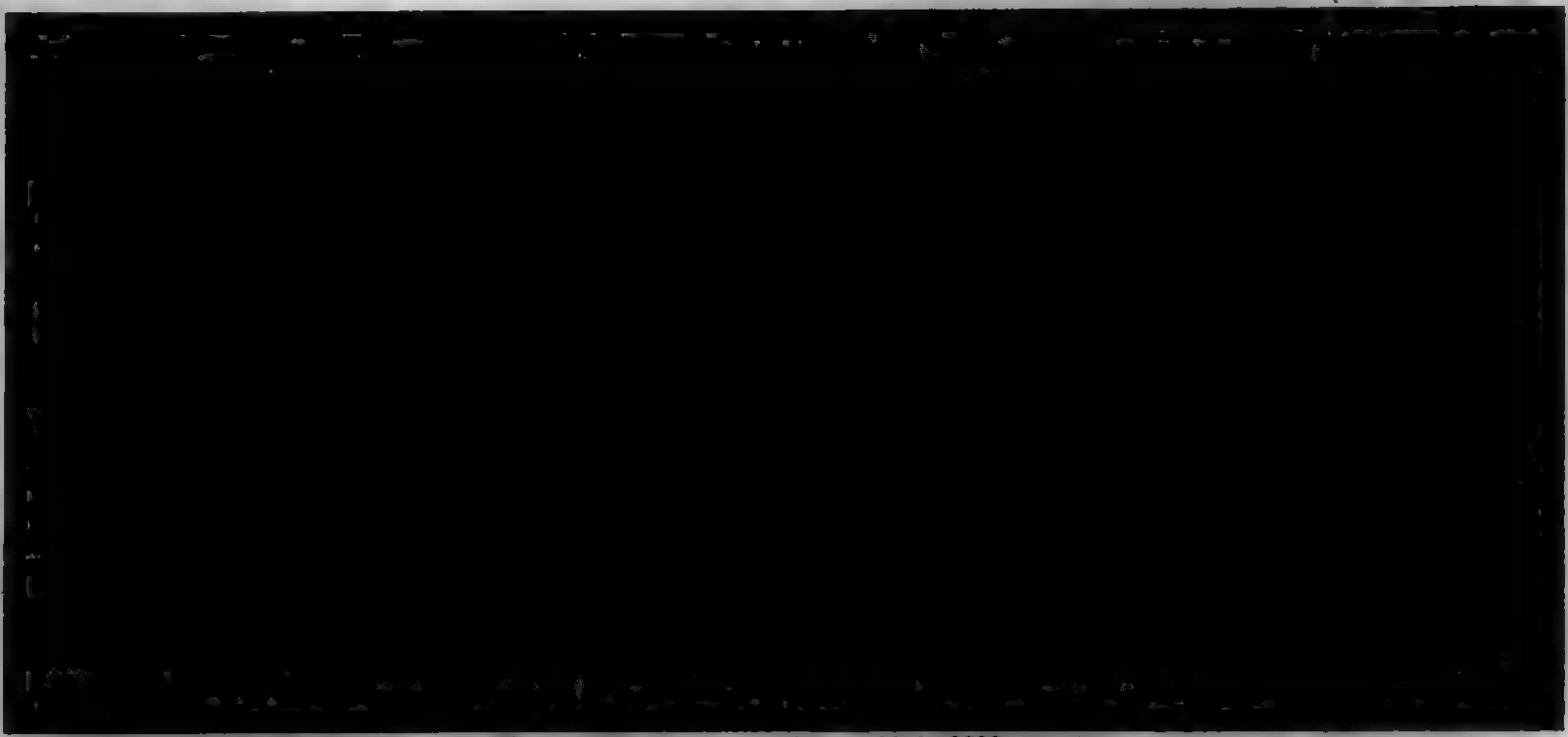


CDC targeted one segment of the market — scientific and engineering computation — with the 6600 computer.

CDC

from page 93

In the spring of 1960, CDC announced its Model 160, a desk-size solid-state computer for small-scale scientific applications. Various enhanced models of the 1604 and the Model 160 were announced during the next few years. In May 1962, the first of the medium-size 3000 series was unwrapped. Like the 1604A, it had a 48-bit word length.

Lawrence Radiation Laboratory in Livermore, Calif., placed an order for a Cray-designed Model 6600 immediately after the system's announcement in July 1962. The 6600 was scheduled for delivery in February 1964. The new model, packed with 350,000 transistors, proved to be difficult to debug, however, and was not actually delivered until September 1964.

"We decided to focus very strongly on one particular segment of the market — scientific and engineering computations — and it was a very wise decision," Norris said. "Our early computers sold so well that IBM became alarmed. They zeroed in on us with . . . practices which finally led to the lawsuit that Control Data filed against IBM."

IBM announced its 360 Model 90 machine between the time of CDC's 6600 announcement and its installation. Neither machine was ready for the market, as the 6600 had production difficulties, and the 360 Model 90 was an idea but not a reality when IBM's sales representatives started touting it, according to a recently published book, *The Computer Establishment*, by Katherine Fishman.

Norris was angered by IBM's tactics of announcing machines and enhanced versions of machines before they were ready, tactics that forced CDC to give its customers more enhancements at cheaper prices before it was ready to do so.

In the meantime, CDC lawyers collected evidence against IBM, which they presented to the U.S. Department of Justice in hopes that the government would sue IBM for violations of federal antitrust laws. In December 1968, CDC tired of waiting for the government, and it formally filed suit against IBM, charging 37 instances of monopolistic practices. The government filed its suit a month later.

The lawsuit against IBM was countered with equal ferocity by IBM. IBM filed suit against CDC claiming that CDC engaged in reciprocal marketing practices: giving its business to companies that bought CDC computers and taking it away if the company did not buy its equipment.

The suits were hurting both companies, and in January 1973, the companies announced an out-of-court settlement. CDC agreed to buy IBM's Service Bureau Corp., a subsidiary that provided remote computing services to businesses in the same way as CDC's consolidation of small service bureaus and data centers did. Service Bureau had become the Cybernet remote computing network and provided remote computing for scientific customers. IBM gave CDC more than $100 million worth of subsidies, and in return, CDC destroyed all the documents it had compiled about IBM's practices.

"We learned early on that you can't compete head on against IBM," Norris said about strategies CDC developed to build its business. To protect CDC from IBM, Norris acquired small peripherals companies, and CDC became the largest peripherals supplier in the industry. He scooped up service bureaus to handle companies that were overloaded or that did not want to invest in their own computer centers. To handle the burgeoning need for computer technicians, he established CDC schools. In 1968, CDC acquired Commercial Credit, a finance company with gross assets of more than $3¼ billion, a move that allowed CDC to survive the 1970-71 recession in which the company's computer operations lost millions of dollars.

"The one [strategy] that was most effective early on was [based on a feeling that] there was a market for computers with very little software," Norris said. The scientists and engineers that CDC catered to generally wrote their own software, so the company could sell a bare-bones system that included the operating system and little else, he said. The resulting lower price of equipment was one of the reasons for the early and strong success of the company's scientific computers, he said.

Norris

In 1973, Cray resigned to form his own company. "There wasn't any impact [on CDC] at the time of his departure because we couldn't afford to get another supercomputer project under way then. The impact came later when he got his first machine on the market," Norris said.

"We are philosophical about it," he said. "You have got to have good competition, and Seymour is good competition — in fact, the best."

CDC continued to develop supercomputers after Cray left when the Star machine was in production, Norris said. ETA Systems, Inc. was formed in 1983 with about 100 CDC employees to "design and manufacture the most powerful supercomputer in the world by 1987," according to CDC literature. "It goes back to that early experience that I had in ERA and in Control Data of giving people part of the ownership to provide some incentive. We felt that to make it a separate company in which we owned a substantial portion would be the best for everybody concerned. They are making excellent progress, and we will see that approach proven to be very sound again," Norris said.

Various mainframe computers continued to be created at CDC, including the company's Cyber line that started in 1970 with the Cyber 70 series and has continued into 1985 with a series of 800 models.

In addition to the diversified business interests, Norris started several projects that address social problems. Training programs for handicapped workers and urban and rural programs for economically disadvantaged people use CDC's Plato computer-based education system to ready people for gainful employment.

"These [programs] are the future of the company," Norris said. "We have been investing in these things for quite a few years. It has been a difficult strategy for us, but it's going to pay off handsomely," he said. The programs are business opportunities, Norris stressed. Several of the programs have become profitable, he said.

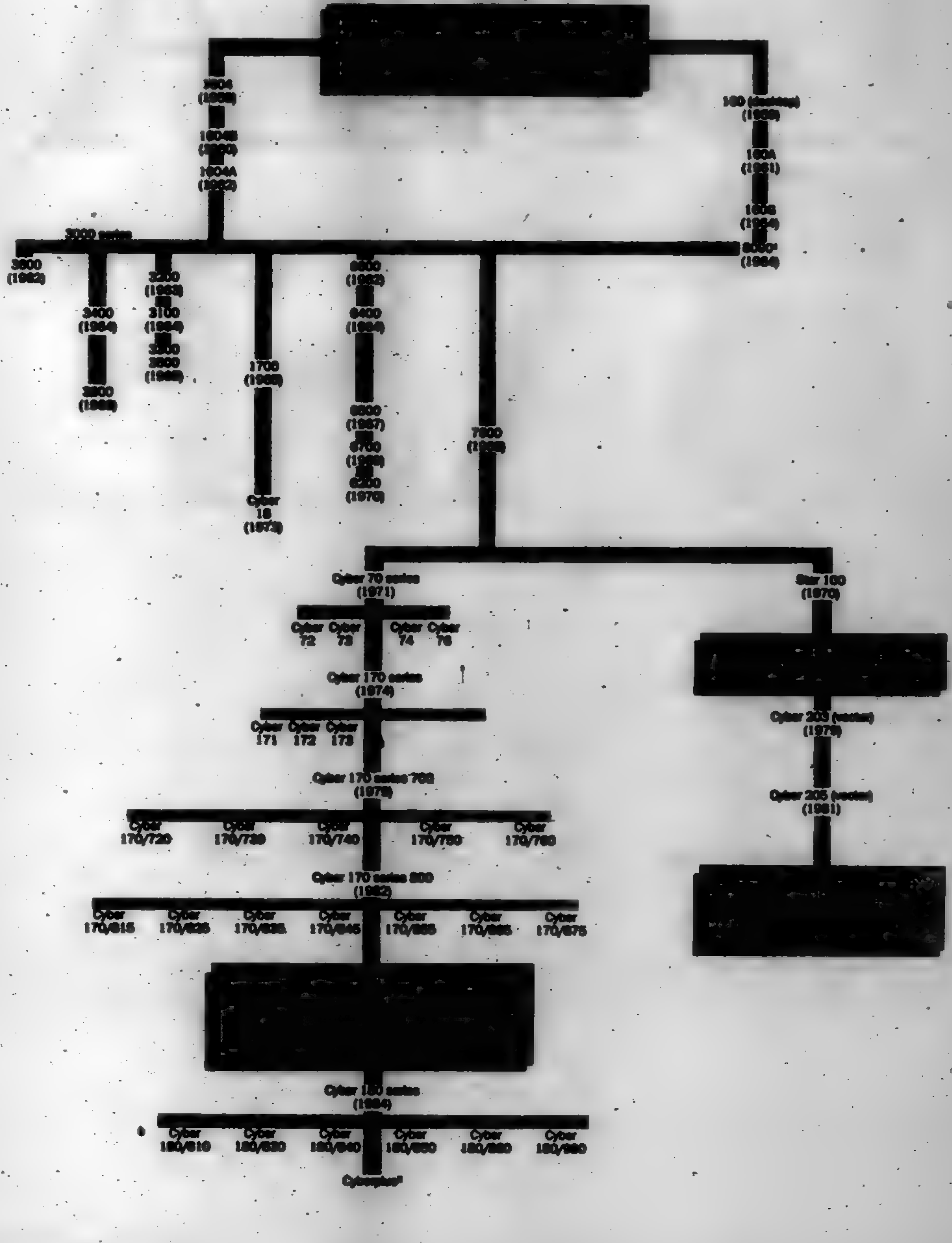
Norris' confidence in these business opportunities is not shared by many CDC watchers. Bill Sheefer, a former general manager of communications at CDC for five years, for example, is not convinced that the social programs were a wise move for CDC. Norris is a technocrat — one who believes that society can be managed by technical experts — Sheefer said, but experience has proven otherwise. "Earnings are up, but profits are going the other way" because of the social programs, he said.

The day-to-day operations of CDC fall to Robert Price now, Norris said. "I'm involved primarily with working with our different constituents outside the company."

"I spend quite a bit of time helping to develop our relationships with other countries," Norris said. "Also, while Bob Price worries about the day-to-day operations, I'm very heavily involved in the projects addressing societal needs like education and training, health care and so forth. I'm really dealing in the future."

CW CHART BY MITCHELL J. [illegible]

Control Data Corp. Family Tree



[1] Peripheral processor for 6000 series, Cyber 70, Cyber 170

[2] Peripheral processor for 800 series

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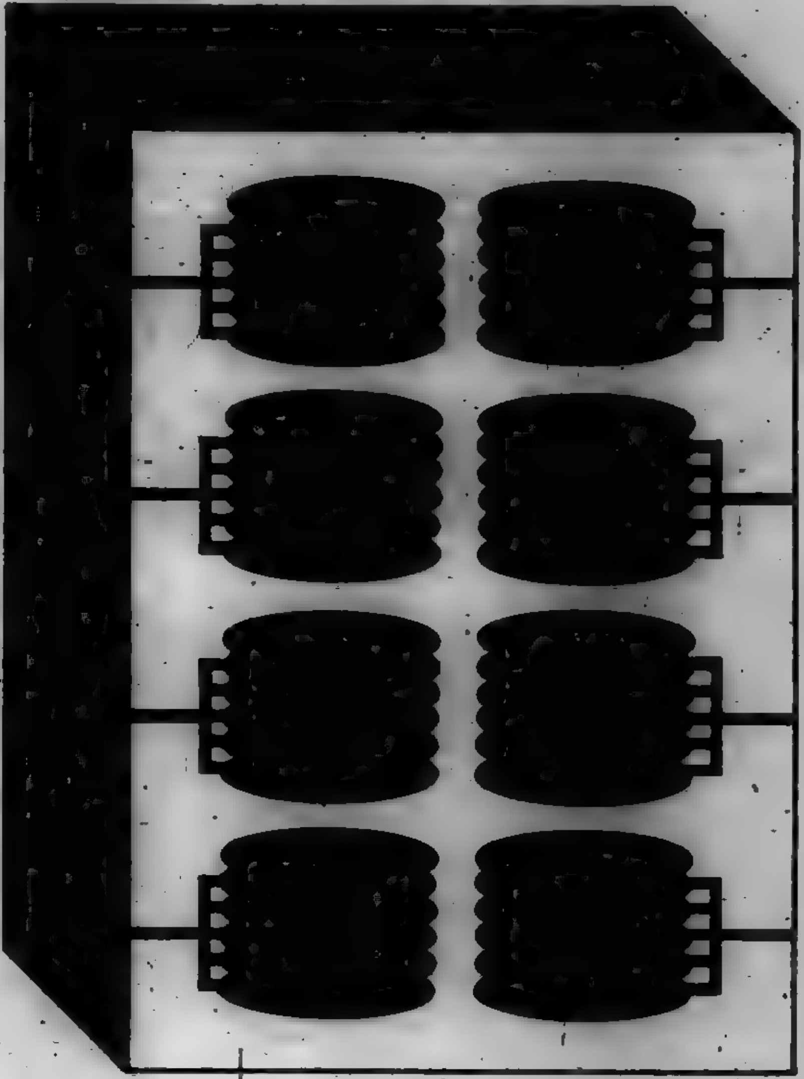

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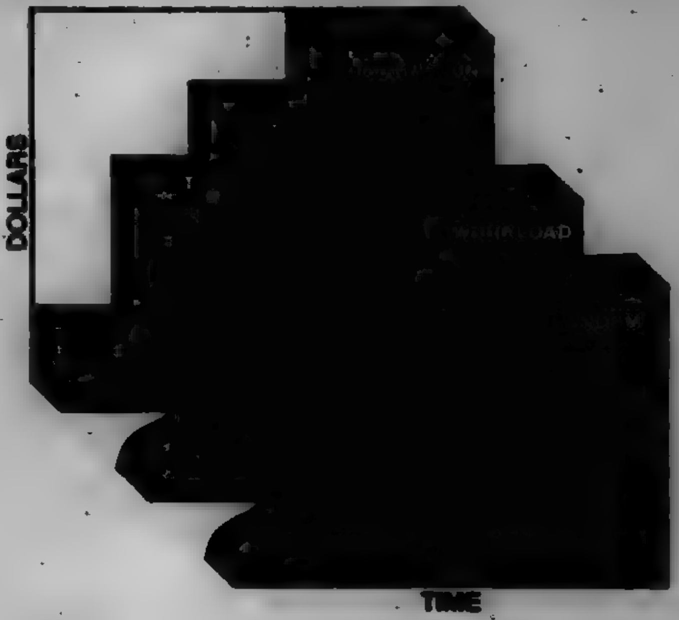

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TERMINALS

■ Esprit Systems, Inc. has released a VDT that is said to provide emulation of Applied Digital Data Systems, Inc.'s Viewpoint terminal.

The ESP 6110+ is an enhanced version of Esprit's ESP 6110. Features include a 14-in. screen that is housed in a tilt-and-swivel case, a choice of green or amber screen and a 7- by 11-dot character matrix. The 6110+ operates at 50 to 19.2K bit/sec. speeds.

The unit costs $395.

Esprit Systems, 100 Marcus Road, Melville, N.Y. 11747.

■ Telesis Systems Corp. has announced a computer-aided design workstation and printed-circuit board design software for the workstation.

The EDA-700 workstation, for printed-circuit board design and mechanical applications, uses Digital Equipment Corp.'s LSI 11/73 microprocessor as the primary CPU. Graphics are supported by a proprietary Motorola, Inc. 68000-based graphics processor.

On-screen menus are accessed with a mouse or via function keys. The unit features a 19-in. color monitor with five assignable colors and a choice of three background colors. The 1K- by 2K-byte pixel roam area can be increased to a 2K- by 2K-byte roam area for $4,000.

The unit costs $43,000 with 1.5M bytes main memory and 65M bytes of disk capacity. The memory can be upgraded to 2.5M bytes for an additional $5,000, and the disk space can be expanded to 140M bytes for an additional $7,500. The EDA-700 is upgradable with the $19,000 EDA-660 coprocessor, the vendor said, which is said to double routing speed and provide an AT&T Unix environment.

The company also released its ECL Toolbox software for the design of ECL and Cmos-based printed-circuit board systems. Features of the package are said to include automatic scheduling and terminator assignment, daisy chain routing and report generation.

The ECL Toolbox costs $15,000.

Telesis Systems, Two Omni Way, Chelmsford, Mass. 01824.

■ Plessey Peripheral Systems, Inc. has announced a Tektronix, Inc. 4010/4014-compatible graphics terminal for Digital Equipment Corp. terminal users.

The PT-100G monochrome graphics terminal is compatible with DEC VT100 and VT52 terminals. It is said to offer a 14-in. nonglare screen in amber or green and has 1,024- by 780-pixel resolution.

The unit costs $1,295, according to the vendor.

Plessey Peripheral Systems, 17466 Daimler Ave., Irvine, Calif. 92714.

■ Westward Technology, Inc. has announced that its Model 3220W color graphics terminal is available domestically.

The 3220W offers resolution of 1,024 by 1,024 addressable pixels with refresh rates of nearly 60 times a second, according to Westward Technology.

The unit, equipped with an RS-232 interface, is used primarily with minis and mainframe computers, the vendor said.

The unit costs $15,450, and the optional eight-plane feature is an added $3,215.

Westward Technology, 90 Montvale Ave., Stoneham, Mass. 02180.

POWER SUPPLIES

■ Power General, a subsidiary of Unitrode Corp., has released a family of 150W, quad-output switching power supplies for microcomputers, disk drive systems, CRT terminals and digital/analog circuits.

The four models in the series — 4150-1, -2, -3 and -4 — give output combinations of 5, 12 and 24 volts dc, the vendor said.

Input voltage ranges of either 90 to 130 volts ac (Vac), or 180 to 260 Vac are available as a factory-wired option, according to the vendor.

The units are fabricated on a single 4- by 8- by 2-in. printed-circuit board that weighs 22 ounces.

All four models cost $169 each.

Power General, P.O. Box 189, 152 Will Drive, Canton, Mass. 02021.

TI from page 93

one-year warranty or an optional one-year, on-site plan that costs $492 to cover transportation costs for the year.

The cost of one-year, on-site coverage previously would have been $990 — $110/mo for the nine months not covered by the 90-day warranty, according to the vendor.

An optional three-year plan — either on-site or carry-in — is available for $2,772 for an on-site plan or $1,296 for a carry-in plan. Maintenance contract rates paid on a monthly basis have been reduced from $135/mo to $113/mo on the model 372A.

Warranty, maintenance upgrades

The warranty enhancements and maintenance reduction are said to be possible because of the incorporation of 256K-byte dynamic RAM chips and the use of the WD900A 5¼-in. hard disk drive.

TI also announced support for the Octacomm MCPU/300 Multiplexer, produced by Responsive Terminal Systems, Inc. of Dallas, which is said to support up to 15 terminals, doubling the current limit.

More information is available from TI at Data Systems Group, P.O. Box 809063, Dept. H-801, Dallas, Texas 75380.

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IBM

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offer a product aimed at the scientific-oriented processing community.

Most industry watchers believe IBM will build on its relationship with Floating Point Systems, Inc. to develop some sort of supercomputer-like attached processor for IBM mainframes.

But what if IBM were to devise a scheme to use multiple 3080s working as parallel processors — especially if those parallel processors were being driven by a 3090 series processor? Most scientific IBM mainframe shops already have at least one 3080. Most of them have multiple systems. IBM now supports AT&T's Unix operating system on its mainframes, so it would not be out of the question to do what several companies have already done on a smaller scale: alter Unix so that it can support multiple processors in a parallel processing environment, thereby producing a series of processors with impressive overall power.

■ IBM has already admitted its interest in the transaction processing marketplace when it signed an agreement with Stratus Computer, Inc. to supply supermini-type fault-tolerant CPUs, which IBM quickly whipped into the System/88. Dedicated 3080s used in conjunction with System/88s, could make a handsome addition to IBM's transaction processing effort and possibly cause some real headaches for executives at Tandem Computers, Inc.

■ Data base management and a swelling sea of disk drives have been growing concerns among big IBM mainframe users. It is possible that 3080 mainframes could be used as the basis of a sophisticated data base machine in the tradition of products currently offered by Britton-Lee, Inc. and Teradata Corp. IBM is rumored to have dabbled already in data base machine design but has held back announcing a product for fear of taking a beating on its own mainframe and disk drive sales.

■ With the spiraling demand for communications capabilities, a 3080-powered communications controller would be an impressive product for serious communications shops. Some industry observers felt IBM would significantly enhance its 3705 communications controller with a very powerful replacement. But when IBM finally enhanced the 3705 with the 3725, the new controller's capabilities fell far short of some observers' expectations. A 3080-based controller would certainly fill some high hopes for a big communications controller.

■ Judging by recent product announcements for its System/36 and 8100, it is clear that IBM is still hot on the idea of distributed data processing (DDP). A 3080 would make a fine file server in a large distributed network, but would probably further confound IBM's already confused DDP strategy.

Possibilities for washed-up 3080s

There are clearly possibilities for what appear to be washed-up 3080 mainframes. But does IBM really want to refocus the machine? Unless 3080s were used in a way that would preclude field-installed machines from being retrofitted, IBM would probably wind up bolstering the used market for 3080s and not providing much incentive for new sales — not a very appealing scenario for profit-hungry IBM. An internally retrofitted version of the 3080 for a special purpose could wind up costing more, from an R&D standpoint, than building a box from scratch with off-the-shelf components.

Still, some variation of the first possibility seems to have a plausible ring to it. The ability to use currently installed 3080s with a 3090 would fill an immediate need for IBM to do something in the scientific processing sector. It would give users who already own 3080s pause when the suggestion is made to sell the thing before it gets any older, and it would open up some doors for IBM to sell more model-to-model 3080 upgrade and memory expansion kits.

With IBM trying to play down its sometimes perceived image of periodically shafting its big systems users, some alternate use for 3080s would be an interesting olive branch for Big Blue to offer. The sketchy case for such an offering, however, does not at this point seem sufficient to warrant taking the "For sale, cheap" sign off the old 3080 just yet. But there is always hope.

SIMULATE

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run the Cadat software. It will be available for shipment in the fourth quarter of 1985.

The company also released an accelerator subsystem that is said to enhance the performance of its Fast-Mask Engine. The accelerator — based on the Motorola, Inc. 68020 processor — is said to allow the engine to verify the layout of integrated circuit designs up to 10 times faster than software.

The Fast-Mask system, running without the accelerator, took 9 hours to run design rule checks on a customized integrated circuit design with 40,000 transistors, a spokesman said. When the system was used with the accelerator, the time to run design rule checks was reduced to one hour and 10 minutes.

Each board in the accelerator subsystem contains 1M byte of random-access memory. A Fast-Mask Engine can reportedly be upgraded on-site by inserting the subsystem into the engine's cabinet. No changes to the user's programs are required.

The accelerator enhancement costs approximately $45,000, and it will be available in the third quarter of 1985.

More information can be obtained from Silicon Solutions at 1380 Willow Road, Menlo Park, Calif. 94025.

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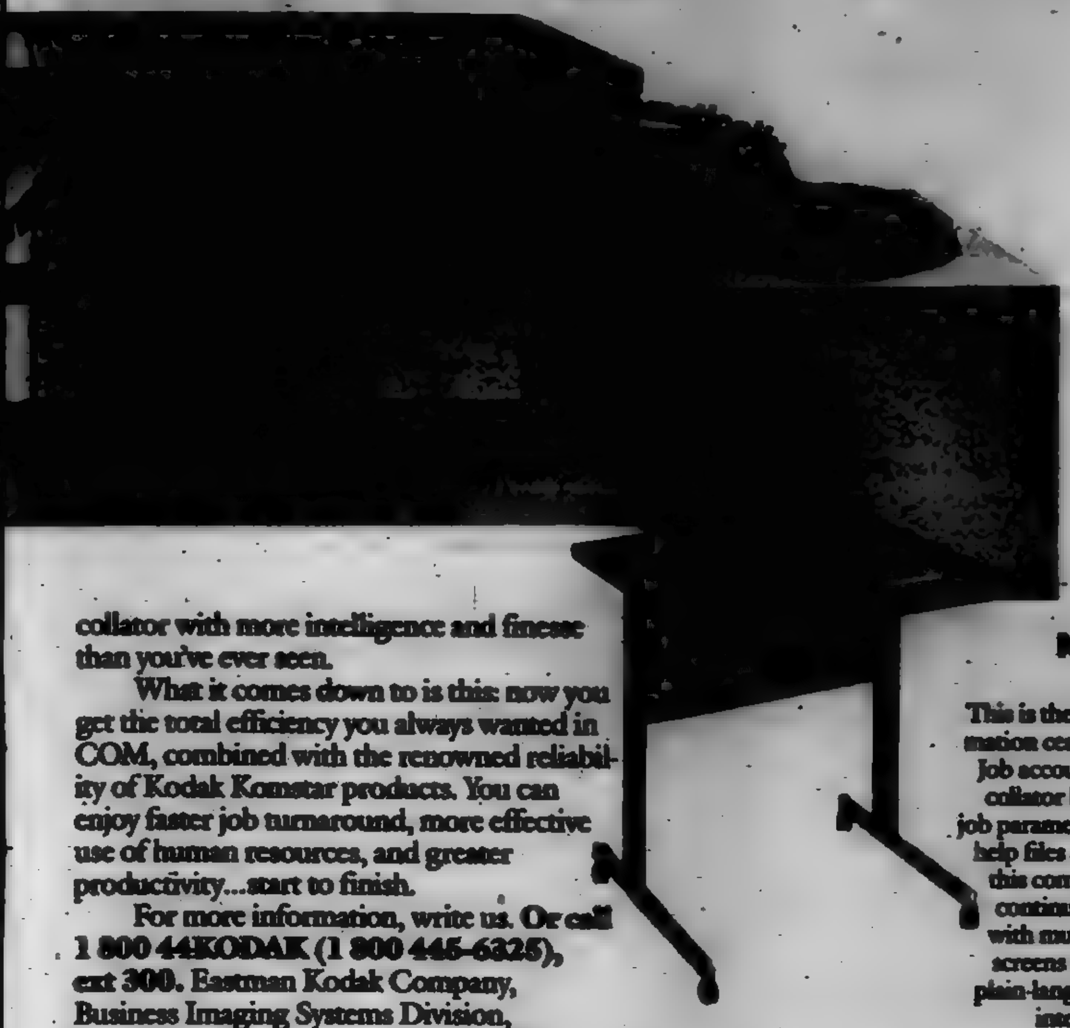

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COMPUTER INDUSTRY

The odyssey of the Microvax II

By Clinton Wilder
CW Staff

HUDSON, Mass. — Several small conference room doors in Digital Equipment Corp.'s semiconductor engineering facility here carry signs saying things like "Gigantic Beanstalk" and "Troll Room." The names are the work of DEC corporate consultant Bob Supnik, a devotee of the computer game "Adventure." Back in the days when he was translating the game into a version for the DEC PDP-11, Supnik decided to rename the rooms after Adventure's more interesting pratfalls.

But for most of the last three years, Supnik and his colleagues have been part of a different kind of adventure. Supnik headed the design team for the 32-bit chip set that drives the Microvax II, the recently unveiled supermicrocomputer that DEC claims has brought VAX-11/780 supermini power to the desktop.

"We had in our minds something that would set the world on fire," Supnik said during a recent interview in the appropriately christened "Treasure Vault" room. "We certainly still think it will."

The odyssey of Microvax II is the story of ambitious computer engineers who enthusiastically bit off more than they could chew and ultimately proved they could digest it. The result was a machine that DEC President Ken Olsen has called "the most exciting, and in many ways, the most significant, product [DEC] has ever developed."

The Microvax journey began quite fitfully in the summer of 1982, after DEC had consulted several external semiconductor vendors on their development cycle estimates for encoding the complex VAX architecture on a thumbnail-size chip. Some people didn't like the answers they were getting, especially Supnik. The memory still arouses the professional pride of the eight-year DEC veteran.

"If we hadn't decided we would make the chip ourselves, they'd be debugging the first pass just about now," he said. "I was absolutely incensed — here were these outsiders telling us how we couldn't get the thing to market in less than 36 months, and some of our people accepted the prognosis.

"I just reached a point where I said it can be done, and I will do it," Supnik continued, tapping his fist lightly but firmly on a table. "And in the great DEC tradition, he who proposes, does."

While Supnik assembled his Microvax chip and floating-point coprocessor chip design teams here, Jesse Lipcon, senior corporate engineer, mustered troops to develop the machine itself at DEC corporate headquarters in nearby Maynard, Mass. All told, less than 40 employees were assigned full-time to the ambitious project.

"We wanted a lean-and-mean team

See SUPNIK page 106

■ Tandon recently announced it had settled patent infringement claims lodged against Sony, and that it will now work on joint development efforts with the Japanese electronics firm
106

■ Intelogic Trace is the name, and servicing equipment is the game as Datapoint moves to fulfill its previously stated intention to spin off its service operations into a new company that will then acquire similar operations of Mohawk Data Sciences
107

■ The computer industry sales slump will apparently not bypass vendors of computer-aided engineering systems; two vendors in this formerly profitable niche recently announced lowered expectations/116

Chip-dumping debate heats up

By Kathleen Burton
CW West Coast Bureau

ANALYSIS

MENLO PARK, Calif. — Allegations of dumping are being hotly disputed in the semiconductor industry these days.

The industry has been reeling from an 80% price drop in 64K-byte and 256K-byte dynamic random-access memory (RAM) products since last August. Now, U.S. and Japanese chip manufacturers are locked in a debate over how those price cuts are justified.

Japanese manufacturers say that efficient production methods and high yields are the key to their lower costs, and that U.S. manufacturers have sparked recent price wars. But U.S. manufacturers claim that the Japanese are the culprits, and a recent petition by Boise, Idaho-based Micron Technology, Inc. asked the U.S. Department of Commerce and the U.S. International Trade Commission (ITC) to arbitrate [CW, July 8].

But some U.S. analysts are unconvinced. "The recent chip-dumping charges are clearly a way for U.S. manufacturers to point a finger during an industry downturn," said Ken McKenzie, a semiconductor analyst at Dataquest, Inc., a San Jose, Calif.-based market research firm. According to McKenzie, selling chips below cost is a common business practice in the industry.

"There's nothing illegal about Japan's chip manufacturers attempting to move inventory at any price, even below cost. Everybody does it," McKenzie said. It is the only strategic decision the Japanese could make, given their ramped-up capacity and today's competitive market conditions, he said.

Representatives from Fujitsu Ltd., Matsushita Electric Corp., Hitachi Ltd. and NEC Corp. claim they are not selling products in the U.S. for less than fair value. They say they can afford to sell more

See DUMP page 117

Court ponders racketeering

By Jeffry Beeler
CW West Coast Bureau

SAN DIEGO — Does a vendor qualify as a racketeering organization and become criminally liable under federal law if it is found guilty in civil cases of defrauding its customers?

That question now faces the 9th U.S. Circuit Court as it ponders a $5.12 million lawsuit that a user in Oklahoma has brought against Burroughs Corp. and a Dallas-based software supplier.

How the court ultimately decides the question may go a long way toward determining how much legal latitude disgruntled users will have in accusing vendors of engaging in racketeering enterprises.

The issue of how strictly federal courts should apply a controversial antiracketeering law lies at the heart of a lawsuit

See RACKET page 115

Slump spurs industry wars

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

One year ago, NCC '84 keynote speaker John Akers, president of IBM, delivered a backhanded rebuke to the media, which he claimed fails to understand the competitive process in the computer industry. The image of the industry as projected through the media, he said, "too often seems to be that of a battlefield, a place of cutthroat competition."

A year later, the industry is down in the dumps, and cutthroat competition is the order of the day.

Not only are U.S. vendors at each others' throats, they are also, to varying degrees, pointing fingers of blame at foreign competitors.

Although few realized it last summer, the semiconductor industry was already on the fast downward track toward a deep depression. Much of the blame has centered on allegations of dumping by Japanese chip manufacturers. But one outstanding fact is that the demand for personal computers was vastly overestimated, and the semiconductor industry, on a worldwide basis, greatly overexpended on new capacity.

The micro disk drive industry was embroiled in controversy last year, and part of the blame can be laid right at the door of IBM. With Big Blue churning out huge num-

See WARS page 114

DEC continues patent suits; files against Emulex for infringement

CONCORD, N.H. — Digital Equipment Corp. recently filed another in a series of recent patent infringement suits against peripheral vendors, charging that Emulex Corp. of Costa Mesa, Calif., used proprietary DEC technology in its DEC-compatible disk controllers.

The suit, filed July 5 in U.S. District Court here, seeks treble damages based on profits DEC allegedly lost to sales of Emulex products. DEC is also requesting an injunction barring Emulex from manufacturing, marketing, selling or distributing the cited products.

The suit charges that Emulex's disk controllers use DEC's patented MSCP port protocol or plug into DEC's patented SBI, Unibus, Q-bus and CMI buses in VAX-11, Microvax and PDP-11 minicomputer systems.

In previous suits, DEC has charged a variety of vendors with infringing upon its patents. "[The Emulex suit] demonstrates the company's longstanding policy and commitment to protect vigorously its innovations resulting from investments in research and development," DEC said in a prepared statement.

In a prepared statement of its own, Emulex said it was not aware of the DEC suit. "We have no direct knowledge of such a suit. We have no comment pending corporate counsel's review and analysis of any complaint which may have been filed," the statement said.

Emulex makes disk and tape controllers, package subsystems for DEC computers, multiplexers and add-on boards for the IBM Personal Computer.

SUPNIK

from page 105

building a lean-and-mean product," Lipcon said. "I have a theory that products reflect their organizations. Big, bloated companies, like IBM, build big, bloated machines. We build distributed systems because we have a distributed engineering organization. This was a project that was not managed by managers. The company just let us clear away management and do the job."

From the beginning, Lipcon drilled his charges on the Microvax II bottom line — the clock. "We had a list of project priorities, and time to market was Nos. 1, 2 and 3," he said. "Price, performance and functionality came later. We knew [Motorola, Inc., National Semiconductor Corp., Intel Corp., Apollo Computer, Inc. and Sun Microsystems, Inc.] were clearly well along with their 32-bit architectures; we weren't arrogant enough to think we were the only ones that could do it. This revolution would happen, with or without us."

Supnik

Competition with chip makers, rather than minicomputer vendors, was a new experience for DEC, Supnik said. "Unlike computer rivals like Data General Corp., [semiconductor manufacturers] pretty much tell you what their plans are and give optimistic target dates," he said. "That absolutely sharpened the company vision and helped everyone focus on the competitive level. [Lipcon] always said we had to assume the worst-case competitive scenario."

Even with time to market as the paramount consideration, Lipcon and Supnik devoted the first two months of the project to selecting their teams. Supnik said the strength of his 30 workers — 20 on the CPU chip, 10 on the floating-point coprocessor — lay not in their glowing resumes but in their ability to rise to the occasion of Microvax II.

"It was not, surprisingly enough, a team of superstars," Supnik said. "The company didn't want to pull away all its top engineers and 'rob Peter to pay Paul.' We simply took talented, bright, enthusiastic people with track records in their areas, and almost everyone had challenges that were new," he said.

Although the Microvax team perfected the chip and brought the product to market well ahead of the original forecasts by outside vendors, the project was not without its snags. In the fall of 1983, Lipcon decided the conceptual design of the Microvax board could not be achieved on the tight project schedule.

"It was just plain too complex," he said. "But we followed what I call the Kiss rule — 'keep it simple, stupid' — and pared it back. The board simply had to be ready when [Supnik's] team finished the chip. In that sense, time to market dictated the design."

In January 1984, Lipcon went through another catharsis when he realized the design schedule of the board's gate arrays was slipping.

"We had to call for help," he said. "Our internal goal [for releasing the Microvax II] had been November 1984. We slipped a quarter or two [during the entire project development], but the competition slipped more."

In the end, however, Microvax II surprised even its designers. Only three debugging passes were required to produce the first batch of working chips. In August 1984, the loading and successful running of the Micro VMS operating system took just 3½ days.

Lipcon said that was the turning point. "I don't think anyone really thought we could do it until last fall, when we started running VMS. People had to understand that it really felt like a [VAX-11/780]. It was a marketing job to get this juggernaut rolling."

DEC chip engineers here are now running batch programs on the Microvax II resting snugly under Supnik's desk. DEC has staked the first claim in the desktop supermini market, and DEC OEMs have greeted the long-awaited Microvax II as a bridge to scores of potential new customers (see story below).

Lipcon

And while DEC's chip foundry here cranks out 32-bit Microvax 78032 microprocessors and Microvax 78132 floating-point chips, Supnik has moved on to new challenges. He isn't even playing "Adventure" on his PDP-11 any more.

"Actually," said the designer of VAX on a chip, "I solved it years ago."

OEMs see Microvax II leveraging lower end of market

The Digital Equipment Corp. Microvax II has been touted as the leading edge of a revolution in CPU downsizing and price reduction that will make superminicomputer power accessible to an array of new users. And no one is awaiting that trend with greater anticipation than the OEMs that tailor their products to DEC VAX systems.

Several OEMs contacted by *Computerworld* agreed that the size and $18,840 entry-level price tag of the Microvax II should help expand their customer bases both within and outside of their current vertical markets.

"We're extremely excited about it," said Tony Glinkokas, director of sales and marketing of PDA Engineering, Inc., a vendor of DEC VMS-based mechanical computer-aided engineering (CAE) software in Santa Ana, Calif. "When you look at the size, power and price, you're looking at bringing computers where they've never been before. We've resisted going into the personal computer world because it takes forever to do a CAE problem [on a micro]. We need 32-bit power and to think there is now a small computer with the power and name of VAX, it's amazing."

PDA does not sell its software packaged with VAX machines, but Glinkokas sees PDA's sales to smaller users expanding if DEC successfully markets the Microvax II to those customers. "It's pretty easy for a smaller engineering company to justify a real engineering tool for the price of a new car or van," he said. "For firms that have been using our software on a [VAX-11/780], the problem is sharing the system with 12 other people. These people want their own little machine."

Glinkokas said the portability of the Microvax II will make his sales calls easier. "I'll put it in the back of a station wagon and take it on [demonstrations]," he said.

According to Len Lazar, president of Zoltech Corp. in Van Nuys, Calif., "customers are coming in from the cold" with inquiries about Zoltech's turnkey computer-aided electronic drafting systems with Microvax II CPUs. "These are people from outside the DEC world, educational users and smaller manufacturers just now looking at some kind of computer facility," Lazar said. "These people had been interested in VAX but could never justify it before at the price. We emphasize [DEC] Q-bus systems — Microvax II allows us to get into the VAX world where previously we were just in the [DEC] PDP-11 [world]."

Most OEMs anticipate a downward expansion within their vertical niches as a result of the new supermicro. "The Microvax II won't bring a new set of customers but a new size of firm," said Bill Payne Jr., manager of systems marketing at Huntsville, Ala.-based Intergraph Corp., a seller of turnkey architectural and electronic computer-aided design systems. "For several years, the trend has been to a reduction in physical size while keeping the same performance. I think that trend will continue."

Computer industry analysts have generally agreed that the Microvax II should boost DEC's OEM and direct sales. But many believe those sales will come at the expense of older DEC VAX products, as buyers shy away from the larger, more expensive minis.

"The VAX-11/730, 750 and 780 are now far off the price/performance slope of today's technology, and the appeal of these machines is now open to serious question," said a recent industry report from International Data Corp., a market research firm in Framingham, Mass. "Until DEC comes up with an aggressively priced two to three [millions of instructions per second] VAX product, system sales in the $100,000 to $400,000 range may falter."

— Clinton Wilder

Disk makers reach accord in patent suit

CHATSWORTH, Calif. — Tandon Corp. and Sony Corp. recently announced the settlement of Tandon's patent infringement suit against Sony, and the two companies also announced plans to develop disk drive products jointly.

Under the terms of the settlement, Sony will pay Tandon an undisclosed amount, including royalties for Sony's sales of 3½-in., double-sided disk drives that allegedly used proprietary Tandon technology. Sony also agreed to allow Tandon the option of using Sony technology in its 3½-in. drives.

In suits filed before the U.S. International Trade Commission (ITC) and a federal court in Los Angeles, Tandon had sought to block U.S. sales of disk drives from Sony and two other Japanese vendors that allegedly infringed on Tandon patents. Tandon's suits against Mitsubishi Corp. and Teac Corp. are still pending, with an ITC hearing scheduled for Aug. 19. Tandon attorney Ray Lupo declined to comment on potential discussions for out-of-court settlements with Mitsubishi and Teac.

Lupo said Sony and Tandon would work jointly to develop a 3½-in. double-sided disk drive with a capacity of more than 1M byte. "The product will be based on technology from both companies," Lupo said.

A favorable May 30 ruling by administrative law judge Sidney Harris in the first phase of the ITC hearing on the patent infringement suit [CW, June 10] spurred negotiations for the recent settlement, Lupo said. "Both companies are very pleased with the settlement," he said.

Lotus files copyright suit against Oregon publisher

BOSTON — Lotus Development Corp. recently announced it has filed a copyright infringement suit against a Portland, Ore.-based publishing company that sells user manuals dealing with Lotus software programs.

Publisher Bob Miller, chief executive officer of Management Information Source, Inc., denied that his company's publications, *The Manual: 1-2-3* and *The Manual: Symphony*, violated any copyrights.

Miller was not surprised by the suit, and in fact, his company has in recent weeks bought advertising space to promote what it describes in the advertisement as, "The book Lotus wants stopped."

Lotus charged that the publications "plagiarize extensively from the text of both Lotus training manuals," and the company has asked for a permanent injunction to halt distribution of Management Information Source's books.

Miller said he was surprised that Lotus announced the suit because it was filed more than two weeks before the announcement and included a request to bar Miller from talking about the dispute.

Lotus, according to Miller, has a weak case because the organization of his manuals is different from the manuals that Lotus provides with its software packages. Miller said his company made a nonfinancial settlement offer to Lotus prior to the announcement and has not received an answer.

Miller said he offered a settlement because of the expense in fighting a copyright battle.

Lotus has aggressively pursued copyright charges in the past year, obtaining injunctions or consent orders against three companies that it charged had copied the actual software.

Most recently, Lotus said Mueller Co. of Decatur, Ill., agreed to a settlement that acknowledged that a Mueller employee duplicated and distributed Lotus software, but that prior to the December 1984 filing of the suit, Mueller management had discovered the problem and taken corrective measures.

Datapoint OKs separate service firm

SAN ANTONIO — The board of directors of Datapoint Corp. recently approved the previously announced conversion of the company's U.S. customer service division into a separate corporate entity.

The new public company, Intelogic Trace, Inc., will be fully owned by Datapoint shareholders. Current stockholders will receive one share of the subsidiary for each share of Datapoint common stock owned; previously released plans call for the new operation to absorb the service division of Mohawk Data Sciences Corp. The new company will represent all the assets and business of the domestic service organization.

The reorganization is subject to a favorable ruling from the Internal Revenue Service or corporate counsel's opinion that the move is free from taxation. The record and distribution date for the spin-off will be announced by Datapoint in the near future.

John Hale, former executive vice-president of Datapoint, was named president of the new company. Datapoint Chairman Asher B. Edelman was named chairman of the new company.

Intelogic Trace, according to statements mailed to shareholders, will commence operations with about 2,000 employees, assets of $76.1 million and liabilities of $26.7 million. Revenue of the service operation for the nine months ended April 27 was $118.6 million.

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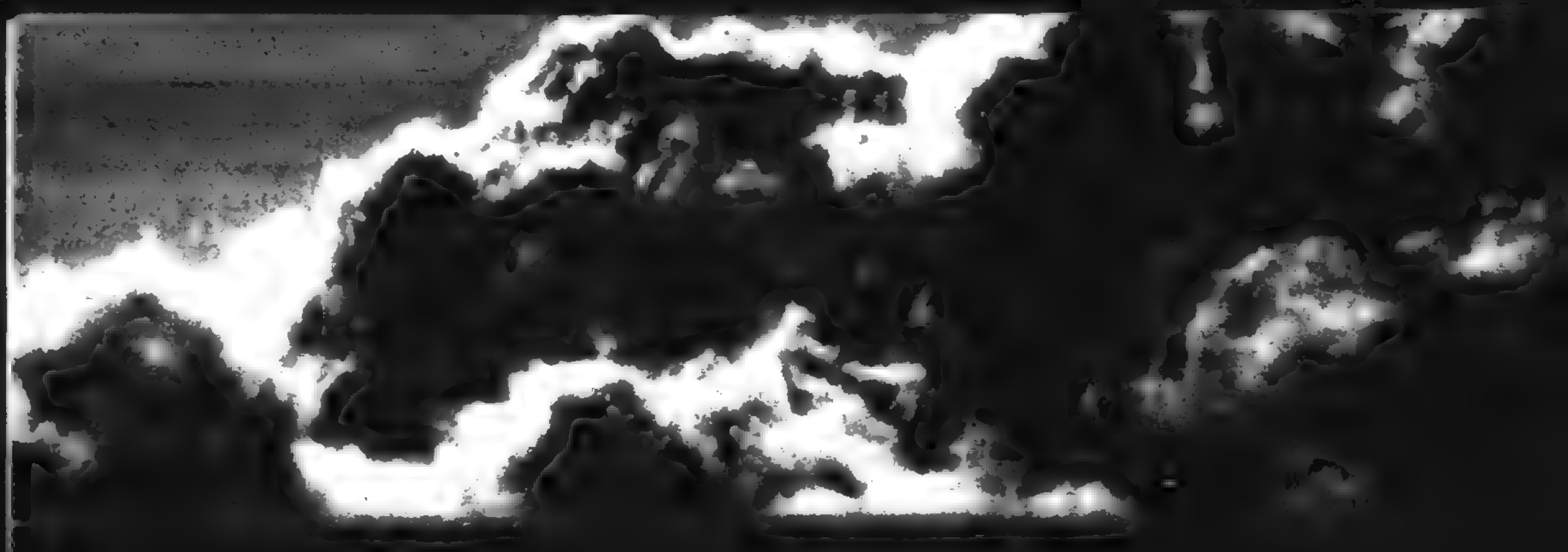

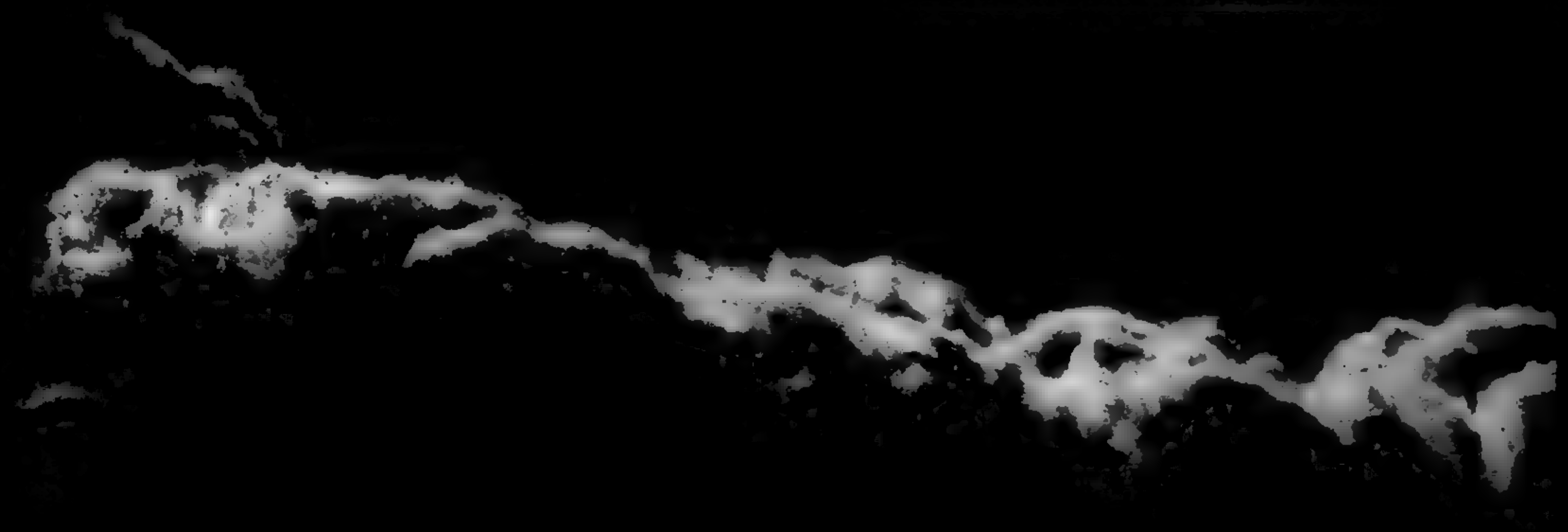

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CONTROL DATA

COMPUTER INDUSTRY

Xebec plans plant closing, consolidation

SAN JOSE, Calif. — Disk drive manufacturer Xebec, Inc. said recently it will close one plant and consolidate other operations due to an expected loss for the quarter ended June 30.

The company said that worldwide net sales for the quarter just ended were about 30% below the previous quarter's sales, which were $45 million.

The decline was due to a softening of demand and changes in customer demand, Xebec said.

Cost-cutting measures being implemented by the company include the closing of the Xebec East manufacturing facility in Pennsylvania and the consolidation of the operations of two subsidiaries, Information Memories Corp. and Dastek.

Another cost-saving step will be the elimination of two corporate vice-presidential functions, Xebec said.

Additionally, the company said it is considering possible write-downs. These include reserves for shutdown costs of certain facilities, write-downs of fixed assets and intangibles acquired from Datapoint Corp. and adjustment of inventories.

Sperry to resell TI system as part of planned AI line

BLUE BELL, Penn. — Sperry Corp. recently announced it signed a three-year contract to purchase Texas Instruments, Inc. Explorer systems to be resold as part of Sperry's Knowledge System product line.

Sperry said it will probably purchase more than $42 million of the TI hardware and software systems over the life of the contact.

The workstation is the first of a planned line of artificial intelligence/expert system products that Sperry intends to offer. Sperry said it will market the workstation with Knowledge Engineering Environment software developed by Intellicorp.

"Artificial intelligence and expert systems are the next echelon in computer evolution and offer dramatic opportunities, especially for a systems-based company like Sperry," said Larry L. Walker, director of Sperry's Knowledge Systems Center in Bloomington, Minn.

The company said it is currently developing 26 expert systems environments and employs more than 150 people working to make commercially viable expert systems products.

Slump spreads to CAE mart

SAN JOSE, Calif. — Two vendors of computer-aided engineering (CAE) systems recently indicated that the slump in computer systems sales has spread to dampen one of the fastest growing market niches.

Valid Logic Systems, Inc., headquartered here, said it laid off about 40 employees from its work force and has scheduled a two-week production shutdown during August.

Mentor Graphics Corp., based in Beavertown, Ore., said it expects second-quarter results to show no growth in profits over the year-earlier period. The company expects sales to be about the same as those in the first quarter of this year.

Both companies cited slow spending rates by customers. "Our customers' business is soft right now, [and] that softness is reflected in Valid's current order rate," said Jared Anderson, chairman of Valid Logic. Anderson said the company will remain profitable but that second-quarter revenue is expected to show no increase over the first quarter.

Trilogy, Elxsi sign merger agreement

CUPERTINO, Calif. — Trilogy Ltd. and Elxsi International recently announced they had signed a definitive merger agreement, formalizing an earlier agreement in principle.

Under the terms of the agreement, Trilogy will issue or reserve for issuance approximately 36 million shares of Trilogy stock to Elxsi security holders. The agreement is subject to approval by Elxsi shareholders and certain regulatory approvals and would provide Elxsi shareholders with slightly less than 50% of the outstanding shares in Trilogy.

Elxsi will operate as a wholly owned subsidiary of Trilogy when the merger is consummated.

In addition, Trilogy said it has agreed to advance certain loans to Elxsi pending completion of the merger, which is expected within three months. Trilogy advanced $5 million to Elxsi in March.

Elxsi is a privately held manufacturer of multiprocessor computer systems designed for engineering and scientific applications. Trilogy was founded by Gene Amdahl to develop wafer-scale integration semiconductors and a large-scale IBM-compatible computer.

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For instance, if you're an airline, hotel, or any other company involved in the travel business,

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Bell Atlantic subsidiary signs leasing pact

PARAMUS, N.J. — Tricontinental Leasing Corp., a subsidiary of Bell Atlantic Corp., recently signed a $100 million joint venture agreement with Forsythe/McArthur Associates, Inc., a privately held computer leasing company headquartered in Skokie, Ill.

The move marks the first venture by the Bell Atlantic subsidiary to gain a share of the lucrative third-party market for IBM mainframe computers and peripherals.

Richard A. Forsythe, president of Forsythe/McArthur, said his firm will provide the marketing and administrative services in the venture and that Tricontinental will provide the financing. The company is regarded as one of the largest privately held companies involved in leasing IBM equipment.

Holding title to 10,000 IBM units

Forsythe/McArthur is currently holding title to approximately 10,000 large IBM computers. It operates from seven regional offices in the U.S.

According to Forsythe, the firm "needed financial muscle" to expand operations in leases involving top-of-the-line IBM 3080 series and the new 3090 mainframes and peripheral equipment.

The Illinois firm will write the leases financed by the venture, and Tricontinental will take title to the equipment through a purchase lease-back arrangement.

ITC as impetus

Forsythe said the impetus for the agreement is the federal Investment Tax Credit (ITC) that will accrue to Tricontinental.

If the U.S. Congress members approve President Reagan's tax reform proposal, and it eliminates the ITC, Forsythe said, "it would dramatically impact if not eliminate the venture."

However, Forsythe noted, "We seem to have lost a little steam for tax reform," and it now appears unlikely that the proposal will be approved before January.

Cipher Data cuts work force

SAN DIEGO — Storage tape drive manufacturer Cipher Data Products, Inc. recently announced cost-cutting measures, including a reduction of its domestic work force by about 13%.

Don M. Muller, chairman, president and chief executive officer, said the sluggishness of the U.S. economy and the minicomputer industry prompted the move.

"It's our view that the economic conditions and current industry slowdown will be with us for several more months, and these actions are appropriate to prevent further erosion to fiscal 1986 financial expectations," Muller said.

WARS

from page 105

bers of desktop devices, it has doled out contracts that could more than double the production runs of some small manufacturers. And just as quickly as it blessed these essentially one-product vendors, IBM could cave in the ceiling by canceling and taking its benefits elsewhere.

Although it is unclear whether the strength of the U.S. dollar or a cutback in consumption caused the slump, it does seem certain that IBM's unabated flood of products has not eased the problem. Just ask Wang Laboratories, Inc. if cutthroat competition is loose in the land.

Take personal computers . . . please! We all know what happened to those vendors foolish enough to believe that they could build on a supposed industry standard. IBM is more than happy to see the entire industry dependent on Microsoft, Inc.'s MS-DOS operating system, but developing a standard I/O system to massage the software brings lawsuits from IBM.

So now that every personal computer is tied to the whims of IBM, the elephant has everyone scared that it really can dance. With the large variety of IBM Personal Computer versions already out, rumors are emanating that PC2 is going to change the rules.

Well, even IBM is not immune to the problems that are plaguing all other players in the industry. No longer propped up by rental income, IBM is facing problems of foreign competition, a strong dollar and weakened demand. It shelved the PCjr, saw the Sierra cut into 3080 series sales and has watched the demand for departmental processing systems dry up.

But IBM is big enough to weather any storm. It can cut equipment prices to the bone and raise the rental fees on software. IBM can ride out a year of adversity because it knows it will be around to catch the next wave of prosperity. A lot of others don't have that kind of cushion.

The innately skeptical might be excused if they think that IBM is not unhappy to see the playing board cleared of some clutter. Some open spaces might give IBM a little more room to position its chess pieces more tightly around AT&T's king. These skeptics might think not that the role of competition is overplayed, but rather that the media is too much in awe of the emperor's new clothes.

HOW
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When it comes to planning an office environment; you probably think about work spaces in terms of squares and rectangles. In other words, shapes with 90 degree corners. Up until now, this way of thinking seemed natural and correct. Since most rooms, desks and office furniture had familiar right-angles, these shapes appeared to work...pretty well. The time has come, however, to change your thinking about space planning by considering another familiar shape... the circle. At Center Core we have used the circle to create workstations that put more people into the same space and, provide more work surface per person. These workstations offer you the simplicity of conventional desks, the privacy and attractiveness of systems furniture—plus, the flexibility and human engineered benefits of ergonomic design. The Center Core concept was the first to group up to six individual workstations around a clear space, or core. This core is extremely functional because it eliminates complicated wire management schemes. Other significant Center Core concept benefits include: Cost Efficiency. Our workstations save up to 40% in floor space and increase primary work surface up to 75% over conventional systems. Aesthetics. Our core concept eliminates visual clutter because all major wiring is out of sight. Also, a wide choice of fabric coverings and wood finishes make Center Core workstations warm and inviting. Flexibility. With our designs you get maximum utilization of available space. Our workstations can be adapted to changes in job functions without your having to buy additional components. Accessibility. With Center Core, both primary and secondary work surfaces are within easy reach. And, most overhead storage falls within the primary work area. When you think about these benefits, then you're thinking Center Core. Once you do, you will never think about conventional systems furniture again. And, that's how we're running circles around our competition. Call us for the Center Core distributor or dealer nearest you. Or, write for more information: Center Core Incorporated, 250 Corporate Court, So. Plainfield, New Jersey 07080. 1-800-433-4304.

CENTERCORE

RACKET

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that Madison J. Bowers has filed against Burroughs and CCH Computax Systems, Inc., a software developer. In addition to alleging breach of contract and misrepresentation, the Tulsa-based provider of tax consulting and accounting services has accused the two defendants of violating the federal Racketeer Influenced and Corrupt Organizations (Rico) Act.

As legal justification for claiming Rico Act violations, Bowers and his San Diego-based attorney, William Woods, cited a prior complaint in which Burroughs was found to have fraudulently marketed a B series system. In Bowers' view such a judgment helps fulfill the legal requirements for prosecution under the Rico Act, which specifies at least two indictable acts of fraud or comparable offenses within 10 years, Woods said.

Both Burroughs and CCH, however, dispute the plaintiff's argument that fraud judgments in civil matters qualify as criminal violations of the Rico Act.

"As a matter of law, [Bowers' contention] is insufficient to state a claim under the Rico statutes," Burroughs attorney Albert F. Shamash said. "If the [opposing side's] theory is sustained, every time a company is involved in a civil case and a judgment is entered on a fraud cause of action, the defendant can somehow be construed as engaging in a racketeering activity. So far as I know, no court has interpreted [the Rico Act] to that extent."

As to the issue of which interpretation of the Rico Act — Bowers' or Burroughs' — is correct, the law itself provides no clear-cut answers. The Act's language, particularly its use of the ambiguous phrase "indictable acts," raises questions about how broadly racketeering statutes were meant to be applied.

Burroughs, through its legal counsel, interprets the law quite narrowly and takes indictable acts to mean convictions. Such a reading would preclude an aggrieved buyer from using prior civil judgments as a basis for suing a vendor under the Rico Act.

Liberal interpretation of law

Bowers, by contrast, has adopted a comparatively liberal interpretation of the federal law and wants Rico Act applicability widened to include any prosecutable fraud, Woods said.

Because both Bowers and Burroughs can cite judicial precedents to support their respective viewpoints, neither interpretation of the Rico Act is universally recognized as valid.

The legal community had been anticipating a definitive ruling this year from the U.S. Supreme Court on the applicability of the Rico statute to business fraud. Lawyers who oppose such application have argued that Congress drafted the law to penalize organized crime elements and that the spreading use of Rico Act claims to win triple damages awards from legitimate business enterprises is too broad an interpretation of the law. The Supreme Court early this month rejected limits set last year by a federal appeals court in New York and instead said it is up to Congress to set any limitations.

So for the time being, the battle to clarify the Rico Act's exact meaning and scope will continue to be fought at the U.S. circuit court level.

As expected, Bowers and Burroughs differ sharply in their opinion of how the outcome of their legal dispute will affect similar cases in the future. If the 9th U. S. Circuit Court sides with Bowers and interprets the Rico Act broadly, "computer companies and other companies will find themselves facing these kinds of racketeering allegations more often," Shamash predicted.

Woods, on the other hand, foresees just the opposite effect. A 9th Circuit endorsement of his liberal Rico Act theory would enable federal courts to clear their dockets by creating a legal basis for dismissing all racketeering claims that are unsupported by at least two prior judgments for fraud. At a time when Rico Act allegations are becoming pandemic, many courts are increasingly trying to rid themselves of frivolous racketeering cases, Woods said.

Except for its unusual interpretation of the Rico Act, Bowers' legal action is almost indistinguishable from a thousand other customer complaints against vendors: During a recent phone interview, Bowers accused Burroughs and CCH of working together to sell him a B92-based accounting system that they knew would be inadequate for his needs.

Asked to respond to the charge, Shamash absolved Burroughs' hardware of any responsibility for Bowers' alleged problems and denied the existence of a formal marketing arrangement with CCH.

Phaser seeks debt shelter

SAN FRANCISCO — Phaser Systems, Inc., a microcomputer software development company, recently filed for protection from creditors under Chapter 11 of the U.S. Bankruptcy Act.

Phaser, a developer of business-oriented software systems, reported assets of $425,891 and debts of almost $2 million.

The company is publicly held and has about 480 shareholders.

Phaser said its principal assets are software products designed to enhance programmer productivity and enable micro-mainframe networking.

The company said it hopes to file a plan for reorganization that will permit further product development and sales.

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NICKELS AND DIMES

Mentor Graphics Corp. reported revenue for the first quarter ended March 31 of $32.3 million, compared with $14.5 million in the comparable period a year ago. Profits were $3 million, or 22 cents per share, compared with $1.5 million, or 12 cents per share, in the first quarter one year ago.

■

Western Digital Corp. announced revenue for the third quarter ended March 31 of $40.7 million, compared with $27.5 million a year ago. Profits were $3.1 million, or 16 cents per share, compared with $1.7 million, or 11 cents per share, in the same quarter one year ago.

■

Xidex Corp. reported revenue for the three months ended March 31 of $73.4 million, compared with $46.5 million in the same quarter last year. Profits were $5 million, or 16 cents per share, compared with $7.3 million, or 31 cents per share, in the same period a year ago.

■

Ramtek Corp. announced revenue for the third quarter ended March 31 of $12.3 million, compared with $8.8 million in the comparable period a year ago. The company reported a net income of $165,000, or 5 cents per share, compared with a net loss of $976,000, or 28 cents per share, in the like period last year.

■

Altos Computer Systems, Inc. reported revenue for the third quarter ended March 30 of $30.7 million, compared with $25.9 million one year ago. Profits were $2.7 million, or 15 cents per share, down from $3 million, or 20 cents per share, in the like quarter a year ago.

■

Computer Task Group, Inc. announced revenue for the first quarter ended March 31 of $26 million, a 50% increase compared with $17.3 million in the like period a year ago. Profits were $773,000, or 36 cents per share, compared with $357,000, or 17 cents per share, in the same period a year ago.

■

ISC Systems Corp. announced revenue for the quarter ended March 28 of $37.9 million, compared with $34.7 million for the same period a year ago. Profits were $2.2 million, or 15 cents per share, compared with $3 million, or 20 cents per share, for the same quarter in the previous year.

■

Automatic Data Processing, Inc. announced revenue for the third quarter ended March 31 of $373.5 million, compared with $334.9 million a year ago. Profits were $36.1 million, or 73 cents per share, compared with $3.1 million, or 65 cents per share, reported one year ago.

■

Applied Data Research, Inc. reported revenue for the three months ended March 31 of $34.3 million, up 59% from $21.5 million in the same period a year earlier. Profits were $566,000, or 10 cents per share, compared with $328,000, or 6 cents per share, in the corresponding period last year.

DUMP

from page 105

cheaply than U.S. chip vendors because of more efficient production methods and higher yield rates.

"Micron has no facts," asserted Ken Shimba, a spokesman for Matsushita. "We always pay attention to dumping margins and set the U.S. prices at a higher level than our domestic prices," he said.

According to Harry McGrath, a spokesman for Hitachi, Micron is trying to scapegoat the Japanese because its own business strategy has backfired. Micron is seriously undercapitalized and cannot compete against Japanese conglomerates and other semiconductor giants, he said.

U.S. chip makers' response

Predictably, U.S. chip makers disagree. "When prices drop 50% to 80% in six months' time, you know there's more at work than normal cost declines," said Larry Grant, general counsel for Micron. According to Grant, the Japanese are dumping memory chips here to gain market share and discourage Korean manufacturers from entering the fray.

Grant denied that Micron led the price wars. Although the company cut its 64K-byte dynamic RAM prices from $2.50 to $1.85 last fall, prices have plummeted since then. Now, 64K-byte products are selling at 50 cents to 75 cents, and the Japanese are to blame, he said.

The dumping allegations will be difficult to prove, said Sheila Sandow, an analyst with the Semiconductor Industry Association, a trade organization in Cupertino, Calif. The Japanese cost of chip production is not publicly available. And even with a cost model being put together by the Commerce Department, yields and volume are still difficult to compute because the Japanese are vertically integrated and often recycle chips internally, Sandow said.

According to Sandow, the real problem is Japan's protected chip market. The Japanese increased capacity 30% over the past eight months, resulting in a surge in exports to the U.S., predatory pricing and dumping, she said.

Ultimately, the Commerce Department and the ITC may have to choose between limiting foreign companies' business ventures in the U.S. or sacrificing U.S. semiconductor profits. If it comes down to tariffs, quotas and other protectionist policies, it could open a no-holds-barred trade war where nobody wins.

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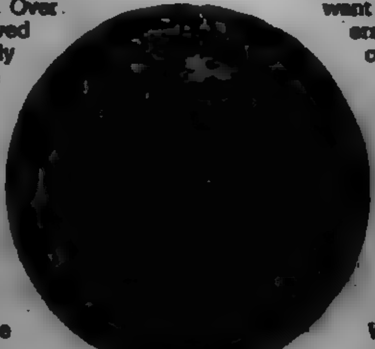

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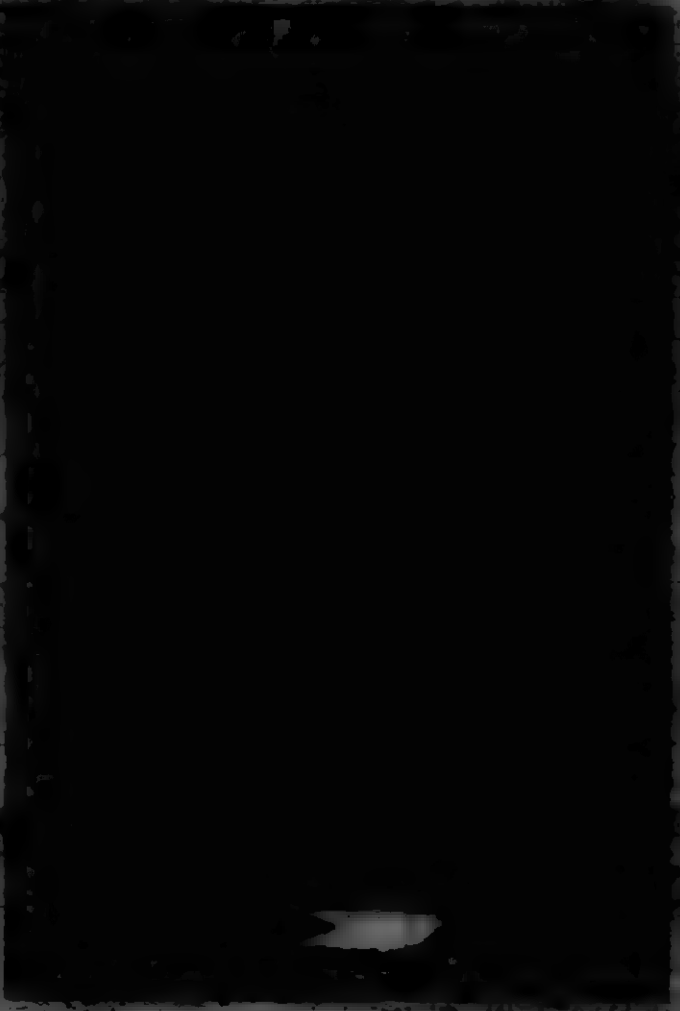

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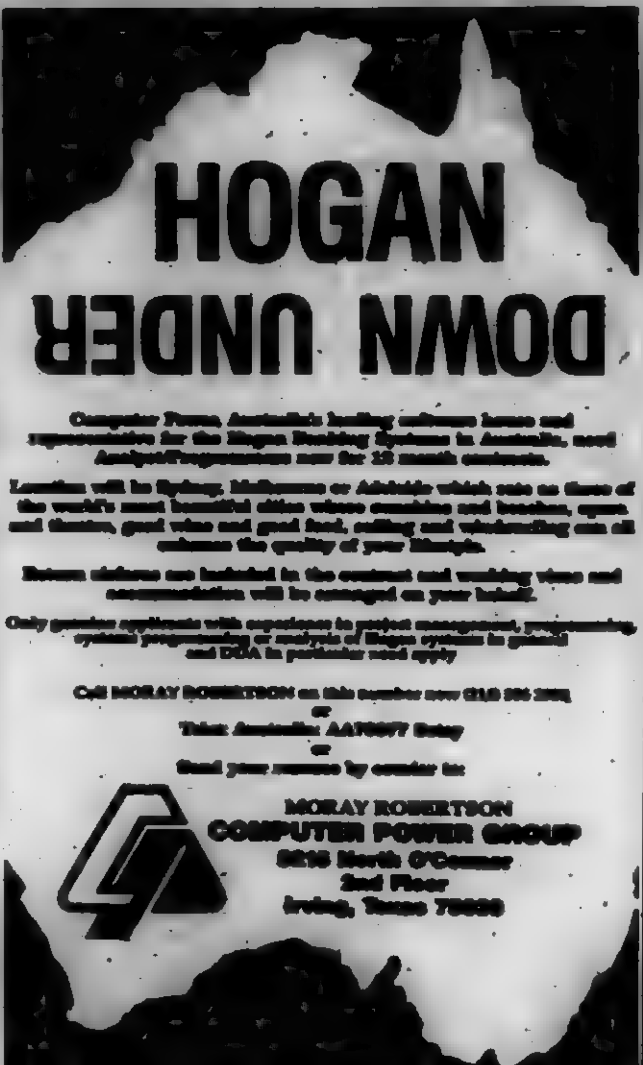

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Ten years EDP experience with primary focus in end user computing and office systems networking.

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This challenging position will involve installing, maintaining and testing procedures and systems as well as consulting with corporate users on problem identification and resolution. A BS/BA in Computer Science or equivalent experience is required along with at least 1 year of systems programming on a Sperry 1100 and excellent communication skills. A background in 1100 O.S. EXEC, 1100 TIP/CMS, and MASM or ASM Assembler is highly desirable.

At Quill, productivity and creativity earn rewards and recognition. We provide an excellent salary and benefits package in addition to growth potential with an industry leader. For consideration, please send your resume, including salary history, in confidence to: Personnel Dept. 7161, Quill Corporation, 100 S. Schelter Road, Lincolnshire, IL 60069. Equal Opportunity Employer.

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Environment:

Hardware: HP 3000/3
2 X HP 3000/68
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Software: COBOL, IMAGE, VIEW, SPL, QUIZ, QUICK, QTP, FORTRAN, IDSI, TDS, GMAP

Project Team Leader

Reporting to the Systems & Programming Manager, the Project Team Leader/Senior Analyst will have responsibility for controlling, Coordinating quality reviewing of all projects assigned to the Programming Team.

The main tasks associated with the position are:

- Assessing the feasibility and effectiveness of proposed systems
- Examining and developing alternative approaches for optimum resolution
- Developing Project specification, estimating resource requirements, time schedules & cost estimates
- Co-ordinating and controlling the activities of all team members to ensure adherence to established procedures and schedules
- Preparing and presenting project status reports on a regular basis
- Providing technical guidance to all team members
- Responsibility for training Saudi-Nationals assigned to the team

A Bachelor's Degree, combined with 8 years data processing experience, including 3 years in Systems Analysis and a minimum of one year Project Management experience in a large scale organization is required. In addition, more than 4 years experience with Hewlett-Packard equipment and must be proficient in COBOL, SPL, VIEW, IMAGE, VPLUS as well as QUICK, QTP and QUIZ.

Senior Programming Analyst

This position calls for in-depth experience with a high degree of knowledge relative to the development and on-going maintenance of application systems in a HP 3000 environment. The Senior Programmer Analyst will be responsible for designing and implementing solutions to complex application problems and the provision of technical guidance and training of other computer staff.

Should have at least 6 years experience in computer programming with high proficiency in the COBOL Language. Background should include training and experience with VIEW, IMAGE and VPLUS. Knowledge of QUIZ, QUICK and QTP would be a plus.

Programmer/Analyst

Reporting to the Project Team Leader, the Programmer Analyst will be involved in writing and testing source code according to specifications and established standards. You will also assist in preparing detailed programming specifications and related support documentation.

Must have a minimum of 3 years Hewlett-Packard experience, including COBOL, VIEW, IMAGE, VPLUS. Experience with QUICK, QUIZ and QTP would be a plus.

Clinical Laboratory Programmer/Analyst

The Clinical Laboratory Programmer/Analyst will assist in the direct support of the MEDLAB PATHLAB product.

Reporting to the Clinical Laboratory Programming Team Leader, you will be responsible for the support and modification of vendor-supplied software, bug-fixes, etc., and the coding and testing of specialized application programs, all written in the FORTRAN language.

Applicant must have minimum of 4 years data processing experience, with at least 2 years of FORTRAN programming. Experience with Clinical Laboratory systems a definite advantage.

Computer Operations Shift Leader

Responsible for a shift consisting of two operators. Candidates should have minimum of 4 years experience working with HP 3000, including at least 2 years as Senior Operator, be able to demonstrate sound supervisory experience, the ability to communicate at all levels and have indepth JCL knowledge, experience with HP 3000 utilities such as Editor, TDP, DBUTIL, Adager would be positive factor.

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This person will work on generation and optimization of 370 object code produced by a C compiler. This person must have in-depth knowledge of IBM 370 architecture, instruction set and object code, as well as extensive knowledge of assembler or object code level debugging on a 370 architecture mainframe under any operating system. A bachelor's degree or equivalent experience and the ability to work well with other programmers investigating suspected code problems are required. Knowledge of C is a plus.

Manager of Hardware Support
This person will manage the Hardware Support Department, which specifies, installs, monitors, and maintains data, voice, emergency power, and security hardware for the Data Center and SAS Institute. This person must be able to manage people with diverse technical knowledge and skills, prepare and interpret specifications, analyze bids, prepare reports, and maintain records. A degree in engineering or a related field, or the equivalent in directly related work experience is required. Applicants must have two years' experience in data processing; one year's experience in a supervisory capacity; and experience in several of the following areas: data communications, voice communications, LANs, security systems, power systems and switchgear, electronic troubleshooting, construction planning, and project management. A working knowledge of SAS software is desirable.

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This person will license SAS software to current and new sites using telemarketing. A minimal amount of travel is required. A bachelor's degree, thorough knowledge of the SAS System or related software, two years' sales experience, and excellent interpersonal skills are required. Experience with data base management systems, preferably SYSTEM 2000 DBMS, is a significant plus.

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This person will provide primary support to users with software installation, SAS supervisor-level problem investigation, I/O interface, and utility procedures usage. Applicants must have two years' extensive SAS programming experience; one year's experience in a VMS environment; knowledge of VMS DCL programming; and familiarity with VMS system quotas and parameters. A bachelor's degree and prior technical support experience are preferred. PL/I, C, and VMS macro programming experience is a plus.

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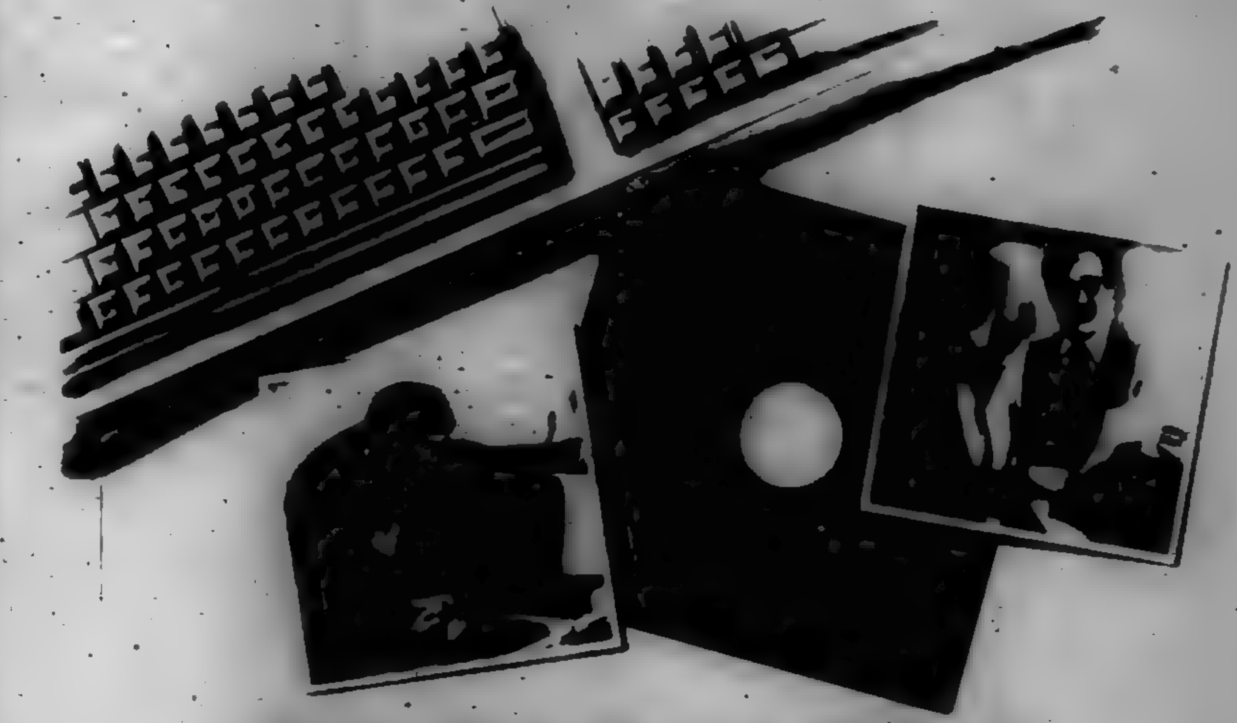

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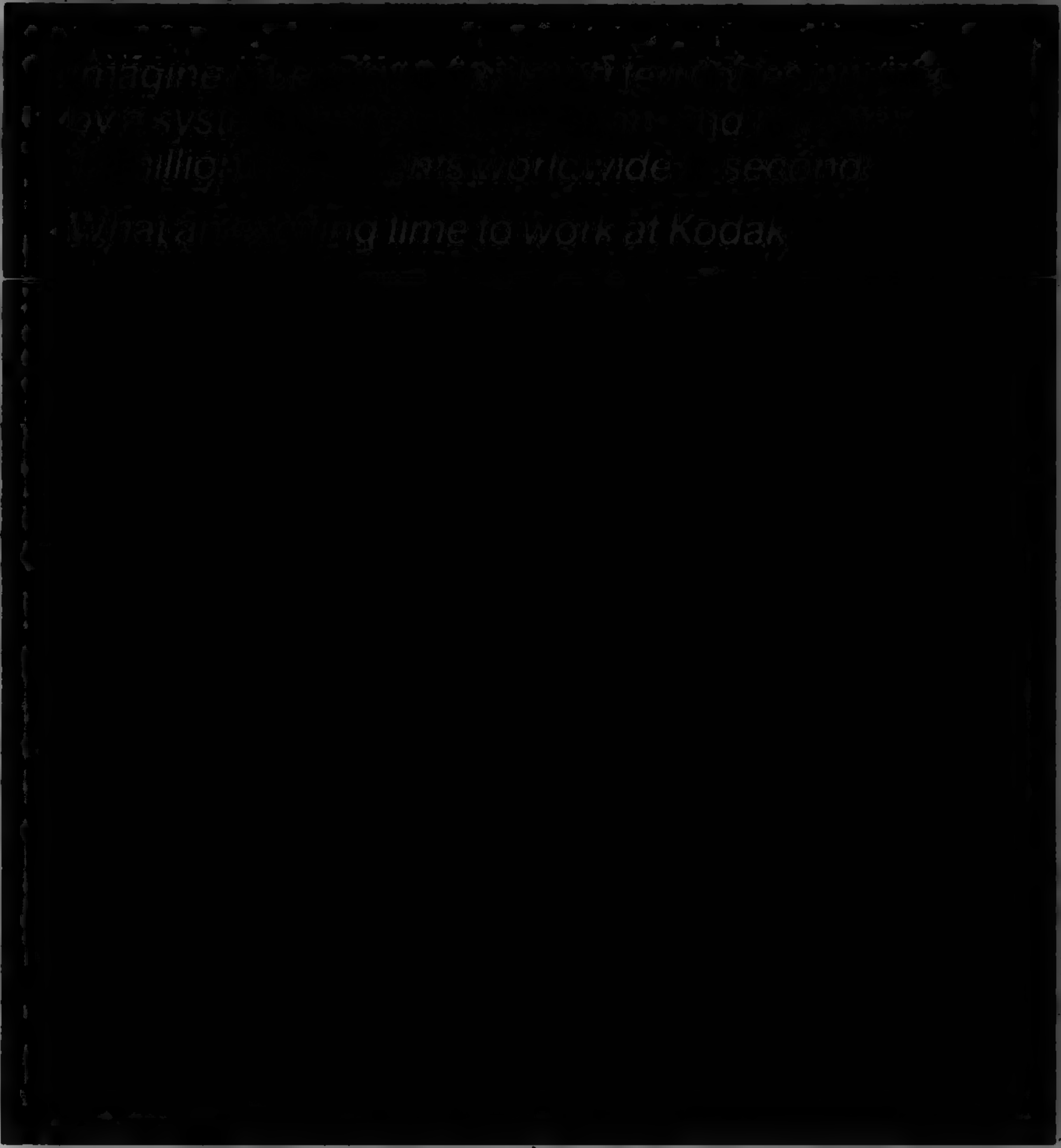
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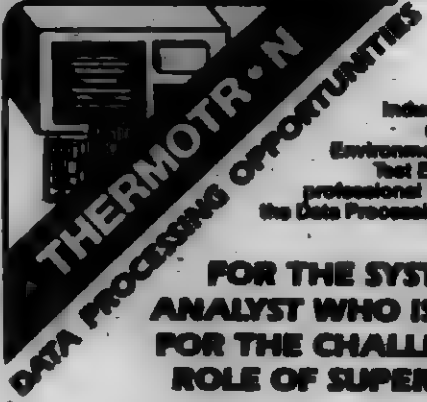

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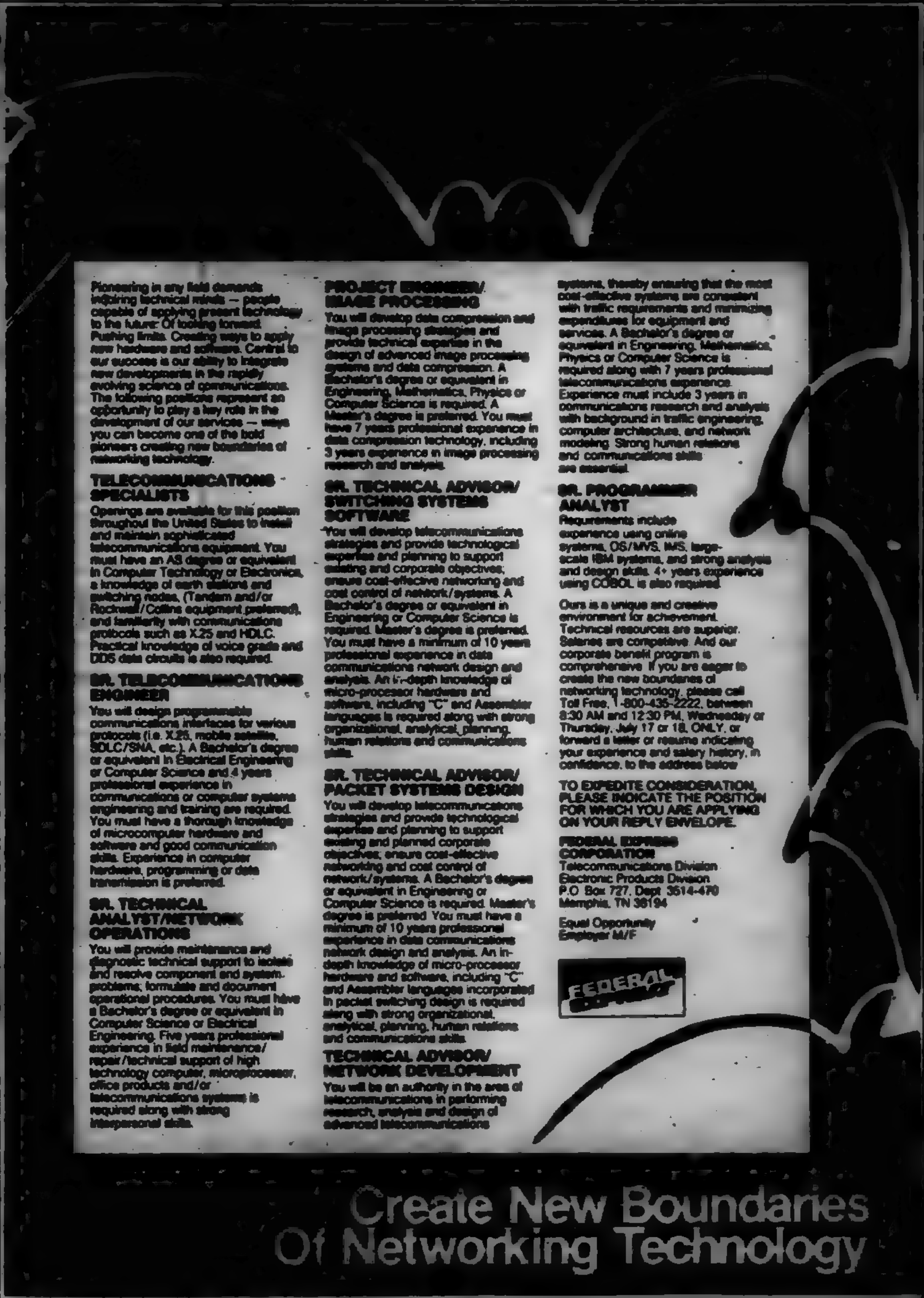

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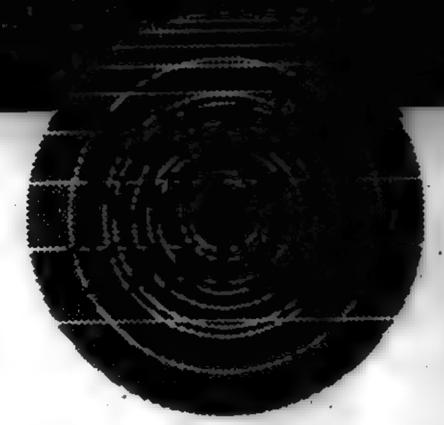

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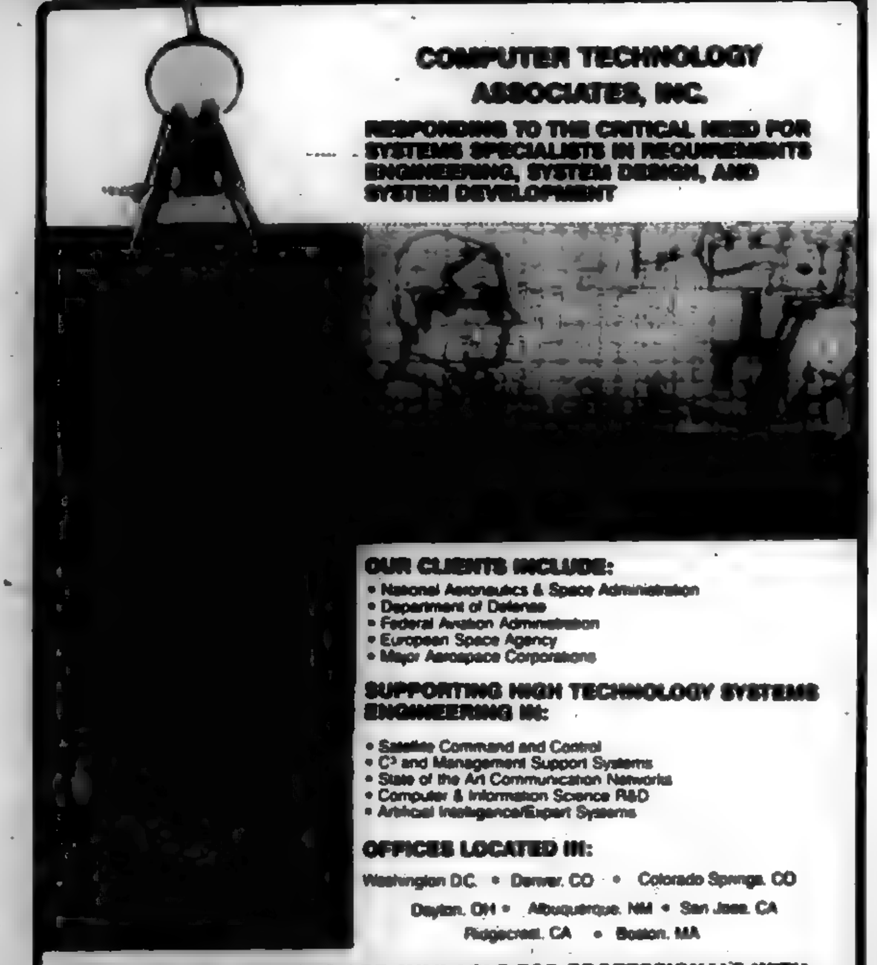

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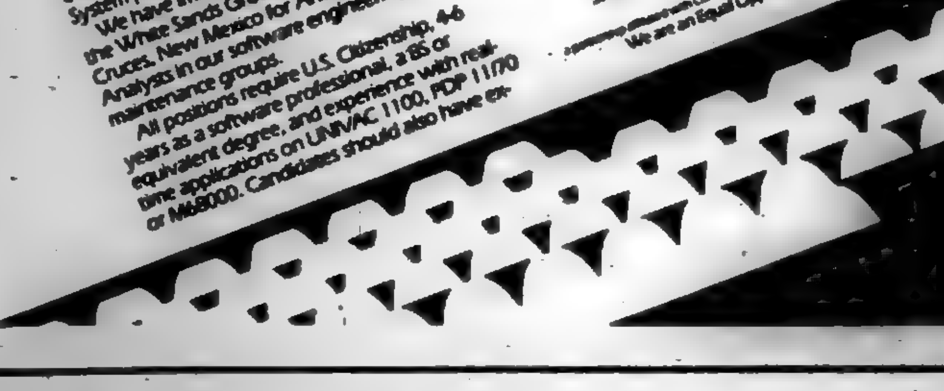

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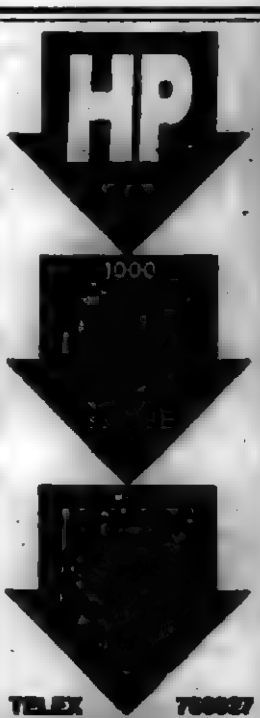

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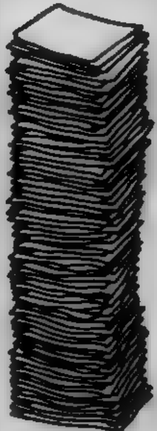

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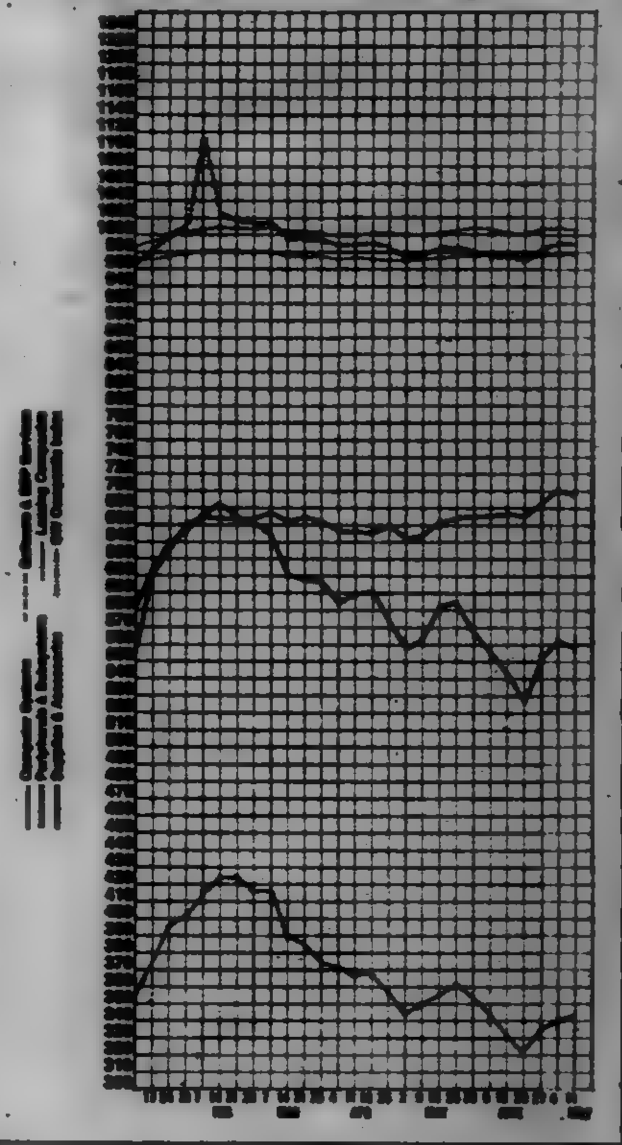
Computerworld Stock Trading Index



Computerworld Stock Trading Summary

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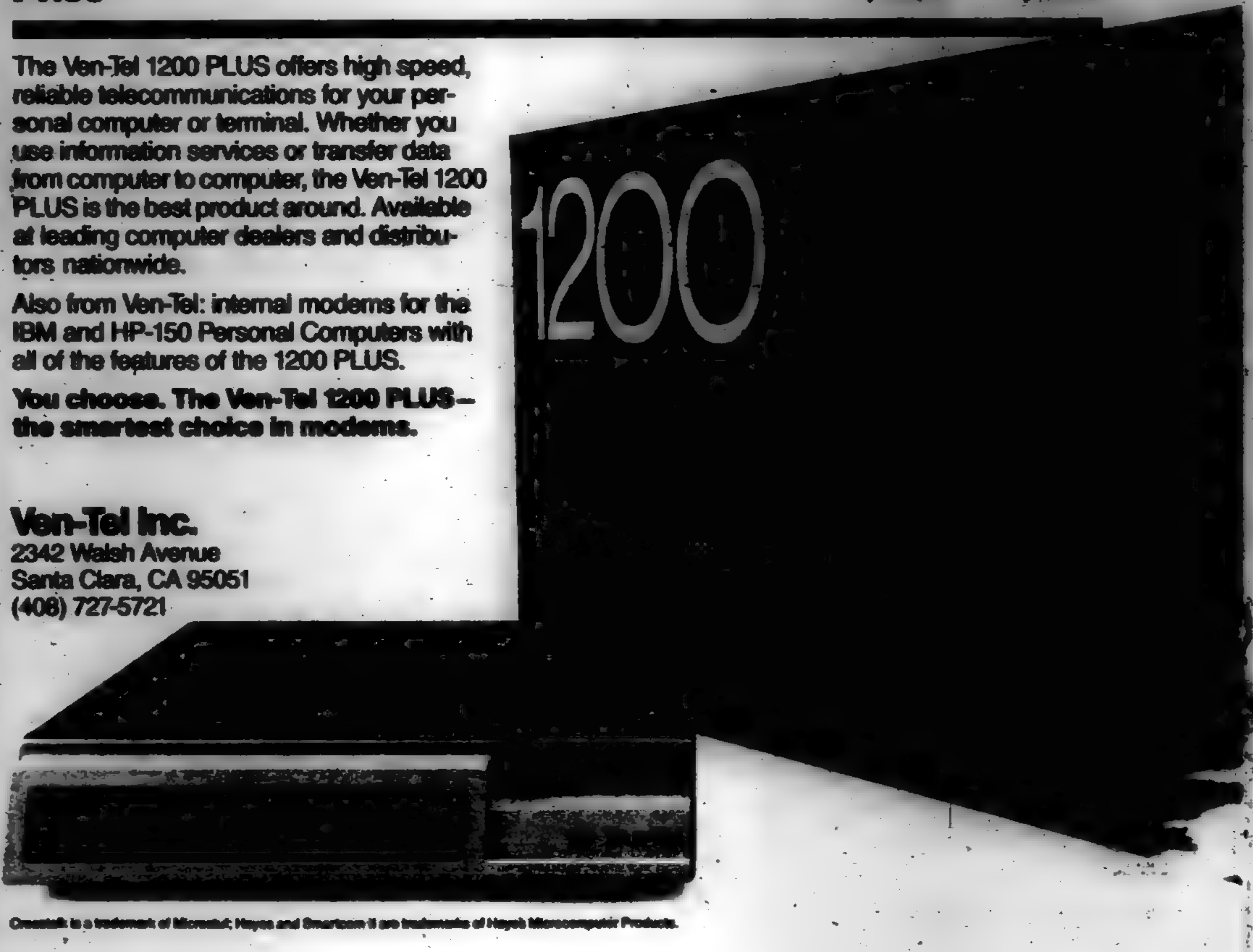

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COMPUTERWORLD

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NCC '85: Big crowds, little action

By Kathleen Sullivan
CW West Coast Bureau

CHICAGO — Although the 1985 National Computer Conference here attracted 8,000 more attendees than last year's show, it will leave behind an otherwise undistinguished record. Since few companies chose this city as the backdrop for product introductions, the show lacked the excitement of previous NCCs.

When asked to comment on their impressions of NCC '85, visitors interviewed by *Computerworld* gave the show — both the exhibits and the technical seminars — mixed reviews. NCC lacked excitement, many said. Though some visitors gave the technical seminars high marks, others complained that the quality of the presentations was uneven.

Vendors registered a different set of complaints, centering on their dealings with the city's trade unions (see story page 6). Representatives from several firms told stories of mishandled equipment, damaged computer systems and abrasive contact with union members.

Yet a spokesman for the American Federation of Information Processing Societies, Inc., the prime sponsor of the show, said that, in his estimation, exhibitors were pleased overall with NCC '85. "The reaction to this year's NCC has been more positive than I've seen in years," said Donald G. Dowd, NCC '85 communications chairman.

Dowd said the show's increased attendance could be interpreted as an optimis-

See NCC page 8

A bird's-eye view of the NCC '85 show floor at McCormick Place

Wang to offer bridge to IBM?

By John Desmond
CW Staff

LOWELL, Mass. — Wang Laboratories, Inc. here has developed products that allow the IBM Personal Computer to run Wang Word Processing and the IBM Personal Computer to link to Wang VS minicomputers, according to Wang internal documents obtained by *Computerworld*.

Wang Word Processing for the IBM Personal Computer would include a Wang keyboard and software for a price of $695.

See WANG page 4

Slump snares mainframe makers

By Peter Bartolik
and Clinton Wilder
CW Staff

Evidence of the continuing computer industry slump was in sharp focus last week as IBM and four of the five Bunch mainframe vendors reported second-quarter profit declines. Sperry Corp. was the three-month period's lone winner, posting a 23% earnings gain over its results from one year ago.

IBM reported that second-quarter profits were down almost 13% from the year-earlier quarter, as revenue growth continued at the dismal pace set in the first quarter. Results from the four other Bunch companies showed that profits declined by 5.6% at Burroughs Corp.; 13% at NCR Corp.; 84% at Control Data Corp., with a $24.9 million operating loss from computer sales; and 29% at Honeywell, Inc.

IBM's financial results for the first six months of the year reflected the dramatic downturn that has thrown the industry into turmoil following two years of overall record growth.

Although much of this year's financial adversity was attributed to the strength of the U.S. dollar abroad, IBM said it estimated that if currency rates had equaled those of the first half of 1984, the company's

See RESULTS page 4

Poll shows mini mart saturated

Sales drop-off attributed to heavy 1984 purchases

By Tom Henkel
CW Staff

DELRAN, N.J. — For mini and superminicomputer vendors wondering why their products have suffered a sales drop-off recently, the answer may rest in the heavy sales of the past year.

[redacted]

A recent survey conducted here by Datapro Research Corp. of 1,702 minicomputer users revealed that most of these users replaced an older system during the past 11 months. A Datapro survey of mainframe users [CW, July 15] turned up similar results. The mainframe users said the average age of their systems was less than 10 months.

By contrast, when surveyed by Datapro on the same question last year, minicomputer and mainframe users said their then-current systems averaged slightly more than 40 months old.

On the whole, the minicomputer users polled this year said they were more pleased with their systems now than they were last year. This conclusion is derived from Datapro's "overall satisfaction" category, a composite score based on several factors, including ease of operation, reliability, vendor services and vendor-supplied software. Most minicomputer vendors included in the 1985 Datapro survey showed a moderate improvement in overall user satisfaction. Some, like Harris Corp. and Honeywell, Inc., showed significant improvements.

Asked whether their systems fulfilled expectations, 85.9% of the mini users polled by Datapro said that they did. But as with the survey's overall satisfaction rating, most vendors' scores showed lit-

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TOP OF THE NEWS

The U.S. Navy is scrutinizing its computerized inventory control system following the arrests of five people charged with diverting stolen jet fighter parts to Iran. Page 2.

■

Net results. Apple lost $17 million in the second quarter as its revenue plummeted nearly $50 million from last year's figure. Page 4.

■

Communications standards are crucial to the future of networking, but NCC-goers view the short-term implications critically. Page 8.

■

Seek and ye shall not find. They're trying all sorts of ways to provide end-user access to mainframe data, but DP managers are finding there is no perfect solution. Page 10.

■

Can the Macintosh make it in the corporate world? Some NCC attendees think it might. Page 12.

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NEWSPAPER

Stolen parts spur Navy probe

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Navy last week began conducting a head-to-toe investigation of its computerized inventory control system in the Naval Supply Systems Command, following the arrests of five individuals who were charged with diverting to Iran stolen weapons systems parts for F-14 aircraft.

U.S. Customs Service special agent John Hensley said last week, "We don't know how they did it. We were afraid during the investigation to push up inquiries into the [computerized inventory] system because we were afraid we would tip them off. We are really in the dark."

Meanwhile, the Naval Investigative Service was busy beginning a more thorough effort to establish the trail used by four Filipino nationals and an Iranian living in England. The Iranian allegedly stole the parts for F-14 aircraft and smuggled them to Iran in containers identifying them as medical supplies and auto parts.

> *'We don't know how they did it. . . . We were afraid we would tip them off. We are really in the dark.'*
>
> — John Hensley
> U.S. Customs Service

The ring was broken by Federal Bureau of Investigation, Customs Service, Navy and U.S Department of Justice investigators who were supposedly tipped off to its existence last fall during a routine audit of exports leaving the U.S.

Last week, Navy officials in Washington, D.C., were unavailable for comment on the security, level of personnel access and the architecture of the computerized inventory control system used by the Naval Supply Systems Command.

"We just don't want to comment on this until we are able to find out more about what happened on the [aircraft carrier *USS Kitty Hawk*] and in San Diego," a Navy spokesman said.

Meanwhile, Winston Kuehl, regional director of the Naval Investigative Service, shed some light on the difficulty that investigators faced trying to determine how the stolen-parts ring operated.

"It is logical to assume that since there is a highly computerized system in operation — the standard supply system for the Navy is computerized — that they were using it in some fashion," Kuehl said.

He said the investigators accumulated a lot of information during the breakup of the ring that is still being pieced together.

No clue as to how parts were removed from system

"We have no certainty to conclude how the parts were getting out of the system. We don't know if they were ordering parts up on the system and then diverting them or just taking parts from existing inventory or as they came in," according to Kuehl.

Kuehl said the Navy "was not in the position to check its system inventory to see if parts were missing. We can't say whether or not the parts were listed as missing." He added that the existing inventory control system was not an integrated one but rather a system of collateral parts that served particular functions.

One of three San Diego residents arrested was a Navy enlisted man, Baluyat Cayabyab, 36, working on board the *Kitty Hawk*. A second was a civilian, Pedro Manansala Quito, 60, employed by the Navy at its Air Logistics center in San Diego where aircraft engines were reworked; a third, Franklin Pangilinian Agustin, 47, ran an insurance business.

The two others arrested were Edgardo Pangilinian Agustin, 45, of Jamaica, N.Y., brother of Franklin Agustin; and an unidentified Iranian national living in England. Court papers identified Saeid Asefi Inanlou, 36, of Middlesex, England, as communicating with the other four.

The stolen-parts smuggling ring was traced back to San Diego through Virginia, New York and London.

Navy officials said they have also traced stolen parts from the aircraft carriers *USS Carl Vinson* and *USS Ranger* and indicated there may be more persons involved in the ring.

"We think they were a bunch of thieves. Their motivation was money," said Quintin Villanueva, Customs Service regional commissioner.

NEWS SUMMARY

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Ramblings from the floor of the 1985 National Computer Conference:

■ William Steele, Sytek, Inc.'s OEM Programs director, borrowed a page from political science to explain why he does not expect a major role for diskless personal computers on local-area networks.

Networked diskless micros will not fly if DP uses them in an attempt to return to a highly centralized computing environment, Steele said. In his view, users will no longer accept overly centralized computing plans, which share many defects with socialist centralized economic plans. "You have your five-year plans, which never work, and you have your annual crop failures," he explained.

■ IBM has changed its stripes — pinstripes, that is. It seems the company's attempt to shuck the image of being stodgy and bureaucratic was reflected in the attire of Big Blue's booth personnel. There was not a three-piece men's blue pinstripe suit or women's two-piece navy ensemble on any of the 30 or so booth attendants. In fact, light-colored suits with brightly colored ties, penny loafers (cordovan colored, no less) and open-toed women's shoes were the dress of the day. And the presentations at the booth, clearly one of the busiest on the floor, were lighter and breezier than we have seen at other shows. It makes us wonder what they did with all that pinstripe wool.

■ Televideo Systems, Inc. is expected to announce a laser printer in time for the Comdex/Fall '85 show, but the machine will not use the popular Canon USA engine. According to a Televideo source, "Canon has a very poor price-performance factor." Canon's engine has a frequency of repair problems, the source said, adding, "We are looking at several Japanese manufacturers of better laser engines."

■ At the press conference introduction of its new and enhanced Control:Manufacturing and Control:Financial applications, Cincom Systems, Inc. also announced that it intends to develop specific versions of those manufacturing/financial systems for the aerospace and defense industries. Cincom President Dennis Yablonsky said the targeted industries represent a massive marketplace that no vendor is adequately addressing.

Cincom also said that, as a result of its recently penned joint marketing agreement with Digital Equipment Corp., it is currently at work on a VAX-compatible version of its Netmaster network control software.

The company also announced that it is developing general ledger and order entry packages for its Business Control System line and will likely be introducing them within the upcoming year.

■ Nonprofit organizations that got free countertop space from the American Federation of Information Processing Societies, Inc. (Afips) in past years were out of luck this year. Afips — reportedly annoyed that some of those countertops were left unattended and became messy — made it a rule that only Afips-affiliated organizations could have the countertops for free. The rest of the organizations had to purchase space — an option some of those organizations could not afford.

■ In the "best-laid-plans-go-awry" category, the 12- by 12-ft frog used by Charles River Data Systems, Inc. was not able to sit atop his customary pad this time. The giant amphibian would not clear the ceiling over the booth he usually sits on, so Afips gave him his own floor space this time around. This was the frog's second unseating, the first occurring in January of 1984 at the Federal Computer Convention in Washington, D.C. There, the frog was relegated to the lawn and got snowed on, according to one of his keepers in the booth.

■ The burning man who demonstrates halon gas in the Fenwal, Inc. booth was accompanied again this year by magician Denny Rourke of Omaha. Rourke claimed to make about 50% of his earnings per year by working magic for trade show crowds.

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Apple cites reorganization costs in first losing quarter

By Clinton Wilder
CW Staff

CUPERTINO, Calif. — Apple Computer, Inc.'s recent layoffs and consolidation moves struck the bottom line last week as the microcomputer vendor reported a $17.2 million loss in the third quarter ended June 30. The results reflected by far the worst period in Apple's 8¼-year history, and it was the company's first losing quarter since it went public in 1980.

Apple attributed the 28-cent-per-share loss to a $40.3 million expense from its dramatic reorganization, plant closings and four-figure layoffs during the quarter. One year ago, the company earned profits of $18.3 million, or 30 cents per share.

Apple's revenue of $374.9 million for the three months represented an 11% drop from the year-earlier quarter and a 14% decline from the first quarter of 1985. The company said it had modest operating profits before taxes of $3.5 million, compared with $28.3 million one year ago. A tax write-off of $16.6 million helped cushion the reorganization and consolidation costs.

Apple President and Chief Executive Officer John Sculley said the firm has successfully lowered its break-even point and increased its cash reserve by 31% to $254.6 million during the quarter. "While it's difficult to predict how long the pause in the computer industry will last, we are confident that Apple is positioned to take advantage of future growth," he said.

Lloyd Cohen, an analyst at International Data Corp. of Framingham, Mass., attributed Apple's loss to its failure to crack the business market with the Macintosh. "Having [Lotus Development Corp.'s] Jazz come out as late as it did caused a severe impact on [its] earnings," he said. "No matter what they say, unless you can get into the business market, you can't survive in the long run."

WANG

from page 1

Wang Office Connection, priced at $1,200, would offer a Wang Systems Networking (WSN) card and WSN software, in addition to Wang WP for the IBM Personal Computer.

Internal debate caused delays?

A Wang spokesman made no comment on the products and would neither confirm nor deny that they exist. A spokesman for a Wang user magazine said internal debates are delaying the products since they represent a change in Wang's strategy of competing head-to-head with IBM, rather than marketing IBM-compatible products.

Wang WP for the IBM Personal Computer would provide users with a modified version of the Wang WP Version 2.5, including such functions as glossary, math, merge/print, sort and a spelling verifier with a 66,000-word vocabulary. The product would provide the IBM Personal Computer and Wang Professional Computer with compatible disk formats. Wang software would not work on IBM Personal Computers without Wang's modified version of the universal keyboard, the documents indicated.

Wang Office Connection with the WNS card and software would allow users to link IBM Personal Computers to a Wang VS for file transfer and remote logon. To a VS, the IBM Personal Computer would look like a remote Wang 2256/C VS/DP workstation.

'Strategically shifting gears'

Wang previously announced the WSN card option for the IBM Personal Computer in 1984 for a price of $1,850 [CW, June 18], but a Wang spokesman said the product was never delivered. "Strategically, we are shifting gears" on the WSN card, the spokesman said, adding, "To talk about that strategy would be premature." The Wang user magazine spokesman suggested that the Wang Office Connection product is a competitively priced enhanced WSN card for the IBM Personal Computer, bundled with the Wang WP software and keyboard.

The WSN card would fit into any expansion slot on the IBM Personal Computer and would run either point-to-point or multipoint communications. It would support transmission speeds of 1,200 bit/sec. to 9.6K bit/sec. The VS would have to be equipped with appropriate VS software, communications controller hardware and Version 6.2 or greater of the VS operating system, the documents indicated.

The two communications services offered by Wang Office Connection would be VS Remote Logon and Bidirectional File Transfer. VS Remote Logon would provide the VS with DP capabilities, including access to Wang Office, the company's series of office automation applications.

The Bidirectional File Transfer product would allow binary file transfer between the IBM Personal Computer and the Wang VS. IBM PC-DOS files could be sent to the VS for storage, and VS print files could be sent to the IBM Personal Computer for printing. Documents created on the IBM Personal Computer with Wang Word Processing could be transferred to a VS.

Both packages would work on an IBM Personal Computer with two diskette drives or on an IBM Personal Computer XT with one disk drive and a hard disk. A minimum of 256K bytes of memory and PC-DOS 2 or higher would be required. The products would support monochrome and color monitors.

Products not supported by the Wang products would be the IBM Personal Computer AT, 3270 Personal Computer, PCjr and all IBM compatibles.

According to Vincent Flanders, associate editor of *Online Data-Access*, a magazine for Wang users based in Austin, Texas, internal bickering at Wang is continuing about whether or not to announce the products, even though the company is geared up to produce them. "Some people are questioning it because they're afraid it'll cut into sales of their own [Professional Computer] and Wang Office Assistant," the company's low-cost word processor, he said.

RESULTS

from page 1

profits would still have declined by more than 7%. The six-month profits of $2.4 billion, or $3.91 per share, were off 15% from the $2.82 billion, or $4.62 per share, reported in the first half of 1984.

Second-quarter profits were $1.41 billion, or $2.30 per share, compared with year-earlier profits of $1.62 billion, or $2.65 per share. Revenue for the quarter was $11.43 billion, up 2.1% from $11.2 billion a year ago. For the six-month period, revenue increased only 2% to $21.2 billion from the first six months of 1984.

IBM President John F. Akers said the company is pleased with orders for its 3090 mainframe, and it has been able to push up shipments into the third quarter for a number of customers.

At NCR, second-quarter profits were $66.6 million, or 67 cents per share, down 13% from $76.2 million, or 73 cents per share, a year earlier. Per-share profits were down only 8% because of the company's stock repurchase programs. Revenue for the quarter was $1.03 billion, up 3% from $998.8 million a year earlier.

Honeywell's second-quarter profits indicated a rapid reversal of its first-quarter results, when the company went against the grain of the spreading industry slump with a 16% profit increase on revenue that increased by 7.5%.

In the second quarter, revenue was $1.55 billion, a 5.3% increase over $1.47 billion in the year-earlier quarter. Profits for the quarter ended June 30 were $52.5 million, or $1.14 per share, compared with $74.3 million, or $1.59 per share, a year earlier.

Honeywell said operating profits were below year-earlier levels in three of its divisions, and the fourth division, aerospace and defense, was even with the pace of a year ago.

Sperry went against the tide of adverse mainframe company financial results, reporting that computer sales offset declines in other areas to push first-quarter profits to $51.5 million, or 91 cents per share. Those results were up 23% over year-earlier profits, excluding the write-down of its investment in Trilogy Ltd.

Sperry's first-quarter profits were actually up 156% from an unusually low quarter one year earlier, when it posted profits of $20.1 million, or 37 cents per share. Without the write-down of the Trilogy investment, profits for the earlier quarter would have been $41.9 million, or 77 cents per share.

The company's revenue for the quarter just ended was $1.42 billion, up 20% from $1.87 billion a year earlier. However, these results were in comparison to a very low quarter. In the preceding two quarters, Sperry reported revenue of $1.45 billion for the third quarter of fiscal year 1985 and $1.79 billion for the fourth quarter; profits were $61.2 million and $105.9 million, respectively.

Gerald G. Probst, chairman and chief executive officer of Sperry, said the company's commercial computer business experienced continued strong performance, while the defense and aerospace and farm equipment businesses were below plan.

Burroughs' revenue posted a scant 1.1% gain from $1.21 billion a year ago to $1.23 billion in the last quarter. Burroughs Chairman W. Michael Blumenthal called the results "somewhat better than expected," considering the industry slowdown.

Profits of the Detroit-based company dipped 5.6% from $57.3 million in the year-earlier quarter to $54.1 million. Per-share earnings fell 7 cents from $1.26 to $1.19 per share.

CDC said profits plummeted from $23.4 million, or 60 cents per share, in the like quarter in 1984, to $3.8 million, or 16 cents per share. CDC revenue remained flat at $1.26 billion.

The Minneapolis firm said it lost $29.4 million in its computer sales before an extraordinary gain of $12 million from the sale of its on-line financial transaction service and other assets. CDC's losses were cushioned by a successful quarter for its financial services unit, Commercial Credit Co.

Also last week, AT&T reported that second-quarter revenue, after the deduction of access charges paid to local telephone companies, declined slightly from the year-earlier level. Profits for the quarter were up just more than 1%, although year-earlier profits were inflated by access costs that did not show up until the third quarter of 1984.

AT&T said second-quarter revenue, after deducting access charges, was $8.55 billion, down slightly from $8.58 billion a year earlier. Profits were $461 million, or 41 cents per share, compared with year-earlier profits of $455 million, or 43 cents per share.

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NCC '85 exhibitor turnout mirrors industry downturn

By Paul Korzeniowski
CW Staff

CHICAGO — Just as a number of hardware and software vendors are doing, the National Computer Conference (NCC) tightened its belt this year.

"The computer industry is in a cyclic phase of consolidation," noted Arnold Smith, chairman of the NCC committee, in an interview at last week's conference.

A by-product of the consolidation is that approximately 100 fewer companies exhibited at this year's show than at last year's show. The number of exhibitors this year is similar to 1981 and 1982 levels — significantly less than those for 1983 and 1984.

Some large companies like Digital Equipment Corp. and Wang Laboratories, Inc. did not attend this year's show. Smith claimed that their absence will not affect future shows. "Attendees come to see products from a number of companies — not from just one vendor," he claimed.

Despite this year's downturn, Smith predicted that the number of exhibitors at next year's show will increase by at least 10%. "My gut feeling, which comes from predictions by companies like IBM, is that the industry will pick up at the beginning of next year," the chairman forecast.

An upturn may prompt the return of traditional participants. "We have been in contact with companies that dropped out of NCC this year, and none have ruled out the possibility of returning next year," Smith said. "Most were faced with financial problems this year." The chairman claimed that this year more than 180 companies representing a broad range of industries were participating at NCC for the first time.

> *"My gut feeling . . . is that the industry will pick up at the beginning of next year."*
>
> — Arnold Smith
> NCC committee

Smith ruled out a number of reasons for the decrease in the number of exhibitors. Some participants have stated that the show should not be scheduled in July. "Some people have complained about the show being run in the summer," he said. "Others think it is a good idea because they can schedule their vacations and bring their families with them to the show."

Despite Smith's assertion, the American Federation of Information Processing Societies, Inc. is attempting to schedule the conference so it will be held in early June. Through 1990, the show will alternate between Las Vegas and Chicago sites. "Convention centers such as [Anaheim, Calif.] and New York are too small to hold the conference," the chairman noted.

All of the Las Vegas shows are scheduled for early June, according to Smith. The 1987 Chicago show is also slated for June, but other Chicago shows are scheduled for July. "We are trying to reschedule all the July Chicago shows," he said. "We would like to move them to May, but we have a better chance of having them moved to sometime in June."

ITT announces applications processor units

CHICAGO — ITT has introduced an applications processor aimed at providing local processing capabilities to users of IBM 3270 workstations or voice/data private branch exchanges.

Two models of the unit were announced here. The Model 1, which includes a 20M-byte fixed media disk drive, costs $18,500. The Model II includes one 60M-byte fixed media disk drive and one 60M-byte tape subsystem. It costs $24,000.

Both models come with Microsoft Corp.'s Xenix operating system, a 1.2M-byte floppy disk drive, one Centronics Data Computer Corp.-compatible parallel printer port, one RS-232C asynchronous terminal port and one device adapter that will support eight coaxial cable-attached devices. The unit reportedly accommodates from 1M to 13M bytes of main memory.

The applications processor is said to give users of the firm's 9200 series display stations the option of either communicating on-line with an IBM 3270 or using the local processing power of the applications processor. Programmers' code can compile and run programs locally, without having to access the host processor. Once a program is complete, it can be uploaded to the host, the company said.

ITT is located at 1515 W. 14th St., Tempe, Ariz. 85281.

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NCC exhibitors frustrated by union setup hassles

By Charles Babcock
CW New York Bureau

CHICAGO — National Computer Conference (NCC) exhibitors said Chicago is their kind of town for a trade show, but many said they have come to loathe dealing with the trade unions that dominate the city's McCormick Place.

Some said they are thinking about not coming back.

"You have to have these big, hulking people, who don't know anything about electronics, moving things around," said an irritated exhibit manager for a large laser printer firm, referring to the Teamsters union riggers.

"A forklift operator dropped our Astra 300 minicomputer, which we needed to run half our exhibit, and ruined it," said Laurel Dutcher, show coordinator for NEC Information Systems, Inc. Because the machines are custom-made, NEC had no backup model in the U.S. and had to assemble another in Japan quickly.

The wood panels that frame the Britton-Lee, Inc. display were gouged in several places during installation, and five minutes before the show opened, an improperly installed fuse cap blew, robbing Britton-Lee's exhibit of power, according to David L. Britton, the firm's president.

A forklift operator carrying *Computerworld's* 14 Digital Equipment Corp. Rainbows "drove into a wall," tumbling the micros from the top of the load and breaking two of them, the newspaper's Operations Manager Jeff Pennett said. Some of those that work have parts rattling around inside them, he said.

Mishaps at trade shows not uncommon

Stories about freight mishaps are not uncommon at a major trade show, and exhibitors arrived knowing that all work was supposed to be done by $23.50-per-hour riggers, $34.25-per-hour carpenters and other skilled laborers.

But many complained that the work was done more poorly than during NCC's previous visit to Chicago two years ago, and union representatives were abrasive about following work-expanding contracts.

"This little guy with a yellow pad went around telling everybody [that] you need a union man to do anything," said Judy A. Diaz, marketing manager for Oracle Corp.

"We couldn't plug in our own machines," complained one exhibitor, and another said three electricians spent hours studying his complicated audiovisual system before accepting the exhibitor's guidance on how to connect the wires. The Charles River Data Systems, Inc. exhibit in Ray Schoessling Hall was charged $50 to plug in its inflatable frog.

[illegible]

Three union workers assemble one chair.

Joseph Hannon, president of the Chicago Convention and Tourism Bureau and managing director of McCormick Place, referred the exhibitors' complaints to aides. Those aides referred questions to Rick Dobson, exhibition manager for the American Federation of Information Processing Societies, Inc., who was unavailable for comment before press time.

"They really take their time, kibitzing and everything," said Oracle's Diaz about the union laborers at McCormick Place. "We asked them why they couldn't speed up, and they said, 'Why hurry? Your company just writes off the expense.' I feel like I'm being robbed from both pockets," she said.

At a printer exhibit, carpenters assembled wooden steps with translucent covers while electricians stood by to screw in the light bulbs, said the exhibit coordinator.

Exhibitors were frequently reluctant to talk about their problems with the trade unions. "I don't want to get into that," said IBM's Exhibit Manager Jeff Malley, as he looked askance.

Many exhibitors needed the services of trade unions during the show, and all of them had to live with the trade union representatives until their exhibits were dismantled last Thursday night.

According to Diaz, word went around Schoessling Hall Friday that a small exhibitor who had complained too much about the slow pace of work had suddenly lost power at his site.

"Can you imagine being at a computer show and not having any power?" Diaz asked.

Many exhibitors expected their bills to be the highest they will have ever paid for a trade show. Exhibitors were already paying $21 per square foot for McCormick Place space, one of the highest rates in the country. The recent PC Expo at the Coliseum in New York charged exhibitors $20 per square foot, and rates in other cities are typically $10 to $11 per square foot, exhibitors said.

Many said work that should have been done prior to the show was not finished by the Friday before the show. So exhibitors paid time and a half on Saturday to get it finished.

The aggressive union attitude and frustration over delays prompted many exhibitors to skirt rules they had come to Chicago planning to honor. D. Michael Hunter, marketing technical administrator for Dotronix, Inc., said he lost power at his site four times during the show, with electricians making lengthy searches for the cause each time.

After the fourth time, he rolled up the carpet himself and found an improperly installed junction box, which he fixed, solving the problem, he said.

The staff of Panasonic Co. requested riggers at 8 a.m. Friday, and when they had not arrived by 3 p.m. Saturday, they went ahead and set up their exhibit themselves. "We informed the management of McCormick Place what we were doing. They were quite understanding," the Panasonic coordinator said.

Paying $914 for table covers

CW staff members balked at paying the $914 quoted by United Exposition Service Co., a company contacted by the show's sponsor for NCC, to have table covers spread on 12 worktables. Instead they bought $47 worth of plastic tablecloths at Woolworth's, covering the tables themselves.

A high-speed printer company spokesman with a 40- by 50-foot exhibit space said he spent $600 to $700 to have his carpet vacuumed during the four days of NCC. He said he was not allowed to bring his own vacuum cleaner, and the charge is an example of why his company is cutting back on its NCC exhibit next year.

"We've decided to go from 2,000 feet to 900 feet. You could call it purely a business decision, but it's enhanced by the fact [that] we don't like the union hassles here," he said.

"A lot of people are going to think twice about coming back," Diaz said.

AI expert systems: Increase in practical applications

Uses range from blood types to interest rates

By Kathleen Sullivan
CW West Coast Bureau

CHICAGO — Within the field of artificial intelligence, expert systems are attracting attention. In an effort to demonstrate some of the practical applications of these systems, a group of panelists presented snapshot views of current projects during a session at last week's National Computer Conference here.

Harvey P. Newquist, editor of "AI Trends," a newsletter published by DM Data, Inc., a Scottsdale, Ariz.-based market research firm, said Shearson Lehman/American Express, Inc. is using an expert system to perform interest rate swapping at its offices in New York.

The system, which was installed in early 1984, allows real-time processing of interest rates and presents suggestions on where to invest money based on interest rates, Newquist said. Of the $15 million the firm took in last year through interest rate swaps, $1 million could be attributed to the installation of the expert system, Newquist said.

The police department in Seattle recently installed an expert system designed to help solve a case involving a serial murderer, Newquist said. In the four years since the first murder occurred, the police have collected more than 300,000 pieces of information, which are now displayed on a wall at headquarters.

The police hope the system, which is based on a Digital Equipment Corp. VAX, will allow its investigators to sort through the information and develop new leads in the case, Newquist said.

According to Mache Creeger, who works at Lisp Machine, Inc., in Los Angeles, his company recently developed an expert system designed for process control. At present, the system is going through beta testing in six locations, including oil refineries.

Thomas Bylander, an Ohio State University graduate student who works at the school's artificial intelligence research laboratory, described the lab's current work with the Conceptual Structures Representational Language (CSRL), a language developed by the lab for use in expert systems. The lab has launched a variety of CSRL projects, including work on a system that will analyze automobile fuel problems and another that will detect welding faults.

The lab is also developing a system that will interpret data related to red blood cell antibody identification, which will be used to match blood types of patients and donors, Bylander said.

Mike Morgan, an engineer at General Dynamics Corp.'s electronics division in San Diego, said his firm is investigating how expert systems can be put to use in equipment maintenance. The company is currently focusing on developing an expert system that will diagnose technical problems in the U.S. Army's M1 tank.

"In the M1 tank, we want to be able to find out where a problem is and solve it quickly," he said. That will involve designing a system capable of analyzing information on the 63 black boxes and 1,400 connections that make up the heart of the tank.

Although many promising applications are now under development, Newquist warned the audience not to expect a retail version of an expert system to be available soon.

"Don't look for expert systems in Computerland or Businessland stores," he said. "You might see them in 10 to 15 years, but not before."

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Study sees DSS taking bigger bite out of end-user budget

By Donna Raimondi
CW Staff

CHICAGO — Decision support systems (DSS) could account for up to a third of a corporation's information services budget and almost half of the end-user budget by 1990, preliminary findings from an MIT study showed. DSS will most strongly influence rapid, ad hoc decision making, will lead to better decisions and will offer an increasing number of alternative solutions to problems, said C. Lawrence Meador, chairman of the board of Decision Support Technology, Inc. of Wayland, Mass., and staff member at MIT's School of Engineering.

Meador and Fred L. Brachman of Brachman Associates in Penfield, N.Y., spoke on the topic "Decision Support Systems: the End User View" at a National Computer Conference session last week chaired by Ephraim McLean, associate professor of information services at the University of California in Los Angeles.

During the session, Meador and Brachman presented findings from a recent study designed to determine the current and future DSS needs of top information services and end-user management. The study, conducted by MIT, surveyed 102 companies in 28 industrial categories with revenues ranging from $500,000 to $40 billion, Meador said. According to Meador, the preliminary findings showed that end-user management and information services management are very close in their knowledge of and expectations for DSS.

Both of the survey groups agreed that the least important results of using DSS techniques will be increased teamwork, cost savings and better control, Meador said.

The most important technologies that will impact the development of DSS are end-user computing facilities, powerful desktop personal computers, fourth-generation languages and graphics, both groups of managers agreed. The least important technologies will be voice interaction, public subscription data bases and automatic programming, the study showed.

End-user management is very aware of the technology involved in implementing DSS, Meador said. Unfortunately, there is a lot of "smokeware" on the fourth-generation language market, and information services will have to be careful about sifting through the smoke to get to the good packages, he said.

When it comes time to justify the implementation of DSS, end-user management and information services management both agreed that the promise of better decisions, end-user effectiveness and end-user demand for and commitment to DSS will be the critical factors, Meador said. Both groups indicated that company politics and the return on investment were not important to a purchasing decision. One important area of disagreement between the groups was that end-user management was unconcerned with the impact of DSS on information services resources, where that factor was important to information services leaders.

The study also revealed that if a new, inexpensive and effective DSS breakthrough suddenly became available, it would take an average of 4.2 years for companies to implement it. Although DSS will be very important to companies by 1990, it takes a long time for companies to implement a working system, Meador said. The development life cycle goes through a variety of stages — planning, research and development, design, construction, testing, evaluation, demonstration, orientation, training, deployment, maintenance and adaptation, he said. Of those stages, design and construction offer few problems, Meador said, but front-end planning is seen by the managers as the single most important stage.

The implication of the study, Meador said, is that information services managers should plan on heavy DSS and end-user computing investments. In addition, they should plan to be using fourth-generation languages and expect knowledgeable users by 1990. End users should get into a planning and evaluation orientation, finding out how DSS can work for them, he added.

According to Brachman, once the decision to implement DSS is made, some basic issues will have to be handled. Information services must determine what position DSS will take in the firm, he said. There is an element of DSS that could fit into all areas of the company structure, he said, from the executive suite to the manufacturing floor. The company must decide where to start out, he said.

At Eastman Kodak Co., where Brachman spent 18 years, he started the DSS development effort in the finance area because the data base — a necessary ingredient in a DSS — already existed. Other areas require the building of data bases, a project that can take from six months to two years, he said.

Users call for communications networking standards

By John Dix
CW Staff

CHICAGO — Communications standards are critical to the future of networking, agreed users queried at last week's National Computer Conference, but the short-term implications are viewed with various amounts of criticism.

"Standards are extremely important, but they are not here yet," said James Hall, general manager of information services with Union Oil in Schaumburg, Ill. IBM's Systems Network Architecture (SNA) is a de facto standard, Hall said, but it is not all inclusive.

Ideally, standards will give users more product alternatives, Hall noted. For now, however, standards are more vendor rhetoric than actual products, he said. The most important standards, according to Hall, will be those that define capabilities similar to those available with IBM's Distributed Office Support System and document handling architectures.

Bill Mulligan, director of administrative services with Rand McNally & Co., agreed that standards are extremely important. The lack of communications standards is holding back many technologies, such as micro-mainframe links, Mulligan said. "We have been hampered by the industry's inability in handshaking for too long."

The industry needs the equivalent of the standard yardstick, according to Ira R. Cash, a senior programmer analyst with Union Carbide Corp. "There are 100 [fewer] vendors at this show than there were last year," Cash noted, a fact that he attributed to a slowdown in user spending spawned by equipment saturation. Users need communications standards to help them maximize their investment in this equipment, Cash speculated.

Cash said that his company is entering a second wave of decentralization. This transformation requires that each of the firm's divisions develop expertise in communications that, if they were available, would be greatly facilitated by standards.

'There are no standards'

"There are no standards," said Martin Gabret, a DP manager in the health care industry who also faults SNA. "SNA has so many holes, it will never be a tight standard — kind of like Cobol."

Eventually, this will change, Gabret said, "especially if AT&T and IBM have to live together." Full standards would open up communications across vendor boundaries, he said. "We are all frustrated."

Vendors contacted said they are also eagerly awaiting national and international standards to which they can build: "Standards are absolutely necessary," according to Thomas Keating, vice-president of sales with Omnitel, a manufacturer of modems. "Nationally we are in pretty good standing in regards to standard transmission rates," Keating said, noting there is a need for further standardization.

NCC from page 1

tic signal to the computer industry, which is in the midst of a dramatic downturn. "I think we're beginning to see the end of the tunnel, in the sense that the exhibitors are saying they have found major buyers here in Chicago," he said.

By the time the show doors closed Wednesday, 86,123 people had registered for NCC, exceeding last year's attendance, Dowd said. Last year's NCC, which was held in Las Vegas, attracted about 65,000 visitors.

Dowd boasted that NCC '85 broke the existing second-day attendance record. The previous record was set in 1983 in Anaheim, Calif., where approximately 50,000 people registered by the close of the second day, he said. Dowd credited Afips' promotional activities — which included making complimentary tickets available at 140 computer retail outlets in Chicago and providing free buses from the downtown area — with the rise in attendance.

Although the number of visitors climbed, fewer companies exhibited their wares in Chicago than last year. This year, 564 companies signed up to show their products, a 19% decline from last year's show, which attracted more than 700 exhibitors.

A number of prominent firms were absent from NCC this year. Included among the missing were Digital Equipment Corp.; Apple Computer, Inc.; Perkin-Elmer Corp.; Gould, Inc.; Compaq Computer Corp.; and Wang Laboratories, Inc. For some firms, the decision to sidestep NCC was reportedly based on a belief that resources would be better spent on vertical market shows.

Few product announcements

Only a few companies chose this year's NCC to announce products. In the microcomputer arena, networking products took the limelight. Sytek, Inc. announced a local-area network head end that is compatible with IBM's PC Network and can support up to 1,000 nodes within a 5-mile radius. 3Com Corp. unveiled the 3Server, a high-end addition to its family of local-area network servers that features a 70M-byte hard disk drive and a storage capacity expandable to 420M bytes.

As expected, Britton-Lee, Inc. extended its data base machine line into the office automation arena, introducing a relational data base server for a local-area network. Designed to support data sharing in an office environment, Britton-Lee's new Relational Server RS310 is compatible with the firm's existing high-end IDM 500 series data base machines, the company said. It features a high-density 10-MHz data base processor and 1M byte of direct-access memory, the firm said.

The show, held at a time when the industry is in a prolonged slump, was marked by further evidence that the downturn has affected some major players, with several companies announcing disappointing financial reports.

Last Monday, IBM reported that its second-quarter profits were down almost 13%, compared with the same period a year ago. NCR Corp. followed suit, also announcing a 13% fall in profits for its second quarter over last year's levels. Honeywell, Inc. later joined the chorus, saying its second-quarter profits declined more than 39%, compared with the same period last year.

The news was better for Sperry Corp., which reported sharply improved financial results for the most recent quarter. Its commercial computer operations reported increases of 33% in revenue and 64% in operating profits, the company said.

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Chicago	Jul 17, Sept 19
Cincinnati	Sept 10
Cleveland	Aug 6
Dallas	Jul 16, Aug 8, Sept 11
Denver	Jul 18, Aug 13, Sept 19
Detroit	Jul 23, Aug 20, Sept 24
Greensboro	Aug 1
Houston	Jul 30, Aug 28, Sept 24
Huntsville	Jul 31
Indianapolis	Sept 17
Kansas City	Sept 12
Los Angeles	Jul 25, Aug 27, Sept 26
Minneapolis	Aug 1
New Orleans	Aug 13
New York City	Jul 31, Aug 14, 28, Sept 11, 26
Newport Beach	Aug 14, Sept 17
Oklahoma City	Sept 17
Omaha	Aug 7
Orlando	Jul 17
Philadelphia	Jul 18, Sept 18
Phoenix	Aug 6
Portland	Aug 6
Rochester	Jul 23
Sacramento	Aug 8
St. Louis	Aug 8
Salt Lake City	Jul 16, Sept 24
San Diego	Sept 10
San Francisco	Aug 1, Sept 5
San Jose	July 25, Aug 15, Sept 26
Tulsa	Aug 15
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End-user access to mainframes: Still no easy solution

By [illegible]
CW Staff

CHICAGO — Visitors to the National Computer Conference (NCC) floor here have tried their hands at a variety of solutions for providing end users access to mainframe data — everything from homegrown configurations to slick, prepackaged facilities. None of those questioned by *Computerworld*, however, seem to have found the perfect solution.

The John Deere Co. is taking a basic step to micro-mainframe communications. At the corporation's engine works division in Waterloo, Iowa, Digital Communications Associates, Inc.'s Irma board is installed in approximately 25 of the company's IBM Personal Computers to give users terminal emulation capabilities and allow them to log on to its mainframe for data access, according to Charles Doerr, manager of computer systems.

Deere has been using the Irma boards for about a year, he said. Admitting the link does not provide sophisticated file transfer capabilities, Doerr said, "The use of the link is not for everybody, and this is the simplest way of transferring data."

"We're still looking for an easy-to-use, one-step product," said David Ray, corporate DP manager at the Ciba-Geigy Corp. pharmaceutical company's Greensboro, N.C., plant. Right now the company is employing in-house software to allow some of its 400 microcomputer users to access mainframe data for financial modeling.

Ray said the company selected the homegrown software "out of desperation. We needed something and didn't want the expense of the packages that are out today."

Ray said the capabilities of today's micro-mainframe links fall short of his expectations. "What's missing is a simple, user-friendly way to download information from the mainframe in a one-step process. Now, you must convert files to get to the mainframe, and format and convert files to get to the micro," he explained.

One company that is preparing to step into a prepackaged micro-mainframe link is Harte-Hanks Communications, Inc., a media holding company for newspapers, television and radio stations throughout the country.

The San Antonio-based company is currently using Irma boards to give about 20 end users in the finance group access to corporate financial information.

Today, however, the company is searching for a better solution to allow users to retrieve financial information from its Cullinet Software, Inc. General Ledger package.

"Management told us to go out and find something that was better than the batch processing we were doing," said Bruce Flory, corporate director.

Harte-Hanks is considering the use of Cullinet's Goldengate package, which will tie users into the Cullinet data base, and allow end users to extract data from the Cullinet General Ledger package and download it into the Goldengate spreadsheet package, noted Homer Faucheaux, director of systems and procurement services.

> ”
>
> *'Everybody claims to have a link, but when you look under the covers, it's an extract.'*
>
> — DP manager
> Dow Jones & Co.

Although the idea of a micro-mainframe link is attractive to many corporations, product selection requires careful consideration, users said. At the circulation department at Dow Jones & Co., giving end users access to mainframe data to create marketing reports would be a valuable capability, according to a company data processing manager who did not wish to be identified.

Dow Jones uses about 300 IBM 3270 Personal Computers, IBM Personal Computer XTs and Sperry Corp. microcomputers in its circulation department.

All requests for reports now come to the company's MIS department. When considering a micro-mainframe link, however, the company is looking to avoid products that require MIS departments to define the information that has to be extracted.

According to the DP manager, "Everybody claims to have a link, but when you look under the covers, it's an extract. We don't want to create another bottleneck for users," the manager said. "If they have to ask information systems to extract a file, they have to wait until we get around to it."

NCC attendees agreed that while giving end users access to mainframe data is often beneficial, too much access threatens security, and might be the factor that is preventing many companies from considering micro-mainframe technology. "There is still a degree of uncertainty about multiple users accessing a common data base," said James Stark of DVRY, Inc., an education and electronics information company.

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Inexpensive micro systems boost user-developed DSS

Need for credible systems critical

By Tom Henkel
CW Staff

CHICAGO — Increasingly powerful systems and rapidly declining memory costs have brightened the horizon for developers of decision support systems. But a panel of researchers at a National Computer Conference session, held here last week, warned that those increased opportunities also open the window for a rash of user-developed decision support systems (DSS) that are based on inaccurate data and invalid assumptions.

Noting the popularity of microcomputers, Miles H. Kennedy, an associate professor of professional management and decision systems at Case Western Reserve University in Cleveland, said that inexpensive systems have been a boon to user-developed DSS.

Comparing today's environments to the time-sharing mainframe environments that existed 10 years ago when the first DSS were developed, Kennedy said early DSS could consume an entire mainframe and cost $20/hour to use. This made the widespread use of DSS uneconomical.

"On an average evening in Cleveland, more decision support systems are written today than in the past 10 years," Kennedy said.

Management tool

He quickly added that future DSS will become even more popular as managers discover the software can be used as a persuasive management tool.

But to make DSS effective management tools, Kennedy said, there is still much work that needs to be done.

For example, improvements in networking technologies and better I/O devices and graphics will be a catalyst for moving DSS into the mainstream of office automation and electronic mail systems.

Structural changes in the way DSS are developed could increase their credibility as tools.

Kennedy said DSS have been designed that can give users an explanation of how their recommendations are reached.

" 'What-if' [analysis] is not good enough; we need 'how-come' [explanations] as well," according to Kennedy.

Credible DSS a critical issue

Developing and maintaining credible DSS are perhaps the most critical issues facing DSS users and developers, Kennedy said.

"I worry a lot that there are people making decisions based on models they have not debugged," Kennedy said.

But even if users develop flawless decision support systems, according to Gary W. Dickson, a professor of management science at the University of Minnesota, it may not help managers make better decisions. Dickson said it has not been conclusively proven that providing managers with better information, graphics or systems will improve the managerial decision-making process.

Dickson said DSS that not only make recommendations but explain how those recommendations were reached would be more helpful to users.

Information centers a boon to end-user computing

CHICAGO — The difference between an information center and an MIS department is that an information center does not do any coding.

Henry Delevati, from Information Builders, Inc. in New York, made that distinction at "Managing Information Centers," a National Computer Conference session held here last week.

An information center should provide the expertise, tools and training to enable an end user to develop his own data processing solution, according to Delevati. Support should continue after the user has written the application. This service separates an information center from a typical corporate training center.

The information center is one of four alternatives facing a user when he determines how to solve a data processing problem. The three other methods are manual means, a traditional MIS application or a time-sharing application.

Not all uses suitable

There are a number of applications that are not suitable for an information center, according to Delevati. "A user could develop a department application, but a payroll system with millions of records should be written by an MIS department," he said.

Information centers can supply significant benefits for certain other applications. He cited one case in which an application developed with the help of an information center and maintained by an end user replaced a time-sharing application. "As soon as the application was completed, the company began saving $100,000 a month," Delevati said.

Bart Benne, who works at the information center at Texas Instruments, Inc., claimed that information centers saved the company $19 million in 1984. The figures were supplied by users who responded to a questionnaire.

The firm has information centers in more than 18 countries, and 14,000 Texas Instruments Professional personal computers are tied into a central network. "When we put the network in place, we had to set strict communications parameters," Benne noted.

One reason for the success of Texas Instrument's information center, according to Benne, was top-level management support. "There were 19 people with an average of 16 years of MIS experience hired when the centers first opened in 1983," Benne claimed. There are now 38 people working in the information centers.

Shifting to end users

Shifting smaller applications from an MIS department to an end user can supply some benefits. One benefit may be alleviating an MIS application backlog. "It is similiar to the benefits that happened when companies shifted from assembler to Cobol for application development," Delevati noted. "Some companies may experience a five- to tenfold increase in application development."

Better working relationships between users and data processing departments was another benefit that Delevati listed. "Once a user develops his own application, he is better able to think through his data processing needs," Delevati said.

Another advantage of information centers was better use of corporate data. Delevati claimed that $30 billion worth of data processing spending goes to blue-collar workers and only $5 billion is used by white-collar workers. "We have to find a more equitable way of getting corporate information in the hands of top managers," he said. "End-user computing and information centers may aid that process."

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Macintosh gaining acceptance in corporate world

Users cite system's graphics, ease of use

By Kathleen Sullivan
CW West Coast Bureau

CHICAGO — Although the IBM Personal Computer has taken the lion's share of the corporate market, Apple Computer, Inc.'s Macintosh still has a place in serious business computing. That was the consensus of a group of National Computer Conference attendees here who responded to an informal *Computerworld* poll on the viability of the Macintosh as a serious business machine.

Although most respondents said the Macintosh has some advantages over its arch rival — the IBM Personal Computer — one respondent was not quite so sure.

Robert C. Locher, director of marketing and administrative services, Eastman Kodak Co., Rochester, N.Y.

Locher

Locher said he felt it is too early to write off the Macintosh in the corporate environment. The Macintosh is just coming into its own in the business world, he said.

"I think it's becoming a serious business machine," he said, noting that a broad range of Macintosh business applications programs have entered the market.

Although the IBM Personal Computer and its look-alikes "crept in and stole a part of the show," the Macintosh still has an edge over these systems because it is easy to use, according to Locher.

Janette Moore, MIS program administrator, American Academy of Dermatology, Evanston, Ill.

Moore described the Macintosh as "a nice home computer." But she said that it lacked the crucial telecommunications capabilities that would allow the machine to become a serious contender in the office environment.

"Like a lot of other companies, Apple expected third-party vendors to create telecommunications programs for the Macintosh," according to Moore. "But only Macterminal is now available." That presents problems for some of the academy's members who own Macintoshes and want to gain access to the academy's data base, she said.

Raymond E. Barber, director of MIS, TRT Telecommunications Corp., Washington, D.C.

Barber echoed Locker's remarks, saying that the Macintosh was much easier to use than the IBM Personal Computer.

Since TRT has already standardized on IBM systems, however, it is questionable whether the firm will adopt Apple's Macintosh, according to Barber.

"We've been debating that question lately," he said.

Mike Smith, senior vice-president of systems development, Rainier Bank Corp., Seattle.

Smith

The Macintosh has already found a place at Rainier Bank.

There, more than 50 Macintoshes are being used in the engineering department for word processing and document preparation applications, Smith said.

"We use IBM in our office automation environment," he said.

"But when we want to design documents, we use the Macintosh," he added.

Stratis Sapuntzakis, UOP, Inc., Des Plaines, Ill.

Sapuntzakis

Since Sapuntzakis' firm does chemical and petrochemical processing design, he noted that the Macintosh was appropriate for specialized applications.

One group of UOP employees bought Macintoshes for its plant control work, according to Sapuntzakis.

"They're using it because of its graphics," Sapuntzakis said.

"That's the strength of the machine, and that's what they're using it for," he added.

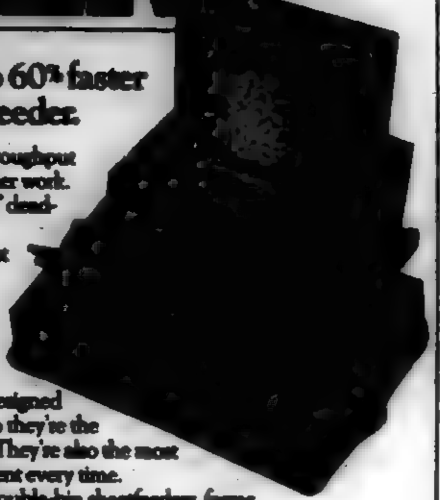
Harold H. Diepholz, development engineer, AT&T Technologies' computer systems center, Lisle, Ill.

Diepholz

Diepholz gave the Macintosh a vote of confidence.

"I would say, yes, it is a serious business computer," he said. "It runs the same major business programs as the IBM Personal Computer, such as [Microsoft Corp.'s] Multiplan and Word.

"And now, [Lotus Development Corp.'s] Jazz is also out," he said.



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Do software vendors sell solutions or technology?

By John Gallant
CW Staff

CHICAGO — *Solutions.* In the software industry, that is one of the most pervasive buzzwords. Vendors claim to sell not just software, but solutions to the pressing problems facing users.

But how do those users feel software vendors are doing at providing real solutions?

Computerworld took to the floor of the 1985 National Computer Conference (NCC) here last week to put together a report card on software makers.

NCC visitors were asked the following question: "Are software vendors really selling solutions — or technology in search of solutions?"

Bryce

Willits

Ruth Willits, vice-president, Northwest Bank & Trust Co., Davenport, Iowa.

"I think software companies are doing a pretty good job overall. With very few exceptions, all the software we have purchased has done what it was supposed to do. If there is one piece of advice I would give to vendors it would be to lower their prices. Software prices have fallen, but not far enough."

Thomas Abel, microcomputer specialist, Northwest Bank & Trust.

"So far, we are very happy with the software we have purchased. I think the vendors could be a little more flexible in the types of user training they provide.

"But we are quite comfortable with the packages we use."

Little

Mel Little, president of the Data Printer Division of Printronix, Inc., a manufacturer of computer printers, Irvine, Calif.

"That question could not come at a more appropriate time. Three of our divisions are currently in the midst of converting to new data base management systems (DBMS).

"Every division thought it had selected the best product, but management has found it is not that easy to implement the systems. The divisions have had pretty mixed results with the software vendors, who, I think, could do quite a bit to improve their performance."

Hamish Bryce, director, Thorn EMI Information Technology, Middlesex, England.

"I think the companies that are successful are selling real solutions. But I think that, on the whole, they could all do a better job. Software vendors' performance will become even more critical in the future. Most users are not interested in computers or how the product is implemented. They are just looking for bottom-line answers. So what the vendors provide will increasingly be the key to success."

Jeffrey Hunter, network administrator, John Deere & Co., Moline, Ill.

"I think the vendors are selling a little of both. One big problem with software is the documentation. It is not designed to be easily read and understood. The learning curve with new products is just too high. It is too tough to train users.

"The initial start-up period with a new product is a big hurdle. Once users learn how to use the packages, they are great. Then, they really are a solution. But the training and adaptation are tough," Hunter reported.

Kelly Havens, assistant director, user services, computer center, University of Notre Dame.

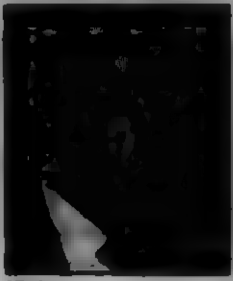
"I think the companies are meeting users' needs. Otherwise, the software products would not sell. They are doing what needs to be done," Havens said.

Mark Eggers, consulting programmer, user services, computer center, University of Notre Dame.

"In certain areas, software is just not meeting users' needs. For example, many vendors seem to be refusing to provide local-area network versions of products.

"Also, in terms of software licensing, the vendors just are not doing what needs to be done to end piracy and solve user problems. My advice to them is to be more in tune with developments in hardware and make their products take advantage of those developments.

"I think they should improve the communications capabilities of their packages to allow people to share information better."



Kleist

Robert Kleist, president, Printronix.

"I agree. The question is very apropos. Software vendors call themselves solutions vendors, but we are finding out very quickly which of them really do provide solutions. Two of our divisional DBMS projects are going well, but the third division is having some difficulties. The package that division has chosen was supposed to be wonderful. But, to date, it has only achieved what I would call an elitist MIS following."

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Operating systems integral to local net transparency

Make net more accessible to user

By Charles Babcock
CW New York Bureau

CHICAGO — Evolving local-area network operating systems have become the key to making networks' capabilities more accessible to users, panel members said at a National Computer Conference technical session here on "The Arrival of LAN Operating Systems."

"The local-area network is only as good as the software that manages it," said panel member G. Craig Burton, vice-president of Novell, Inc. of Orem, Utah, producer of the Novell Netware operating system.

In the past, when a user moved an application program from one point on the network to another, he experienced "a high probability of application failure," explained panel member Gerald Popek of Locus Computing Corp., the Santa Monica, Calif., manufacturer of the Locus local-area network operating system.

Likewise, transferring data around the network ran the risk of altering the data, or worse, losing it as wrinkles in network management caused unexpected changes in how it was handled, Popek continued.

Underlying technology

Part of the difficulty was the network's dependence on the user "understanding the underlying technology" and adopting the right codes and formats to suit the destination he was trying to reach on the network, Popek said.

All locations on the network should be transparent to the user, and this capability must be built into a sophisticated, third-generation local-area network operating system, he said.

In addition, local-area net system developers say the operating system should allow a user on the network to access any application and have it run the same as it would at the point where it originates.

A user should be able to use peripheral devices without having to tell the network their location.

Net transparency

Such steps toward network transparency will make local-area networks more useful to the growing number of personal computer users who need network services but who cannot afford to devote much time trying to access them, said Noel E. Schmidt, session leader, whose Architecture Technology Corp. in Minneapolis is a consulting firm on configuring local-area nets.

Local-area net operating systems discussed by panel members, in addition to Locus and Novell, included a new version of Concurrent from Digital Research, Inc., Concurrent-DOS 286; and PC-NOS from Applied Intelligence of Mountain View, Calif.

E. Michael Loftus, marketing manager for Digital Research's System Software Division, said a redirector, or extender of the local-area net operating system, can provide network transparency to users.

Functions independently

The redirector "functions independently from the operating system," taking calls to the printer, disk drives and other devices and redirecting them to the proper place.

Through the redirector, incompatible equipment can be linked together on a local-area network and remain accessible to all users, he said.

Complete user transparency allows any user to tell as soon as he logs on the network the node in which he is operating and what network services he has, Loftus said.

Although they can be rigged to deal with a variety of devices, local-area net operating systems like Concurrent-DOS and Novell Netware are oriented to serving microcomputers and peripherals that use the IBM PC-DOS or MS-DOS operating systems, the spokesmen said.

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Hayes Microcomputer to endorse X.25, X.PC protocols

By Eric Bender
CW Staff

CHICAGO — Hayes Microcomputer Products, Inc. last week disclosed plans to support two additional communications protocols, the CCITT X.25 standard and Tymnet, Inc.'s X.PC, in future products.

Hayes, the leading supplier of microcomputer modems, will adopt X.PC for asynchronous communications and begin using X.25 as personal computer communications become synchronous, according to Gary Betty, Hayes marketing vice-president.

The move is designed "to overcome the confusion that exists over protocols," Betty said during an announcement at the National Computer Conference (NCC) held here last week.

Many firms have held off expanding their personal computer communications links because of uncertainty about which protocols they will be required to support, Betty added.

X.PC will provide improved error-checking capabilities, support for multiple-host sessions and other features that will prove crucial as transmission speeds increase and microcomputer communications become more critical to businesses, Betty said.

He also noted the widespread adoption of X.25 as an interface standard by most value-added network carriers.

Hayes examined several other widely used protocols that have been proposed as standards, including Microcom, Inc.'s Microcom Networking Protocol.

Path for future

Among the reasons for endorsing X.25 and X.PC, Hayes felt that the protocols "had to be in the public domain, had to be supportive of international standards, had to meet the needs of today's environment and had to provide a migration path for the future," Betty said.

Current Hayes products support the proprietary Hayes Verification protocol and the Xmodem protocol. Future software products reportedly will be compatible with all Hayes software based on those protocols.

Hayes will publish the specifications for its implementations of X.25 and X.PC, as it did for its modem command sets, which Betty asserted have become a de facto standard.

No delivery schedules for products incorporating the newly endorsed protocols were announced.

Additional information is available from Hayes through P.O. Box 105203, Norcross, Ga. 30348.

VDT-related angina found

SAN FRANCISCO — A study by the Computer Workers of America (CWA), a 650,000-member union, and the North Carolina Occupational Safety and Health Project, has found a correlation between working with a VDT and an increase in incidents of angina — chest pain that is often the first sign of heart disease.

The study sampled 1,000 telecommunications workers in North Carolina and found that 18% of VDT workers aged 30 to 39 experienced angina compared to a general average of 4%.

Other health problems cited by the study were increased eyestrain, musculoskeletal problems and increased stress.

The president of the CWA called upon the U.S. government to conduct more extensive research into the area of possible VDT health problems.

A CWA spokesman reported that the union plans to file a health hazard request with the Cincinnati offices of the National Institute for Occupational Safety and Health's Hazard Evaluation Services Branch.

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Display top priority for laptop shoppers

OSCAR & ASSOCIATES, INC. PHOTO

Kelleher

By Edward Warner
CW Staff

CHICAGO — Those interested in buying a laptop portable personal computer are looking for three things: display, display and display.

That was the response offered by several National Computer Conference attendees interviewed by *Computerworld* on the show floor last week.

Robert D. Kelleher, manager of data center operations for Alberto-Culver Co. in Melrose Park, Ill.

"I'd love to have one in my office for my own purposes," Kelleher said.

As he spoke, Kelleher was examining the NEC Home Electronics, Inc. PC-8401A, a 4.7-lb machine with built-in Micropro International Corp. Wordstar software and an LCD. Kelleher said he had no problems viewing the screen but estimated that its 16-line display would not be as useful as the 25-line displays he is accustomed to using on his company's mainframe data terminals.

The quality, rather than the size, of the display of another laptop at the show, the Data General Corp. Data General/One, was an issue for some attendees.

William Lydon, manager of future product planning for Johnson Controls, Inc., in Milwaukee, Wis.

Lydon said that Johnson Controls had considered buying several DG/Ones and had even worked with a demonstrator model but found the machine's screen "didn't appear to be readable." The Hewlett-Packard Co. 110 laptop was unacceptable for the same reason, he added. "The desire [in the company] is to have laptops," Lydon said. "It's just a question of getting something usable."

Though Lydon said he found that the NEC PC-8401A's display "looks better than the [DG/One]," another visitor to the NEC booth said he couldn't "read it very well from here," as he stood an arm's length away.

August H. Blegen, executive director of the Association of Data Communications Users, located in New York.

Blegen said he had been considering the purchase of a laptop, but was holding off for at least a year until improvements in technology brought down the prices of laptops and improved their screens. Price is going to be important, he elaborated, because "people are going to have this [laptop] as an adjunct to something else," most likely a desktop computer. A good price, he added, would be about $1,000.

> *'The desire [in the company] is to have laptops. It's just a question of getting something usable.'*
>
> — William Lydon
> Johnson Controls, Inc.

Jesus Briso-Montiano Morel, general director of the Jobrimont computer dealership in Madrid.

Briso-Montiano, while looking over a Grid Systems Corp. Compass laptop, said he liked the machine's electroluminescent display but not its $3,450 price. "This particular machine is good but too expensive for Spain at the moment," he said.

S. M. Krzyzaniak, Cobol programmer with Natural Gas Pipeline in Lombard, Ill.

Krzyzaniak said screen resolution was the most important laptop feature for her needs. She said she was also concerned with a laptop's appearance.

"I don't like working weekends either, so just run the job and maybe we can both finish early!"

Inman urges investment of resources in technology

Information handling called critical to gains

By Clinton Wilder
CW Staff

Investment of human and financial resources in technological advancements is essential, both for economic growth and global stability. So said retired Adm. Bobby R. Inman in the keynote address of last week's 1985 National Computer Conference (NCC).

Inman, chairman and chief executive officer of Microelectronics and Computer Technology Corp. (MCC), called on major institutions in both the private and public sectors to spur investment in emerging technologies and to master the human talent to foster, manage and market them. He said corporations, universities and the federal government must emphasize innovation, long-term planning and partnerships among themselves and other nations in order to succeed in the remaining years of this century and beyond.

"Information handling has been at the heart of gains in every major area," Inman said, "and it will continue to be critical to all the gains that beckon ahead of us."

In addition, Inman said, postwar economic alliances among the U.S., Japan and Western Europe have been the critical factors in avoiding global military conflict for the past 40 years. Citing a "turbulent period of change in Soviet leadership" in the next several years, Inman said the world's economic and military balance of power may rest on U.S. economic cooperation with its allies.

'Most critical element of the future'

"A Soviet decision on whether to assert their conventional military power may rest on how they judge the cohesion of the Western alliances," Inman said. "How we hold those, and avoid trade wars and trade barriers, may be the most critical element of the future. The information-handling industry is at the cutting edge, not only for its own growth but for hope for a peaceful and stable world."

Inman sounded many such global themes in his remarks in the Arie Crown Theater at McCormick Place. He said a critical area for the future of the microelectronics field lies in the fast-growing economies of several Asian countries, including nations of the Pacific Basin and China. "In these nations, we face very tough new economic competitors but also see the creation of vast new markets," he said.

Inman specifically urged American industry to move ahead quickly in factory automation and to accelerate the process of converting research and development advances into marketable products. "The No. 1 priority for industry is to accommodate the accelerated pace of change," he said. "Far too little effort has been focused on manufacturing technology, especially in developing [an industrywide] systems approach."

Inman, former director of the National Security Agency and deputy director of the Central Intelligence Agency, said government must play a much greater role in technology advancement than it has to date.

Inman

He said existing public funds, for example, should be channeled from federal farm subsidies to programs to educate farmers about emerging agricultural technology.

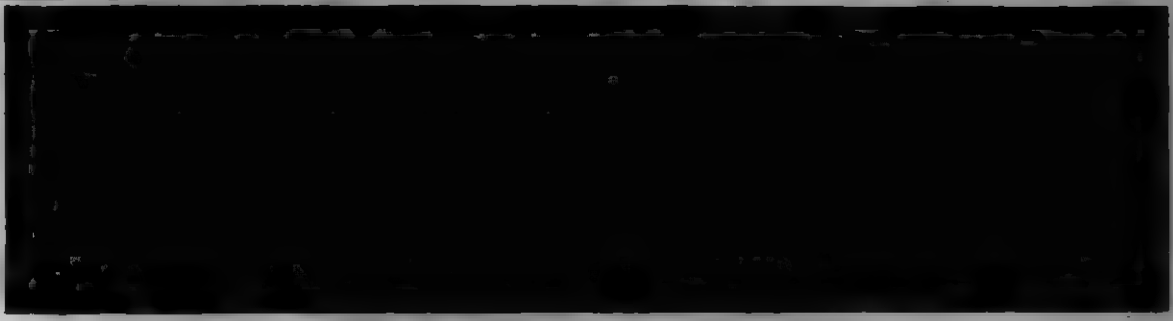
He urged the Federal Reserve Board to create a "model financial transaction system for the 1990s" that could be made available to commercial banks. "The government must focus existing revenue on long-term problems," he said.

Inman called for reform of American education at every level and for retraining of displaced workers, both to prepare citizens better for a technology-oriented world.

Inman praised the current controversial effort in his native state of Texas to prohibit failing students from participating in athletics. "In the Southwest, one approaches the subject of interscholastic football with great trepidation," Inman said, drawing laughter from the audience.

"But we must change our attitude from one of keeping students happy to getting them prepared. Our No. 1 need is talented people, and investment in education at all levels is the most critical step toward meeting those needs."

Inman said that the current computer industry downturn is a cyclical phase and he remains optimistic for the future. "We are in a slump, but it is a slump in the rate of growth," he said. "As an industry matures, it is increasingly difficult for start-up companies to find niches, but there are 181 new companies [exhibiting] at NCC."



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Britton-Lee introduces server for office data sharing

By John Gallant
CW Staff

Britton-Lee, Inc. is slated today to extend its data base machine line into the office arena with the introduction of a relational data base server for a local-area network.

Scheduled to be unveiled at a press briefing this morning, Britton-Lee's Relational Server RS310 was designed to support data sharing in an office environment, a spokesman said. Compatible with the firm's existing high-end IDM 500 series data base machines, the RS310 utilizes a high-density 10-MHz data base processor and 1M byte of direct access memory.

The system reportedly will come equipped with up to 170M bytes of Winchester disk storage and a 60M-byte cartridge tape drive. With its Ethernet local-area net, the RS310 is said to act as a relational data server for an entire departmental net. The system offers the capability to process up to 10 simultaneous queries and can serve up to 50 network users.

Like Britton-Lee's other data base machines, the RS310 is said to operate simultaneously with computers from different manufacturers, allowing users on diverse processors to tap into a common data source. The RS310 is slated for general availability in the first quarter of next year and will be priced at $45,950.

At today's press briefing, Britton-Lee is also expected to announce Release 3 of its host data base machine software with support for eight different hardware and operating system environments. The host interfaces for Britton-Lee's processors include Digital Equipment Corp. VAX processors under VMS; University of California at Berkeley Unix 4.2; DEC's Ultrix implementation of Unix; AT&T Unix System V; IBM Personal Computers under Microsoft Corp.'s MS-DOS; and AT&T's 3B20, 3B5 and 3B2 under System V.

Release 3 of Host Software allows the Britton-Lee machines to attach to and support the above computers.

Britton-Lee is also slated to introduce a faster 10-MHz data base processor and a disk controller for its 500 series systems.

Britton-Lee is located at 14600 Winchester Blvd., Los Gatos, Calif. 95030.

Japanese defended

By Susan Blakeney
CW Staff

Shuji Masuda is fond of saying that when the U.S. economy sneezes, Japan catches a cold. After speaking with Masuda, one might get the impression that Japan is busily stockpiling its medicine cabinet with cold remedies.

Masuda, Hitachi America Ltd.'s manager of peripheral systems marketing department, was at the National Computer Conference this week. He used the occasion to dispel some of the negative coverage that Japanese companies have suffered in the U.S. press lately, to argue for better trade relations between the U.S. and Japan and to announce three Hitachi products: the MT310-X tape storage subsystem, called MT300-X; the OL301-2 optical disk library system; and the Intelligent Peripheral Interface-3 storage controller.

With respect to the present economic confrontations now plaguing Japanese and U.S. electronics companies, Masuda said the Japanese are trying to move as fast as they can.

"It's like a horse race. You don't have to be the top runner to be competitive — or to be rewarded."

As for allegations that Japanese firms are guilty of dumping their products in the U.S., he responded strongly by saying that the U.S. economy, and therefore its pricing, is artificially ma-

See JAPAN page 19

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There are also cases where an industry benefits from the efficient exchange of information.

In the property and casualty insur-

Bridge unwraps communications tools for TCP/IP nets

By John Dix
CW Staff

Bridge Communications, Inc. introduced, at last week's National Computer Conference, communications servers and network gateways for Ethernet-type networks that use the Department of Defense's Transmission Control Protocol/Internet Protocol (TCP/IP).

TCP/IP, standardized for use by the DOD for defense networks, are higher-level protocols that provide net and transport services above the physical and data link protocols defined and used with Ethernet. The protocols are an integral part of the University of California at Berkeley's Unix 4.2 operating system.

The products include the following:

- The GS/3-IP, a gateway used to interconnect remote TCP/IP-based Ethernet networks.
- The CS/1-SNA-TCP/IP server, which enables hosts on a TCP/IP network and products with Bridge server interfaces to access IBM Systems Network Architecture (SNA) hosts over Ethernet.
- The CS/100-TCP/IP terminal server that connects up to 14 RS-232 devices to a TCP/IP-based Ethernet net.

These products reportedly complement Bridge's previously announced CS/1-TCP/IP server that supports from eight to 32 devices.

The GS/3-IP gateway enables up to eight TCP/IP-based Ethernets to be interconnected using dial-up or leased lines. Line speeds supported range from 1,200 to 64K bit/sec. Data transfer rates between Ethernets can reportedly reach 175K bit/sec.

The CS/1-SNA-TCP/IP was designed to enhance communications between engineering and traditional data processing shops, according to the vendor.

The server reportedly enables users of engineering workstations that support TCP/IP — such as Sun Microsystems, Inc. and Masscomp Co. equipment — to use Ethernet to establish a TTY window for IBM 3278 screen emulation.

This new SNA server is said to provide full network connection and the necessary protocol conversion, enabling terminals and personal computers on the network to emulate IBM 3278 displays. The protocol conversion function is reportedly provided on a port-contention basis.

Available immediately, the CS/100-TCP/IP costs $5,400 for a 14-port box, plus a $250 annual software fee. The CS/1-SNA-TCP/IP costs $13,000 and carries a $1,000 annual software license fee. The GS/3-IP will reportedly be available in October for $10,500 with a $250 yearly software license.

Bridge is located at 1345 Shorebird Way, Mountain View, Calif., 94043.

JAPAN

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nipulated. "[The U.S. government] is keeping the interest rates high, and it is keeping the exchange rate high. This hurts U.S. companies as well as Japanese firms that are doing 30% to 40% of their business overseas. It's to everyone's benefit that high U.S. interest rates and the foreign exchange imbalance be addressed very quickly."

In addition, he claimed that pricing products low enough to be successful in a market was not unfair if the prices remained low after the vendor had captured that market. "That is the real challenge to Japanese companies," he said.

Furthermore, Masuda contended that a truly competitive environment does not just mean pricing products strategically, but making the product superior in several ways: product performance, reliability, service and support, availability and uniqueness.

"If people come by our booth, they will see that Hitachi has good products. This undoes some of the bad image we've gotten lately," Masuda added.

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WORLD DIGEST
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RANGOON, Burma — One of Asia's least automated countries is taking a cautious step into the computer age with the installation of three superminicomputers at key government ministries. Until now, government users here have had to line up for scarce time on an old Model 1902S computer from the UK's International Computers Ltd. (ICL), reputedly the last of its kind in operation anywhere in the world.

This machine, located at Rangoon University, suffers frequent breakdowns and lacks spare parts, since ICL no longer makes parts for it. However, since 1971, the 1902S has been the mainstay of government computing here.

Still, Burma's leaders reportedly remain largely ignorant of computing and apprehensive as to its effects on this nation's rigidly planned and controlled economy. Computer imports have to be cleared individually at the cabinet level — it is estimated that there are just 10 minicomputers and 35 microcomputers in this country of 37 million people. Visitors arriving at Mingaladon Airport here carrying personal computers have them impounded by Burmese customs officials until they leave.

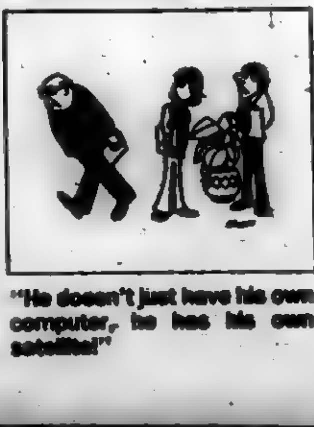
OTTAWA — Bell Northern Research (BNR) has announced the opening of a $3.5 million laboratory where prototypes of advanced circuits will be built. The lab is part of a $14.4 million project to develop the capability to produce gallium arsenide semiconductor circuits for high-speed logic and memory applications. Cost of the project is being split by BNR and the National Research Council of Canada.

Research will focus on optimizing the operational speed of gallium arsenide circuitry in communications systems while increasing the number of tasks the circuits can perform. Potential applications for the circuits include use in high-speed data processing systems and fiber-optic transmission systems.

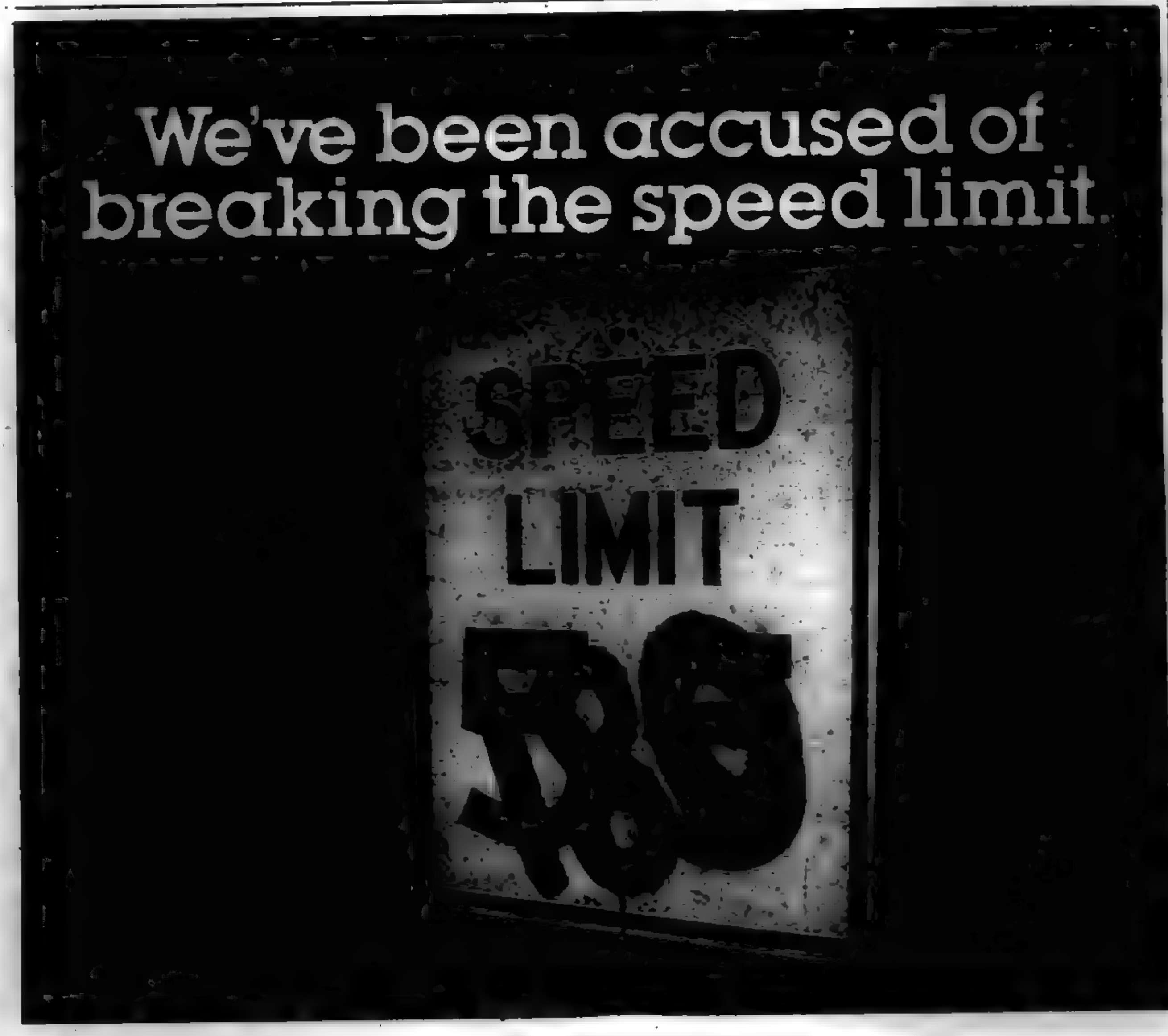
TOKYO — Sales of the top 10 computer manufacturers in Japan, including mainframe, mini and microcomputer makers, increased an average of 24% in 1984, according to *Computerworld Japan*. IBM Japan was bumped from second to third place in domestic sales by NEC Corp. Export sales grew more than domestic sales, and IBM Japan was the leading Japanese exporter.

BANGKOK, Thailand — The state-owned Krung Thai Bank, which serves rural areas of the country as well as the capital, will install approximately 250 automated teller machines nationwide over the next five years. The ATMs are leased machines bearing the label of N.V. Philips, a Dutch firm. The machines are made by Diebold, Inc. of the U.S. They will be linked to Philips PTS 6813 processors at six regional centers, which in turn will be hooked up to a Tandem Computers, Inc. Nonstop II configuration here, acting as a message switch. This decentralized network approach minimizes the number of expensive long-distance leased lines required, while permitting full interbranch communication.

BANGKOK, Thailand — In a surprise switch, long-time IBM stronghold Siam Commercial Bank has become the second bank in Thailand to buy Nixdorf Computer AG's automated teller machines, following the lead of Bank of Ayutthaya, which recently became the West German manufacturer's first Thai customer. The ATMs will be linked to a Nixdorf 8864 mini, which will act as a front-end to the bank's two IBM 4381s. The bank would not say how many of the Nixdorf terminals it will install.



"He doesn't just have his own computer, he has his own satellite!"



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NEWS

SURVEY from page 1

tle change in this category over the previous year.

There were a few notable exceptions, however. As the rise in its users' overall satisfaction rating indicated, Harris appears to have made a remarkable turnaround during the past year. In the 1984 survey, only 57.14% of Harris users polled said their systems met expectations. This year, that percentage rose to 85.71%.

The news was not as rosy for McDonnell Douglas Corp.'s Microdata division and Sperry Corp. Both showed dramatic declines in the category, according to Datapro. In 1984, 91.03% of Microdata users polled said their systems fulfilled expectations. This year, that percentage slipped to 88%. In 1984, 81.96% of Sperry users polled said their systems lived up to expectations. This year, 74.29% said they did.

Datapro also asked the respondents to its 1985 minicomputer user survey whether they were willing to recommend their systems to others. Eighty-seven percent said they would. There were two exceptions to the generally positive response, however: Sperry's System 80 and Digital Equipment Corp.'s VAX-11/785.

According to Datapro, its survey disclosed that 65.71% of System 80 users responding were willing to recommend that system to others, while 14% said they would not. Twenty percent said they were undecided. Of VAX-11/785 users who responded, 63.64% said they would recommend their system, while 27.27% said they were undecided.

Three vendors were omitted from this year's Datapro survey. MAI/Basic Four, Inc. and MDS Qantel Corp. processors were not included because, according to Datapro, these vendors were not listed on at least five responses to its questionnaire, as the survey firm requires. A total of 9000 questionnaires were sent to minicomputer users. Motorola/Four Phase Systems, Inc. was also eliminated from this year's survey because, a spokesman said, Datapro felt Four-Phase was no longer a major contender in the minicomputer market.

The Datapro survey, "User Ratings of Computer Systems," costs $29 and is available from the company at 1805 Underwood Blvd., Delran, N.J. 08075.

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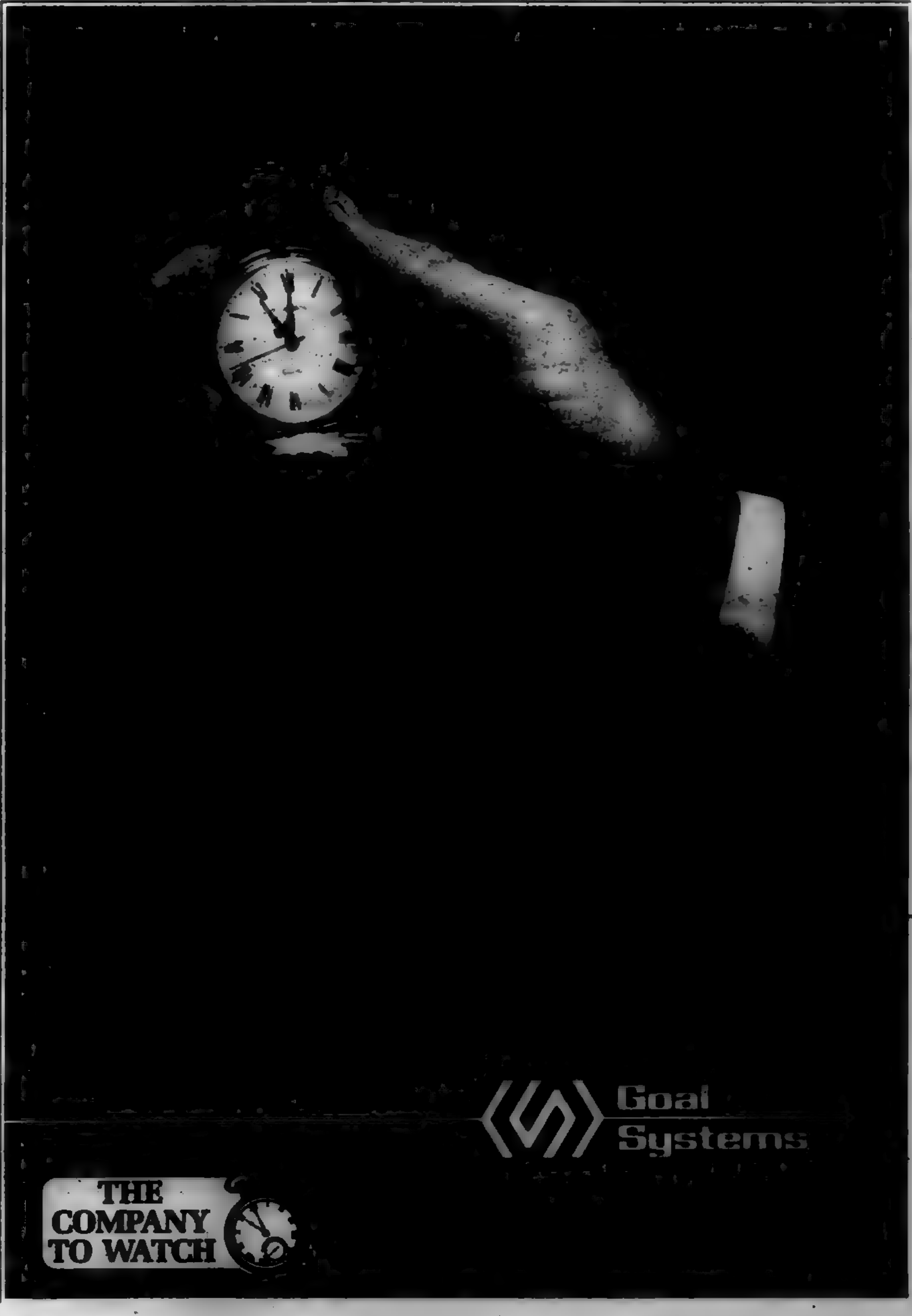

Users rate their minis

Survey Item				
Number of User Responses	17	62	114	87
Average Life of System (in months)	11.6	9.3	12.8	8.5
Acquisition Method (%)				
Purchase	70.59	82.26	83.33	70.11
Rental or Lease from Manufacturer	17.65	0.00	2.63	8.05
Lease from Third-Party	11.76	17.74	14.04	20.69
System Ratings[1]				
Ease of Operation	3.41	3.53	3.41	3.46
Reliability of System	3.53	3.47	3.51	3.65
Reliability of Peripherals	3.47	3.52	3.38	3.57
Manufacturer's Maintenance Service				
Responsiveness	3.41	3.53	3.47	3.56
Effectiveness	3.18	3.31	3.40	3.46
Manufacturer's Technical Support				
Troubleshooting	2.76	2.98	3.08	3.30
Education	2.82	2.92	2.95	3.15
Documentation	2.59	2.70	2.86	3.24
Manufacturer's Software				
Operating System	3.35	3.48	3.39	3.60
Compilers and Assemblers	3.27	3.29	3.20	3.58
Applications Programs	2.59	2.92	2.96	3.06
Ease of Programming	3.00	3.32	3.19	3.44
Ease of Conversion	2.88	3.20	3.03	3.21
Overall Satisfaction	3.06	3.46	3.27	3.56
Additional Ratings[1]				
Ease of Expansion	3.24	3.63	3.09	3.57
Compatibility of Hardware Carried Over from Other Systems	3.18	3.29	3.32	3.32
Compatibility of Programs/Data Carried Over from Other Systems	3.06	3.22	2.88	2.90
Power and Energy Efficiency	3.06	3.22	2.71	3.22
Productivity Aids Help Keep Programming Costs Low	2.81	2.87	2.84	3.19
Software support delivered by Vendor	2.65	2.73	2.65	3.14
Keeping Up with and Implementing Vendor Changes to Hardware/Software[2]	3.12	2.95	2.77	3.08
Delivery/Installation of Equipment[2]	2.88	2.85	2.88	2.78
Delivery of Required Software[2]	2.81	2.98	2.77	2.87
Did the system do what you expected it to do? (%)				
Yes	76.47	95.16	90.35	95.40
No	11.76	0.00	3.51	3.45
Undecided	11.76	4.84	3.51	1.15
Would you recommend system to another user? (%)				
Yes	70.59	95.16	79.82	98.85
No	11.76	0.00	13.16	0.00
Undecided	17.65	4.84	7.02	1.15

SHAPIRO RESEARCH CORP. CHARTS

Survey Item				
Number of User Responses	11	6	174	11
Average Life of System (in months)	8.2	12.8	10.0	13.8
Acquisition of Method (%)				
Purchase	90.91	100.00	68.54	90.91
Rental or Lease from Manufacturer	0.00	0.00	15.52	0.00
Lease from Third Party	9.09	0.00	13.79	9.09
System Ratings*				
Ease of Operation	3.36	3.33	3.40	3.27
Reliability of System	3.36	3.50	3.71	3.55
Reliability of Peripherals	3.55	3.50	3.68	3.55
Manufacturer's Maintenance Service				
Responsiveness	3.45	2.83	3.58	3.36
Effectiveness	3.55	3.00	3.54	3.55
Manufacturer's Technical Support				
Troubleshooting	3.09	2.80	3.22	3.11
Education	3.11	2.67	3.15	2.80
Documentation	3.00	2.83	2.89	3.00
Manufacturer's Software				
Operating System	3.60	3.17	3.54	3.44
Compilers and Assemblers	3.60	3.17	3.41	3.11
Applications Programs	2.71	2.17	3.00	3.17
Ease of Programming	3.22	3.50	3.33	2.89
Ease of Conversion	2.88	2.50	3.37	2.17
Overall Satisfaction	3.30	2.83	3.47	3.11
Additional Ratings*				
Ease of Expansion	3.73	3.20	3.61	3.45
Compatibility of Hardware Carried Over from Other Systems	3.55	2.25	3.00	3.11
Compatibility of Programs/Data Carried Over from Other Systems	3.44	2.00	3.16	2.38
Power and Energy Efficiency	3.40	2.33	3.20	3.11
Productivity Aids Help Keep Programming Costs Low	3.44	3.20	3.07	3.00
Software Support Delivered by Vendor	3.11	2.00	3.09	3.00
Keeping Up with and Implementing Vendor Changes to Hardware/Software*	3.00	3.00	3.29	3.10
Delivery/Installation of Equipment*	2.73	2.80	3.10	2.91
Delivery of Required Software*	2.90	2.80	3.03	3.09
Did the system do what you expected it to do? (%)				
Yes	90.91	83.33	95.40	81.82
No	0.00	0.00	1.72	0.00
Undecided	9.09	16.67	2.87	9.09
Would you recommend the system to another user? (%)				
Yes	63.64	66.67	94.83	81.82
No	0.00	33.33	1.15	9.09
Undecided	27.27	0.00	4.02	9.09

Users rate their minis

Survey Item								
Number of User Responses	[illegible]	198	[illegible]	15	[illegible]	25	[illegible]	24
Average Life of System (in months)	[illegible]	8.8	[illegible]	12.7	[illegible]	10.3	[illegible]	9.8
Acquisition Method (%)								
Purchase	[illegible]	69.70	[illegible]	86.67	[illegible]	60.00	[illegible]	87.50
Rental or Lease from Manufacturer	[illegible]	10.61	[illegible]	0.00	[illegible]	24.00	[illegible]	8.33
Lease from Third Party	[illegible]	18.69	[illegible]	13.13	[illegible]	16.00	[illegible]	4.17
System Ratings[1]								
Ease of Operation	[illegible]	3.58	[illegible]	3.60	[illegible]	3.48	[illegible]	3.00
Reliability of System	[illegible]	3.83	[illegible]	3.60	[illegible]	3.28	[illegible]	3.58
Reliability of Peripherals	[illegible]	3.65	[illegible]	3.40	[illegible]	3.28	[illegible]	3.08
Manufacturer's Maintenance Service								
Responsiveness	[illegible]	3.42	[illegible]	3.57	[illegible]	3.46	[illegible]	3.29
Effectiveness	[illegible]	3.50	[illegible]	3.36	[illegible]	3.21	[illegible]	2.95
Manufacturer's Technical Support								
Troubleshooting	[illegible]	3.13	[illegible]	3.27	[illegible]	2.96	[illegible]	2.78
Education	[illegible]	3.12	[illegible]	3.00	[illegible]	2.76	[illegible]	2.78
Documentation	3.13	3.10	[illegible]	3.20	[illegible]	2.56	[illegible]	2.39
Manufacturer's Software								
Operating System	[illegible]	3.51	[illegible]	3.67	3.67	3.16	[illegible]	2.91
Compilers and Assemblers	[illegible]	3.45	[illegible]	3.55	[illegible]	3.28	[illegible]	2.95
Applications Programs	[illegible]	2.99	[illegible]	3.00	[illegible]	2.63	[illegible]	2.39
Ease of Programming	3.18	3.31	[illegible]	3.31	[illegible]	3.24	[illegible]	3.09
Ease of Conversion	3.00	3.40	[illegible]	3.44	[illegible]	2.88	[illegible]	3.04
Overall Satisfaction	[illegible]	3.47	[illegible]	3.54	[illegible]	3.08	[illegible]	3.00
Additional Ratings[2]								
Ease of Expansion	3.10	3.51	[illegible]	3.79	[illegible]	3.44	[illegible]	3.21
Compatibility of Hardware Carried Over from Other Systems	2.75	3.19	[illegible]	3.09	[illegible]	3.00	[illegible]	2.86
Compatibility of Programs/Data Carried Over from Other Systems	[illegible]	3.17	[illegible]	3.18	[illegible]	3.04	[illegible]	2.90
Power and Energy Efficiency	[illegible]	3.33	[illegible]	3.36	[illegible]	2.87	[illegible]	3.27
Productivity Aids Help Keep Programming Costs Low	[illegible]	3.13	[illegible]	3.15	[illegible]	2.56	[illegible]	2.54
Software Support Delivered by Vendor	[illegible]	3.02	3.17	2.92	[illegible]	2.42	[illegible]	2.52
Keeping Up with and Implementing Vendor Changes to Hardware/Software[2]	3.12	3.24	[illegible]	3.43	[illegible]	3.08	[illegible]	2.80
Delivery/Installation of Equipment[3]	3.01	3.03	[illegible]	3.00	[illegible]	2.80	[illegible]	2.83
Delivery of Required Software[3]	[illegible]	3.05	3.04	2.71	[illegible]	2.92	[illegible]	2.74
Did the system do what you expected it to do? (%)								
Yes	93.13	95.45	[illegible]	93.33	[illegible]	92.00	[illegible]	87.50
No	[illegible]	2.53	[illegible]	6.67	20.00	4.00	[illegible]	12.50
Undecided	2.29	2.02	[illegible]	0.00	0.00	4.00	[illegible]	0.00
Would you recommend the system to another user? (%)								
Yes	[illegible]	96.97	[illegible]	93.33	90.00	84.00	[illegible]	83.33
No	9.92	0.50	0.00	6.67	10.00	8.00	[illegible]	8.33
Undecided	2.29	2.53	[illegible]	0.00	0.00	8.00	[illegible]	8.33

[1] Ratings are from 4.0 to 1.0, with 4.0 high.

[2] Ratings are from 4.0 to 1.0, with 4.0 = very easy and 1.0 = very difficult.

[3] Ratings are from 4.0 to 1.0, with 4.0 = ahead of schedule and 1.0 = very late.

DATAPRO RESEARCH CORP. CHARTS

Survey Item			
Number of User Responses	35	12	31
Average Life of System (in months)	9.9	10.9	10.3
Acquisition Method (%)			
Purchase	51.43	75.00	67.74
Rental or Lease from Manufacturer	37.14	12.50	
Lease from Third Party	11.43	25.00	19.35
System Ratings[1]			
Ease of Operation	2.84	3.42	3.42
Reliability of Mainframe	3.13	3.58	3.52
Reliability of Peripherals	2.87	3.55	3.42
Manufacturer's Maintenance Service			
Responsiveness	3.29	3.83	3.52
Effectiveness	3.00	3.92	3.45
Manufacturer's Technical Support			
Troubleshooting	2.57	3.36	3.10
Education	2.15	3.09	2.76
Documentation	2.29	2.83	2.67
Manufacturer's Software			
Operating System	3.09	3.60	3.28
Compilers and Assemblers	3.18	3.44	3.24
Applications Programs	2.22	3.10	3.00
Ease of Programming	2.86	3.44	3.21
Ease of Conversion	2.91	3.11	3.21
Overall Satisfaction	2.83	3.60	3.28
Additional Ratings[2]			
Ease of Expansion	3.21	3.27	3.36
Compatibility of Hardware Carried Over from Other Systems	2.58	2.90	3.04
Compatibility of Programs/Data Carried Over from Other Systems	2.94	3.00	2.87
Power and Energy Efficiency	2.78	3.36	3.10
Productivity Aids Help Keep Programming Costs Low	2.38	3.11	2.87
Software Support Delivered by Vendor	2.40	3.10	2.86
Keeping Up with and Implementing Vendor Changes to Hardware/Software[3]	2.60	3.42	3.17
Delivery/Installation of Equipment[3]	2.80	2.83	3.16
Delivery of Required Software[3]	2.83	2.83	3.07
Did the system do what you expected it to do? (%)			
Yes	74.29	91.67	93.55
No	14.29	8.33	3.23
Undecided	11.43	0.00	0.00
Would you recommend the system to another user? (%)			
Yes	65.71	83.33	87.10
No	14.29	0.00	87.10
Undecided	20.00	8.33	0.00

Users rate the vendors

Survey Item									
Number of User Responses	[illegible]	62	[illegible]	313	[illegible]	188	[illegible]	489	[illegible]
Average Life of System (in months)	[illegible]	9.3	[illegible]	11.3	[illegible]	10.3	[illegible]	10.1	[illegible]
Acquisition Method (%)									
Purchase	[illegible]	82.26	[illegible]	78.27	[illegible]	71.81	[illegible]	73.62	[illegible]
Rental or Lease from Manufacturer	[illegible]	0.00	[illegible]	4.79	[illegible]	14.36	[illegible]	9.20	[illegible]
Lease from Third Party	[illegible]	17.74	[illegible]	16.61	[illegible]	12.77	[illegible]	16.36	[illegible]
System Ratings[1]									
Ease of Operation	[illegible]	3.53	[illegible]	3.45	[illegible]	3.46	[illegible]	3.50	[illegible]
Reliability of System	[illegible]	3.47	[illegible]	3.59	[illegible]	3.71	[illegible]	3.80	[illegible]
Reliability of Peripherals	[illegible]	3.52	[illegible]	3.44	[illegible]	3.66	[illegible]	3.62	[illegible]
Manufacturer's Maintenance Service									
Responsiveness	[illegible]	3.53	[illegible]	3.49	[illegible]	3.56	[illegible]	3.45	[illegible]
Effectiveness	[illegible]	3.31	[illegible]	3.42	[illegible]	3.52	[illegible]	3.52	[illegible]
Manufacturer's Technical Support									
Troubleshooting	[illegible]	2.98	[illegible]	3.17	[illegible]	3.20	[illegible]	3.12	[illegible]
Education	[illegible]	2.92	[illegible]	3.06	[illegible]	3.14	[illegible]	3.11	[illegible]
Documentation	[illegible]	2.70	[illegible]	3.06	[illegible]	2.98	[illegible]	3.14	[illegible]
Manufacturer's Software									
Operating System	[illegible]	3.48	[illegible]	3.54	[illegible]	3.52	[illegible]	3.51	[illegible]
Compilers and Assemblers	[illegible]	3.29	[illegible]	3.43	[illegible]	3.39	[illegible]	3.46	[illegible]
Applications Programs	[illegible]	2.92	[illegible]	2.99	[illegible]	2.95	[illegible]	2.97	[illegible]
Ease of Programming	[illegible]	3.32	[illegible]	3.35	[illegible]	3.31	[illegible]	3.36	[illegible]
Ease of Conversion	[illegible]	3.20	[illegible]	3.13	[illegible]	3.32	[illegible]	3.06	[illegible]
Overall Satisfaction	[illegible]	3.46	[illegible]	3.42	[illegible]	3.42	[illegible]	3.44	[illegible]
Additional Ratings[1]									
Ease of Expansion	[illegible]	3.63	[illegible]	3.42	[illegible]	3.58	[illegible]	3.47	[illegible]
Compatibility of Hardware Carried Over from Other Systems	[illegible]	3.29	[illegible]	3.38	[illegible]	2.96	[illegible]	2.98	[illegible]
Compatibility of Programs/Data Carried Over from Other Systems	[illegible]	3.22	[illegible]	3.04	[illegible]	3.09	[illegible]	2.84	[illegible]
Power and Energy Efficiency	[illegible]	3.22	[illegible]	3.02	[illegible]	3.18	[illegible]	3.20	[illegible]
Productivity Aids Help Keep Programming Costs Low	[illegible]	2.87	[illegible]	2.97	[illegible]	3.06	[illegible]	3.22	3.17
Software Support Delivered by Vendor	[illegible]	2.73	[illegible]	2.87	[illegible]	3.06	[illegible]	3.02	[illegible]
Keeping up with and Implementing Vendor Changes to Hardware/Software[2]	[illegible]	2.95	2.77	2.94	[illegible]	3.26	[illegible]	3.19	[illegible]
Delivery/Installation of Equipment[3]	[illegible]	2.85	[illegible]	2.82	[illegible]	3.08	[illegible]	3.00	[illegible]
Delivery of Required Software[3]	[illegible]	2.98	[illegible]	2.84	[illegible]	3.01	[illegible]	3.03	[illegible]
Did the system do what you expected it to do? (%)									
Yes	[illegible]	95.16	[illegible]	93.61	[illegible]	95.21	[illegible]	94.07	[illegible]
No	[illegible]	0.00	7.41	2.24	[illegible]	1.60	[illegible]	3.07	[illegible]
Undecided	[illegible]	4.84	[illegible]	3.19	[illegible]	3.19	[illegible]	2.66	[illegible]
Would you recommend system to another user? (%)									
Yes	[illegible]	95.16	[illegible]	87.54	[illegible]	93.62	[illegible]	93.87	[illegible]
No	[illegible]	0.00	7.41	5.43	[illegible]	2.66	[illegible]	3.07	[illegible]
Undecided	[illegible]	4.84	[illegible]	6.71	[illegible]	3.72	[illegible]	2.45	[illegible]

[1] Ratings are from 4.0 to 1.0, with 4.0 high.

[2] [illegible]

[3] [illegible]

67	[illegible]	150	[illegible]	12	[illegible]	88	[illegible]
9.6	[illegible]	10.7	[illegible]	10.3	[illegible]	11.3	[illegible]
84.18	[illegible]	66.00	[illegible]	66.67	[illegible]	69.32	[illegible]
19.40	[illegible]	24.67	[illegible]	0.00	[illegible]	12.50	[illegible]
14.93	[illegible]	8.67	[illegible]	33.33	[illegible]	18.18	[illegible]
3.62	[illegible]	3.46	[illegible]	3.56	[illegible]	3.60	[illegible]
3.62	[illegible]	3.66	[illegible]	3.91	[illegible]	3.55	[illegible]
3.47	[illegible]	3.37	[illegible]	3.64	[illegible]	3.38	[illegible]
3.44	[illegible]	3.31	[illegible]	3.73	[illegible]	3.20	[illegible]
3.36	[illegible]	3.13	[illegible]	3.64	[illegible]	3.14	[illegible]
3.10	[illegible]	2.88	[illegible]	3.18	[illegible]	2.70	[illegible]
3.04	[illegible]	2.83	[illegible]	3.36	[illegible]	2.73	[illegible]
2.79	[illegible]	2.69	[illegible]	3.09	[illegible]	2.57	[illegible]
3.36	[illegible]	3.50	[illegible]	3.67	[illegible]	3.36	[illegible]
3.44	[illegible]	3.20	[illegible]	3.50	[illegible]	3.36	[illegible]
2.80	[illegible]	2.76	[illegible]	3.30	[illegible]	2.80	[illegible]
3.22	[illegible]	3.40	[illegible]	3.17	[illegible]	3.64	[illegible]
3.25	[illegible]	3.21	[illegible]	3.10	[illegible]	3.34	[illegible]
3.36	[illegible]	3.35	[illegible]	3.58	[illegible]	3.39	[illegible]
3.63	[illegible]	3.70	[illegible]	3.92	[illegible]	3.57	[illegible]
3.19	[illegible]	3.30	[illegible]	3.27	[illegible]	2.73	[illegible]
3.30	[illegible]	3.02	[illegible]	2.89	[illegible]	3.11	[illegible]
3.27	[illegible]	3.07	[illegible]	3.17	[illegible]	3.13	[illegible]
2.70	[illegible]	2.80	[illegible]	3.00	[illegible]	3.51	[illegible]
2.73	[illegible]	2.68	[illegible]	2.83	[illegible]	2.67	[illegible]
2.85	[illegible]	3.02	[illegible]	3.00	[illegible]	2.71	[illegible]
3.11	[illegible]	2.97	[illegible]	3.25	[illegible]	3.02	[illegible]
3.00	[illegible]	2.89	[illegible]	2.92	[illegible]	2.73	[illegible]
2.54	[illegible]	89.33	[illegible]	100.00	[illegible]	94.32	[illegible]
1.49	[illegible]	5.33	[illegible]	0.00	[illegible]	3.41	[illegible]
4.48	[illegible]	4.67	[illegible]	0.00	[illegible]	1.14	[illegible]
1.04	[illegible]	89.33	[illegible]	91.67	[illegible]	92.05	[illegible]
2.99	[illegible]	8.00	[illegible]	0.00	[illegible]	0.00	[illegible]
2.99	[illegible]	2.67	[illegible]	8.33	[illegible]	7.95	[illegible]

DATAPRO RESEARCH CORP. CHARTS

CALENDAR

WEEK OF AUGUST 18

AUGUST 18-22, DALLAS — Systems Development: Information Modeling. Contact: Arthur Young & Co., Arthur Young Education Center, 1950 Roland Clarke Place, Reston, Va. 22091.

AUGUST 18-23, LOS ANGELES — The International Joint Conference on Artificial Intelligence. Contact: Claudia Mazzetti, American Association for Artificial Intelligence, 445 Burgess Drive, Menlo Park, Calif. 94025.

AUGUST 19-20, BOSTON — Data Communications II: Digital Communications Systems. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

AUGUST 19-20, DETROIT — Information Centers: End User Computing. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

AUGUST 19-20, HASBROUCK HEIGHTS, N.J. — Unix/Xenix. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 21-22 in Hartford, Conn.; Aug. 26-27 in St. Louis; and Aug. 28-29 in Philadelphia.

AUGUST 19-20, PORTLAND, ORE. — Principles of Prototyping. Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Aug. 22-23 in Calgary, Alta.

AUGUST 19-21, NEW YORK — SAS Computer Performance Evaluation Course. Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 19-21, NEW YORK — Telecommunications Management. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

AUGUST 19-22, SAN ANTONIO — Vsam: Its Structure and How to Use It. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 26-29 in Fort Lee and Los Angeles.

AUGUST 19-22, SAN FRANCISCO — Data Base Development Workshop. Contact: Elise Rabelais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

AUGUST 19-23, PHILADELPHIA — Advanced Systems Analysis. Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

AUGUST 20, NEW YORK — CICS/VS Application Design. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 22, 27 and 29 in New York; and Aug. 26-29 in Denver.

AUGUST 20-22, NEW YORK — SAS Processing Course. Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 21-23, ARLINGTON, VA. — Local-Area Networks. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 26-28 in Montreal.

AUGUST 21-23, BOSTON — Data Base Administration and Data Resource Development. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Sept. 11-13 in Dallas.

AUGUST 21-23, CARY, N.C. — SAS Operations Research Course. Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 22-23, NEW YORK — SAS Report Writing Course. Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

WEEK OF AUGUST 25

AUGUST 25-30, DALLAS — Systems Development: Design Phase. Contact: Arthur Young & Co., Arthur Young Education Center, 1950 Roland Clarke Place, Reston, Va. 22091.

AUGUST 26-27, SAN ANTONIO — CICS/VS Performance and Tuning. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 26-28, PARSIPPANY, N.J. — Vsam in Cobol. Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

AUGUST 26-29, FORT LEE, N.J. — IMS/DB (DL/1) Application Programming. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 26-29, SAN FRANCISCO — Integrated Information Technology Conference and Exposition (Intech '85). Contact: Jill Nieman, National Trade Productions, Inc., 2111 Eisenhower Ave., Alexandria, Va. 22134.

AUGUST 26-30, HOUSTON — Analysts' Skills Workshop. Contact: Elise Rabelais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

AUGUST 27-29, HOUSTON — SAS Basics Course. Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 27-29, CARY, N.C. — SAS Applied Time Series Analysis and Forecasting Course. Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 28-29, SAN ANTONIO — Recovery/Restart. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

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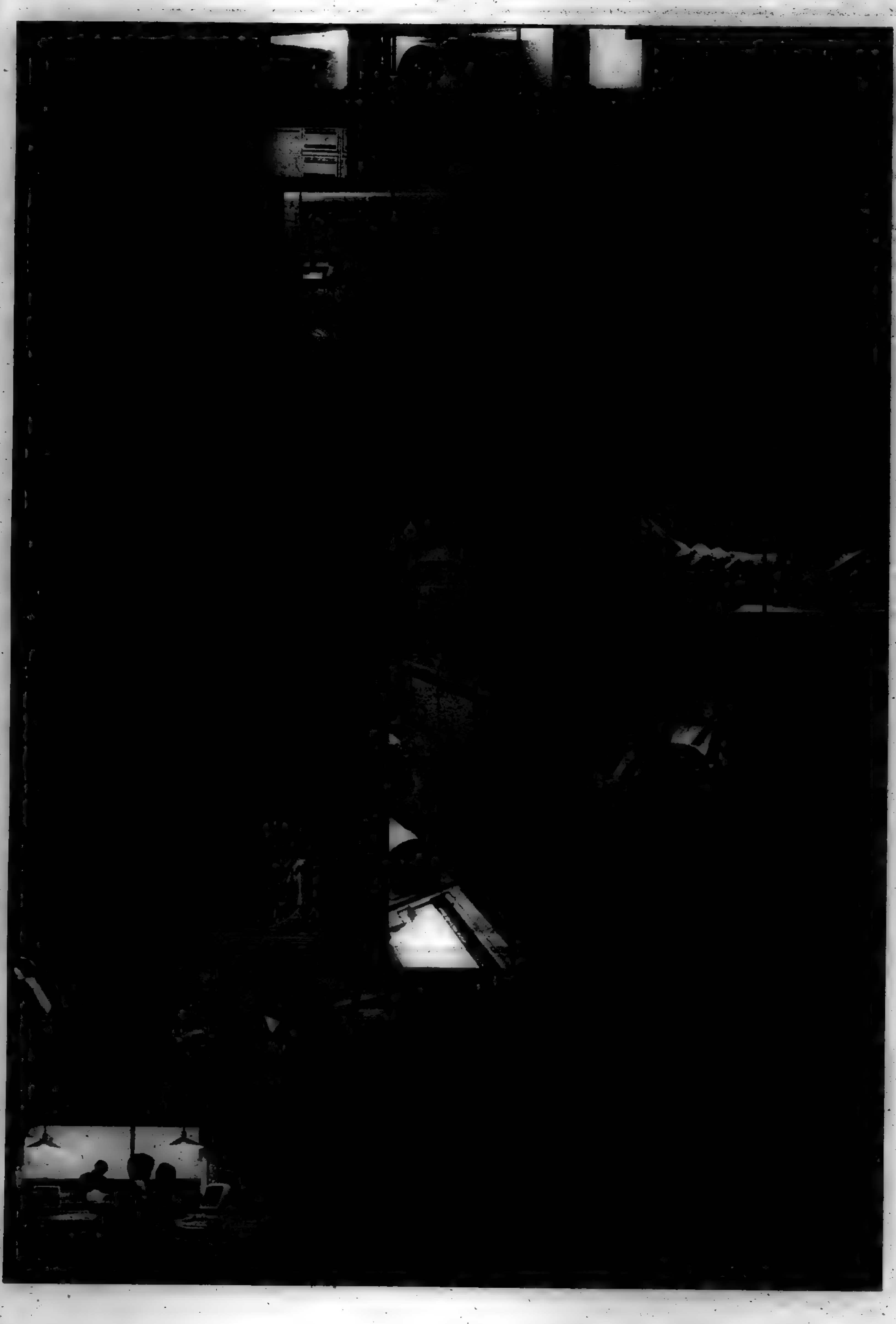

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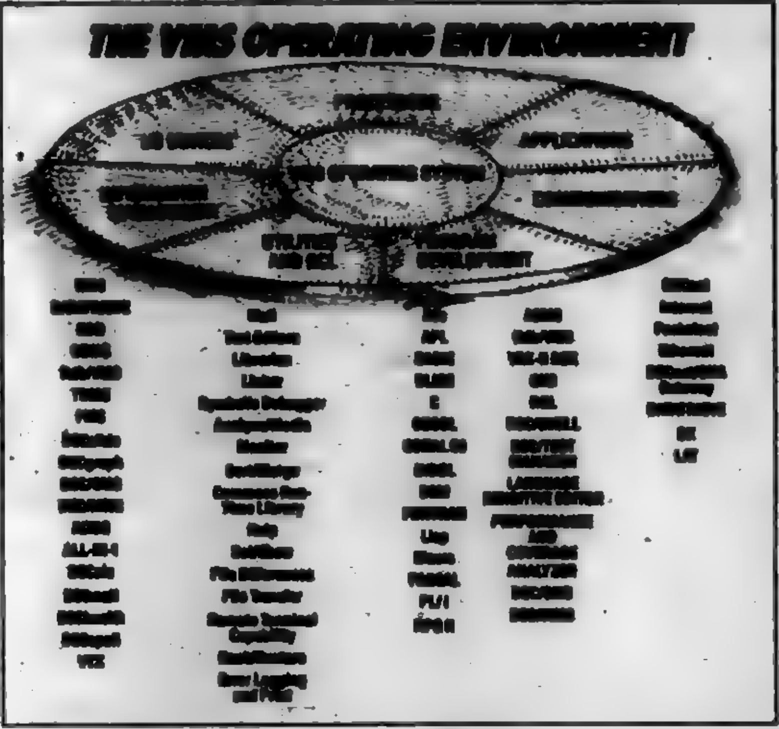
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EDITORIAL

Whale watching

Call me Ishmael.

I'm vice-president of marketing with a major mainframe applications software vendor. For the past few years, I've spent more time than I care to total, grappling with this great white whale known to people everywhere as the "Major Computer Trade Show."

National Computer Conference, Comdex — whatever their proper names, they are big and buoyant. I have enjoyed the hunt, but now I hear dire warnings that the breed may be nearing extinction.

The demise of the major computer trade show has been predicted at least since the Houston Horrors of 1983 and the time when Comdex became a bigger Las Vegas draw than Liberace. When things become large and powerful, people tend to enjoy taking easy shots at them, which helps explain pursuits such as whale hunting or the moose season in New Hampshire.

Frankly, the computer industry should be little alarmed and marginally concerned by the fact that the erstwhile trade show titans no longer draw the numbers of exhibitors they once did. It is a sign of industry maturity and enhanced user sophistication that both forces are responding to real problems with real solutions by using the trade show medium to advance the information management revolution.

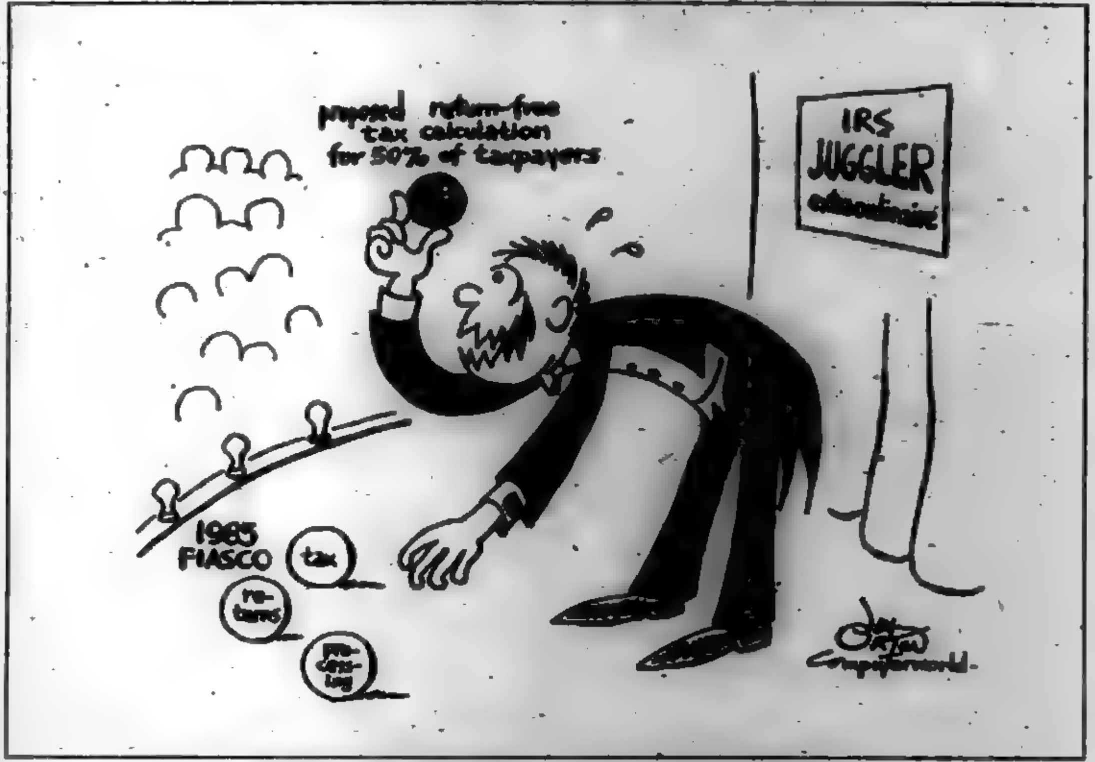
Some vendors see a horizontal show like NCC or Comdex as a perfect vehicle for dealing with OEMs, value-added resellers and retailers with multiple-product needs; others prefer the vertical technology- or application-focused shows, having come to grips with the ego-bruising reality that not every computer-related product is ideal for every business computer user.

Maturity and sophistication can be as becoming to technologies as to people. I was in Chicago for NCC last week. I came back with some meat and some blubber. Exhibitor ranks were reduced.

Maybe they were, compared to the halcyon years of 1983 and 1984. But compared with those days, *everything* about the computer industry is now subdued. This NCC was good for some vendors, not good for others. Next year, the latter may go somewhere else, or go nowhere at all.

One of the appealing facets of the computer industry is its absence from arbitrary (read: government) restraints and its quicksilver response to freewheeling market forces — just as whale hunters respond instantaneously to forces of nature.

So, call me Ishmael. Or maybe Pollyanna?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'So I didn't do too well with three — Let's see how I do with four!'

LETTERS

Roadblocks to relational DBMS

In the article, "Symposium panel fields DBMS questions," [CW, June 24] its author, George Schussel, attributed to me the statement that "born-again" DBMS, including IDMS/R, Datacom DB and TIS are *not relational*. As a report of what I said, this is largely incorrect.

I stated that the present release of Cullinet Software, Inc.'s IDMS/R is not relational, but I did not make any such description of Applied Data Research, Inc.'s (ADR) Datacom DB or of Cincom Systems, Inc.'s TIS or of born-again DBMS in general.

What I did say about the born-again DBMS was that, so long as they continue to allow data base access via their lower level languages, there would be a serious problem: Users of these lower level languages would be able to subvert many integrity constraints specified in the higher level relational languages.

This means that ADR's combination of Ideal and Datacom DB or Cincom's TIS cannot become fully relational unless and until the vendors of these products solve the integrity subversion problem in addition to supporting any functions from the relational model not yet implemented.

The assertion that many of these points are only of academic interest reminds me of nontechnical criticisms of earlier years, especially the one: "The relational model is a religion." Such criticisms are usually made by people who have little or no understanding of the relational model.

E. F. Codd
San Jose, Calif.

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VIEWPOINT

Resting on the laurels of American technology

LECHT ON SCIENCE
Charles P. Lecht

I had begged off accompanying my friends through the American Pavilion at Japan's International Exposition at Tsukuba (Tsukuba Expo '85) by saying that I had already toured it on several occasions, was tired and would prefer to wait out their visit at a nearby coffee shop. While all this was indeed true, I did not tell them that the main reason for my reluctance to revisit our national pavilion was that I find the exhibit depressing. The picture of American science that it presents, in comparison with what can be found elsewhere at the fair, is more Stone Age than Space Age.

Tsukuba Expo '85 is a fair dedicated to help further understanding of the benefits brought to humanity by today's scientific achievements. It is also an expression of our hopes and aspirations for what these benefits might bring to tomorrow's world.

The expo's theme is "Dwellings and Surroundings — Science and Technology for Man at Home," and its participants include more than 47 foreign countries, 37 international organizations and 28 domestic (Japanese) corporations. The exhibits sprawl over 252 acres, making it the largest science fair of its kind.

During the expo's first four weeks, four million people visited the fairgrounds — indicating that the forecasted attendance of 20 million is certain to be exceeded before the show closes in mid-September. The expected attendance at the U.S. pavilion is sure to exceed five million, and I wouldn't be surprised if it approached 10 million — most visitors are intensely curious as to what the country that put a man on the moon is up to these days.

Before I first visited the fair, I was certain that our national pavilion would be the finest one there. In view of our yelling "foul" at Japan over its international trade practices in computer and communications systems, could there be any doubt that we'd do anything less than our best to win a gold medal at a scientific olympics and thus substantiate our case in front of the world scientific community? Tsukuba Expo '85 presented an excellent opportunity for America to put on a high-quality performance to help prove its case.

So what did we do? We created a pavilion that is so awful that one foreign friend suggested that it appeared to be the "child of an American-hating saboteur bent on destroying our world-renown space-age scientific image. The outer pavilion is a tent-like structure whose message is a dedication to days of yore and gore when men proved their masculinity by bashing each other, and damsels had ample cause to be in distress."

But, if the exterior of our national pavilion is sad, what's inside is enough to make a patriotic citizen weep.

In addition to official government showpiece exhibitions, presumably sponsored by the U.S. Department of Commerce, it houses a cluster of American corporate exhibits from the likes of Dupont Co., Polaroid Corp., Texas Instruments, Inc., Digital Equipment Corp. and Thompson Ramo-Woolridge, to name a few of the 40 U.S. companies said to have supported our pavilion.

Yuppies on vacation

Manned by what appears to be yuppies on vacation, the exhibits are laid out in a manner reminiscent of Tokyo's Akihabara [CW, May 13 and May 27]. They are strewn about as though our pavilion's planners hadn't been given a hint that they were creating a space-age science show dedicated to the future.

Consequently, the designers have created a disorganized, tasteless mess of scientific paraphenalia, some of which may qualify for space-age antiquity (circa 1960). Adding insult to injury, some are annotated by claims to their invention by a bearded bevy of dead Nobel Prize laureats — indeed, the pavilion sports a touch-sensitive monitor dedicated to the lives and works of America's 133, which would have been great had Expo '85 been a historical event.

After promising a journey through the world's foremost achievements in artificial intelligence, the exhibits — amazingly — take visitors back in time so that they may learn of American contributions to the origins of this important science without suggesting what it may hold for the future. Missing is any kind of solid statement about the future of robotics, medicine, agriculture, energy and so on as found in the Japanese government's pavilion. Posters and jazzy displays featuring photographs and ill-conceived graphics surround an occasional hard-wired push-the-button-and-watch-the-lights diagram similar to what one might expect at a high school science fair.

Show is mindless

The 12-minute show, titled "To think" is mindless. Our pavilion offers a sorry statement of accomplishments in science in a world enjoying a scientific renaissance brought about by American ingenuity. Not that it says *nothing*, but when a country is supposedly No. 1, the public rightly expects something more.

My biggest fear is that, in the absence of anything as substantial in our national pavilion, visitors may wonder whether America's competitiveness hasn't been replaced by a contentment to rest on our laurels.

Whether we've been so busy yelling "foul" at any and every nation that's out there hustling, we seem not to have taken the time to notice that other nations may be making real progress in science and may well be catching up. The U.S. will have to do much better than it has done at Tsukuba Expo' 85 next time around, or we'll give foreign competitors a big assist by sending potential customers elsewhere.

I sit awaiting my friends. On their arrival, I know that I am not alone in my feelings. They express their own dismay by saying, "We now know why you begged off. The show was senseless, and the sole American robot in it was out to lunch."

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Certification: a gauge for computer professionals?

READER'S PLATFORM
Robert R. Cromer

With so many corporations and DP shops reporting positive experience with certified computer professionals during the past few years, it's about time for the antiprofessionalism faction to have its say.

Especially remarkable is the claim that certification does not even make the list when hiring entry-level people. In fact, there is no such thing as an entry-level certified data processor or computer programmer.

As for other negative attitudes reported by researchers, any of those interviewed may have — with or without their knowledge — had contact with "closet" certified data processors or computer programmers within their organizations.

One of the best-kept secrets within the computer information systems community is the plethora of tales told about erstwhile competent, productive staff members suddenly becoming incompetent upon discovery of their certification. The only change was knowledge of an individual's status by coworkers and supervisors.

Home-grown testing

With regard to implications that an organization's home-grown testing better indicates an applicant's potential productivity within the shop than does industry certification, the claim may be correct — if the search is for technical specialists rather than for knowledgeable professionals.

From the availability viewpoint, "fast-fingered Franks and Frankies" outnumber practicing certified professionals by 95 to one.

The purpose of the Institute for the Certification of Computer Professionals (ICCP) continues to identify those individuals who are truly knowledgeable, responsible and professional. In support of this purpose — and consistent with its character — the Data Processing Management Association Special Interest Group for Certified Data Processors produces a complete, knowledge-based, review course package.

Used by colleges and universities, corporations and local ICCP chapters, the "Uniform Review Course" material is consistent with the knowledge level of certified data processor candidates with a master's degree in MIS. Remarks from those who present the review course "in the field" suggest that even certified data processor candidates who find themselves unsuccessful in the certification effort claim greater respect for the breadth and depth of the subject covered in the review and tested in the exam.

For companies and individuals — whose hiring practices continue to discriminate against certified computer professionals — the self-fulfilling prophecy will continue. They are unlikely to encounter many resumes that identify the applicant as a certificate holder and are unlikely to discover a certified data processor or computer programmer within the organization until just before or after the certificate holder's departure. Such is the case where an inability — or unwillingness — to distinguish between technician and professional persists.

Advertisements with disclaimers

I suggest that organizations that choose to avoid interviewing or employing industry-certified computer professionals do so by qualifying their recruitment specifications and advertisements with the disclaimer: "Industry certification not recognized here." In fact, I urge such a practice for organizations whose internal and public financial policies and practices may be in conflict with public perceptions of privacy or with the law.

Because of the certificate holders' ethical and legal obligations, they are automatically placed in jeopardy when employed by organizations whose policies and practices cannot tolerate close scrutiny.

For those organizations seeking to employ the best-qualified, professional people — and for those that wish to include certifed computer professionals — I suggest that properly identify themselves in recruitment specifications and advertising. ‡

Cromer is the education director for the Data Processing Management Association Special Interest Group for Certified Data Processors.

DP employers on the wrong track with job histories

READER'S PLATFORM
John Callahan

A major factor that potential employers rely upon is an applicant's job history — labeled most often as the track record. The very term denotes a race that can be objectively evaluated as though one were racing a measured distance, being checked at various checkpoints against a stopwatch.

This a false concept. Applicants are not animals in a race nor are they runners in a track meet. Yet these false analogies carry over into the working world where they prevail as accepted standards. Falsely premised, however, are the assumptions of that standard.

Just as machines, sprinters and racehorses can be measured against a clock, so, too, people are measured by their work histories against some kind of clock.

Those applicants who have reached a certain job level within a certain time frame are considered to be the winners — and all companies want winners. Those who have failed to attain the proper level within the time frame are the losers. The company management would never consider interviewing people like that, let alone hire them.

Never mind that many companies today are in deep financial trouble facing the prospects of bankruptcy. Yes, just continue to ignore the mass evidence in DP, showing that DP is for the most part in a sorry state in spite of all the super technology changes pouring from the pipelines.

All this sends out a clear message that even the most die-hard theorists arguing in behalf of the track record cannot hide from this evidence: There are serious troubles in data processing in U.S. industry, and the track record as a tool has failed to accomplish the job attributed to it.

In spite of these repeated failures to identify potential employees, personnel department managers and DP department managers cling to this sacred track record tool.

As a result, the job track record has become enshrined as the major tool for selecting applicants for interviews. It is not difficult to assume that the track record also weighs heavily in the final choice of applicants. So, it has a dual function that compounds the extent of the false premises upon which the track record is founded.

It is a false assumption that top performers can readily find new jobs. Therefore, any applicant who has been unemployed for any extended period is not a top performer, hence not a suitable applicant.

There is a gross failure to recognize that even top performers will work only when economic conditions are favorable. These people must also undertake extensive job searches.

There is the failure to recognize that even top performers are sought out only when there is an existing need by companies for their services. Jobs do not just drop into the applicants' laps. Job searches are the rule — yes, even in data processing — and especially if the applicant is seeking a higher level job.

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>
> *There is a serious flaw in the assumption that a person with many job changes is an unstable employee.*

There is a serious flaw in the assumption that a person with many job changes is an unstable employee.

No track record will ever reveal the factors that motivate an applicant. Job histories do not allow applicants to express what they strongly liked or disliked about particular jobs, nor do they give any indication of the kinds of tasks the applicant enjoys.

DP is a first target for budget reductions. It should not be surprising that unexpected job changes occur within an industry marked with high instability.

Isn't it time to take a hard look at the use of the track record as a major basis for applicant selection? Isn't it time to relegate this tool to an ancillary aid to help balance out applicant selections?

Why not use other means to gather information for applicant evaluation, such as a possible questionnaire that could be mailed to applicants to glean a fuller and clearer picture before meeting with them? Such a questionnaire could identify job tasks and environmental and managerial factors that are strong motivators for an applicant.

If improved conditions in hiring, job stability and productivity are desired, then new means need to be developed to relegate the track record method to its proper ancillary role. It is time to dethrone it and its overbearing importance.

Callahan is an Arlington, Texas-based DP consultant.

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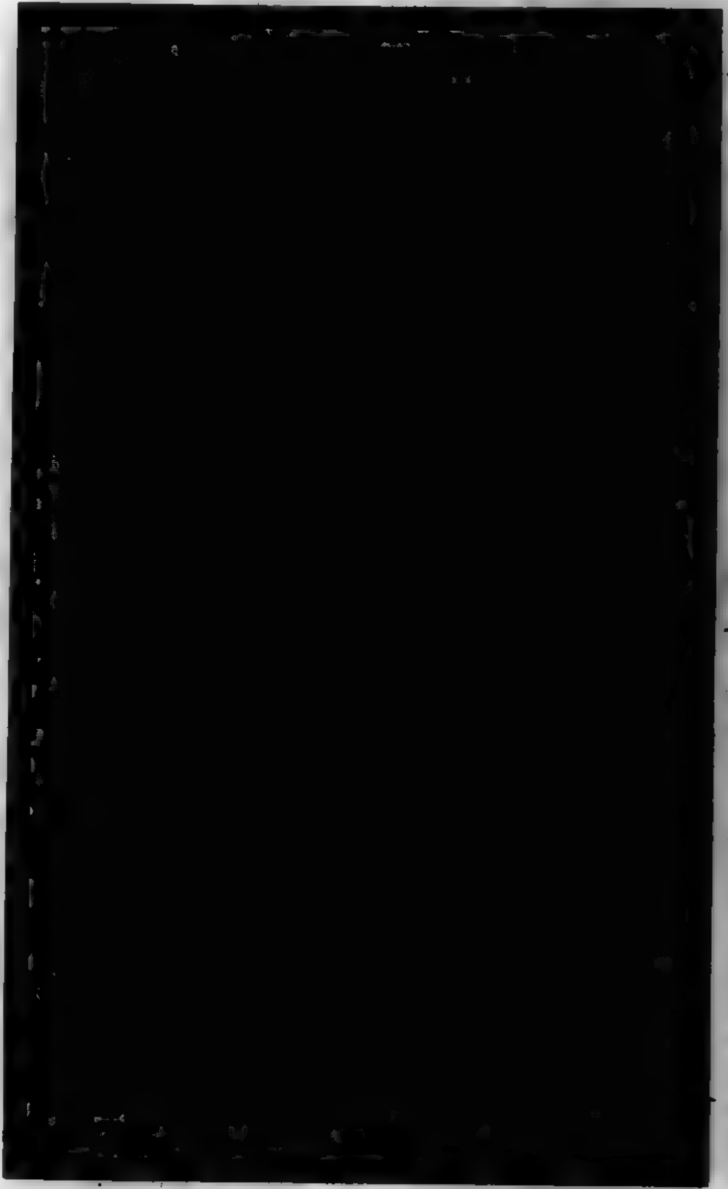
The time has come for straight talk about database management systems.

"The only reason to buy a database management system is to build better applications."



Throughout the history of the software industry, proponents of one database architecture after another have promoted their respective systems as the sole solution to a company's application backlog problem.

The early debate centered on hierarchical versus network architecture. Advocates of inverted file entered the argument in the 70's. And today, relational is the architecture of choice.

While this discussion about architecture is interesting, it's just not the issue.

Database management systems, beginning with the very first, were created to do one thing and one thing only—they were created to build better applications. *Building applications—efficient, online applications, faster, with fewer people—is the only real issue.*

Today corporations have a huge backlog to contend with. And the applications they need to develop have different characteristics. Some may be retrieval only. Some may be heavy on update. Some will run the company, and will require professional development. Some can be created by end users to satisfy their own needs.

It is extremely important to have a database management system that can handle all applications. *It is essential* that a database include tools rich and comprehensive enough to accommodate both the professional developer and the end user. It's the richness and power of these tools that's critical to the successful implementation of highly responsive fourth generation applications. What's demanded, in fact, is software that goes a *step beyond* today's conventional relational database systems.

With a comprehensive database management system and the appropriate tools like the kind I'm talking about, you'll make the data processing department a *strategic asset* instead of corporate overhead. You will make your company succeed in a highly competitive world.

In Cullinet's new Annual Report, Presidents and CEO's of major corporations speak about the positive impact Cullinet has had on their operations. For a copy that you might like to read and pass along to your company president, write to me. I'll see that you get one.

J J Cullinane

John J. Cullinane
Chairman of the Board

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The only database management system worth buying is one that meets these six requirements.

Stated simply, IDMS/R is a step beyond today's conventional relational DBMS because it meets these key requirements for building successful applications.

1. MIS Application Development Facilities

The application development system required to build high performance production applications requires more than a fourth generation language. Cullinet's ADS/OnLine is a comprehensive application development environment for the MIS professional combining fourth generation language with a menu-driven modular development approach. Integrated with the data dictionary, this minimizes not just the programming but the entire design, development and documentation of an application. Furthermore, this approach produces a dramatic reduction in maintenance and support.

2. End-User Application Development Facilities

Because Cullinet recognizes the difference between production and end-user applications, as well as the need for both to share common data, we provide an easy to use end-user oriented development and inquiry system. The Automatic System Facility of IDMS/R is a non-procedural, menu-driven tool designed for end-users. Once data tables are defined, an application is automatically generated. The query facility of IDMS/R provides menu-driven query capability and full online help, so end-users can build working applications in minutes and get reports easily and efficiently.

3. Relational Architecture

IDMS/R allows for the definition of databases using the relational data model. Data tables and associated user views are easily defined online. Additionally, any number of key fields may be defined. IDMS/R also supports advanced relational features including referential integrity and domain definition. This architecture provides the capability to address all application requirements.

4. High Performance Database and Application Tuning Facilities

IDMS/R is a full multi-tasking, multi-threaded system providing for concurrent processing of on-line and batch, update and retrieval applications. Additionally, tuning facilities provide efficient indexing techniques, space management, page management, and buffer management. No conventional relational DBMS has these capabilities.

5. Dictionary Driven DBMS

Data integrity and data independence are essential in a DBMS environment. The dictionary actively controls the source and use of all data. Data definitions, data validation criteria, data formats and security are all defined within the dictionary and exist only once, eliminating redundancy and ensuring integrity. This information is then automatically used throughout the system. Examples of the functionality of this facility include never needing to define output formats for query; never needing to define field attributes for screens; never needing to code validation and editing criteria when using ADS/OnLine. Only IDMS/R provides this level of dictionary integration.

6. Open System Architecture

With the unique Open System Architecture of IDMS/R you can maximize your investment in existing software. IDMS/R accepts data from outside the database environment with direct access to VSAM files. In addition, applications written to access other databases like IMS, DL/1, TOTAL, or VSAM can directly access IDMS/R without modification. IDMS/R is designed to work in virtually all IBM mainframe operating systems and teleprocessing monitor environments.

IDMS/R: More than a relational DBMS

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SOFTWARE & SERVICES

Flexibility key to Bendix' HRMS

By Mitch Betts
CW Washington Bureau

ARLINGTON, Va. — Bendix Aerospace, a unit of Allied Corp., recently developed a human resource management system (HRMS) that puts report generation in the hands of personnel officers, rather than in those of the MIS department.

"We wanted flexibility, and we wanted to enhance the productivity of our personnel people," explained Janie S. Tremlett, manager of human resource systems, in a recent interview here. Consequently, the HRMS is designed to permit the human resource unit's 130 users to create routine and ad hoc reports from the data base.

"This way, you don't have to spend your whole life negotiating between the MIS department and users on a report," Tremlett said.

About three years ago, Bendix Aerospace realized it needed to modernize its 15-year-old, batch-oriented personnel system and began to transform it into an on-line system, Tremlett said. The new HRMS, she said, has three major components:

Tremlett

- The personnel management system and benefit plan administration system software from San Francisco-based Tesseract Corp., both of which are on-line, interactive systems that allow users to input, update and access data through customized screens.
- An in-house report library that consists of programs used to produce major administrative reports.
- A facility for ad hoc queries based on Intellect, the natural language query software from Artificial Intelligence Corp. of Waltham, Mass.

Each of the systems has its own security facilities, Tremlett noted, so users have separate passwords for each system. Tremlett said she requires password changes every 30 days, monitors activity logs and emphasizes security in training sessions and user manuals.

Ron Armstrong, MIS project manager at Bendix Aerospace, praised the Tesseract software for its fast response time. He said response time is between one and three seconds for most searches through the data base of approximately 250,000 records. "It's the most efficient system I've ever seen," Armstrong said of Tesseract.

Armstrong said the Tesseract screens organize information in a logical way, so that all insurance data is presented on one screen, for example.

Tremlett and Armstrong said the company is moving toward a paperless human resource system. The ease-of-use features of Tesseract have helped to wean personnel officers from their traditional paper forms, they said. In addition, the natural language query features of Intellect make the data base more manageable and accessible to novice users.

The HRMS runs on an IBM 3081 mainframe at a data center in Teterboro, N.J., with the CICS teleprocessing monitor and Cullinet Software, Inc.'s IDMS data base management system, according to Armstrong. He added that the Teterboro center

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- Introduced by Motorola Information Systems, Transtext allows users of the company's minicomputers to communicate with IBM's Disoss/39
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Slump moves to software

SOFTALK
John Gallant
CW Senior Editor

Like a rumor of war, the computer industry slump has finally reached the software heartland.

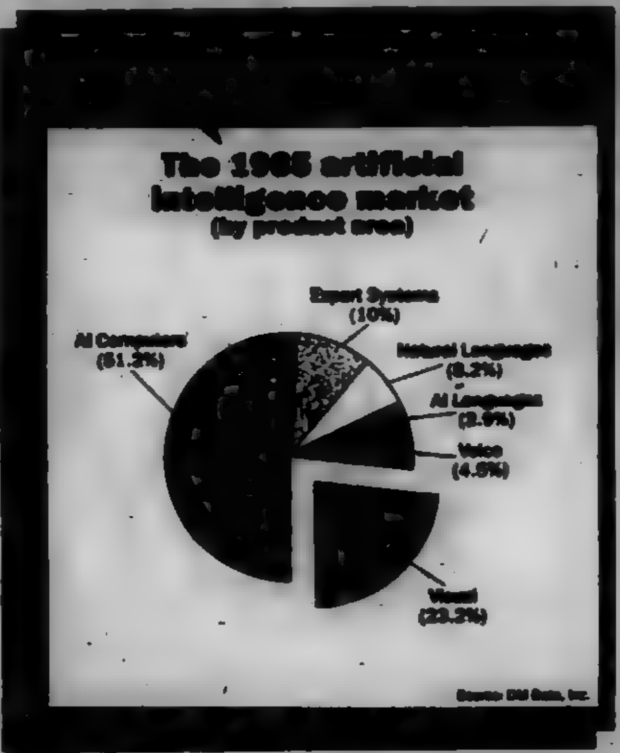
Accustomed to annual revenue and profit growth in the range of 35% to 50%, software manufacturers are now moderating their optimistic estimates for the year and steeling themselves to deal with delayed — if not canceled — sales and reduced revenues.

How closely early-quarter shortfalls experienced by such companies as Management Science America, Inc. and Applied Data Research, Inc. are tied to the slump remains to be seen. The software industry is prone to first- and second-quarter doldrums, but any additional problems caused by the slowdown put extra pressure on vendors to make up lost ground at year's end.

Fortunately, software makers have not had to resort to the severe cost-cutting steps many of their hardware counterparts have already taken. Indeed, there is little evidence thus far that software companies will need to do anything more drastic than tighten their belts for the leaner, though far from desperate, days ahead.

The past months have been euphoric ones for software mak-

See SLUMP page 46



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SOFTSCOPE

Notes from the software industry front

Software International Corp., in conjunction with General Electric Credit Corp., is providing financing assistance to customers looking to purchase its mainframe and minicomputer applications, including the recently announced Masterpiece series [CW, July 1].

Through GE Credit, Software International will extend credit to help buyers finance their software acquisitions. Andover, Mass.-based Software International is a subsidiary of General Electric Software Products Co.

■

Digital Equipment Corp. of Maynard, Mass., and Information Builders, Inc. have penned a cooperative marketing agreement for the newly unveiled VAX version of N.Y.-based Information Builder's Focus fourth-generation language. The companies will conduct joint product seminars, cooperate in trade show activities and develop joint marketing support materials.

■

Pansophic Systems, Inc. of Oak Brook, Ill., will be investing more than $1 million in Schonfeld & Associates, Inc. and will expand the marketing of that company's Ingot decision support system, which runs on a variety of mainframes and minis. For its role in the joint marketing and financial agreement with Evanston, Ill.-based Schonfeld & Associates, Pansophic has received an option to acquire certain assets of the company, including the Ingot product line.

■

In recent weeks, Wang Laboratories, Inc. of Lowell, Mass., and Nashua, N.H.-based BKW, Inc. have inked two agreements. One is a development pact that calls for BKW to design a series of "banking-related software communications products." The second is a joint marketing agreement that enables Wang to sell BKW's software to banks using Wang hardware.

■

McLean, Va.-based Verdix Corp. and Intellimac, Inc. signed an agreement that allows Rockville, Md.-based Intellimac to acquire the source code of the Verdix Ada Development System. Intellimac plans to host and target the Verdix product on both its commercial Ada development processors and its Milspec multiprocessor computers.

■

Motorola/Four Phase Systems, Inc., a Cupertino, Calif.-based subsidiary of Motorola, Inc., will be marketing and distributing Software Research Corp.'s Documpower network software for Four Phase office equipment. The Four Phase version of Natick, Mass.-based Software Research's software will be marketed under the name of Transtext.

■

Two units of the Schlumberger Computer-Aided Systems Group, Applicon and Factron, will begin marketing HHB Softron's design evaluation software. Applicon will market HHB Softron's Cadat logic and fault simulation software with its Applicon Bravo very large-scale integrated circuit and Bravo printed-circuit board computer-aided design, engineering and manufacturing systems. Factron will market Cadat as part of its Automated Test Program Generation facility for its line of circuit board testers.

"It keeps saying it's shut down in honor of Einstein's birthday."

SOFTWARE & SERVICES

Tool identifies potential buyers from mailing list

WOBURN, Mass. — Persoft, Inc. has announced More, an expert system direct marketing tool that identifies potential customers from mailing lists. The package runs in IBM MVS and DOS environments.

Designed for direct mail marketers and service bureaus, the More system includes three modules: list segmentation and selection, decision support with marketing and financial output reports and a data base foundation that maintains list information on individuals.

According to a spokesman, More improves direct mailing responses and reduces mailing costs by selecting the best prospects. The package weighs relevant information about individuals on a mailing list, considers when the individual last purchased something via direct mail and determines the average purchase amount for an individual, according to the vendor.

The package also reviews how often the individual has responded over a series of mailings and evaluates the type of products the individual has purchased by direct mail. Merchandise return information and other factors are also included in evaluations.

The More package is priced at $375,000.

More information is available from Persoft, located at 600 W. Cummings Park, Woburn, Mass. 01801.

Motorola, IBM link debuts

CUPERTINO, Calif. — Motorola Information Systems, a division of Motorola, Inc., has introduced Transtext, a program that allows users of its Series 4000/5000 minicomputers to communicate with an IBM Office Systems Network via IBM's Distributed Office Support System (Disoss).

Transtext provides Motorola users with document management capabilities and permits the integration of data files with text. Capabilities for document manipulation, filing and electronic distribution of documents are also included.

The product consists of software that runs on the host within the IBM network and one of three programs that runs on the Motorola Series 4000 and 5000 systems. The Transtext interface resides on an IBM host running CICS and Disoss Version 3.

Motorola users can transfer documents in native, revisable and final form versions. Transtext Native Form allows Series 4000 and 5000 users to assemble and transfer Motorola/Four Phase Systems, Inc.'s Foreword word processing documents in native mode to other Series 4000 and 5000 systems in the network.

Transtext Revisable Form allows documents to be exchanged between users where they can be edited and returned to the originator in a form compatible with IBM's revisable form text document architecture. Transtext Final Form allows users to exchange, display and print documents in a form compatible with IBM's final form text document architecture.

The Transtext Interface, Native Form and Final Form are priced from $800 to $6,000. Transtext Revisable Form will be available in November and is priced at $1,500.

More information is available from Motorola Information Systems, located at 10700 N. Deanza Blvd., Cupertino, Calif. 95014.

CDC enhances analysis program for Cyber 200 supercomputers

MINNEAPOLIS — Control Data Corp. has announced that the UAI/Nastran program, designed for advanced general-purpose finite element structural analysis, has been enhanced to run on the CDC Cyber 200 series supercomputers.

UAI/Nastran was developed by Universal Analytics, Inc. (UAI), which adapted the National Aeronautics and Space Administration's Structural Analysis (Nastran) program to create the product. CDC also announced a companion version that runs on the Cyber 180 series computers.

UAI/Nastran is designed for a variety of engineering applications, including static and dynamic structural analysis, steady state and transient heat transfer analysis, three-dimensional fluid-structure interaction problems and buckling.

The program is used for the analysis of structural designs for aircraft and spacecraft, automobile frames and bodies, turbine and jet engines, bridges, high-rise buildings, nuclear power plants and power transmission towers.

With enhancements in the product for the Cyber 200, structural problems of virtually unlimited size can be analyzed, a spokesman said. An automated multistage substructuring feature reduces the difficulty of setting up large structural models.

UAI/Nastran for the Cyber 180 Model 810 is available for an initial $2,550 fee and a monthly fee of $2,100. For the Cyber 180 Model 860, the initial fee is $2,550, and the monthly fee is $2.95 per CPU minute, or $2,100 per month, whichever is greater. For the Cyber 205, the initial fee is $12,000, and the monthly fee is $10.25 per CPU minute of $6,000 per month, whichever is greater, the vendor said.

CDC is located at 8100 34th Ave. S., HQW10H Systems Division, Minneapolis, Minn. 55417.

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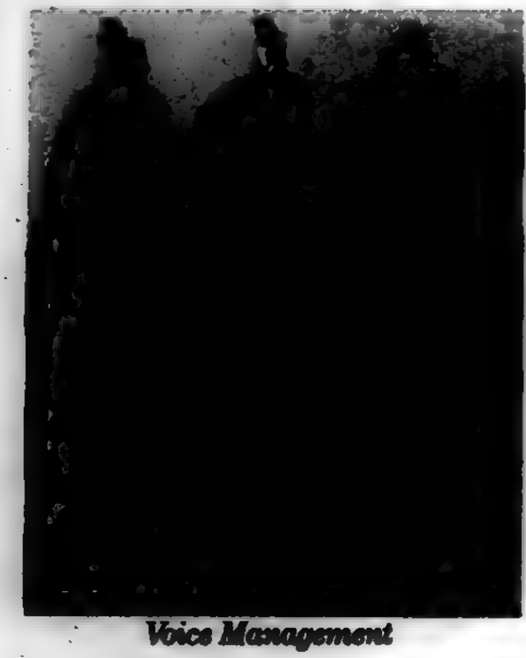
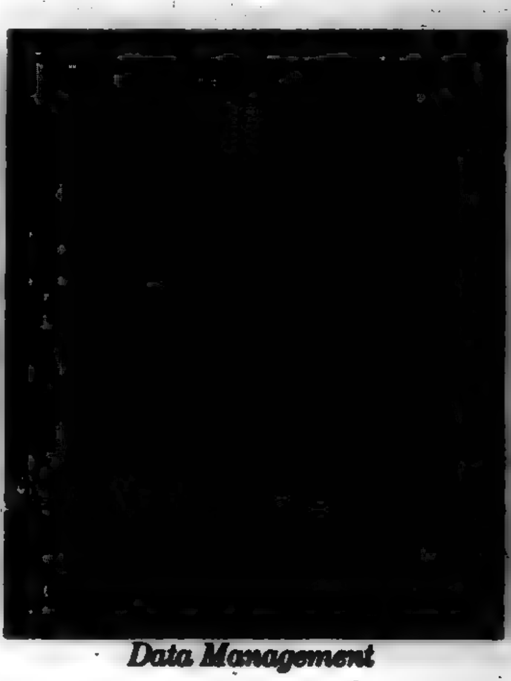


Voice Management



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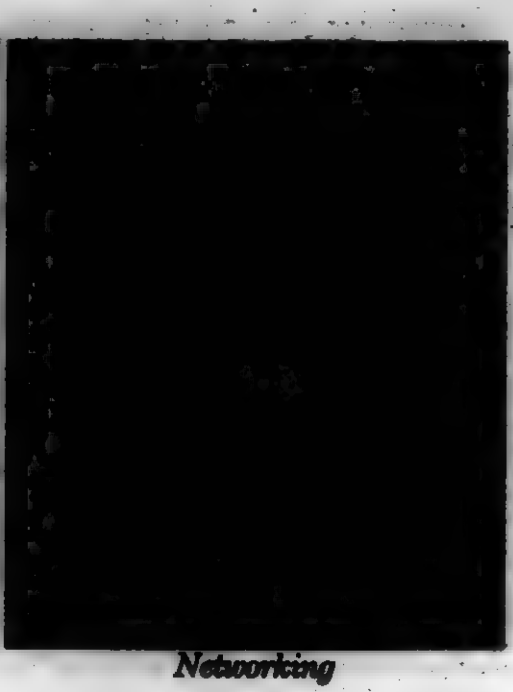

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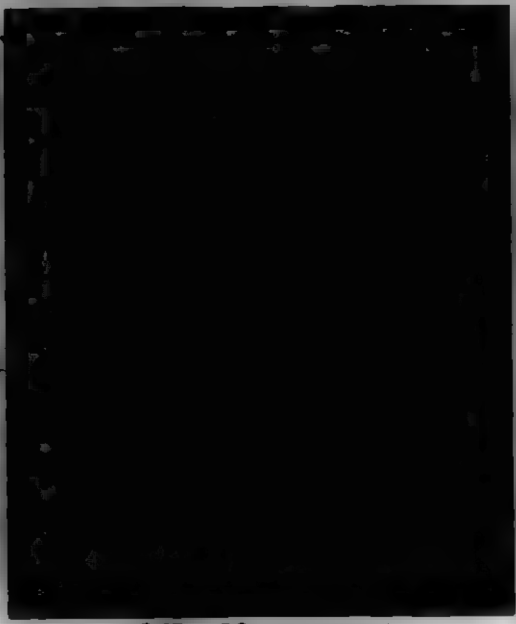

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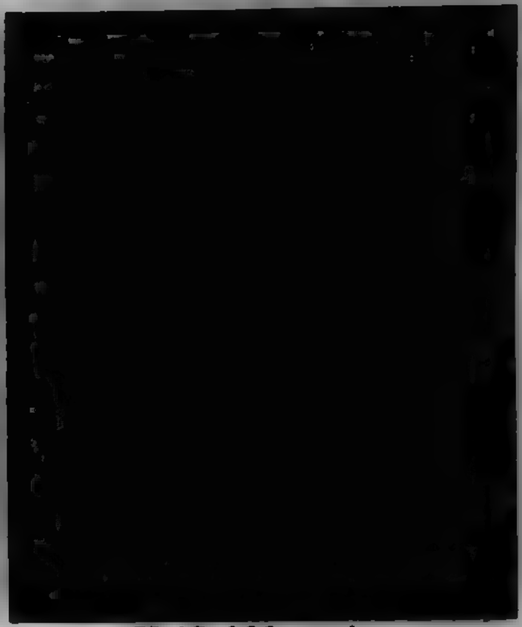

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To find out more about System 85 and System 75, call your AT&T Information Systems Account Executive or 1-800-247-1212.

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Nixdorf announces series of software

WALTHAM, Mass. — Nixdorf Computer Corp. last week announced a series of software products for various systems in its product line.

The following were included in the announcement:

■ Release 2 of Nixdorf's Nidos/VSE operating system for the Nixdorf 8890. Release 2 includes two features that extend the 8890's capabilities in a distributed-processing environment: a job transfer program and a file transfer program. Release 2 also supports a multihost facility, said to provide terminal networking capabilities, the company said.

Release 2 also provides enhanced support for IBM-type Fixed Block Architecture storage devices. Release 2 costs $12,000 for a one-time fee and is available immediately.

■ An enhanced Programmer Workstation Partition Data Set, called PWS II, for Nidos/VSE Release 2. The package provides an on-line interface to the PWS library and features support for accessing system functions like console support, spooling and transaction control programming. The package costs $3,750 and can be leased for $125/mo.

■ Market Master, a property appraisal and tax collection package for the 8850. The property appraisal segment of the package costs $16,000, and the tax collection costs $7,300, the company said.

■ An applications development package for the 8890 called Hibol/TCP. The package runs under Nidos/VSE Release 2 and is supported by Nixdorf's Task Control Program. Hibol/TCP is said to generate all of the code required for Cobol/TCP programs by producing Cobol source code. The company claimed use of the package can reduce debugging time by as much as 80%. It costs $15,000 for a one-time license fee or can be leased for $500/mo.

■ Comet Calc, a spreadsheet program for the company's 8870 minicomputers. It costs from $350 to $750, depending on the 8870 configuration.

Nixdorf is located at 300 Third Ave., Waltham, Mass. 02154.

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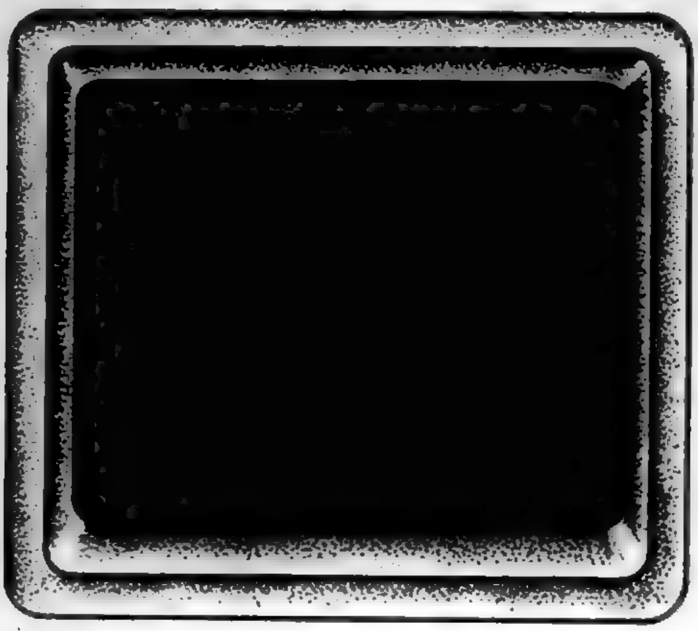

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*Focus is a product of Information Builders, Inc.
INTELLECT/FOCUS runs on IBM and IBM-compatible mainframes.

SYSTEMS SOFTWARE

■ Unipress Software, Inc. has introduced the Amsterdam Compiler Kit for AT&T Unix-based processors.

The Amsterdam Compiler Kit is a package of Basic, C and Pascal native and cross-compilers for a variety of processors, including Zilog, Inc.'s Z8000 and Z80; Intel Corp.'s 8080; and Motorola, Inc.'s 6502. The kit includes complete source code for programs as well as internal documentation for modifications or programming language additions, the vendor said.

The Amsterdam Compiler Kit is priced at $9,950.

Unipress Software, 2025 Lincoln Highway, Edison, N.J. 08817.

■ BMC Software, Inc. has announced two packages in the Superoptimizer product family, systems software said to reduce the size of messages going to and from an IBM IMS/VS or CICS/VS system and its 3270 family screens and printers.

The Superoptimizers improve end-user response time on remote 3270 terminals by sending smaller messages faster, according to a spokesman. Queuing or other network delays are reduced because smaller messages mean less load on the network.

The products allow older IBM printers, such as the 3268, to begin printing sooner by reducing the time it takes to transmit a page of data. For Systems Network Architecture character set printers like the 3287, which begin printing when they receive data, the Superoptimizers examine the data to be printed and send tabbing orders to boost printing speed.

In other features, Superoptimizer detects outbound or inbound data stream errors; supports 3270 functions like program-defined symbols, extended attributes and windows; and exploits IBM's MVS/XA, the vendor said.

Superoptimizer/CICS, available now, is priced at $17,250 for the first CPU. Superoptimizer/IMS is scheduled for fourth-quarter availability.

BMC Software, P.O Box 2002, Sugar Land, Texas 77478.

■ Westinghouse Electric Corp. has announced Multsess software for increasing the productivity of network terminal users.

Executing as an IBM Vtam application program under the MVS operating system, Multsess provides single-key switching between multiple applications without rendering them inactive, the vendor said. With Multsess managing sessions, one terminal can to do the work of several and reduce system overhead.

Multsess allows ACF/Vtam users to execute multiple and concurrent applications sessions such as TSO, CICS and IMS without logging off and on. Full security system interfaces, with cross-domain support and automatic profile execution, are included with Multsess. To enhance security, the Multsess directory restricts terminals to predefined applications.

The perpetual license fee for Multsess is $14,000.

Westinghouse, Management Systems Software, 777 Penn Center Blvd., Pittsburgh, Pa. 15235.

See TOOLS page 43

SOFTWARE & SERVICES

TOOLS

from page 42

■ **Data 21, Inc. has announced CICS-Help 4, an IBM CICS windowing package that provides Help windows for CICS applications and allows multiple applications to run on a single CICS terminal. The package runs in IBM MVS and DOS environments.**

Release 4 allows Help screens to be added and updated while the application they document is executing, a spokesman said. Help screens can be added to conversational programs with no program modifications. Multiple CICS applications may be active on a single CICS terminal and toggled using a function key. CICS applications can be initiated with a dedicated key without affecting the transaction currently running on the terminal.

CICS-Help windows can be designed to replace the entire application screen or a portion of the screen, the vendor said.

The perpetual license fee for CICS-Help is $3,995 for DOS systems and $7,995 for MVS systems.

Data 21, 3868 Carson St., Suite 309-5, Torrance, Calif. 90503.

■ **University Computing Services Corp. has announced that its interactive Cobol/Cobol 74 debug facility is available for Burroughs Corp. Burroughs A series, as well as B5900, B6900 and B7900 mainframes.**

The product includes the ability to display or change program variables and interrupt program execution at user-selected breakpoints. It also includes on-line Help facilities and the ability to perform line-by-line or multiline program continuation, reference and display of source code.

It is priced at $7,500.

University Computing Services, 254 E. Main St., Newark, Del. 19711.

■ **A+ Software, Inc. has announced the Systems Programmer series for IBM's MVS. The product provides Dasd analysis and management facilities.**

Product features include Dasd configuration flow analysis, tuning aids, component failure impact analysis and a variety of cross-reference reports, a spokesman said. Utilities aid load module analysis, job control language validation and date conversion.

A disaster recovery planning facility supports IBM component failure impact analysis methodology. All resources required to run a job or system, such as tape drives, Dasd and work space, are identified. On-line and batch analysis tools are provided for flowcharting single jobs or an entire system.

The tools run under MVS. Systems Programmer series software is priced at $7,500.

A+ Software, 16 Academy St., Skaneateles, N.Y. 13152.

■ **Lawson Associates, Inc. has announced the Access/38 and Access/DB business management software for IBM System/38 users.**

The Access/38 package allows users to define and execute their own on-line inquiries and generate reports using standard System/38 data. The software costs $9,000.

The Access/DB package, geared to the data processing professional, is said to enable the creation of on-line, interactive IBM RPG-III programs allowing for additions, changes and deletions to the data base. It costs $4,000.

Lawson Associates, 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.

■ **Adpac Computing Languages Corp. has introduced Version D1.00 of its Diagraphics for Data Processing (DFDP) for developing system specifications on an IBM 3270 or compatible terminal under IBM's MVS/TSO operating system.**

DFDP Version D1.00 includes an extended data definition library that stores information about an analyst's specifications, including record and file layouts and data elements.

Information in the data definition library can be uploaded into any of the major data dictionaries. The system can also download information from the data dictionary and provide the analyst with a list of data elements and their corresponding codes.

DFDP D1.00 is priced from $9,500 to $30,000.

Adpac, 340 Brannan St., San Francisco, Calif. 94107.

■ **Advanced Systems Concepts, Inc. has announced an enhanced version of its Probe analysis tool for IBM System/38 applications.**

Probe allows users to display all programs referencing physical data elements, regardless of logical view or file redirection. The product also allows users to view programs that access particular data elements or fields within a file group.

Probe is priced at $1,000.

Advanced Systems Concepts, Suite 3, 1350 Remington Road, Schaumburg, Ill. 60195.

■ **On-Line Software International, Inc. has introduced Verify, a system for regression testing IBM CICS application programs on IBM mainframes under DOS or OS.**

Verify is said to eliminate the need for repetitive operator input by providing automatic testing capabilities. Screen I/Os are logged to the disk for examination, either as full screens or field by field with character and hex formatting capabilities. Previously logged data can be used to retest modified applications programs, the vendor said.

Continued on page 44

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Continued from page 43

The product can print I/O screen displays in a variety of formats that can be used for generating programmer documentation and user-reference manuals.

Verify is priced at $25,000 for DOS and at $35,000 for OS.

On-Line Software International, Fort Lee Executive Park, 2 Executive Drive, Fort Lee, N.J. 07024.

■ Morino Associates, Inc. has introduced Release 2 of its MVS Problem Alert System (MVS/PAS) for diagnostic support of IBM's DMS and DB2 data base management systems.

MVS/PAS Release 2 includes a Program Temporary Fix Chain Management Facility that provides a resolution set of fixes required to correct software problems and can automatically generate System Modification Program control statements for application of the fixes. The product also includes enhanced reporting capabilities for identification, prioritization and solution of systems maintenance problems.

MVS/PAS costs $12,000.

Morino Associates, 8615 Westwood Center Drive, Vienna, Va. 22180.

PRODUCTIVITY AIDS

■ Manifold, Inc. has introduced Version 1.2 of Ada-Quick, an applications development tool for users of Software AG's Adabas data base management system and Natural fourth-generation language.

Version 1.2 of Ada-Quick allows users to access Adabas through a menu-driven environment. User views can be incorporated into other on-line systems, and user-generated profiles can be saved for later use, the vendor said.

Ada-Quick is priced at $7,500.

Manifold, Suite 7, 1655 Greenfield Ave., Los Angeles, Calif. 90025.

■ Advanced Systems Concepts, Inc. has announced that its Productivity Plus package for IBM's System/36 now includes a device configuration flowchart. Productivity Plus offers System/36 programmers additional functions, such as display file recompilers and file re-creation modules.

According to a spokesman, the flowchart produces a diagram of the relationships between all devices configured on a System/36. Devices listed on the same path are listed in ascending address order. System devices, as well as devices connected to any workstation controller, are detailed.

Each module is priced at $95, and the entire package costs $600.

Advanced Systems Concepts, Suite 8, 1350 Remington Road, Schaumburg, Ill. 60195.

APPLICATION PACKAGES

■ Digital Equipment Corp. has announced Version 2 of its VAX VTX videotex software for its VAX line of computers.

VAX VTX Version 2 allows users to create personal menus to go directly to frequently accessed pages and select more than one choice per menu. It also includes an unlimited keyword search facility to find information residing on a remote system.

The product will be available in September. Prices for VAX VTX range from $9,000 for the Microvax to $37,500 for the VAX 8600 systems.

Digital Equipment, 146 Main St., Maynard, Mass. 01754.

■ Expanded on-line capabilities have been added to Release 5.5 of Software International Corp.'s Accounts Payable package for Wang Laboratories, Inc. Wang VS minicomputers.

The enhanced Accounts Payable system is said to take advantage of the Wang system's internal capabilities, as well as Wang's native keyed-file access method. Expanded inquiry capabilities give users immediate access to information in the data base.

Accounts Payable provides the ability to perform inquiries by vendor name, invoice or voucher number. Software International's Accounts Payable system is priced from $12,000 to $21,000, depending on configuration.

Software International, 1 Tech Drive, Andover, Mass. 01810.

■ Control Data Corp.'s Business Information Service has added a market analysis module to its Marksman decision support software for marketing executives.

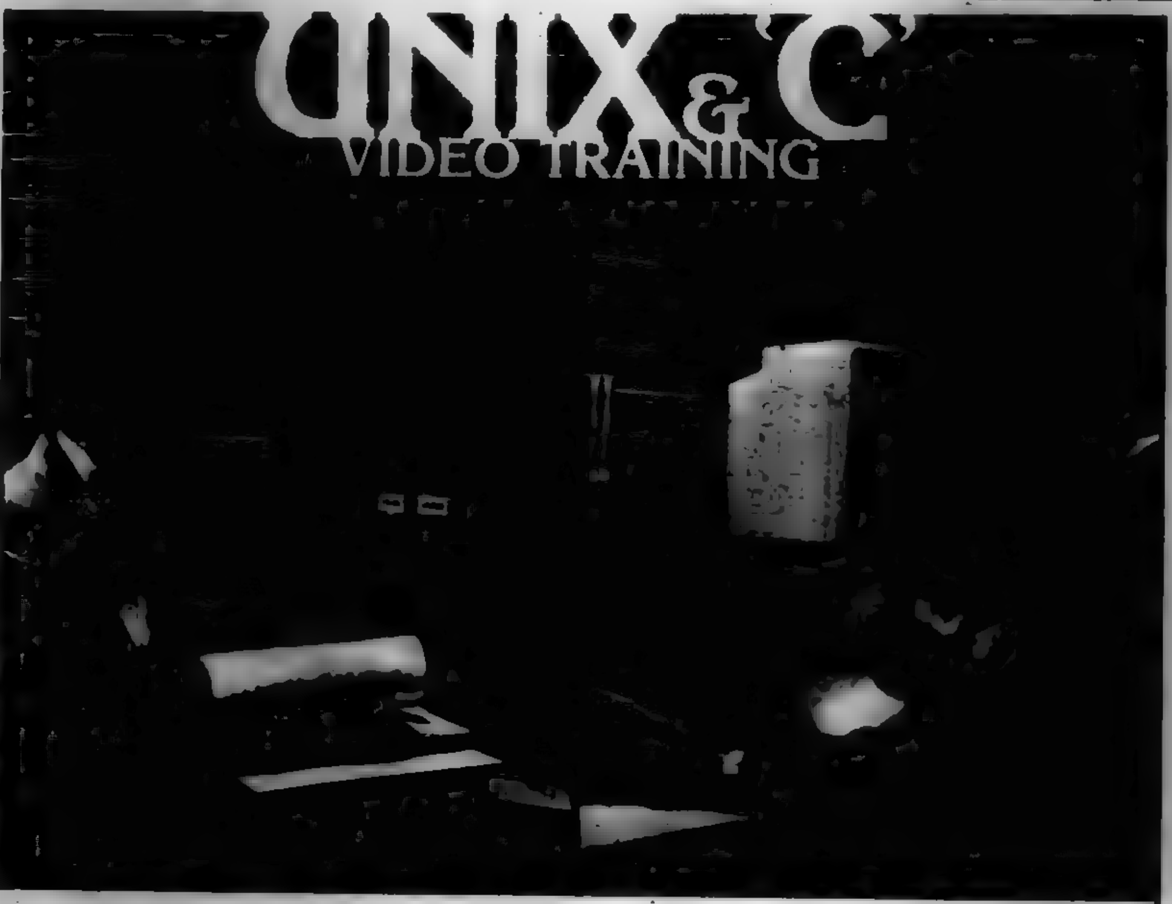
Marksman is available for the IBM 4361 mainframe or Wang Laboratories, Inc. VS minicomputer and includes advertising support and promotion modules.

The market analysis module includes a Nielsen analysis feature that allows users to view various Nielsen measures. The module can perform percentaging, consolidation and indexing operations, exception reporting, market segmentation analysis and can support "what-if" analyses.

The module also provides analysis capabilities using data for warehouse, withdrawals, share and pricing information, data for weight value, number of ads and feature pricing. It also includes a brand development index/category development index facility.

Marksman is priced at $250,000 and is also available through the Control Data Shared Network.

Control Data, 500 W. Putnam Ave., Greenwich, Conn. 06830.



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SOFTWARE & SERVICES

SLUMP

from page 37

ers. Profit and revenue figures attested to the health of the independent large systems software industry and the growing importance of software itself. In-house software development has become, for many organizations, prohibitively expensive, and qualified software professionals are increasingly scarce. Both factors continue to fuel the growth of the packaged software industry.

But while the specter of slowdown may only be standing in the doorway for now, its visage is sobering.

Although analysts are still predicting seemingly healthy 25% to 30% growth for the remainder of the year, many software companies based their 1985 spending on earlier, more sanguine revenue forecasts. Expenditures for training, hiring, customer service and research and development were founded on revenue assumptions that may soon be shaken.

In the short run, those fixed costs will take their toll on profits if revenues sag. In the long run, should the slowdown in users' capital spending worsen, software vendors may look to trim costs through reductions in training programs and hiring. If the slump continues unabated, many vendors will have little choice but to lay off staff or pare R&D programs. Such steps are taken at both the vendor's and the user's peril.

"The software companies have their training, hiring and development efforts running at pretty aggressive levels right now," said Peter Cunningham, president of Input, Inc., a Mountain View, Calif., market research firm.

"People are the biggest factor," Cunningham continued. "They have to develop, sell, install and support the software and train the users. Software vendors cannot afford to stop development, hiring and training. If they try to turn off their staffing and development projects because of variations in orders, they could be in deep trouble."

So could users. The backlog of tasks awaiting automation and the applications needs uncovered daily demand a constant and increasing flow of new software products. A bottleneck in the development pipeline would ensure plenty of lost opportunities for both vendors and users.

According to Cunningham, the growing maintenance income of the large software companies, which represents a substantial chunk of revenue for a vendor like Computer Associates International, Inc., will act to dampen the oscillations spawned by the slump.

And there is one bright spot for users amid the bad news. Several analysts and company executives cited the possibility of more drastic price cutting due to increased competition among vendors.

Overall, the onus for weathering whatever forces hit the industry rests on the shoulders of the management of software companies. Those executives who can effectively corral costs without overreacting — and slashing staff and development projects — will probably find it quite comfortable living with more moderate, but still enviable, growth.

HRMS

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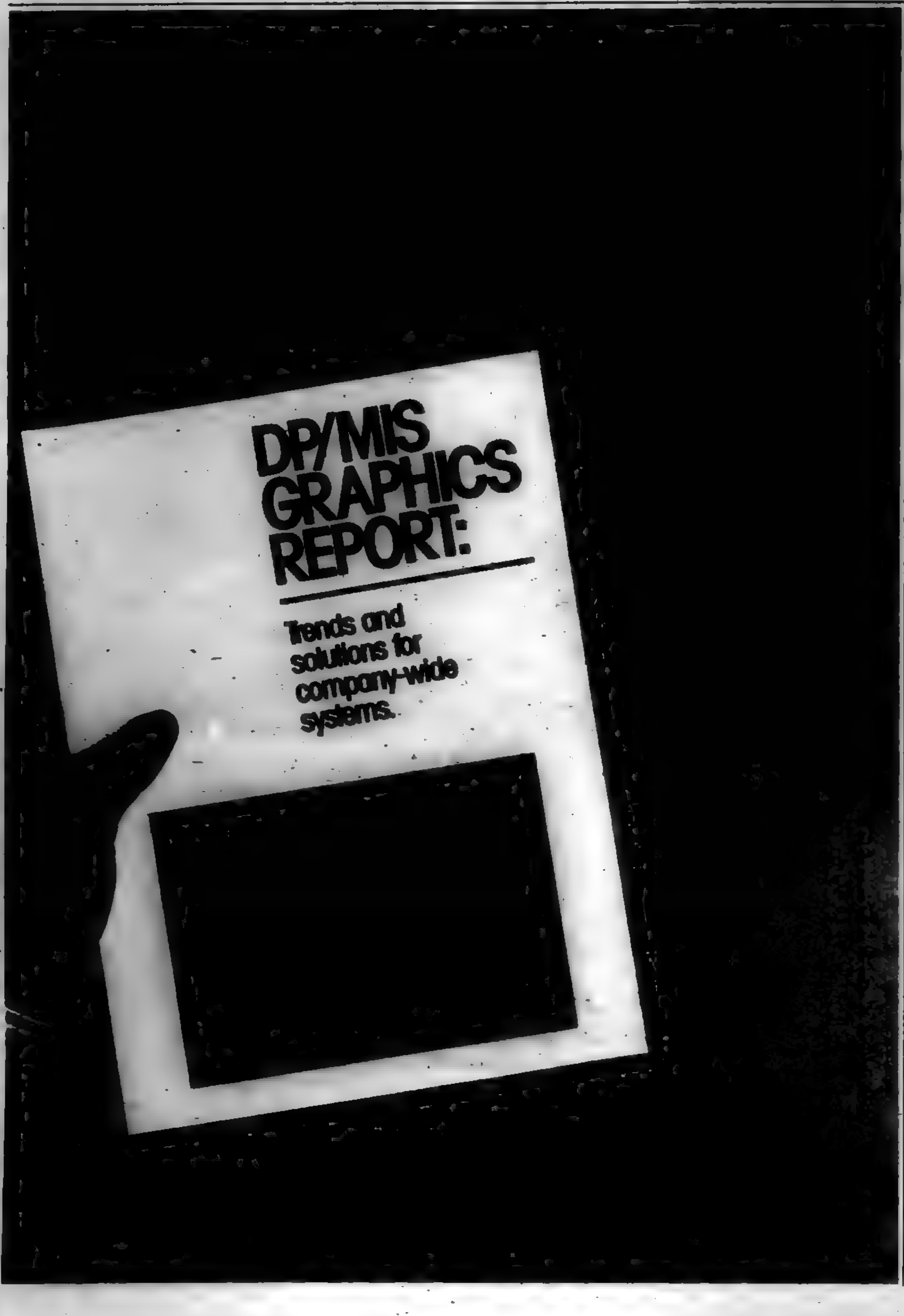
will be a beta test site this fall for IBM's forthcoming 3090 mainframe and will migrate from CICS to Cullinet's IDMS-DC teleprocessing monitor.

A big advantage of IDMS is that it is structured for easy expansion, an important consideration for an acquisitive corporation like Allied, Armstrong said. IDMS is a "natural blend" with the Tesseract software, he said.

In the future, Tremlett and Armstrong said they will continue to fine-tune the HRMS and bring hourly and international employee records into the system. Armstrong added that downloading mainframe data to personal computers may be arranged in the future — for statistical modeling and forecasting, for example — but only if a strong need is proved.

"Which would you rather believe, an old computer printout or me?"



MICROCOMPUTERS

Martin Marietta expands IT micro software line

PRINCETON, N.J. — Martin Marietta Data Systems' ITSoftware division has expanded its line of IBM Personal Computer software with the introduction of Runit, a PC-DOS shell, and Mailit, a document conversion and transfer program.

The $100 Runit package provides a consistent user interface among various applications and simplifies program selection, use of PC-DOS utilities and mainframe logon, according to ITSoftware President Norm Agin.

With function keys and pop-up menus, the package allows users to design a customized main menu that is displayed when the micro is turned on. Users can select a program with a mouse or cursor command, and they do not have to remember the program's directory or how to start it, Agin said.

Runit pop-up menus also reportedly permit users to execute most PC-DOS operating commands without knowing the command syntax or typing in commands. Additionally, the package lets users design their own applications directories.

After writing logon scripts with the Runit logon language, the user is presented with the scripts in a pop-up menu when the logon option is selected from the main menu. The only action required to attach to a mainframe operating system or application program is to provide a password, according to the vendor.

The logon feature is currently available for IBM MVS/TSO and VM/CMS operating systems and Digital Communications Associates, Inc. (DCA) and CXI, Inc. 3270 emulation boards. Forte Communications, Inc. boards, Hayes Microcomputer Products, Inc. modems and Renex Corp. protocol converters will be supported in a subsequent release, scheduled for third-quarter delivery. That release also will support virtual disk storage on the mainframe, according to Agin.

Runit requires 64K bytes of internal

See RUNIT page 62

MICRO BITS/THOMAS MADRON

PC-DOS 3.1 offers added functionality

IBM's PC-DOS 3.1 operating system for the Personal Computer and Personal Computer XT and AT provides several new features and resources, including two additional commands for end users and six new PC-DOS function calls that directly support networking.

Excluding the utility programs distributed with PC-DOS, the operating system itself consists of four components: the boot record; the read-only memory Basic Input/Output System (ROM Bios) Interface; the PC-DOS program file, IBMDOS.COM; and the command processor, Command.COM.

IBMDOS.COM provides, among other things, a variety of built-in standard functions accessible by user programs. The PC-DOS functions are available through various interrupts, with interrupt 21H being standard across various implementations of MS-DOS, including PC-DOS.

Some PC-DOS networking functions were provided in PC-DOS 3. The additional required functions, 5E00H through 5F04H, are implemented in PC-DOS 3.1. None of these six functions will work without IBM's Netbios, and they are irrelevant in stand-alone personal computer environments. Those functions obtain a machine name on the network, set and get printer setups on a print server and carry out other network housekeeping.

Machine name here means the server name on the PC Network as specified in an Ascii string containing a path

See PC-DOS page 62

Madron is manager of computer services at North Texas State University, Denton, Texas.

- Ricoh announced two microcomputer printers and a digital image scanner/48
- Micro Focus introduced Co-Math, a library of mathematical functions that works with the vendor's microcomputer Cobol products/48

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Signs of saturation increase

SMALL TALK
Eric Bender
CW Senior Editor

Everyone seems to have a list of reasons for the current computer industry slump, typically beginning with the nationwide slowdown in capital investment. This long, slow summer will give us all plenty of time to polish those explanations, but "saturation" keeps cropping up in discussions of micro purchasing with MIS personnel.

In this case, saturation obviously doesn't mean that a personal computer now sits proudly on every desktop in corporate America or that the multitudes of machines out there are anywhere near reaching their potential.

It does mean that after several years of struggling to equip a suitable suite of micro equipment for word processing, financial analysis and data base management, many companies have filled the pipeline to their users. And the other emerging stand-alone applications just have not created anything like that level of demand.

"You're not seeing the kind of helter-skelter buying you saw in '83," commented Rich Reed, manager of office systems at Cigna Corp.'s employee benefits and health care division in Bloomfield, Conn. "Everybody was caught up in this buying frenzy. That's changed; purchases now are much

See SATURATION page 62

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IBM SQL/DS and DB2 relational DBMS now on PC

ORACLE, the relational DBMS compatible with IBM's SQL/DS and DB2, is now available on the IBM PC/XT and PC/AT. While SQL/DS and DB2 run only on IBM mainframes, ORACLE runs on IBM mainframes as well as on DEC, DG, HP and most other minis and micros. Any application written for SQL/DS or DB2 will run without modification on the complete range of systems supporting ORACLE, including PCs.

SQL/DS and DB2 are relational database management systems; ORACLE is a relational DBMS plus an integrated set of 4th generation software tools for application generation, report writing, color graphics and network communications.

Oracle Corporation introduced the first relational DBMS in 1979. Now, ORACLE provides the only complete implementation of the IBM-standard SQL language available for the PC.

Oracle Corporation cites three principal application areas for its product's capabilities:

■ The ORACLE Application Development Center provides a PC-based development center for the creation of DB2 and SQL/DS applications. The flexibility of the personal computing environment is made available to programmers creating applications for use with IBM's relational database products.

■ The ORACLE Personal Information Center extends the Information Center concept to the Personal Computer. ORACLE's application generator, graphics, spreadsheet and other end-user tools provide a SQL/DS and DB2 compatible Information Center on the desktop.

Users can become acquainted with the facilities and power of the Information Center in the personal computing environment, and transfer their knowledge and skills as the MIS Information Center facility evolves. The ORACLE Personal Information Center provides the facilities for MIS to develop the cooperative relationship with end users so vital to the success of the Information Center.

In addition, with ORACLE on departmental superminis, users can create identical Information Centers at the department level.

■ The ORACLE Distributed Information Center provides an intelligent set of communication links among multiple systems, with ORACLE running on IBM mainframes and various minis and PCs.

Using ORACLE's SQL*LINK networking facility, ORACLE on such diverse systems as MVS, VM/CMS, VAX/VMS, UNIX and PC/DOS can selectively exchange database information using the full capabilities of the SQL language. Applications, portable across all environments, can be run identically on any system, and data can be intelligently extracted for use at any site.

ORACLE is currently installed on over 1000 supermini and mainframe systems around the world, as well as on thousands of PCs and compatibles. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and many government agencies.

For further information, contact Oracle Corp., Dept. C, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350.

Ricoh unveils printers, scanner for micros

WEST CALDWELL, N.J. — Ricoh Corp. has unwrapped a laser printer, a thermal transfer printer that can be changed to a color printer with optional software and a digital image scanner for microcomputers.

The Ricoh LP4060 tabletop laser printer costs $3,000 and has both RS-232 serial and parallel ports for use with microcomputers. The 8 page/min printer is said to produce either portrait or landscape output at a resolution of 300 by 300 dot/in. from either four on-board fonts, host-data downloads or cartridge-loaded fonts.

The printer emulates the Diablo Systems, Inc. Diablo 630 impact printer and has a bit-mapped memory that is said to permit printing forms, logos and other forms of graphics data in areas of up to 35 sq in. Downloaded graphics can be printed with up to four times the magnification, the vendor said.

Ricoh's TP2051C, which costs approximately $400, is a thermal transfer color printer that is said to print text and graphics in seven colors on either plain paper or transparencies.

At a print resolution of 180 dot/in. using a 24-dot print head, the TP2051C prints bit-by-bit CRT-displayed graphics and character-by-character IBM CS1 and CS2 plus nine international character sets.

A parallel Centronics Data Computer Corp. interface is standard.

The company's flatbed digital image scanner, the IS30, is said to provide a basic reading density of 300 by 300 dot/in. It also can produce 180, 200 and 240 dot/in. for compatibility with a variety of output printers, including ink-jet, laser, thermal transfer and dot matrix printers.

The IS30 is said to be able to read books, sides of boxes and thick documents that can be placed on the 8½- by 11½-in. flatbed. Maximum reading speed is approximately 14 sec. for an 8-½ by 11-in. document at 300 dot/in. The unit, which will cost approximately $2,000, comes with a parallel interface and will be available in fourth-quarter 1985.

Ricoh is located at 5 Dedrick Place, West Caldwell, N. J. 07006.

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CXI beefs up Pcox tool

PALO ALTO, Calif. — CXI, Inc. has announced an upgrade to its Pcox 3270 PC software which gives users of Digital Communications Associates, Inc.'s Irma 3278 emulation board the functionality of an IBM 3270 Personal Computer terminal.

The Pcox software upgrade, for IBM Personal Computers, Personal Computer XTs, ATs and compatibles, permits simultaneous viewing of up to five interactive host applications, two notepads and a Personal Computer session on a microcomputer screen.

With the Pcox 3270 PC upgrade, information can be transferred from one window to another or at variable spots within the same window. Users can combine information from one or more host sessions, as well as a Personal Computer spreadsheet in the form of a customized report in a notepad session.

Attached parallel or serial printers can also be transformed into host-addressable IBM 3287 printers, CXI said.

The product reportedly gives Irma users an interface to the IBM 3270 Personal Computer Application Program Interface (API), permitting them to run softare developed for the API.

Available in August, the software also is compatible with CXI's Pcox 3278 and Pcox 3279 Standard and Plus coaxial connections, the vendor said.

Typical usage of the Pcox 3270 PC requires about 264K bytes of memory. Maximum usage requires 327K bytes of memory.

Pcox 3270 PC software costs $395.

For more information, CXI is located at 3606 W. Bayshore Road, Palo Alto, Calif. 94303.

Micro Focus' math aid out

CHICAGO — Micro Focus, Inc. last week introduced Co-Math, a library of mathematical functions that works with the company's microcomputer Cobol offerings.

The new software will permit programmers who design and maintain financial and mathematical programs to stay within the standard Cobol environment and create programs utilizing extended mathematical functions, according to the vendor. Priced at $200 and available immediately, Co-Math works with Micro Focus' Professional Cobol, VS Cobol Workbench or VS Cobol.

Co-Math's mathematical functions reportedly include exponentiation, power, square root, natural log, log 10, sine, cosine, tangent and arctangent XY. The product can be used in conjunction with Micro Focus' Co-Graphics software, the company said. Co-Graphics is said to provide access to Virtual Device Interface standard graphics routines supplied by Graphics Software Systems, Inc.

More information is available from Micro Focus at 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

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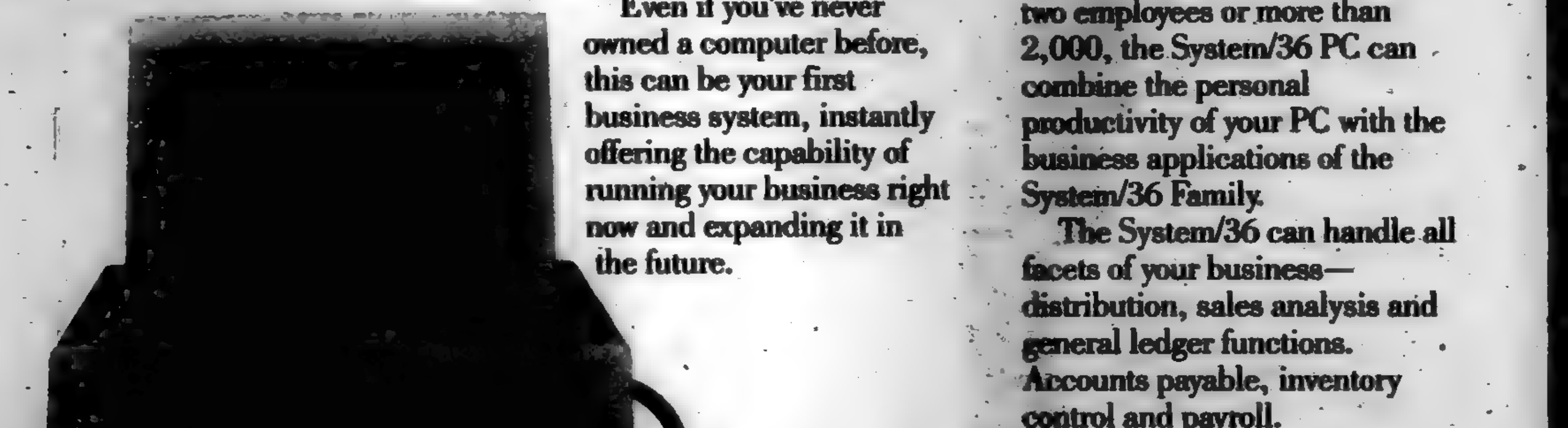

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System/36 PC can be a standalone computer for small companies or a departmental system or even part of a distributed network for larger companies, providing multiuser access to data.

The System/36 PC is made up of a 5364 Processor attached to an IBM PC, PC XT or PC AT. And you can connect up to three more of these personal computers. Or you can connect terminals such as System/36 printers or displays.

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Whether your business has two employees or more than 2,000, the System/36 PC can combine the personal productivity of your PC with the business applications of the System/36 Family.

The System/36 can handle all facets of your business—distribution, sales analysis and general ledger functions. Accounts payable, inventory control and payroll.

IBM System/36 PC.

And you can get traditional PC functions such as spreadsheets and word processing.

Software for the System/36 has been developed over the years and has proven invaluable in all kinds of businesses of all sizes. And with the thousands of programs written for both IBM PC and System/36, the sky's the limit for business and planning applications.

The System/36 PC even provides you with data security features so that the right data gets into the right hands.

Small yet powerful.

All of this processing power can sit right on a desk or under it—either horizontally or vertically. It measures a mere 21¼"x16¾" x6½"—about the size of a small suitcase.

Yet as small as it is, this little box has multiple processors, with main memory that can be dedicated to running your business functions. In plain English, this means you can get better response time. The System/36 PC comes with a 1.2 MB diskette drive and either 40 or 80 MB disk storage, depending on your information storage needs.

Easy to use.

The System/36 PC is easy to learn and to use. If you need assistance, it has over 2,800 "help" screens that take you step-by-step through any rough spots. You can merge data you've generated on your PC with information that's on your System/36 PC. And you can share information that is stored in the System/36 PC with other attached IBM Personal Computers or System/36 terminals.

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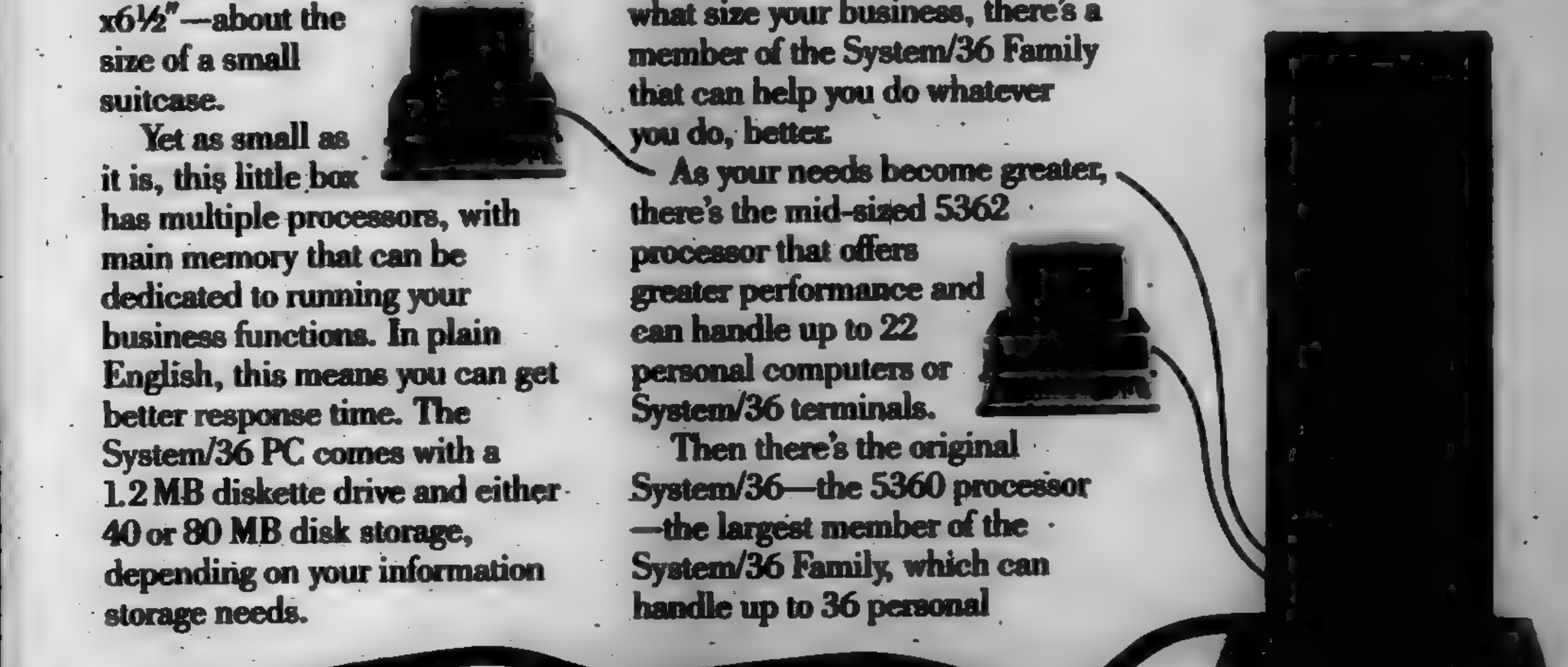

Firms join in funding human resources tool

By Edward Foster
Special to CW

PRINCETON, N.J. — Corporate managers concerned with white-collar productivity have joined a consortium to fund the development of Productivity Map, a program for the IBM Personal Computer that will help track the performance of managers in the way other programs track inventory or sales.

The program is in the early stages of development at Pacesetter Software Co. here. Participants in the consortium include 3M Corp., Westinghouse Electric Corp., GTE Corp., Northern Telecom Inc., Nabisco Brands, Inc. and the U.S. General Accounting Office.

Productivity Map is being designed for "somebody who has to track managers or functions in areas of a company that are difficult to measure," according to Michael Hierl, president of Pacesetter. "What we're hearing from our beta test group is that the big need is not for tracking productivity in manufacturing but in systems, research and development, human resources and other knowledge- and worker-intensive areas."

Consortium members are paying Pacesetter a one-time $12,500 fee for an organizationwide license to use the software and qualify as a beta test site. The members are also providing Pacesetter with feedback and technical assistance on the various approaches to productivity management that they want to see in the package.

Hierl said he has not decided about pricing or distribution policies for the final product, which is expected by the end of the year, but his inclination is to continue the one-time corporate license fee, probably for a higher price than the beta testers are paying.

Productivity Map will not concentrate on one approach to tracking performance but will instead integrate many different methods now employed by consortium members, using up to 20 different kinds of graphics representations built into the system. A large part of the program will be tutorial in nature.

Pacesetter originally formed its consortium based on experience with Organization Map, a program it sells for producing organizational charts and analyses. Organization Map customers, Hierl said, suggested the outlines of the new program and formed the original consortium membership.

Amy Archambeau, manager of organization and manpower planning for GTE's human resources staff, said that she expects the consortium itself to have a great deal of value, whatever the final result of the software development. "The consortium aspect is a hidden benefit just in terms of the affiliation with other people in the group," she commented.

Foster is a senior writer with Computerworld's *sister publication* Infoworld, *where this story first appeared.*

Micro modeling program bows

BREA, Calif. — P-Cube Corp. has announced ISP Methodology, an information systems planning method supported by microcomputer software running on IBM Personal Computers and compatibles.

The ISP Methodology uses a model that shows the relationships between different systems and organizational processes. The model highlights opportunities for improving an organization's information infrastructure and for using computer technology to improve the organization's competitive position, according to the vendor.

The model also is said to simulate the impact of new systems, changes in existing systems and changes in organization processes and functions.

ISP modules allow users to set priorities on systems projects, to develop corporate data bases and to define the specific set of systems an organization should be developing to meet near-term and long-range information needs. The modules also help users evaluate alternative funding strategies for information systems development.

The package operates under IBM's PC-DOS 2.1 and requires 256K bytes of random-access memory.

The basic price for ISP Methodology is $12,000.

P-Cube is located at 915 Kings Canyon Road, Brea, Calif. 92621.

SOFTWARE

■ **Micro Focus has announced enhancements to its Sourcewriter, a Cobol applications generator for use on the IBM Personal Computer line.**

Enhancements to Sourcewriter reportedly include the ability to produce programs that permit multiple users to access the same file simultaneously. Also added were systems security features, including password protection, logging and recovery, the latter of which permits files to be restored.

Sourcewriter reportedly generates U.S. General Services Administration (GSA)-certified standard Ansi 74 Cobol source code. It is completely compatible with Micro Focus' GSA-certified Cobol compilers.

A data dictionary-based tool, Sourcewriter is said to allow applications prototyping.

Sourcewriter costs $1,395 until July 31 when the price increases to $2,000. It is also offered in a package with Professional Cobol for $3,000 until July 31.

Micro Focus, 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

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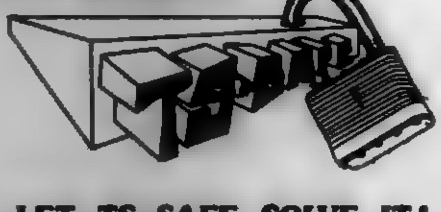

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TOOLS

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■ Ashton-Tate has introduced Courseware training materials for use with its Framework and Dbase II and III business software products.

Courseware reportedly can be used for self-paced study or classroom instruction. It provides an introduction to Ashton-Tate applications and instruction in Dbase II and III programming.

Courseware is offered in three packages of increasing complexity, each consisting of a student workbook and an associated instructional diskette. Administrative teaching kits for instructors include overhead materials and course notes.

Courseware costs $39.95 for an introductory-level package, $48.95 for the intermediate Framework package, $49.95 for the intermediate Dbase II and III packages and $59.95 for the advanced-level package. The teaching kit is $185.

Ashton-Tate, 10150 W. Jefferson Blvd., Culver City, Calif. 90230.

■ Marc Software International, Inc. has introduced two word processing programs for the IBM Personal Computer and personal computers running under Microsoft Corp.'s MS-DOS operating system.

Wordmarc Composer, a word processor for use with complex documents, reportedly supports multiple-font printing devices for laser and dot matrix printers and the use of mathematical and scientific symbols.

Wordmarc Author is said to be a simple word processor designed specifically for use by managers. All of the formatting functions of Wordmarc Composer are said to be included.

Both programs reportedly were designed in accordance with the University of Chicago Dissertation Office's Manual of Style.

Wordmarc Composer costs $495. Wordmarc Author costs $295.

Marc Software International, No. 200, 260 Sheridan Ave., Palo Alto, Calif. 94306.

■ Structured Software Solutions, Inc. has introduced Facet, a software package for the creation of windows on the IBM Personal Computer XT or AT that link into an AT&T Unix application running on a host.

The package, which consists of a module for the host and for the Personal Computer under IBM's PC-DOS, reportedly permits users to create up to 10 individual session windows, even while running a PC-DOS application.

The package resides in memory and allows users to configure windows of any size, color or screen placement they wish, according to a spokesman.

The software relies on the X.PC protocol for communication between the Personal Computer and the host, reportedly permitting concurrent file transfer while interactive work continues in other sessions.

The software costs $195 for the Personal Computer module. Host modules are currently available only for the Personal Computer XT or AT under Unix; they cost $249.

Structured Software Solutions, Suite 205, 4031 W. Plano Pkwy., Plano, Texas 75075.

■ Gimpel Software has announced a diagnostic program for C-language applications running under the Microsoft Corp. MS-DOS operating system.

PC-Lint is said to analyze C programs and to report on bugs, glitches and inconsistencies. The product reports on errors such as type inconsistencies across modules, parameter-argument mismatches, library usage irregularities, uninitialized variables, value-return inconsistencies and variables declared but not used.

PC-Lint is delivered with user-modifiable standard library descriptions for most major compilers, according to Gimpel.

The product requires a minimum of 128K bytes of memory.

The cost of PC-Lint is $139.

Gimpel Software, 3207 Hogarth Lane, Collegeville, Pa. 19426.

■ Keyword Office Technologies, Inc. has announced an IBM Personal Computer software program that reportedly allows users of the Keyword 7000 disk-to-disk conversion system to translate documents for transmission to remote, incompatible word processing systems.

Com-File is said to operate on users' existing telecommunications facilities or networks to allow transmission of documents in revisable form.

Using a diskette from the source machine with the Keyword 7000, users may create Com-File documents on an IBM micro's PC-DOS format floppy or hard disk drive. The Com-File version of the document is transmitted by standard telecommunications services to a remote micro with Keyword 7000, which converts the text from Com-File form to the target word processor format.

At each end of the transmission, Com-File requires the Keyword 7000 disk drive unit and controller board, an IBM micro with minimum internal memory of 256K bytes and communications hardware and software that support 8-bit transparent transmission.

The cost of Com-File is $495. Bundled with Keyword 7000 hardware, Com-File costs $9,995.

Keyword Office Technologies, 2047 Hamilton Ave., San Jose, Calif. 95125.

■ Viewlogic Systems, Inc. has announced that its Workview series computer-aided engineering (CAE) software is now compatible with Data General Corp.'s DG/One per-

Continued on page 86

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MICROCOMPUTERS

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table computers.

The Workview series, which includes an entry-level system, a digital design system and an analog design system, allows electronic design engineers to generate documentation and to communicate to other CAE and computer-aided design workstations, the vendor said.

Engineering functions include schematic entry, interactive logic simulation and wave form processing. Workview can also run on the IBM Personal Computer XT and AT and compatibles.

Viewlogic's Workview series costs from $3,500 to $8,500, depending on the module.

Viewlogic Systems, 33 Boston Post Road W., Marlboro, Mass. 01752.

■ The Key Board has announced a version of its data base management system for the IBM Personal Computer, Personal Computer XT, AT and PCjr.

The Data Base package is said to feature full disk-file capacity, relative files, 32,000 records per file, 4K-byte record size and 100 fields per record. Functions include sort, append, reformat, field calculations, count and totaling, sequential file interface capability and multiple logical field queries. The software reportedly includes report and mailing label printing capabilities.

The Data Base resides in 128K bytes of memory and runs on most IBM-compatible systems.

Cost of the software is $49.95.

The Key Board, P.O. Box 753, Cedar Crest, N.M. 87008.

■ Burt Woolf Management, Inc. has introduced its Team System, data base management software for the IBM Personal Computer.

Designed for small to medium-size nonprofit organizations, Team System reportedly stores business and home addresses and phone numbers, birth dates and the prefixes and salutations used in correspondence. The ability to print continuous labels or business envelopes is included for use in bulk mail projects.

Users are reportedly able to store up to 10,000 records using Team System in an IBM Personal Computer with a hard disk. On a Personal Computer without hard disk, 250 records can be stored per diskette.

Team System is priced at $495.

Burt Woolf Management, Suite 214, 167 Corey Road, Brookline, Mass. 02146.

■ First Byte, Inc. has announced enhancement and a price cut for its Smoothtalker speech synthesis software for the Apple Computer, Inc. Macintosh.

Smoothtalker Version 2 reportedly now offers a female voice, along with the male voice previously featured.

Smoothtalker reportedly converts English language text, input via the keyboard or an Ascii file, into speech that is output by the Macintosh's built-in speaker. It reportedly works on either the 128K-byte or 512K-byte Macintosh models.

Smoothtalker's price is $99, down from $149.95, the vendor said.

First Byte, 2845 Temple Ave., Long Beach, Calif. 90806.

■ Vertisoft Co. has introduced a version of its LLS Legal Billing/Office Accounting software for IBM Personal Computers equipped with a hard-disk storage unit.

The software is said to be an integrated time and client billing and general ledger program. The entry of a transaction into the software at one location can automatically cause the entry to be entered at other locations in the package.

The hard-disk version of the package reportedly retains all itemized transactions of each month.

The software in its hard-disk version is priced at $1,395. The dual-diskette drive version is $995.

Vertisoft, 447 Willis Road, Saline, Mich. 48176.

■ Wyman Associates, Inc. has introduced Ontime scheduling software for the IBM Personal Computer.

Ontime reportedly schedules jobs using any of six methods including FIFO, minimize average completion time, weighted completion time, average job lateness, range of job lateness and number of late jobs.

Actual times can be accumulated and reported along with budgets, profits, time remaining, work loads and capacity forecasts.

Ontime is priced at $495 and requires 128K bytes of memory and two double-sided, double-density diskette drives.

Wyman Associates, Suite 221, 181 Second Ave., San Mateo, Calif. 94401.

■ SBT Corp. has announced professional time and billing accounting software designed for use with the Ashton-Tate Dbase III or Dbase II data base management systems on the IBM Personal Computer and other microcomputers that run Dbase software.

Dprofessional can also be run independently or with other SBT accounting software programs such as Dpurchase, Dpayable and Dledger. SBT provides source code for user modification and customizing.

Dprofessional is a menu-driven program that allows users to enter and analyze data and generate reports. Other reports include client ledger listing, transaction analysis, billing analysis, cash receipts register, accounts receivable aging and work in progress.

The software requires either the Microsoft Corp. MS-DOS or Digital Research, Inc. CP/M operating system, two floppy drives or one hard disk drive and a minimum total disk capacity of 720K bytes of memory.

The software costs $395.

SBT, 3 Harbor Drive, Sausalito, Calif. 94965.

■ STSC, Inc. has introduced a version of its APL-Plus UNX system for the AT&T Unix PC.

An enhanced APL interpreter and applications development system for Unix, the program is said to offer partial compilation of APL code.

Also reportedly offered are true concurrent file sharing, nested arrays compatible with IBM's APL2 and a communications facility that lets users log on to a remote host and transfer data.

The software costs $995.

STSC, 2115 E. Jefferson St., Rockville, Md. 20852.

■ Vertical Solutions, Inc. has introduced several software products for use with Software Publishing Corp.'s PFS:File data base and IBM's Filing Assistant software.

The packages announced included Importer, which reportedly permits PFS:File users to import data from column-oriented Ascii files, and Forms, which reportedly prints invoices, checks, purchase orders and other forms from a PFS:File or Filing Assistant data base.

Also announced were Market Prospector, which reportedly permits a predefined PFS:File or Filing Assistant data base to support the needs of sales workers, and the Market Prospector Plus service, a Vertical Solutions list of potential sales contacts. That list, provided on diskettes, is priced from $200 to $2,000.

Also introduced was Startup, which reportedly lets the user develop customized software menus.

Importer and Forms each cost $140. Market Prospector and Startup each cost $50.

Vertical Solutions, P.O. Box 5061, Evanston, Ill. 60204.

■ Sophco, Inc. has introduced its Protec 3 system security software for the IBM Personal Computer XT and AT.

Protec 3 reportedly offers audit trails that track user names, program used, date used and other criteria. Also included are features to block users from copying software from a shared hard disk and to provide access control via passwords and logon identification codes.

Protec 3 is priced at $350 and requires Microsoft Corp.'s MS-DOS 2 or higher and 128K bytes of memory.

Sophco, P.O. Box 7430, Boulder, Colo., 80306.

■ Systems Compatibility Corp. has unwrapped two software products that allow documents to be shared by several microcomputer word processors.

Software Bridge lets users convert among Multimate International Corp.'s Multimate, Micropro International Corp.'s Wordstar, Samna Corp.'s Samna Word and IBM's Displaywrite III on IBM Personal Computers and compatible computers without a protocol translator.

W-Link reportedly provides compatibility between Multimate and Wang Laboratories, Inc.'s Professional Computer Advanced Word Processing. The software converts documents created on either system to a format

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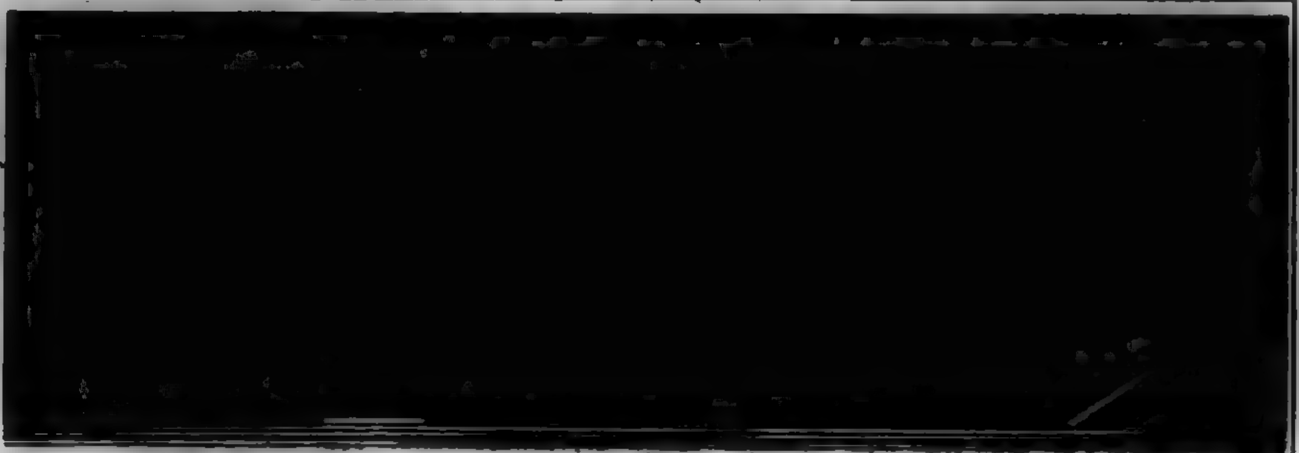

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MICROCOMPUTERS

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recognized by the other.

Software Bridge and W-Link each cost $495.

Software Compatibility, 410 N. Michigan Ave., Chicago, Ill. 60611.

■ Burroughs Corp. has unveiled three software packages for its B25 micro — Enhanced Multiplan, B20 Draw and Context Manager.

An upgrade to Multiplan, Enhanced Multiplan reportedly adds the ability to solve formulas containing circular references and to retain spreadsheets. In addition, the package increased Multiplan's memory capacity from 32K bytes to 1M byte.

B20 Draw is said to allow users to create pictures and templates from a selection of lines, squares, points, triangles and sine curves.

Context Manager lets up to 10 application programs run concurrently on a workstation under multiple operating systems, including Burroughs' Btos, Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M 86, according to the spokesman.

Enhanced Multiplan, B20 Draw and Context Manager each cost $250.

Burroughs, One Burroughs Place, Detroit, Mich. 48232.

■ Systemware, Inc. and Forecasting Planning Associates have announced an inventory data base system for data centers that is said to support disaster recovery planning, budget forecasting and analysis, configuration management and component failure impact analysis.

Called Data Center Manager/I (DCM/I), the software consists of four separately priced components: Basic Inventory Module, Budgeting Module, Configuration Module and Maintenance Module.

The Basic Inventory Module is the first available and prerequisite to the others. Its functions include the ability to track equipment and software in-house and on order, purchase and lease costs and financial commitments.

DCM/I runs on IBM Personal Computer XT and compatible computers. The Basic Inventory Module licenses for $4,995.

Systemware, Suite 1000, N. Central Plaza II, 12770 Coit Road, Dallas, Texas 75251.

SYSTEMS

■ PC Technologies, Inc. has announced an enhanced version of its multiuser expansion system for the IBM Personal Computer XT and AT.

The Xtender II expansion board and software reportedly allow the XT or AT to serve as the CPU for up to nine terminals, compared with the five users supported by Xtender I on the XT. Other enhancements include compatibility with, rather than emulation of, IBM's PC-DOS 2.1, and support of asynchronous communications software.

The standard system consists of Intel Corp. 80286 and 80186 microprocessors with an optional 80287 math coprocessor; 1M byte of system random-access memory, expandable to 4M bytes; an I/O interface unit with eight RS-232 ports; and system and utilities software.

The system is said to support most standard Ascii terminals, allowing them to run micro application programs under PC-DOS 1.1, 2, 2.1 and 3 and Digital Research, Inc. CP/86, MP/M and Concurrent DOS.

The cost of Xtender II is $4,995.

PC Technologies, Box 2060, 704 Airport Blvd., Ann Arbor, Mich. 48106.

COMMUNICATIONS

■ Decatek, Inc. has announced a half-duplex, two-wire, 9.6K bit/sec. modem that fits into an expansion slot of an IBM Personal Computer.

Zipmodem is equipped with protocol conversion software that translates Ascii data into Ebcdic data that conforms to System Network Architecture/Synchronous Data Link Control protocol. The menu-driven package provides IBM Logical Unit 1, 2 or 3 emulation.

Used with a mainframe Zipmodem, a user is able to monitor transmission errors.

An IBM Personal Computer Zipmodem costs $2,995 and a mainframe Zipmodem sells for $1,995.

Decatek, P.O. Box 600, Mountain, Ga. 30083

■ Excore Corp. has introduced its Excore-Net baseband local-area network for use with IBM Personal Computer Network software and IBM's PC-DOS 3.1.

Excore-Net reportedly consists of plug-in network interface cards and can link up to 16 machines in the Personal Computer line, with up to 1,000 feet between each machine.

The net is said to be based on a token-passing ring architecture and to offer 2M bit/sec. data transfer rates.

Each interface card to the network is priced at $349.95.

Excore, 10 Victor Sq., Scotts Valley, Calif. 95066.

■ Data General Corp. has announced an internal 1,200 bit/sec., 300 bit/sec. modem for the Data General/One portable micro.

The modem is said to include an autodial/autoanswer feature. The product allows direct connection with telephone lines through a standard modular jack or can be used with a DG acoustic coupler at 300 bit/sec.

The modem allows users to access DG's Comprehensive Electronic Office (CEO) automation system

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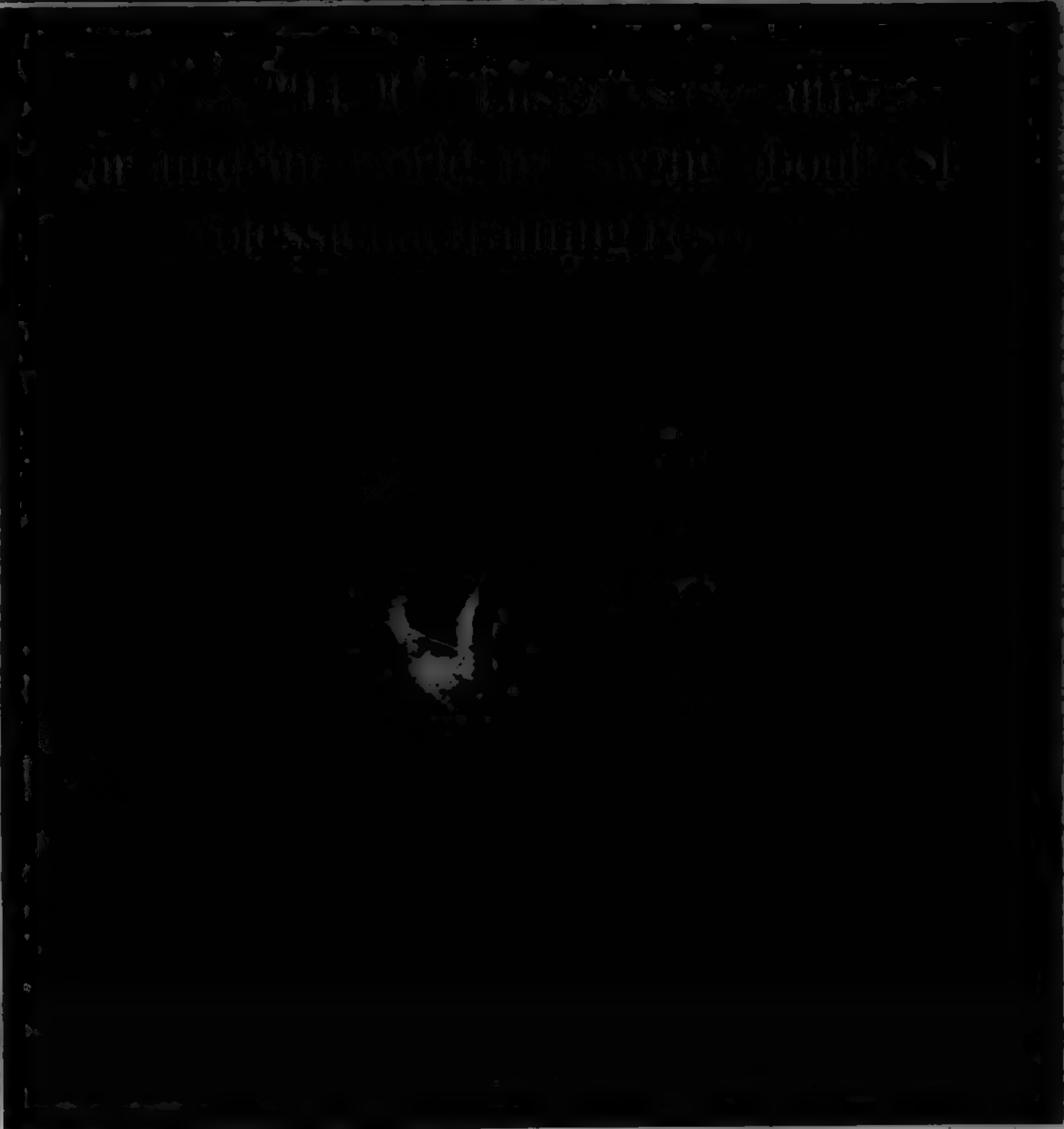

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through the DG CEO Connection.

The 1,200 bit/sec., 300 bit/sec. modem is priced at $525.

DG, 4400 Computer Drive, Westboro, Mass. 01580.

■ Network Software Associates, Inc. has introduced AdaptSNA PCcom II communications software for the IBM Personal Computer.

AdaptSNA PCcom II reportedly uses IBM's Synchronous Data Link Control protocol and offers transmission speeds up to 19.2K bit/sec. Also offered are multidrop capabilities, password protection and the use of Help screens.

Other features of the software are said to include autodial capabilities on some modems and a timer/alarm clock. The software can execute IBM PC-DOS commands on a remote Personal Computer from a local Personal Computer.

The package costs $475.

Network Software Associates, 19491 Sierra Soto, Irvine, Calif. 92715.

■ Honeywell, Inc. has announced a version of its PC 7800 software that reportedly allows Apple Computer, Inc. Macintosh micros to serve as workstations for Honeywell mainframes using the Honeywell GCOS 8 operating system.

The software enables a Macintosh to emulate a Honeywell VIP 7800 terminal by emulating function keys, attributes and special-purpose switches on the terminal, allowing the micro to access a Honeywell DPS 8, DPS 88 or DPS 90 mainframe. The software accepts character input either from the Macintosh keyboard or from a remote information processor through a communications network.

PC 7800 transfers time-sharing files for interaction with the micro, with protocols for error detection and recovery. Attached printer support allows the transfer of Macintosh screen images directly to a printer.

The cost of the PC 7800 software for the Macintosh is $295.

Honeywell, P.O. Box 8000/A-79, Phoenix, Ariz. 85066.

■ US Robotics, Inc. has announced enhancement of its Telpac communications software for the IBM Personal Computer line.

Telpac reportedly now gives users five subject headings: file, telephone, utility, settings and a Help mode. Also new are windows that can be displayed for each subject heading to guide the user through the heading's functions.

Telpac reportedly gives users access to files on remote computers and permits them to transfer files to a remote system or move files within their Personal Computers. It was designed to work with US Robotics modems and compatibles and stores an unlimited number of telephone numbers for autodialing.

Telpac costs $149.

US Robotics, 8100 McCormick Blvd., Skokie, Ill. 60076.

■ Yourdon Software Engineering Co. has announced a version of its Analysis Tool Kit program development software for the IBM Personal Computer XT and Personal Computer AT.

Analysis Tool Kit, originally developed for the Wang Laboratories, Inc. Personal Computer, is a micro-based computer-aided design (CAD) system for software developers. The product reportedly enables systems analysts to create data-flow, entity relationship and state transition diagrams and free-form graphics. The mouse-driven graphics allow the user to create symbolic graphics models for real time, on-line and batch processing systems, the vendor said.

The IBM micro version requires with a high-resolution bit-mapped graphics controller, a 10M-byte Winchester disk drive, 640K bytes of main memory and a graphics printer. Software drivers for the printer and plotter interface are included in Analysis Tool Kit utilities.

Analysis Tool Kit for the XT and AT costs $3,500.

Yourdon Software Engineering, 1501 Broadway, New York, N.Y. 10036.

■ Quam Corp. has introduced its QC1018 board for networking IBM Personal Computers under the Datapoint Corp.'s Arcnet token-passing scheme.

The QC1018 reportedly is a half-size board for use in a slot in the Personal Computer's expansion chassis.

The QC1018 node and passive hub cost $449 and $499, respectively.

Quam, Suite 208, 900 W. 128th St., Minneapolis, Minn. 55237.

■ Graphics Software Systems, Inc. (GSS) has announced GSS-Grafstation communications software for microcomputers running Microsoft Corp.'s MS-DOS, IBM's PC-DOS or AT&T's Unix.

According to a spokesman, the package allows personal computers connected to host processors to operate as distributed intelligent graphics workstations.

The GSS-Grafstation is priced at $250.

GSS, 25117 S.W. Pkwy, Wilsonville, Ore. 97070.

■ American High-Tech Industries, Inc. has introduced Magnum MCS-A, a communications hardware and software system for the IBM Personal Computer.

Magnum MCS-A reportedly includes an asynchronous modem and a multifunction board that fits into one of the Personal Computer's expansion slots. Also included is the firm's

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*Trademark of AT&T.

4900 Old Ironsides Drive, M/S 520 Santa Clara, CA 95054.

MICROCOMPUTERS

Turbocom software, which provides asynchronous terminal emulation using character translation.

Emulation of the Digital Equipment Corp. VT52 and VT100 terminals and the IBM 3101 and Data General Corp. Dasher 210/211 terminals is included. Users can also construct any other terminal emulation.

The Magnum MCS-A costs $1,195, the vendor said.

American High-Tech Industries, Suite 201, 11111 Wilcrest Green Drive, Houston, Texas 77042.

■ MCI Communications Corp. has announced Commdesk, a program that allows IBM Personal Computers to access MCI data services while running other applications.

The package works with modems that transmit data at speeds of 110, 300 and 1,200 bit/sec. and is compatible with Hayes Microcomputer Products, Inc. communications protocols.

The software reportedly provides multitasking capability so that a user can run a second application with Commdesk. The package costs $295.

MCI, 1133 19th St. N.W., Washington, D.C. 20036.

■ Business Computer Network, Inc. announced three personal computer software products. Called Telpath, the software replaces Superficent and includes electronic updating via a toll-free number through the firm's host computer.

In addition, Telpath can be configured with two software upgrades, Telgate and Telmail. Telgate allows users to access most on-line data base services with one keystroke and Telmail lets users send and receive electronic messages by accessing electronic mail services, with a single keystroke.

Telpath sells for $99.95; Telpath with Telgate costs $139.95. Telgate is also available as an upgrade to Telpath for $39.95. Telmail, which is only available as a Telpath upgrade, costs $69.95.

Business Computer Network, 1046 Central Pkwy. S., San Antonio, Texas 78247.

■ Percom Data Corp. has announced a storage and expansion unit for IBM's Personal Computer.

The Expander Plus includes four expansion card slots and can be configured with up to two combinations of Winchester hard disk, removable cartridge or streaming tape backup, according to the vendor.

The product can be configured by the dealer for any two combinations of 10M-, 20M- or 30M-byte Winchesters; 10M-byte ¼-in. streaming tape backup; or 10M-byte removable hard disk drives.

The unit sits on top of the micro and includes a 130W power supply, four ac receptacles, five front-panel control switches, an ac power surge suppressor, a frontpanel static discharge plate and space for the two drives. Expander Plus costs $995.

Percom Data, 11220 Pagemill Road, Dallas, Texas 75243.

■ Alloy Computer Products, Inc. has introduced its Microstor-73, an external hard disk drive and tape backup subsystem for the AT&T Unix PC.

The Microstor-73 reportedly integrates a hard disk drive, in a choice of several capacities, with a file-oriented, streaming tape backup unit, giving a formatted capacity of 20M bytes per cartridge.

The Microstor-73 costs $3,295 for a version with 20M bytes of formatted hard disk storage and $4,295 for a 40M-byte version. The data encryption chip sells for $300.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, Mass. 01701.

■ Data Technology Corp. has added several models to its Transmate line of removable hard disk storage subsystems for the IBM Personal Computer and Personal Computer XT.

Each of the units uses removable 10M-byte cartridges, each incorporating a dedicated servo pattern that reportedly permits users to interchange cartridges between compatible subsystems. The cartridges may be removed for storage as well, the vendor said.

Models in the line include the 1400/R102 dual 10M-byte cartridge system, priced at $3,195; the 1300/R10, an internally installed

Continued on page 58

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Continued from page 57

10M-byte system priced at $1,695; and the 1400/R10, an external 10M byte system priced at $1,995.

Data Technology, 2525 Walsh Ave., Santa Clara, Calif. 95051.

■ Magnetic Memory Corp. has announced a streaming tape backup system for Winchester hard disk drives used with the IBM Personal Computer and Personal Computer XT and AT.

The ST/20 is said to be a half-height internal tape drive using digital tape cassettes. It includes a controller board for the standard IBM expansion slot and menu-driven software running on Microsoft Corp. MS-DOS and IBM PC-DOS systems.

The cost of the ST/20 is $795.

Magnetic Memory, 2550 Ninth St., Berkeley, Calif. 94710.

■ Data Technology Corp. has introduced ¼-in. cartridge tape drives, in externally and internally installed versions, for use in the IBM Personal Computer.

The Teammate Models 1300/T60 and 1400/T60, both add-on versions, reportedly use 45M-byte or 60M-byte tape cartridges and can conduct a backup at the rate of 5M byte/min. A software utility that permits files to be restored individually or in an image backup is included.

The 1300/T60 costs $1,395. The 1400/T60 costs $1,695.

Data Technology, Teammate Division, 2775 Northwestern Pkwy., Santa Clara, Calif. 95051.

PRINTERS/PLOTTERS

■ Alphacom, Inc. has introduced the Alphapro 401 daisywheel printer, which offers built-in Centronics Data Corp.-type parallel and RS-232 serial interfaces.

The Alphapro 401 reportedly prints at 35 char./sec. and includes a bidirectional forms tractor feeder. A cut sheet feeder is optional.

Also included is a 2K-byte buffer, expandable to 16K bytes, according to the vendor. The unit supports proportional spacing, boldface, overprinting, superscripts, subscripts and single pass underlining.

The Alphapro 401 costs $599. The cut sheet feeder costs $149.

Alphacom, 2323 S. Bascom Ave., Campbell, Calif. 95008.

■ Princeton Graphic Systems has unwrapped four color monitors for the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatibles.

The HX-9 and HX-9E are both 9-in. diagonal red-green-blue (RGB) color monitors with 160mm by 120mm display areas. Each monitor has 20 MHz bandwidth and 0.28 dot pitch, 16 colors and noninterlaced operation. The HX-9E is for use with the IBM Color Graphics Card, the vendor said.

Both monitors are compatible with Apple Computer, Inc. microcomputers with the addition of an RGB 80 card.

The SR-12P is a 12-in. diagonal analog RGB color monitor for use with the IBM Professional Graphics Card or equivalent. It has a 215mm by 160mm display area, 30-MHz video bandwidth and 0.26 dot pitch. Resolution is 640 by 480 dots at 30.48-kHz scan and 640 by 400 dots in emulation mode, the vendor said.

The HX-12E is a 12-in. diagonal RGB color monitor with 215mm by 160mm display area, 18-MHz video bandwidth and 0.28mm dot pitch.

The HX-9 costs $650, and the HX-9E costs $750. The SR-12P costs $990, and the HX-12E is $795.

Princeton Graphic Systems, 170 Wall St., Princeton, N.J. 08540.

■ Crosstech, Inc. has introduced a seven-color graphics printer for the IBM Personal Computer.

The Model CTI-7180 Color Printer reportedly allows combined text and graphics and software-selectable graphics modes of 816, 1,632 and 3,264 dot/line. Text is printed at 180 char./sec. in the pica type style and 90 char./sec. in the near-letter-quality type style.

The software controls individual colors. The unit is priced at $1,145 with a parallel interface and $1,295 with a serial interface.

Crosstech, 2730B Aiello Drive, San Jose, Calif. 95111.

■ Facit, Inc., a subsidiary of L. M. Ericsson, has introduced its 4509 printer for use with IBM Personal Computers or compatible machines.

Facit 4509 reportedly features two operating modes, a mode emulating the Epson America, Inc. RX-80 printer and an IBM/Epson emulation mode. The 80-col. dot matrix printer prints at 120 char./sec. and includes multiple font and pin graphics capabilities.

Character printing in 10, 12 and 17 pitch reportedly is possible in varying heights. Three resolution settings — 60, 120 and 240 dot/in. — are available for graphics reproduction. The unit costs $495.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

■ Datasouth Computer Corp. has announced its Daisywheel 36 medium-speed letter-quality printer with both Centronics Data Computer parallel and RS-232C serial interfaces.

The Daisywheel 36 has a maximum speed of 36 char./sec. and an average speed of 32 char./sec. It features bidirectional logic seeking, full stops for each character, proportional spacing, autounderlining and shadow printing.

Red/black printing is available.

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MICROCOMPUTERS

The printer reportedly handles cut sheets up to 16.5-in. wide with a friction feed platen. Options include an automatic sheet feeder and a forms tractor for perforated fan-fold forms.

The printer costs $895, the vendor said.

Datasouth Computer, 4216 Stuart Andrew Blvd., Charlotte, N. C. 28210.

■ Ziyad, Inc. has announced Paperjet 400, an automatic sheet and envelope feeder that works with Hewlett-Packard Co.'s Laserjet printer, and Paperjet 2000, a 47 char./sec. daisywheel printer.

The Paperjet 400 reportedly consists of two paper trays and an envelope tray that are housed underneath the printer. The product holds up to 450 sheets of paper and 75 envelopes. The adjustable paper trays store standard, legal, executive and European paper.

Paperjet 400 sells for $1,395 and the Paperjet 2000 costs $4,495.

Ziyad, 100 Ford St., Denville, N.J. 07834.

■ Sakata USA Corp. has announced a high-resolution amber monochrome monitor for the IBM Personal Computer.

The Sakata SA-1500 reportedly is 12-in. high and completely portable. It features resolution of 800 dots by 780 dots, a 2,000-char. display, horizontal frequency of 18.43 kHz, vertical frequency of 60 kHz and video bandwidth of 25 MHz.

Cost of the SA-1500 is $179.

Sakata USA, 651 Bonnie Lane, Elk Grove Village, Ill. 60007.

■ Wang Laboratories, Inc. has announced a color matrix printer and a daisywheel printer for the Wang Professional Computer.

The Colorwriter 19 is said to be an eight-color dot matrix printer that attaches to the micro through a parallel port interface and operates in draft, memo and near-letter-quality modes. Print speeds, depending on pitch, range from 154 to 200 char./sec. in draft mode, 90 to 108 char./sec. in memo mode and 30 to 40 char./sec. in near-letter-quality mode.

The PC/WOA-PM015 is a bidirectional, letter-quality daisywheel printer that reportedly prints at 40 char./sec. The product uses a serial RS-232 interface and also operates with the Wang Office Assistant micro.

The Colorwriter 19 is priced at $1,395 and the PC/WOA-PM015 is priced at $995.

Wang Laboratories, One Industrial Ave., Lowell, Mass. 01851.

■ NEC Home Electronics (U.S.A.) Inc. has announced two 12-in. monochrome monitors that are transistor-transistor logic compatible with the IBM Personal Computer, Personal Computer AT and compatible computers that have monochrome display/printer adapter cards.

The green phosphor JB-1280DA and amber phosphor JB-1285DA monitors can display 80-char. columns by 25 lines, a spokesman noted.

Video bandwidth is said to be 20 MHz; resolution is 720 horizontal dots by 350 vertical lines.

The monitors cost $189.

NEC Home Electronics, Suite 16, 700 Nicholas Blvd., Elk Grove Village, Ill. 60007.

BOARD-LEVEL DEVICES

■ Tecmar Memory Products Corp. has announced Fastcard, a 384K-byte memory board for the AT&T PC 6300. The board is said to expand main memory to a maximum capacity of 640K bytes.

Fastcard reportedly includes 16 32K-byte dynamic random-access memory (RAM) chips and a 16-bit bus interface for improved read/write access. The product contains 384K bytes of RAM for system use, with an additional 16K bytes for caching and print spooling.

The package also includes the Brightbill-Roberts and Co. Grafix Partner graphics editing software.

The product is priced at $595.

Tecmar Memory Products, 7345 E. Acoma Drive, Scottsdale, Ariz. 85260.

■ STB Systems, Inc. has announced the Super Res 400 video adapter board that reportedly allows IBM Personal Computer XT and AT users to display high-resolution monochrome text on color monitors.

The board is said to emulate the IBM Color Graphics Adapter to allow all software to run on a single display monitor. It reportedly works with color monitors with horizontal scan rates of 25 kHz and 640- by 400-line resolution, such as the Mitsubishi International Corp. AT-1341A and Dynscr Corp. 14 CHI.

The Super Res 400 is said to provide users with 32K bytes of video display buffer memory in all text and graphics modes.

The product, packaged with STB's PC Accelerator print buffer and RAM disk utility software, is priced at $595.

STB Systems, Suite 125, 601 N. Glenville, Richardson, Texas 75081.

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VAX 8600	[illegible]	7.6
PowerNode [illegible]	[illegible]	11.7
CONCEPT 32/87	[illegible]	11.7
VAX 11/780	[illegible]	4.8
PowerNode [illegible]	140	12.1
CONCEPT [illegible]	140	12.1

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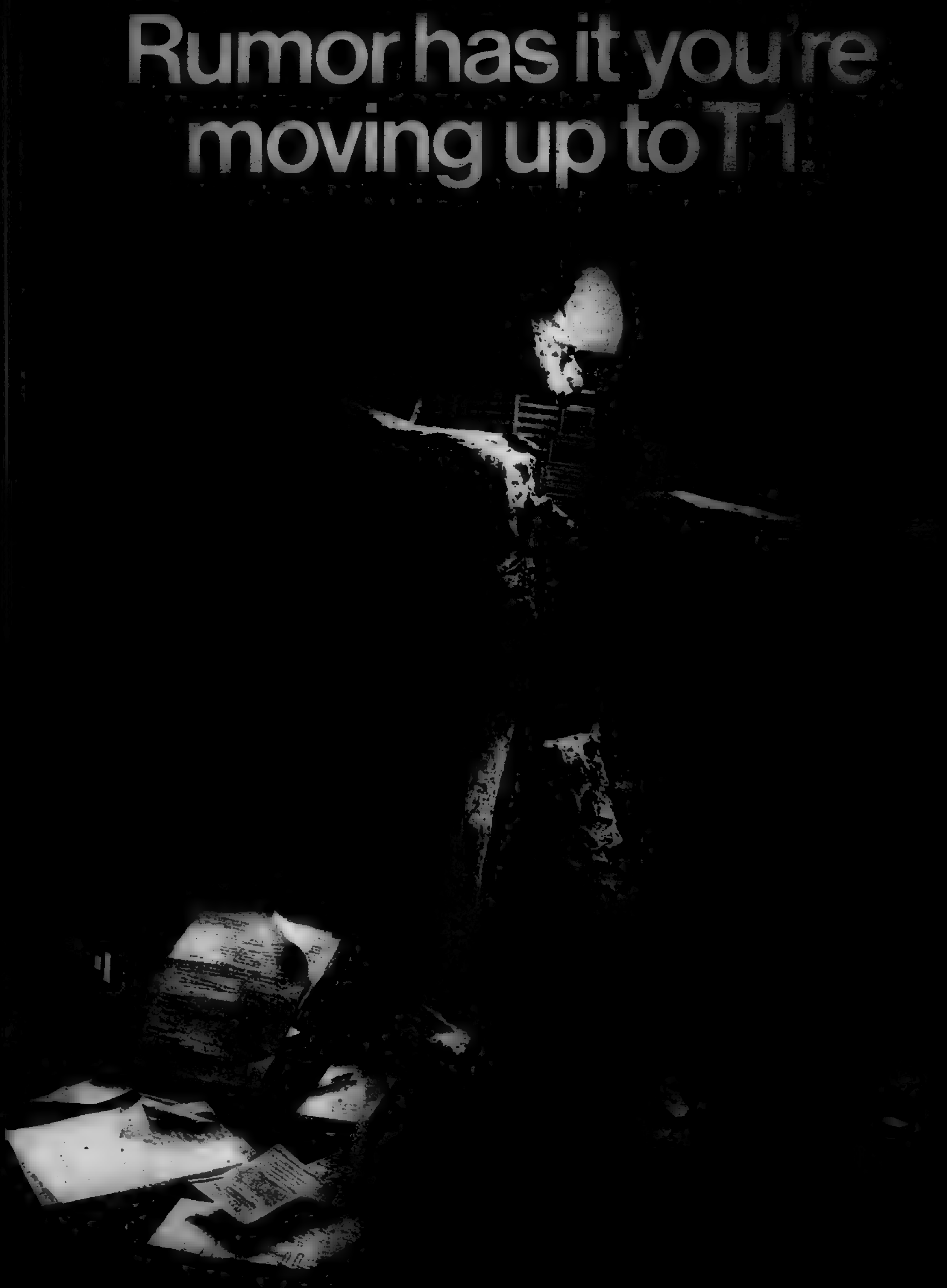
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INFOTRON SYSTEMS

PC-DOS from page 47

specification. Networking software sometimes must find out what and where a server machine is, and this function call provides that information.

The two new commands for end users are Join and Subst (substitute). Of the two, Subst is potentially the most useful.

Join connects a drive to a directory on another drive to produce a single directory structure from two separate directories. Join supersedes the Assign command. Subst allows the use of a different drive specifier to refer to another drive or path.

Both commands have relevance for the general user but greatly simplify some network access within an IBM PC Network environment. The Subst command appears to be particularly useful since it is possible to specify a pseudo drive name to a path specification.

To use the Subst command it is first necessary to use the Lastdrive command in a Config.SYS file so that PC-DOS will be able to deal with more drive names than its normal default. Lastdrive can be set to any character in the alphabet.

On a local-area network the path might go to a network server. On a stand-alone system, Subst allows a program that does not understand paths (Micropro International Corp.'s Wordstar, for example) to actually access a file through a complicated path structure.

Unfortunately, at least one frequently used command, Mode, which has never been very user friendly, must be described as user hostile in PC-DOS 3.1.

Among other things, Mode initializes the serial port or ports. There is no way, however, to obtain a report of the current status of the port assignments. Mode should be able to read the ports and report the current status when Mode is typed without parameters.

When used in tandem with another command, CTTY, the communications hardware apparently is not initialized immediately by Mode until something is shipped to the serial port. Thus, CTTY may appear not to work when, in fact, it will.

Another minor complaint is that the numerous references in the PC-DOS 3.1 manual to the technical reference manual suggest that the two should be packaged together even for casual users.

Without the technical reference book it is not even possible to use or understand the Ansi extended screen and keyboard control, which can be useful in constructing batch commands, among other tasks.

On the other hand, except for a few minor glitches, the documentation is complete and attractive.

On the whole, PC-DOS 3.1 seems to have taken care of most of the problems in Version 3 and extends considerably its power over all PC-DOS 2 versions.

The new version is likely to run directly on some compatibles. I tested PC-DOS 3.1 on both a Personal Computer XT and a Tandy Corp. Model Tandy 1200HD. It worked equally well on both machines.

RUNIT from page 47

memory and PC-DOS 2 or higher.

Mailit, priced at $300, was designed to simplify electronic mail and other office automation tasks for companies with IBM mainframe-based electronic mail systems, according to ITSoftware.

The initial release works with IBM's Scripts and Professional Office System (Profs) and DCA and CXI emulation boards.

Mailit is said to translate documents prepared with a microcomputer word processor into IBM formats. Additionally, it permits nondocument files, such as programs and data files, to be sent to and from the mainframe for routing to other personal computer users via Profs, the vendor said.

The software requires 128K bytes of internal memory and PC-DOS 2 or higher.

More information is available from Martin Marietta Data Systems through P.O. Box 2392, Princeton, N.J. 08540.

SATURATION from page 47

more measured."

While Cigna's micro purchasing hasn't slowed substantially in the past year, a random — and statistically insignificant — round of interviews earlier this month generally found significant declines.

Microcomputer purchasing "has slowed down dramatically since the first of the year," reported the MIS manager at a large East Coast consulting firm. "There's no corporate policy on it; it's starting at the bottom of the company. There's just no demand." After buying many systems last year, "we went to a level of saturation," he said.

In the early days of corporate personal computing, even highly paid employees would wait to use a machine, but "nobody's standing in line anymore," said Ron Goldfarb, office automation manager at Pratt & Whitney Co. in East Hartford, Conn.

"That goal of one [personal computer] per person seems further off than it did a year ago," he added. "Maybe we don't need one [personal computer] per person."

For many firms, the next step for desktops is a plunge much further into the deep waters of office automation, networking and distributed computing. These are dangerous waters and not everyone likes what they find when they dip a toe in.

Among the biggest corporations, "a very, very large contribution to the slump is the lack of delivery on announced products," said Thomas Billadeau, founder of TRB & Associates in Ogunquit, Maine.

Office products often arrive not only late but oversold, and customers have grown very skeptical in the past few years, he said.

"End users are more involved in the decision-making process, and they're more impatient than people who've been involved in the industry for years," Billadeau maintained.

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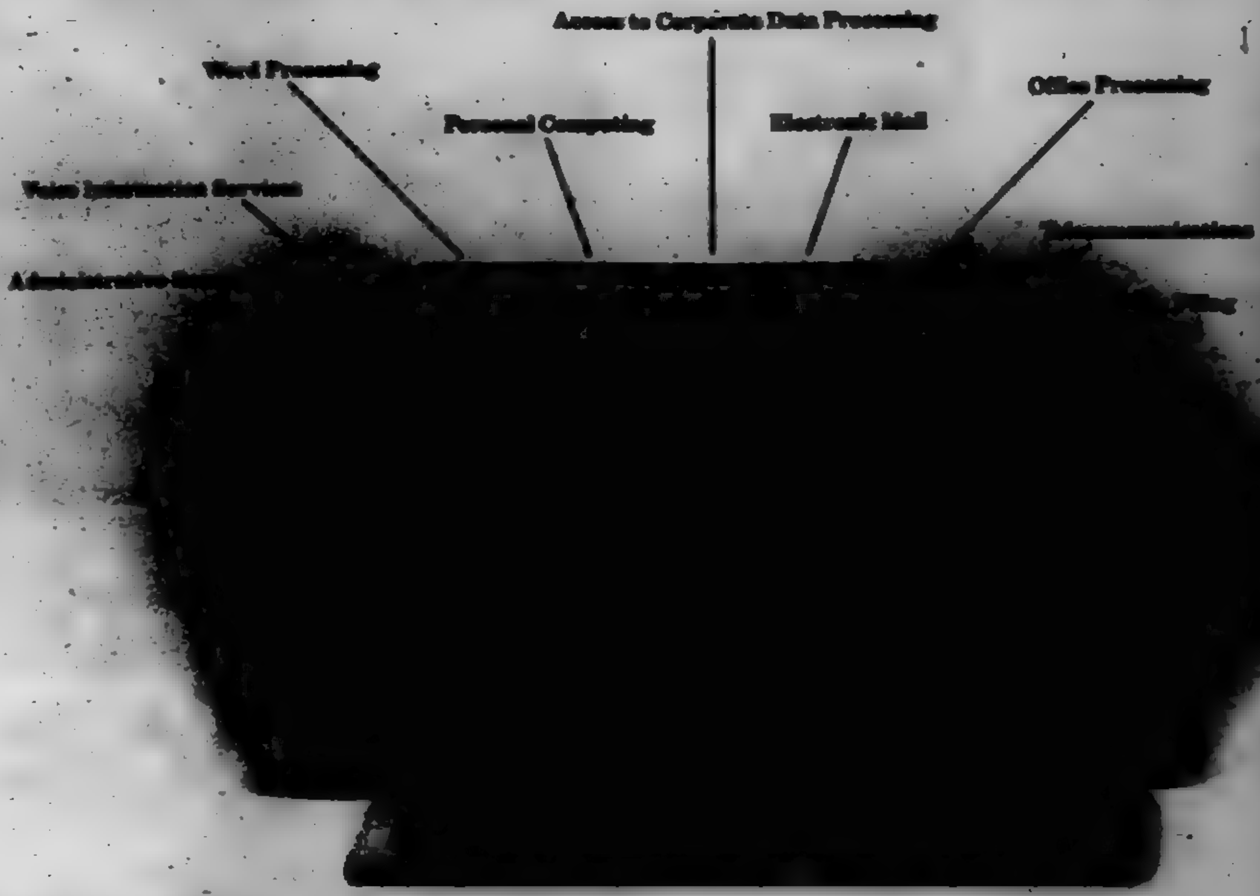

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Growing up with MS-DOS

Kathleen Sullivan
CW West Coast Bureau

> *At the outset, IBM's head of corporate relations explained why he had come along. It was because "this is the most unusual thing the corporation has ever done." Gates thought it was about the weirdest thing Microsoft had ever been through, too. Once again, Gates, Ballmer and the other Microsoft attendees had to sign a legal document, this time stipulating that they would protect in confidence anything they viewed at the meeting. Then they saw the plans for Project Chess. IBM was going to build a personal computer.*
>
> — from *Fire in the Valley* by Paul Freiberger and Michael Swaine

In the annals of the personal computer industry, this meeting would be recorded as a momentous occasion.

Mainframe powerhouse IBM had gone courting, looking for a microcomputer software virtuoso. Its search ended in the evergreen forests of the Northwest, where a young programmer named Bill Gates ran a company that sold personal computer languages.

In August 1981, when IBM entered the market with its Personal Computer, the importance of this earlier rendezvous would become clear. Every computer rolling out the IBM factory doors carried the imprint of Microsoft Corp., which was outfitting IBM's machine with its 16-bit operating system.

By 1985, the creator of MS-DOS was celebrating its 10th anniversary, an event that made it an elder statesman in the personal computer industry. Unlike many companies felled by competition, Microsoft has prospered, charting impressive gains each year (see chart ID/4).

In revenue, Microsoft is the second largest independent microcomputer software company. Lotus Development Corp., the Cambridge, Mass., firm that catapulted to the top of the market with its 1-2-3 spreadsheet program, has led the field for the past two years.

Although the No. 1 position eludes Microsoft, the company has built a solid foundation for future growth by developing a diverse product line. Expected to post revenue of $150 million this year, a $40 million increase over 1984 levels, Microsoft enjoys some advantages over rival Lotus.

"In the long run, Microsoft is in a stronger position than Lotus because it is the only independent company that has been successful in systems software as well as applications products," says Bob Lefkowits, an analyst with Infocorp, a Cupertino, Calif.-based market research firm. "That means Microsoft will be in control of its own destiny on both sides of the shop."

Currently, Microsoft's revenue is drawn equally from its systems software

(Continued on ID/4)

MICROSOFT

A conversation with Bill Gates

> *"We're a multiple-product microcomputer software company. We've never believed that any single product is key to our future; rather, it is our tools, our approach, our reputation, our people. There's no single product at Microsoft that's even close to 15% of our revenue."*

What are your present responsibilities at Microsoft?

Our goal is to get a workstation running our software onto every desk and eventually in every home. A lot of the vision of how we get there in terms of evolving the hardware, the software and the tools we will use is my responsibility.

What issues are important to your key customers?

They want the same thing we want. They want to see a workstation on every desk top. They want to keep this a growing business that attracts whole groups of end users that we haven't had yet. We're all focusing on issues related to networking and to a graphical user interface.

As you know, we moved up to the [Intel Corp. 80286] for a lot of the systems, and the [80386] comes after that. There are some exciting things with custom graphics chips and the new types of screens, where we have to get software not to be dependent on that stuff. That ties in pretty closely with what we're doing with Windows.

What does Microsoft hope to accomplish with Windows?

Commonality is one of the things we're missing in a big way. Once the stuff is common, everything is going to be identical, whether it is the way you start something up or switch or scroll or select a menu. That's one of the primary goals of Windows. We didn't see any way to get that with the current generation of applications, because some of them are so popular. Why should somebody change unless there was something really new? We've gotten a strong reception because everyone agrees that the hardware — the display, the graphics chips, the printers — are going to be there.

Why is a graphical interface important?

There have to be a variety of common tools that are used in common situations, so that everybody builds on top of those common tools. If you're still talking about a spreadsheet where you have to know to put a formula in a cell and to make this variable refer to that variable, there's a certain level of complexity that exists there, irrespective of how much sugar coating there is with a great user interface. So we think it's crucial to get a graphical user interface.

Once we're there, we'll focus on other questions. Do you have to think of your data as being in separate files? Do you have to remember which application built it? Do you have to know which data relates to other data, or will you be able to refer to it more like you would in talking to a human — for instance, the financial officer about financial data?

Windows was first announced in November 1983, but its release has been delayed several times. Has Windows been eclipsed by other products?

No other product has gotten any significant number of third parties to build graphical applications. In our systems software group, we are building the pieces that are important for people to build applications on. So we're ahead of where the needs are because we need to build our foundation well in advance.

IBM just introduced the [Personal Computer] AT, which has that really super level performance. Six months ago, IBM introduced the Extended Graphics Adapter, and it's just starting to sell.

To do graphics, the more performance you have, the better off you are. You need things like laser printers and pointing devices. If you look at the trade-off between character-oriented applications and graphics applications, it's only with extra speed and resolution that you can start to say everything will eventually be graphical.

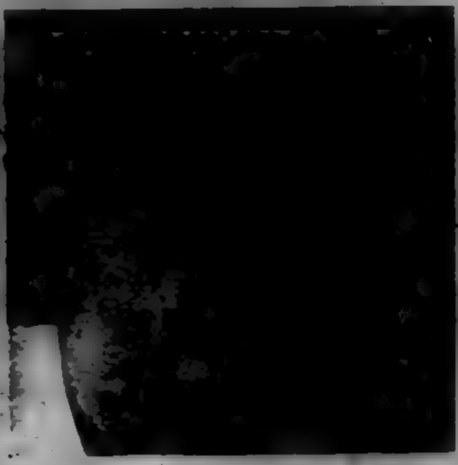
How has Microsoft changed over the past year?

Our systems group has about doubled in size over the last two years. The company two years ago had about 250 employees; today it has 900. We've been very successful in applications and have met our goals in that area.

We have this product philosophy of depth applications. Programs like Project, Chart and Access are very serious depth applications. I think that philosophy is being more accepted.

The all-in-one type of philosophy is less successful than many people had anticipated, particularly as we get to environments like Windows, which allow multiple applications to work together and exchange data.

(Continued on ID/10)



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group and its applications group, according to Bill Gates, Microsoft's 29-year-old chairman and chief executive officer. Once known primarily for its work in languages and operating systems, Microsoft has also demonstrated its success as an applications developer.

"Applications is an area of high growth for us," says Gates, whose fascination with computers surfaced in the late 1960s while he was still a teenager in Seattle. As a high school student, he worked — without pay — debugging programs in a local firm's Digital Equipment Corp. minicomputer.

The company Gates started in 1975 with friend Paul Allen recorded its first sale when the two sold their Basic to Micro Instrumentation Telemetry Systems, manufacturer of the Altair computer.

Microsoft and Macintosh

Today, Microsoft is ringing up sales of applications software. The firm has found particular success with packages for the Apple Computer, Inc. Macintosh.

"We've sold more than one application for every Macintosh that's been sold," Gates says. "You can look at any personal computer at any time anywhere — there's nobody that's ever sold one application onto every single [computer]. Not even close."

The company recently surprised the industry with Excel, a spreadsheet package for the Macintosh. When Excel was announced the first week of May, Microsoft stole some thunder from Lotus, which was late in delivering its long-anticipated Jazz integrated software program.

CW CHART BY MITCHELL J. HAYES

Yet one accomplishment in the applications arena still eludes the firm, according to Jon Shirley, Microsoft's 47-year-old president.

"We need to have a hit applications product in the DOS marketplace," he says.

Microsoft Word has come close, but it hasn't achieved the kind of "hit status" Shirley is looking for. "I'd like to be able to say unequivocally that something is number one," he says.

Shirley, a 25-year veteran of Tandy Corp., became Microsoft's president two years ago. When he arrived, his primary task was to bring order to what had been a loosely run company.

"At the time, Microsoft was essentialy run by Bill, who liked to spend his time on technical matters, not on matters related to running the company," Shirley says.

Today, Shirley handles the day-to-day business matters of the growing firm. Microsoft now employs about 900 people, having added 300 workers to its payroll since 1984. Next year it will move its staff into new quarters on a 53-acre site in nearby Redmond, Wash.

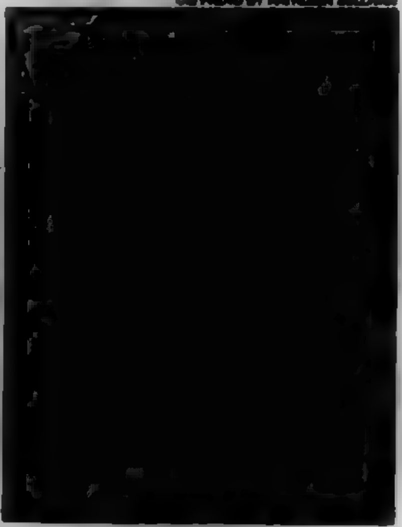
In an industry that thrives on creativity and an entrepreneurial spirit, increasing size could present problems. So Microsoft makes an effort to keep bureaucracy from creeping in, Shirley says. For Microsoft employees, that means Friday afternoon beer busts, companywide meetings, flexible working hours and ongoing technical sessions.

"We try not to let the business of running the company change the way we do software," he explains.

At its sprawling headquarters in Bellevue, Wash., Microsoft has assigned each programmer a private office, which can be decorated to the person's tastes. Many are colorful; some boast impressive stereo systems. When working on unannounced products, the windows that open onto the common hallway are papered over or draped with fabric.

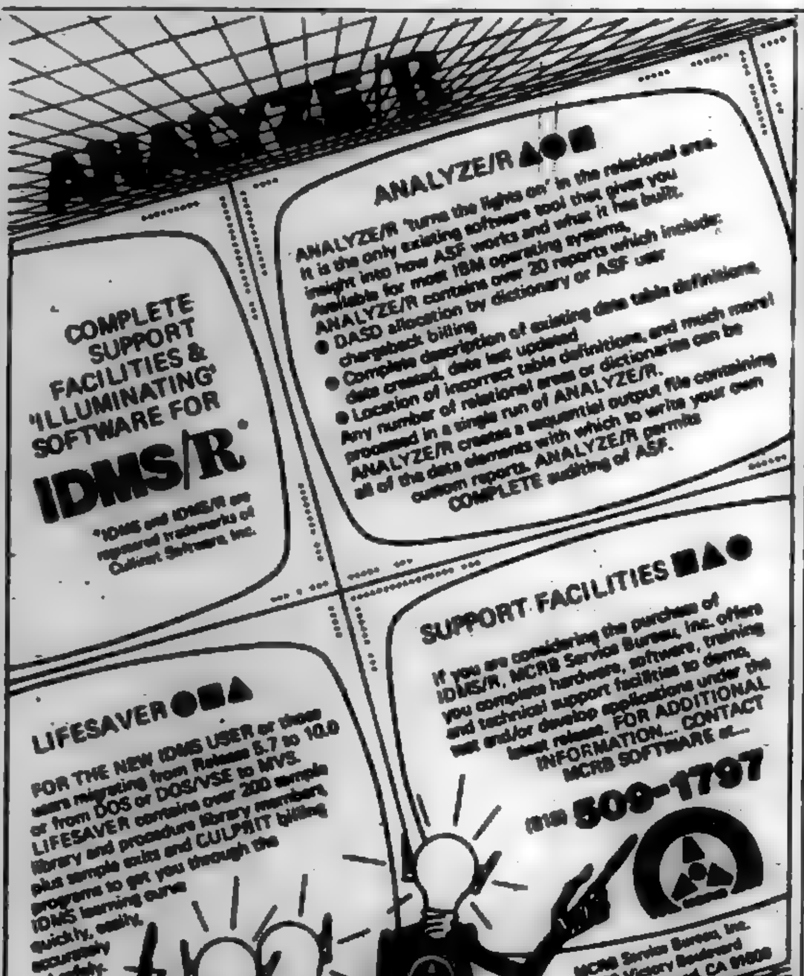
Projects are organized around small groups of people, Shirley says. "We believe good microcomputer software is done by small numbers of people. The largest development group at Microsoft is the Windows group, which got up to 22 people. Even in that group, the people were split into four separate modules."

CW PHOTO BY KATHLEEN SULLIVAN


Jon Shirley

Windows

Windows, an extension to the MS-DOS operating system that seeks to provide a graphics user interface, was introduced with great fanfare more than a year and a half ago.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Microsoft has endured criticism for the project's many delays and postponed delivery dates.

In June, Microsoft finally released Windows to hardware manufacturers and independent software developers. A retail version will be readied within the next several months, says Steven Ballmer, the company's vice-president of systems software.

Since Windows was first announced in late 1983, IBM and Digital Research; Inc.; the Pacific Grove, Calif., firm that created the CP/M operating system, have joined the fray. From Shirley's point of view, however, neither product stands up as a worthy competitor. "Of those two products, Topview is clearly a failure, and Gem is relatively unambitious in its goals," he notes.

According to Kathleen Lane, an analyst with Dataquest, Inc., a market research firm based in San Jose, Calif., Windows faces an uncertain future in an unproven market. "With Windows the question is, 'Who wants it?' " Lane says. "The market has not yet decided the acceptance of this type of product."

Although Gates is sure that Windows will generate enthusiasm, he says it is sometimes hard to describe the benefits of a graphical interface to the uninitiated. But the level of skepticism would be dramatically higher if it weren't for the existence of the Macintosh, he says.

"Having seen the Macintosh, people can imagine, 'Wow, this is going to be great!' It will have all the benefits of DOS and have something that, in fact, even goes beyond what the Mac's doing in terms of being a multiple applications system and working with color," Gates says. "[Windows] is a super, complete system that goes beyond what people have seen."

Gates concedes that the problems the company had encountered in meeting its original deadline for Windows were unfortunate. But the product will be able to stand on its own merits, he says. "Any product lives on its quality once it comes out," he notes.

Infocorp's Lefkowits was also optimistic. "Even though it's late, it will be competitive with Topview," he says. "Windows will be a product to be reckoned with."

Lefkowits does not expect Microsoft to suffer as a result of its delayed shipment of Windows. But the company's credibility could be compromised if its relationship with IBM changes.

"If the bloom goes off the rose, and IBM adopts a proprietary operating system or stops working with Microsoft, that will hurt the firm, even though its base is strong."

Both Gates and Shirley dismiss speculation that IBM might abandon its open systems approach. In August, when IBM introduced the Personal Computer AT, it chose Microsoft's Xenix operating system as well as the newest version of MS-DOS for the machine, they note. "IBM is enthusiastic about where we're taking DOS," Gates says.

Microsoft has a number of objectives regarding future versions of MS-DOS, according to Gates. "It's safe to assume that Microsoft will introduce a multitasking version of DOS, but we're not ready to announce it yet," he says. The firm is also devoting its efforts to getting around the current 640K-byte address space limitation of DOS and adding protection, Ballmer adds.

Whether the issue is enhancements to DOS or new applications programs, most analysts believe Microsoft is prepared for the long haul. "We're not at a point where we're going to see a stable industry," notes Dataquest's Lane. "There are still huge, huge steps in technology to be taken that will require a lot of research and development."

The firms that will thrive will be those that are able to adapt to change. "Microsoft is perceived as a company that has always had vision," Lane says.

The next three to four years are crucial, Gates agrees. "Some people still see the software industry as a flash in the pan," he said. "But the innovative group of companies that have taken the long-term approach will prove to the world that the software industry is a great thing."

> ***"***
>
> *'Some people still see the software industry as a flash in the pan. But the innovative group of companies that have taken the long-term approach will prove to the world that the software industry is a great thing.'*

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MIS at Microsoft: Building from the micro up

Sitting in a sunny conference room a few doors away from the computer systems room, Neil R. Evans, Microsoft Corp.'s director of corporate systems/MIS, recalls his first impressions of the company.

"When I came to Microsoft two and a half years ago, it was chaos," he explains. "They really didn't know what MIS was when I first arrived."

At the time, the firm was doing its bookkeeping on a personal computer and handling inventory control through a time-sharing service. It had no business plan to serve as a guidepost for its next phase of development.

"The company had no capacity planning for personal computers, electronic mail or MIS," Evans says. "It was a situation of uncontrolled growth."

The situation presented a unique opportunity for Evans, who left a job as application development manager at DEC's disk manufacturing plant in Colorado Springs, Colo., to work at Microsoft. In his new position, he would be able to build a data processing department from scratch.

Under Microsoft's president, Jon Shirley, a blueprint for growth was put in place. It was a critical step, Evans says. "A system reflects the business and should be keyed to the business. Our ability to plan for growth is only as good as the business' ability to plan. The MIS department has to know the key issues."

Even during his short tenure, the changes have been significant. "Before, it took 40 days to close the general ledger and publish the monthly financial statement," he says. "Now it takes 10 days. It used to take three weeks to complete and ship an order. Now it takes only one to two days."

Managing Microsoft's computer systems has proven to be challenging, because the company is more dependent than most on its computers, Evans says.

"The systems here are a lifestream system," he explains. "If they weren't working, the company couldn't run." Of its approximately 850 employees, 500 have personal computers, and all personnel — including workers in six foreign countries — are tied into the firm's Xenix-based electronic mail system.

According to the 37-year-old Evans, his primary challenge at Microsoft is coping with the intensity of the company's work environment. "It's a double-edged sword," he says. "In this company, you're more needed, but you're also more under the gun."

Evans' department serves an experienced and sophisticated set of personal computer users. Their livelihood depends on Microsoft's fortunes in a fast-paced industry where product life cycles are measured in months.

> **"**
>
> *'The systems here are a lifestream system. If they weren't working, the company couldn't run.'*

"Users at Microsoft are overly demanding," Evans says. "They're impatient. They're intense. They're used to getting instant gratification, because they work with personal computers and expect fast feedback."

Two systems groups

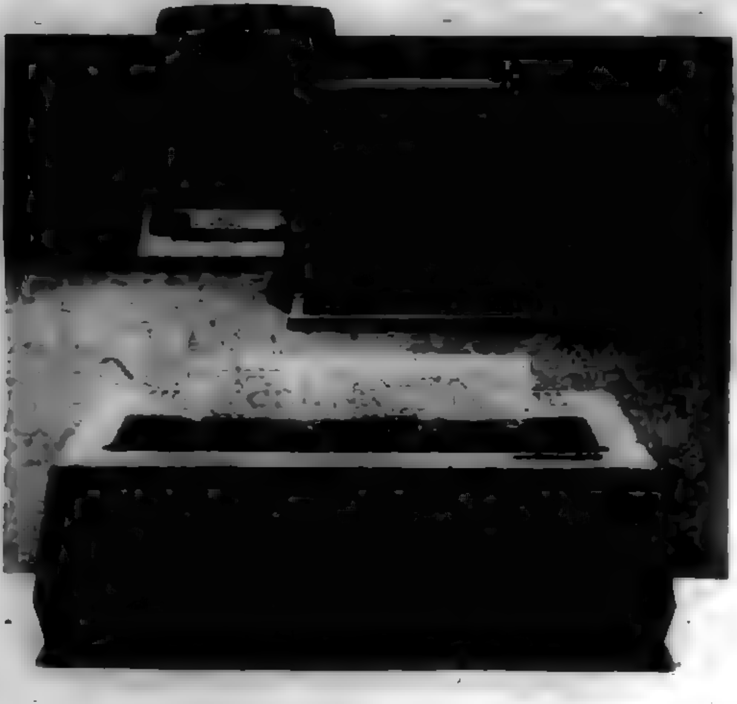
There are two systems groups at Microsoft: corporate systems and MIS. All personal computers, electronic mail systems and software development machines fall under the corporate systems group; accounting, order entry, distribution and manufacturing systems are managed by the MIS staff. Twelve people work in the corporate systems group; 18 handle the MIS operation.

At Microsoft, each software programmer has an IBM Personal Computer AT; the developers also share workstations designed by Sun Microsystems, Inc., a Mountain View, Calif.-based firm.

In the MIS department, Microsoft has installed two DEC VAX-11/780s. The company is using Maxcim, an integrated financial, distribution and manufacturing program developed by NCA Corp. Next year, Evans says, the firm plans to trade in the systems for a VAX 8600, which would double the MIS group's computing power.

Evans says his experiences at Microsoft have changed his outlook on how a company should manage its computer systems. "Working here has opened up my ideas of who should use computers and how they should be controlled," he says.

In general, he notes, a firm's systems can be divided into three categories, each with a different level of control. Although there should be very strict controls on access to corporate data base — no uploading of information, for instance — the policies governing departmental computers should be less restrictive, and computers should be only loosely controlled.



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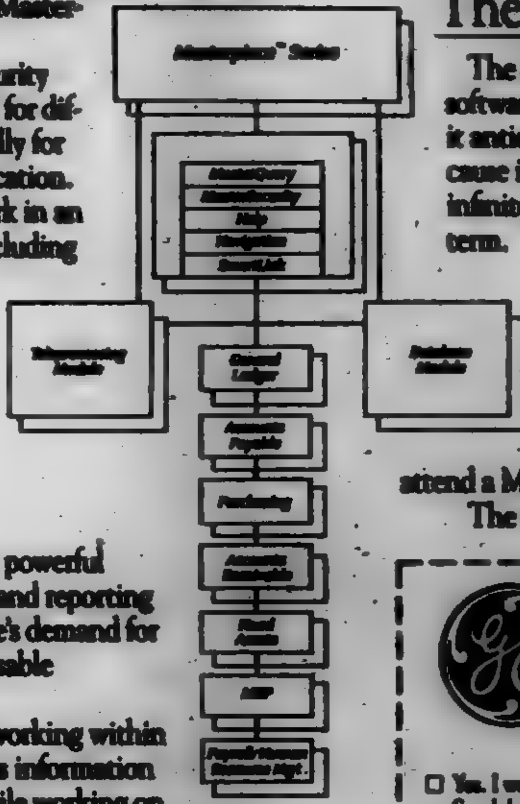

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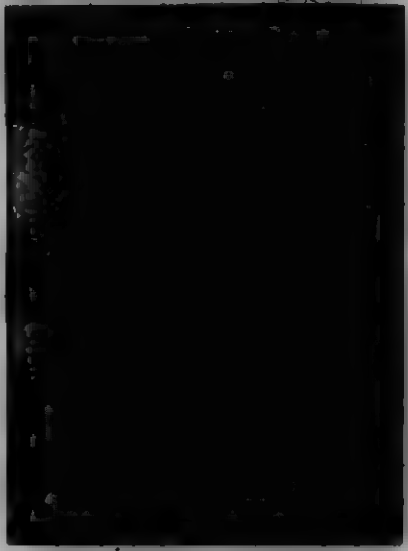

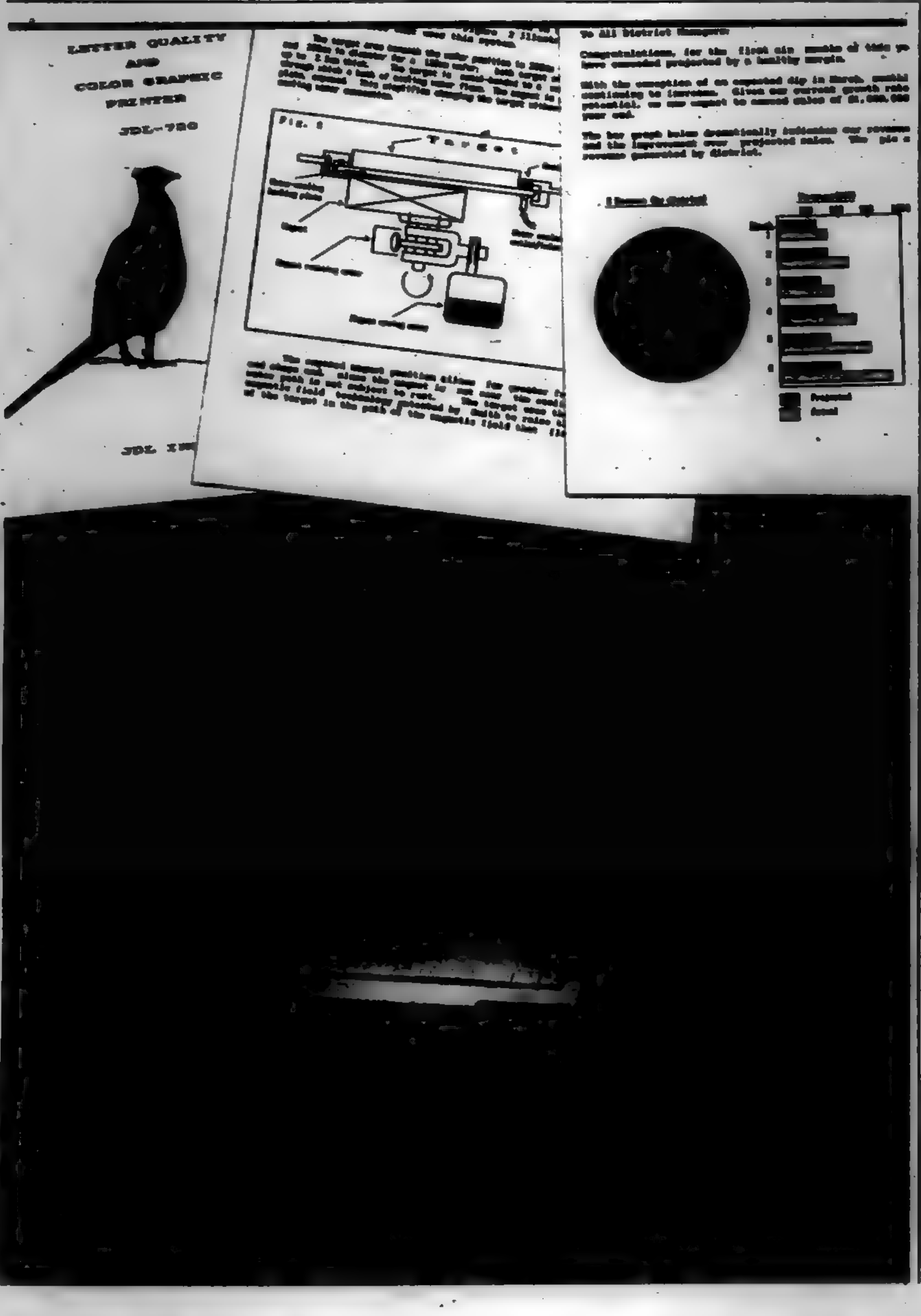

(Continued from ID/3)

In Europe, we have the most successful applications; our Multiplan spreadsheet is No. 1 in France, Germany and Japan. Our Macintosh software line is incredible. We continue to have very ambitious plans in the applications area.

What kinds of ambitious plans?

Mainly those plans have to do with getting the applications really using networks and helping people to use the benefits they can get out of that.

Also, getting our applications to use graphics more; using the newer version of DOS; doing data interchange the way that Windows supports it. There are a lot of fairly clear things that users are asking for.

One analyst says the biggest challenge facing Microsoft during the coming years is finding quality software to bring under its label. What is your reaction to that statement?

I don't think that's a problem. We already have a very complete product line that we're committed to evolving.

We've always had the philosophy of training people to use our proprietary development techniques instead of just relying on getting people who already have a way they want to do things. That's worked very effectively for us.

We're a multiple-product microcomputer software company. We've never believed that any single product is key to our future; rather, it is our tools, our approach, our reputation, our people. There's no single product at Microsoft that's even close to 15% of our revenue.

When do outside acquisitions make sense for Microsoft?

When you take something that requires expertise that we don't have, where you get some brand name support and you get to work with somebody who really knows what they're doing, like our work with AT&T on Unix.

The guys who worked with us on the Access communications program had done mainframe communications work for about eight years. We also have a certain set of projects we decided to do in-house; things like Word and DOS and Windows are totally in-house developed.

If I see a really good product that we can integrate with our data exchange strategy, align with our user

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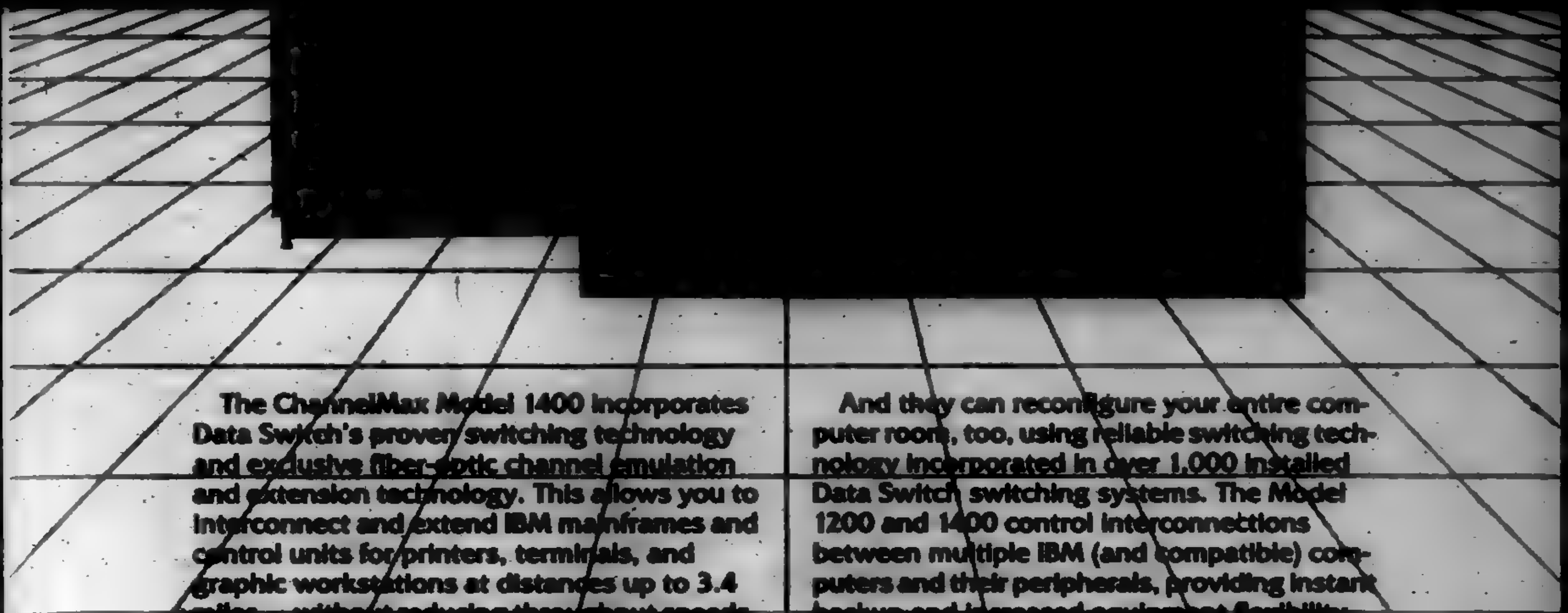

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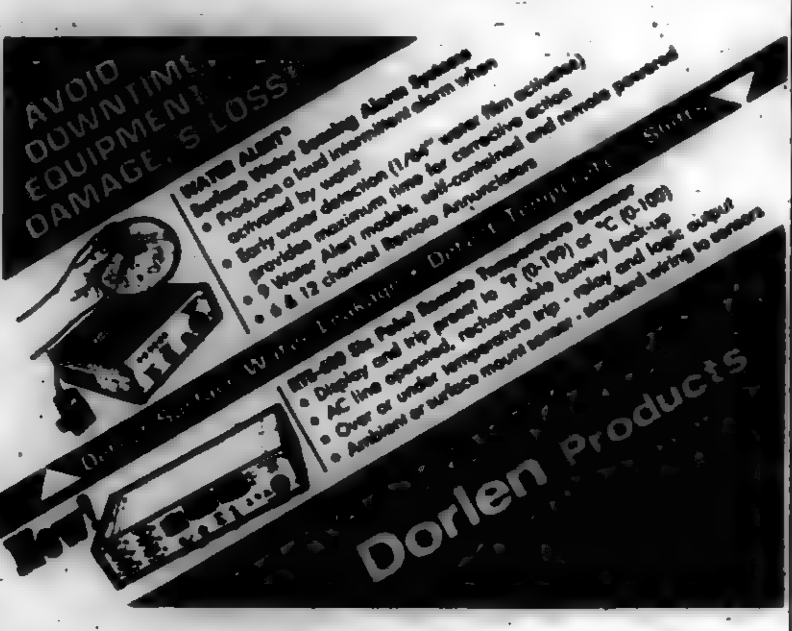
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interfaces and offer with international support, then there are some good opportunities. Our licensing stuff has worked out very well for us. We've always believed in the mixed model. We'll continue to have that balance.

Does Microsoft have in-house expertise on artificial intelligence?

Yes. We're the most active in that area as far as a microcomputer software company goes. It's our future work. It's something that I'm personally pretty involved in.

The opportunity to blend our success as a company that offers software out in the commercial world with these AI techniques is very exciting, particularly since we're now in a position to influence hardware architecture so that it will work well for that.

We take a very pragmatic approach to how we can apply learning techniques to productivity packages. They could be running on present-day hardware in less than two years. These learning techniques can help us get over the low-level things that machines can't do today, things that make them real troublesome to work with. That's what we call softer software.

What will softer software let us do that the current generation of software will not allow?

Present-day software doesn't allow you to refer back to previous actions and say, "Let's do what we did at the end of the month last time, but this time let's do pie charts on each of the regions, and let's do an in-depth breakout on the products that lost money." You can't communicate like that. You have to say, "OK, which file did I have, which record is it in, which tools should I use, what graph command should I give again that I gave last month?"

> ”
>
> *We take a very pragmatic approach to how we can apply learning techniques to productivity packages. . . . These techniques can help us get over the low-level things machines can't do today, things that make them real troublesome to work with. That's what we call softer software.*

In softer software, the fact that you've done something before allows you to refer back and explain how you want to do things differently in terms of high-level concepts. It requires a view of data that doesn't exist yet. And it requires a degree of pattern-matching activities that don't exist yet. It's hard stuff.

Does softer software bear any resemblance to expert systems?

No. Expert systems don't learn. They are a fixed encoding of the knowledge of an expert into a programmatic tool. That's a different thing. What you have now is just rote. If you want to do exactly the same thing to exactly the same data, then you can use things like keyboard macros. But there's no flexibility there; it's just rote repetition. In truth, no, there's nothing like softer software out there today.

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Managing The Software Crisis

Part 2

By Ken Orr

Software development is in a state of flux. Information systems managers have too much to do, too little time to do it, too few people and too many options. Among the suggested solutions are systems development methodologies (SDM) and fast-track development approaches based on the use of fourth-generation languages and rapid prototyping.

In part one of this series last week, I discussed the evolution of various competing systems development approaches: traditional, structured, process-oriented, data-oriented and fast-track. In this second part, we will look at representative experiences of large organizations in dealing with the move from traditional implementation tools such as Cobol, Fortran and PL/I to fourth-generation languages and fast-track development.

In addition, we will look at strategies for integrating fourth-generation technology

with structured SDMs and consider the possible impact of computer-aided software engineering (Case) tools on software development in the near future.

Almost everyone has seen write-ups in the technical journals on some major success using one methodology or another. I will not attempt to recap those stories here. Rather, I will cite three to draw some conclusions, perhaps, about the effectiveness of the various approaches to systems development.

A fourth-generation pioneer

Our first example is a Fortune 500 corporation that pioneered the use of fourth-generation languages. Frustrated after years of difficulty with the centralized information systems organization, the management of one of the large user organizations within the corporation persuaded top management to try a new approach — using a new user-friendly language on a different computer, one dedicated to a single application.

Top management agreed, and the user organization put a team of bright users together to build its own system. The experience was a major success. The application was completed largely without the help of the centralized information systems department and within a very short time. The system itself enabled the organization to improve clerical operations and to reduce the clerical staff throughout the corporation.

As a result of this success, the corporation began to introduce fourth-generation languages to an ever-widening user and data processing framework. But application of the languages on the core or "backbone systems" was restricted to those that could be safely interfaced with the corporate data base. The major functions that updated the corporate data base were still developed using more traditional third-generation languages and data bases.

A year or two ago, information systems management, by now composed of the same people who had brought the fourth-generation systems into the organization, found they needed some way to integrate the control techniques.The organization then installed a data-oriented SDM to control the management of information systems throughout the company.

A fourth-generation follower

Our second example, a government organization, shows what can happen when a new technology is employed without an understanding of its strengths and weaknesses and without good management.

In this case, information systems management attempted to develop a production payroll system on an extremely short deadline.

Here, the ease with which a fourth-generation language could be applied justified a fast-track development schedule. But because of user pressures, information systems management threw away the textbook — there was very little in the way of requirements definition, design or documentation. Although the initial version met the schedule, there were problems after the system was installed.

The first sign that something was seriously wrong came when the organization attempted to bring up one of the major organizational entities on the centralized payroll. This entity had a great many temporary employees, and the system simply couldn't handle the data. This inability caused considerable embarrassment for the information systems organization, because the difficulties were reported in the newspapers.

The next and fatal problem occurred when information systems management had to go back to top management and ask for another computer. Just two years earlier, they had recommended the purchase of a $5 million computer to run the fourth-generation system. It was supposed to last from seven to nine years.

Now, information systems management was back, hat in hand, asking for another computer — only this time the price tag was $12 million to $15 million. The increase in computer requirements could be traced directly to the inefficiencies of the fourth-generation language that had been used to implement the system and to the limitations of the data base available with the language.

Needless to say, top management was not pleased. Outside consultants were called in, and consequently, the information systems director left.

The best of both worlds

The third example, also a government organization, uses fourth-generation languages in conjunction with a data-structured SDM, with very encouraging results. Over the last five years, productivity has increased by more than 300%. Management attributes this success to the

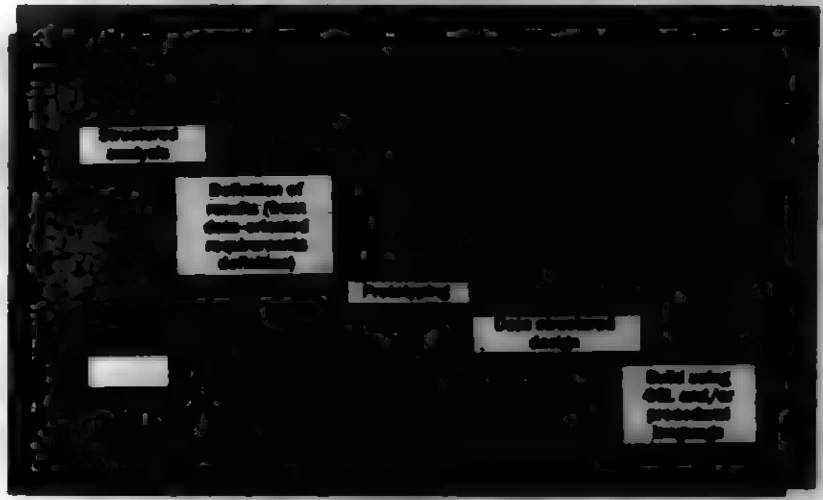
Structured analysis
Definition of results (from data-oriented requirements definition)
Prototyping
Data structured design
Build using 4GL and/or procedural language

Figure 1

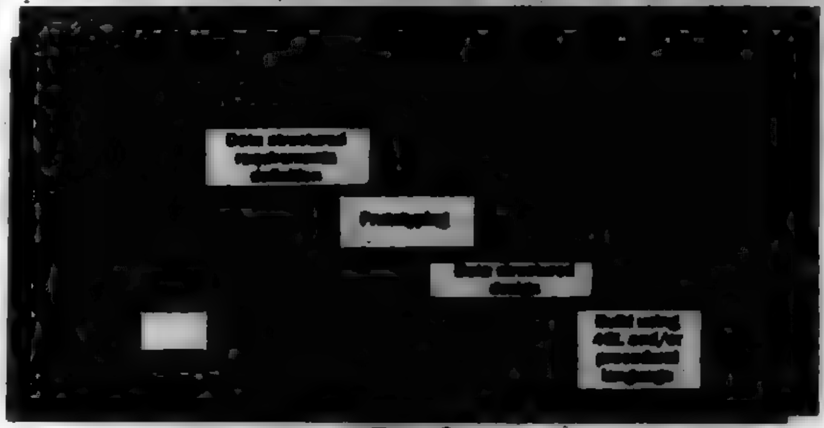
Data structured requirements definition
Prototyping
Data structured design
Build using 4GL and/or procedural language

Figure 2

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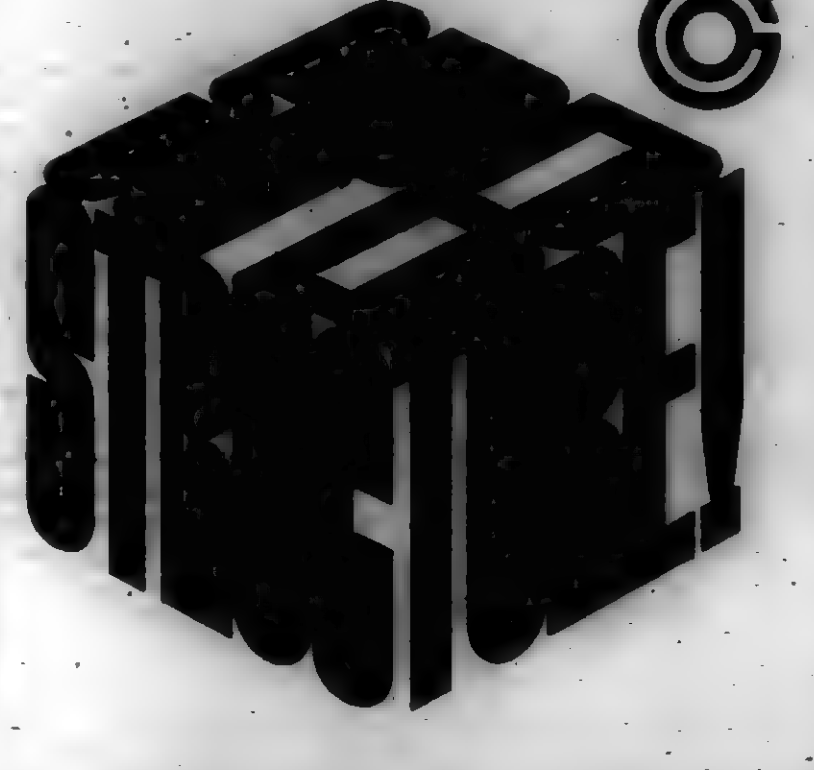

adoption of a consistent design approach: a data-oriented SDM coupled with implementation through a mixture of an efficient fourth-generation language, Cobol and CICS.

The manager of the organization says, "Because of the power of [fourth-generation languages], there is the danger that users and programmers will begin to avoid doing requirements and design. Our experience has been that if anything, the need for good requirements and design is greater using [fourth-generation languages] than using traditional languages.

"We've experimented with prototyping," he adds, "but we plan to use it only for very small applications, especially where the problem is very uncertain. We're convinced that prototyping is a tool, not a panacea."

Winners and losers

In the world of fourth-generation information systems, there are winners and losers. The first and third organizations are clearly winners in the use of fourth-generation techniques, and the second is a loser. Why? The differences have to do with management's understanding of software development.

In the first and third organizations, management understood that fourth-generation tools and techniques offered the opportunity to improve performance dramatically, particularly in the build and test phases. But they also recognized the need for disciplined development using SDMs to ensure that critical factors would not be ignored in the rush to implement.

SDMs were created, in large part, because those involved in developing systems recognized that good systems require a number of things that are not immediately evident to their users or to inexperienced analysts and programmers. Among these key elements are requirements and design documentation, back-up and recovery procedures, security, controls and audit trails.

The indiscriminate use of fast-track development techniques produces gains in productivity primarily by omitting many of these items, items that the school of hard knocks has taught experienced software managers to build into their systems. While such omissions may or may not be acceptable for small, personal systems, they are clearly unacceptable for the major backbone systems of the organization.

Future directions

It is clear from our experiences that tools such as fourth-generation languages, prototyping and high-speed analysis have a place in modern systems development. Indeed, any tool that makes it possible to speed the requirements, design, implementation or maintenance process is truly valuable.

In many organizations, however, fast-track development techniques have been sold without qualification. Experience indicates that fast-track development works best on small to medium-size systems. On large systems or on systems where performance is a critical issue, fast-track techniques and tools can still be used, but they must be used with caution.

One organization with whom we work made a commitment to using fourth-generation languages for all new development, only to find that in cases where performance was an issue or where there was a great deal of complex computation, it had to resort to Cobol. In the end, approximately 60% of the finished product was done in a fourth-generation language and the remaining 40% in a mixture of second- and third-generation languages.

Recommendations

Today, we are recommending to our clients that they adopt a data-oriented SDM with a framework that allows for the integration of high-speed analysis, prototyping and fourth-generation languages within a controlled life cycle (Figure 1). Doing so ensures that the major elements required for quality software development are present. The data-oriented methodology should have a strong logical data base component.

If the organization is currently using and/or committed to a process-oriented SDM, we recommend that it integrate its structured analysis with a state-of-the-art logical data base design methodology (Figure 2).

We are also recommending that our clients begin planning to install Case tools to aid in the requirements definition and design phases of their systems. Moreover, we recommend that they plan to interface these tools with system and program generators as well as fourth-generation languages (Figure 3).

In many respects, the information systems field is confronting the same problem faced by car manufacturers. In the late '70s, U.S. automobile companies found that to meet Japanese competition, they not only had to produce cheaper, more advanced cars more quickly but also had to improve quality at the same time. They invested heavily in new plants and procedures, installing computer-aided design and manufacturing systems to improve speed and quality.

Case systems

Similarly, if information systems managers are to speed development and improve software quality simultaneously, they will have to invest in Case systems for their analysts, programmers and users.

One of the common complaints about SDMs has been that they create too much paperwork, and since that paperwork includes graphics as well as text, it is laborious to create and maintain. Case systems overcome this problem. They provide the user with graphics workstations linked to design data dictionaries and host computers for compilation,

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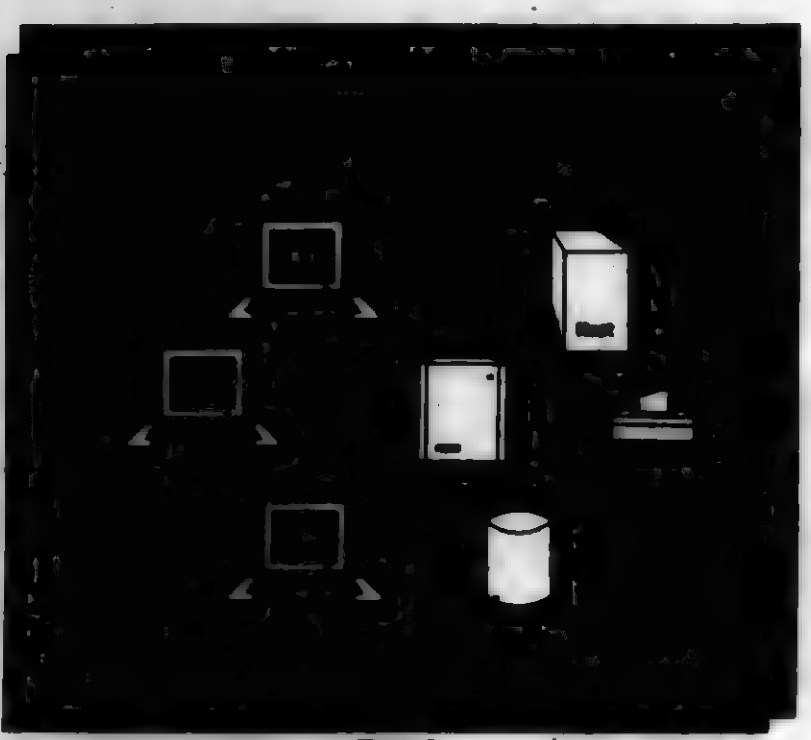

Figure 3

testing and interface with corporate data dictionaries.

In our own organization, we have been using the Nastec Corp. Design-aid system for nearly three years, and all of our internal documentation is currently on the computer. Changes can be made quickly to our systems design documentation at a very low cost, and camera-ready copies can be produced at any time.

Key to the fourth generation

In our experience, one characteristic distinguishes highly productive information systems organizations from those that are not as productive — discipline. Without exception, those organizations that do the best job of delivering high-quality software on time and under budget are the ones that have a systematic approach to all development and maintenance. They apply that discipline whether they are doing a 100-man-year project or a one-man-month one.

A second characteristic of more productive organizations is their commitment to planning. They plan for the future. Rather than viewing a new tool or technique, such as a fourth-generation language, as if it were going to answer all their problems, they research the new product and then integrate it within the basic framework of their disciplined approach.

A third characteristic of these organizations is that they are data-oriented. The data base design philosophy that underlies the application systems of the organization is clearly the key to the fourth generation.

In the next 10 years, we are going to be redoing many of the large backbone systems in our organizations. To prepare for this undertaking, we need to make sure that our data bases are organized around a business communications model that will facilitate business rules and relationships now and in the future.

New technologies typically evolve through three stages: proceduralization, mechanization and automation. If we are to improve systems development speed and quality, we will have to adopt an engineering — in other words, disciplined — approach to building systems. We will have to invest in implementing a good fourth-generation structured SDM and automating it with Case tools.

Integrating past and future

There is no such thing as a free lunch — remember the saying, "If it sounds too good to be true, it probably is." Software tools and technology are getting better; undoubtedly, this trend will continue. But tools and techniques will never become a substitute for intelligent management. Indeed, the faster things change, the more important intelligent management becomes.

We have a saying at our company. What we want for ourselves and our clients is to be able to "float on the technology." When technology changes, we want to be able to incorporate those changes into our way of doing business. We want to avoid becoming anchored at one level in the technology.

At the same time, we recognize that one of the jobs of intelligent management is to preserve that part of the past that works. There are some lessons to be learned here from when the Japanese introduced the robot. They discovered that the organizations that made the best use of robots were those that had the best manual manufacturing systems.

We're finding that the same holds true in the information systems business — those organizations that make the best use of the fourth generation are the ones that have been doing the best job of information systems engineering all along.

About the author

Ken Orr, president of Ken Orr & Associates, Inc., is one of the principal developers of the data structured systems development methodology.

Orr has held various positions, including vice-president of Advanced Systems for Langston, Kitch and Associates, Inc.; director of information and communications for state government; vice-president of a management consulting firm and manager of software development for Service Bureau Corp.

He is the author of Structured Systems Development, Structured Requirements Definition *and* The One Minute Methodology.

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COMMUNICATIONS

DATA STREAMS

SBS: Making its way back to the MCI nest

By John Dix
CW Staff

Satellite Business Systems (SBS), 16 years in the making, has come back to roost with MCI Communications Corp.

A little-remembered fact in the recent deal — where IBM sold SBS to MCI in exchange for 16% of MCI's stock — is that MCI was one of the three companies that founded SBS back in 1969.

The history of SBS is interesting. John D. Goeken, one of the original founders of Microwave Communications, Inc., said in an interview [CW, Oct. 29] that "MCI thought that satellites would be ideal for long-haul telecommunications services. To try to make MCI into a more uniform company, in 1969, we formed a company with [Communications Satellite Corp. (Comsat)] and Lockheed Corp. called CML."

Faced with legal battles against established communications giants like AT&T — the monolith feared the gnat and, in retrospect, rightly so — MCI sold CML to IBM and Comsat General in July 1974.

Under the terms of that deal, Comsat General was to up its stake in the company to 45%, and IBM was to obtain a 55% share for $3.2 million. It was not to happen. Bowing before the hue and cry raised by competitors, the Federal Communications Commission blocked the acquisition in February 1975. In that ruling, the FCC established conditions under which the sale would be allowed.

Enter Aetna Casualty and Surety Co. On September 26, 1975, this subsidiary of Aetna Life and Casualty Co. joined the former partnership, diluting IBM and Comsat's interest in the company as required by the FCC. Three months later, the newly named Satellite Business Systems had submitted a system proposal to the FCC.

In January 1977, the FCC approved the SBS application. After a few court battles brought by competitors and an antitrust investigation conducted by the U.S. Department of Justice, SBS was ready to fly.

Eight years later, the investment in SBS topped the $1 billion mark, with most of that money coming from the original three investors. But the company had yet to earn a profit. In 1984, SBS revenue was $290 million, and losses were estimated at $100 million.

The financial burden was getting too heavy, and last July, Comsat bowed out, selling 20% of its share to Aetna and the remaining 80% to IBM, giving the mainframe maker a controlling interest.

IBM replaced the SBS president with a Big Blue veteran, who didn't turn, and really couldn't have turned, the company around. The fundamental problem with SBS was that it was founded on the belief that demand for data communications, particularly high-speed data, was about to explode.

SBS believed that by 1980 it would have 126 earth stations installed, 375 by

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- Astrocom announced a seven-port statistical intelligent multiplexer that supports up to seven asynchronous terminals at speeds of 9.6K bit/sec./64
- TCL introduced a repeater for use with Ethernet-type networks that enables cables to be interconnected/64
- Analytics Communication Systems has announced Sherlock, a programmable encryptor/66

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Auxiliary Equipment/66

Equatorial unveils two-way satellite service

MOUNTAIN VIEW, Calif. — Equatorial Communications Co. has announced the addition of two-way satellite services to its one-way packet-switched satellite network product line.

Featuring a 4-ft transmitting and receiving micro earth station, the network service is designed for private corporate data networks with large central processing sites and hundreds or thousands of dispersed sites. Geared primarily to transaction response and data collection applications, the system supports terminal-to-host and terminal-to-terminal communications, the vendor reported.

Four application areas are being targeted by Equatorial — financial transactions, process monitoring and control, retail point-of-sale and branch office administration.

The company's C-200 transmit and receive micro earth stations have been tested since December 1984. Earlier this year, the company reached an agreement with Farmers Insurance Group of Los Angeles to sell an Equatorial interactive network to support data transactions from 3,000 agent and branch claim offices, a spokesman said.

Once equipped with an earth station, interactive network customers purchase the amount of network capacity required in each direction, reflecting the differences between transaction inquiries and the typical response. Capacity is available in increments of 9.6K bit/sec. Terminal reception of data sent over the network from the host computer may be continuous at up to 19.2K bit/sec.

Customer networks are operated from the company's Network Control Center here. The center provides redundant transmitting and receiving electronics, an uninterruptible power source and continuous network monitoring and diagnostic analysis. Customer data is transmitted via Equatorial-owned and operated satellite transponders, 12 on Galaxy II and four on Westar IV.

In a typical packet-switched interactive network, users at remote locations use the C-200 micro earth stations to communicate through a geostationary satellite, which relays the message to a customer's central data base or to another micro earth station via an Equatorial master earth station. The 36-ft master earth station receives the response, packetizes the incoming data and transmits the signal to the designated receiving site.

The company's use of spread spectrum transmission technology permits the use of

See NET page 66

Telebit introduces asynchronous error correcting modem

Trailblazer offered in circuit card, stand-alone versions

CUPERTINO, Calif. — Telebit Corp. announced recently an asynchronous error correcting modem for use with dial-up lines that is said to provide an average throughput of 10K bit/sec.

The Trailblazer, targeted at Fortune 1,000 corporations, is available as a stand-alone device or as a circuit card for IBM Personal Computers and compatibles.

Trailblazer is based on a Motorola, Inc. 68000 microprocessor and uses a Texas Instruments, Inc. 320 signal processor, the company reported. It combines a proprietary modulation technique with two standard modulation methods as well as a patented technology to achieve the 10K bit/sec. throughput over voice-grade dial-up lines. The product is said to have adaptive duplex capability that enables it to transmit in half or full duplex.

At high speeds, Trailblazer uses a Dynamically Adaptive Multiple Carrier Quadrature Amplitude Modulation, a proprietary technique the company developed. At lower speeds, which the modem falls back to in 100-bit increments as line quality degrades, the device uses Differential Phase Shift Key or Frequency Shift Key modulation.

Trailblazer also relies on a patented technology that divides the bandwidth of a voice-grade dial-up line into 512 communications carriers, according to Telebit President H. R. Johnson. Other modems typically use only one or two carrier signals, the president claimed.

The speed of transmission between Trailblazers is determined at the outset of a transmission as the modems test a telephone line and analyze the quality for each carrier in terms of the signal-to-noise ratio. Each of 512 carriers, which are actually 7.8Hz channels divided by frequency, is capable of carrying six bits when the line quality is good, the company reported. Individual carriers may be of a lower quality and may be capable of supporting only two bits.

Incoming data, which is sent in the form of packets, is analyzed by a receiving modem to find out whether the transmission has been corrupted. If an error is detected — using a cyclical redundancy check character — the receiving modem rejects the contaminated packet and requests a retransmission.

After each packet is successfully sent, the modems reanalyze each channel and, if necessary, adjust the data rate to conform to any interim changes in its signal-to-noise ratio, Johnson said.

Because Trailblazer can match a channel's data rate to its current interference level, the product has access to a 50% wider bandwidth than conventional modems, the company reported. Trailblazer uses line bandwidth ranging from 300 Hz to 3,400 Hz, compared with a spread of 700 Hz to

See TELEBIT page 66

MULTIPLEXERS/ MODEMS

■ **Racal-Milgo, Inc. has announced the Omnimode 1614 modem with built-in diagnostic and test features that supports data speeds of up to 16.8K bit/sec. in point-to-point applications.**

The 1614 has fall-back speeds of 14.4K bit/sec. and 12K bit/sec., the vendor said. It features a Remote Modem Control Option to allow modem speed, configuration and transmit level to be adjusted at remote sites with no operator present. The Omnimode 1614 also features an unattended testing capability for fault isolation.

The Omnimode 1614 is priced at $10,000 and is scheduled for fourth-quarter availability.

Racal-Milgo, 1601 N. Harrison Pkwy., Sunrise, Fla. 33323.

■ **Telebyte Corp. has announced that the Accelerator Series 31 asynchronous data compression unit now supports Wang Laboratories, Inc.'s 2200 minicomputer System Flow Control functions.**

The Accelerator can be installed between the Wang 2236 data terminal and a modem to triple data throughput over existing modem links using the product's data compression algorithm, the vendor said. Used in conjunction with a 2,400 bit/sec. modem, Wang 2200 throughput is said to range from 7.2K bit/sec. to 9.6K bit/sec.

Channel rates supported range from 100 bit/sec. to 2,400 bit/sec. with the terminal set to operate at four times the channel rate. The Accelerator supports synchronous and asynchronous modems. Encoded bit strings are transmitted between Accelerators using a modified X.25 protocol to provide error checking and data security, the company reported.

Prices for the Accelerator Series 31 products range from $995 to $1,095 per unit.

Telebyte, 215 Oak St., Natick, Mass. 01760.

■ **Western Datacom Co. has announced the 424 Error Free full-duplex, 2,400 bit/sec. rack-mount modem that automatically determines the best operating speed for the quality of a transmission line.**

The 424 has fall-back rates of 1,200 bit/sec. and 300 bit/sec., the vendor said. The product is compatible with Bell Laboratories 212A and 103 modems at 1,200K bit/sec. and 300 bit/sec. and with CCITT V.22 modems at 2,400 bit/sec.

The 424 costs $895.

Western Datacom, 5083 Market St., Youngstown, Ohio 44512.

■ **Astrocom Corp. has announced the Astrocom Statistical Intelligent Multiplexer-7 (Asim-7), which supports up to seven asynchronous terminals on one line and transmits data at speeds of up to 9.6K bit/sec.**

Features of the Asim-7 include a menu-driven screen that allows parameters to be set from a terminal keyboard, a spokesman said. In the event of a power failure, the Asim-7 operating parameters are stored in nonvolatile memory to prevent destruction.

A remote terminal setup capability allows the selection of parameters to be controlled from any customer-selected location.

The seven-port system is priced at $1,395.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

■ **Western Telematic, Inc. has announced a four-user automatic-dial Bell Laboratories 212A-type modem, designated the Model MM-41.**

According to a spokesman, each port in the MM-41 has a 20-number directory that lets the user automatically dial by name or number. Edit commands allow the addition or deletion of names from the directory.

The unit also provides a password call-in feature for security.

The MM-41 modem is priced at $795.

Western Telematic, 2435 Anne St., Santa Ana, Calif. 92704.

LOCAL-AREA NETWORKS

■ **TCL, Inc. has introduced a repeater for use with Ethernet-type IEEE 802.3 local networks that enables cable segments to be interconnected. The Model 2210 allows networks to be extended to 2½ km.**

The repeater is said to regenerate missing preamble bits, assuring all controllers time to synchronize, a spokesman said. Frame fragments are extended to 96 bits and are transmitted on both the transmitting and receiving side, thus minimizing collisions and retransmission, the spokesman added.

The TCL repeater is also said to enhance collision detection in both directions. After detecting a collision, the repeater transmits a 32-bit jam signal to both sides, then terminates the transmission to prevent a network lockup.

Continued on page 66

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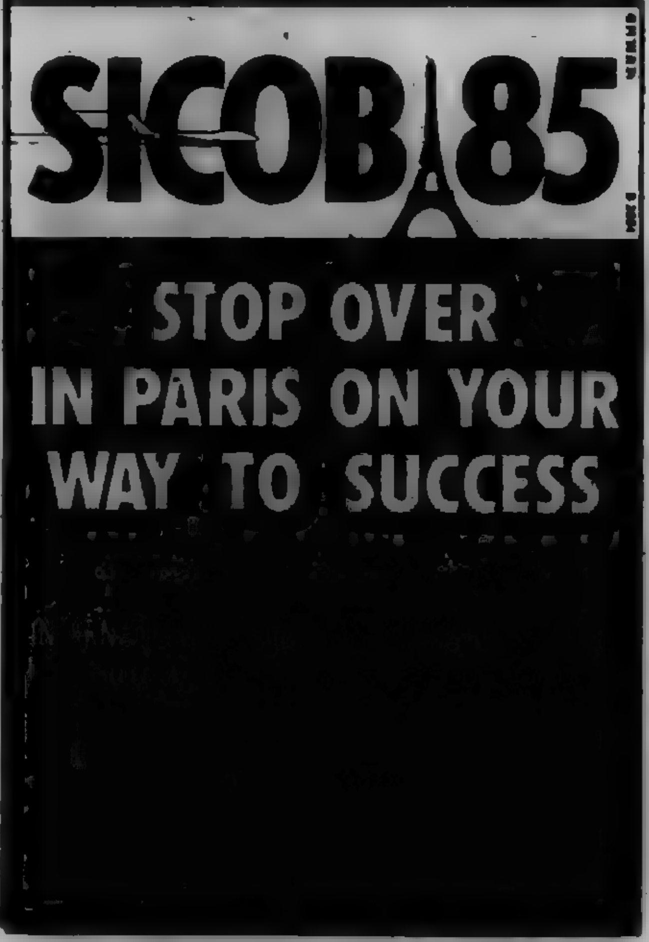

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Continued from page 64

A minimum of 96 bits will always be transmitted.

The repeater restores the original signal fidelity by removing timing, symmetry and amplitude distortions before transmitting the repeated signal.

The Model 2210 repeater is available in either 115V/60Hz or 230V/60Hz models and is priced at $1,795.

TCL, 41889 Albrae St., Fremont, Calif. 94538.

AUXILIARY EQUIPMENT

■ Analytics Communication Systems has announced Sherlock, a programmable encryptor.

The product reportedly works for end-to-end or link applications on dedicated or multiport circuits. Sherlock uses the Data Encryption Standard and meets U.S. government Standards 1026 and 1027 for link encryption applications, according to the vendor.

It works with half-duplex or full-duplex, asynchronous and synchronous transmission at rates from 50 to 9.6K bit/sec.

The encryptor features a 24-char. LCD. Physical security includes three pick-resistant locks to protect key entry and logic and locked-in cables. The product reportedly includes automatic testing as well as diagnostics.

Sherlock costs $2,495, the vendor said.

Analytics Communication Systems, 1830 Michael Faraday Drive, Reston, Va. 22090.

■ Bytex Corp. has added packet switching and baseband interfaces to its line of electronic matrix switches.

An X.21 interface enables a user to patch, switch and monitor up to eight ports at speeds up to 38.4K bit/sec. for each card and a maximum line speed of 307.2K bit/sec.

The baseband card supplies full-duplex, synchronous and asynchronous transmission at speeds up to 19.2K bit/sec. It interfaces with digital service units and channel service units. Sixteen ports can be supported on the card, and the card's maximum transmission speed is 76.8K bit/sec.

The baseband port card is priced at $2,640, and the X.21 port set costs $1,750.

Bytex, Southboro Office Park, 120 Turnpike Road, Southboro, Mass. 01772.

TELEBIT

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2,800Hz for most competing products, Johnson said. The greater bandwidth, in turn, results in increased communications speeds.

Broadened bandwidth also enables the modem to transmit data even over low-quality phone lines and opens up applications that, until now, have remained technologically or financially impractical, the company reported.

Ten large corporations are said to be using Trailblazer already, all of which served as beta test sites for the product. They reportedly credited the modem with delivering an average throughput of 10K bit/sec.

In addition to being manufactured and sold directly by Telebit as Trailblazer, the modem will by marketed by Digital Communications Associates, Inc. under the name of Irma's Fastlink.

Trailblazer costs $1,995 and is available for immediate shipment.

Telebit is headquartered at 10440 Bubb Road, Cupertino, Calif. 95014.

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small earth stations and C-band (4 GHz and 6 GHz) frequencies. The spread spectrum transmission is said to provide protection against interference from other satellites, from terrestrial microwaves and from signal degradation during rainstorms.

Company spokesmen estimated the savings over leased telephone lines to be approximately 35%. Costs are broken down as follows: $5,800 for the earth station, $900 for the installation, $45 per month for maintenance, $20 to $100 per month for satellite services and $35 per month for network management providing maintenance of the master earth station.

More information is available from Equatorial Communications, which is located at 300 Ferguson Drive, Mountain View, Calif. 94043.

SBS

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1983 with two satellites in the air and 600 with three satellites and improved technology.

Today the company has achieved roughly what it expected to have achieved back in 1980. And much of the growth in revenues has come from carrying traffic other than high-speed data as was the company's original intent. For example, in 1983, of the 30 transponders on three SBS satellites, only six were being used for the company's Customer Network Services. Of the remaining capacity, 40% was used for cable TV, 10% for SBS' Skyline voice service and 30% was reserved for backup.

SBS based its predictions on detailed case studies involving 415 companies from the Fortune 500. These studies showed the risk the company was taking.

In fact, a company spokesman once admitted that the fate of the company might hinge on the creation and acceptance of new applications such as electronic mail, teleconferencing and direct channel-to-channel computer communications.

Maybe MCI can stem SBS losses by using the system to augment its voice network while waiting for these other applications to become reality.

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SYSTEMS & PERIPHERALS

Nixdorf hardware announced

WALTHAM, Mass. — Nixdorf Computer Corp. today unveiled a series of hardware additions to various systems in its product line.

Highlights of the hardware announcements include the following:

- An addition to the company's 8870 line of minicomputers called the Model 45. The unit features 256K to 1M bytes of main memory and can accommodate 24 workstations. It can run either Nixdorf's Interactive real-time operating system, Niros Release 5.1, or the company's Terminal Automatic Monitoring Operator System, Tamos.

A basic configuration, consisting of a CPU, 256K bytes of main memory, one 8-in. Fujitsu Ltd. fixed media disk drive capable of storing 66M bytes of data, streaming tape drive, one workstation, an internal modem and emergency power supply, costs $33,400. Volume deliveries will begin in the first quarter of 1986, the vendor said.

- Nixdorf's first IBM-compatible microcomputer, called the 8810/25 Compact Personal Computer (CPC), which, like the firm's System Professional Computer 8810 Model 65 micro, reportedly can be attached to Nixdorf host processors as a native terminal.

The 8810/25 reportedly comes with a 9-in. monitor, detachable IBM Personal Computer-style keyboard, thermal graphics printer, a choice of one or two dual-density disk drives and a 10M-byte hard disk drive.

Other features include 256K bytes of random-access memory (RAM), which is expandable to 640K bytes, an Intel Corp. 8088 microprocessor and support for Microsoft Corp.'s MS-DOS Release 2.11 operating system.

A basic system, consisting of 256K bytes of RAM, dual floppy disk drives, monitor, graphics capabilities, thermal graphics printer, serial port, parallel port, red-green-blue port, operating system, Microsoft's GW Basic programming language and Digital Research, Inc.'s Graphics Environment Manager software, costs $2,500, according to vendor.

The cost of systems that include a 10M-byte hard disk drive begins at $3,900, the company said. The microcomputers will be available in September.

- A low-end addition to the company's distributed processing systems called the 8860/Micro 5. The unit features the same data capture and distributed functions as the 8860 processor and can function as a stand-alone processor or in a corporate network. The 8860/Micro 5 can access centralized 8860 or host data bases.

The system operates under Nixdorf's Distributed Processing Executive operating system and includes a CPU, peripheral control unit, 5¼-in. fixed disk drive, 5¼-in. diskette drive and a workstation. It comes with 128K bytes of main memory and is software compatible with other members of the 8860 product line.

The 8860/Micro 5 costs $10,000 for a basic configuration and will be available in October.

The company is located at 300 Third Ave., Waltham, Mass. 02154.

Pyramid's 98X debuts

Unix-based twin-CPU unit beefs up high end

CHICAGO — Pyramid Technology Corp. last week unveiled a high-end addition to its 90X line of reduced instruction set computer (Risc) processors.

Called the 98X Isoprocessor, the unit consists of two symmetric CPUs, which are said to function equally, as opposed to a master/slave type of operation. The company said the 98X system architecture allows both the kernel and user code designed for the company's AT&T Unix operating system, called OSX, to execute on either CPU.

Capable of supporting up to 256 users and up to 32M bytes of main memory, the 98X has a maximum disk capacity of 5G bytes. The two-CPU configuration, the company said, consists of two equal Risc CPUs, which offer approximately 1.75 times the performance of the company's uniprocessor configuration. A spokesman said current users of the 90X uniprocessor can upgrade to the 98X configuration for roughly $90,000.

Pyramid 98X superminicomputer

The 98X CPUs employ Schottky transistor-to-transistor logic chips and feature a CPU cycle time of 100 nsec. Each Isoprocessor consists of an instruction unit, an execution unit, 32K bytes of cache memory and a microcode sequencer. The instruction units prefetch instructions from a 4K-byte instruction cache and operands from register stacked or immediate fields. The execution units perform as

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- Xylogics unwrapped disk and tape controllers for VME bus systems/72
- A printer for IBM System/34, 36 and 38 users was introduced by Output Technology/72

INSIDE

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PE 3200s get array processor

OCEANPORT, N.J. — Perkin-Elmer Corp. has announced that users of its Series 3200 superminicomputers can now attach up to three array processors manufactured by Floating Point Systems, Inc. (FPS) to their systems. The addition of the array processors is said to expedite large-scale arithmetic computations.

FPS-5000 series array processors can be added to the PE systems, a Floating Point spokesman said. Each processor is said to add up to 18 million floating-point operation/sec. of internal performance, according to a Floating Point a spokesman said.

Prices range from $45,000 to $100,000, depending on the number of processors that are added.

Using FPS-supplied library routines or user-developed applications programs, the FPS-5000 processors are said to solve simultaneous equations; to multiply, normalize and invert matrices; to perform single-dimensional and multidimensional Fourier Transforms, digital filtering and convolutions; and to generate tabular functions.

FPS software includes processor

FPS's Standard Math Library software comes with the added processor. Optional applications software includes the FPS Standard and Advanced Libraries, FPS Simulation Library, FPS Signal Processing Library, FPS Geophysical Processing Library and FPS Image Processing Library.

These packages range in price from $975 to $1,275.

More information is available from PE, Data Systems Group, Two Crescent Place, Oceanport, N.J. 07757.

Lee Data unwraps Series 610 processor

MINNEAPOLIS — Lee Data Corp. has launched a number of products, including a multiuser associate processor, a color graphics display terminal for large-scale IBM computer users and two graphics systems printers for use with Lee's Series 300 and 400 controllers.

The multiuser Series 610 Associate Processor is said to form an extension of a company's IBM 3270 network and to offer productivity tools for individual departments by allowing 3270 users to share personal computer-like functions.

The unit allows users to create a shared relational data base and to use common word processing and spreadsheet applications by adding processing at the controller level. The 3270 terminal is connected to a Lee Data 400 controller through an RS-232 interface. This allows the terminal to access the mainframe or the associate processor, which is an Intel Corp. 80286-based processor.

The Model 614 in minimum configuration includes 1M byte of main memory, 40M bytes of hard-disk storage and Microsoft, Inc.'s Xenix operating system. The Model 614 in an average configuration costs $18,990 and includes 1M byte of random-access memory, 70M-byte hard disk storage, a streaming tape drive, the Relational Data Base Systems, Inc. Informix data base applications software and the Xenix operating system. The units will be available in September.

Lee Data also announced a color graphics display terminal for IBM mainframe environments, which also has asynchronous capabilities to connect to other vendor's systems, including systems from Digital Equipment Corp. The terminal has a four-session windowing capability. The Model 2131 Open Window display system provides concurrent access to one or two large-scale mainframes. Using the four windows allows simultaneous display of information from separate host applications or data bases, allowing data to be copied from one window to another. Each window is

See LEE page 76

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Leasing offers added cash flow, flexibility, tax breaks

By Kenneth E. Steinback
Special to CW

Computer leasing can be a good business strategy, especially for companies with large data processing equipment needs. Yet, many of the same firms that could benefit the most by leasing their computer equipment are unfamiliar with the advantages of third-party leasing.

Probably the most important factor in leasing is that there is no capital outlay. This often allows business managers to make more profitable use of their cash resources and keeps bank lines of credit intact for the expansions that can't be financed with a lease.

There can also be tax advantages to leasing. For example, lease payments are usually treated as deductible business expenses. For most companies, this means the actual cost of the lease is only half the cost of the payments.

Also, with leasing, system users have less of a chance of getting stuck with outdated computer equipment, which might be worth as little as 10 cents on the dollar.

Such a situation is possible in companies that quickly outgrow computer equipment. The cost of reselling computer equipment can be enormous, especially for users who do not have extensive knowledge of worldwide secondary markets.

Flexibility is another potential user benefit to leasing. Lessors can often get the equipment users need on a timely basis. Third-party leasing companies, for example, often specialize in locating equipment needed by users.

Lease plans can be structured to fit a company's needs, and lease payments can sometimes be arranged to meet a company's particular cash flow needs. For example, some customers need the unique flexibility offered by short-term leases, which run anywhere from six to 36 months.

Third-party leasing companies can give users the flexibility to incorporate mixed vendor's systems. For obvious reasons, most OEM leasing programs do not promote this kind of strategy.

Any data processing executive knows the headache of equipment delivery and set-up. Leasing companies can offer flexible delivery schedules because of their hardware inventories and purchasing networks. Often, early order positions of hard-to-find hardware are available from third parties. Also, if users have existing delivery problems, leasing companies can sometimes help.

Steinback is president of Computer Sales International, Inc., and a director and treasurer of the Computer Dealers and Lessors Association, an industry trade organization.

TURNKEY SYSTEMS

■ Cybernex Ltd. and Microstar have launched a North American Presentation Level Protocol Syntax (NAPLPS) decoder said to be standard reference model compatible.

The NCG1024 decoder allows the user to display information from NAPLPS data bases on a color monitor. The color monitor is not included in the system. An RS-232 interface allows access to the host computer on which the NAPLPS data is available.

The system, which consists of a graphics controller and a CPU module that is VME-card based, a keyboard, switching power supply and Naplps software in a metal desktop enclosure, costs $4,995.

Cybernex, P.O. Box 9066, 1257 Algoma Road, Ottawa, Ont. K1G 3T8

PROCESSORS

■ Dual Systems Corp. has released six VMEbus modules said to be targeted to 32-bit computer system design work.

The VMPU-32 VMEbus CPU module has a 16-MHz Motorola, Inc. 68020 CPU, a 1M-byte, dual-port random-access memory (RAM) with 32-bit data path and parity error detection, paged memory management, optional floating-point coprocessor, real-time clock with lithium battery backup and up to 32K bytes of on-board erasable programmable read-only memory (Eprom). The board was designed to run AT&T's Unix operating system. It costs $5,250 and will be available in the fourth quarter of 1985.

The Vmem VMEbus module offers RAM storage of 2M bytes based on 256K-byte dynamic RAM chips. The Vmem is said to be able to prefetch and cache the next sequential longword. The prefetch cache allows an 85-nsec access time on sequential reads, 290-nsec access time on random cycles and 240-nsec access time on writes. The unit supports 32-, 16- and 8-bit data transfers. The Vmem units cost $3,995.

Also available is a V9TRK VMEbus module for control of a 9-track tape drive in multiuser computing systems, which operates in IBM Ansi standard format. The V9TRK is a four-layer dual-height printed-circuit board built to Revision B of the VMEbus standard. The V9TRK is

Continued on page 72

How is
Duquesne Systems
teaching
Fortune 500
companies
to share?

Continued from page 71

priced at $1,250.

The company's System Controller Module (SCM) is a VMEbus system controller module that connects to the back of slot one on the backplane via the P1 connector. The SCM is said to operate in conjunction with the CPU, memory, I/O, disk controller and other VMEbus modules in Dual's family, but it is not restricted to Dual modules. It is compatible with Revision B of the standard VMEbus specification. The SCM board costs $495.

The Viop I/O processor module can serve as a stand-alone CPU with the functions and features of the Motorola 68000 16- and 32-bit microprocessor. It can also marry a variety of I/O channel-compatible modules to VMEbus systems. It is said to function with either Dual's IO-S8 card or with modules from other manufacturers.

Features include 512K bytes of dual-port dynamic memory with parity error detection, up to 64K bytes of Eprom, 10-MHz operation, and it costs $1,495. The IO-S8 costs $495.

The Optimatrak-32 Storage Module Device (SMD) Disk Controller is said to control up to three Winchester disk drives, which employ the SMD interface. In conjunction with a disk transfer algorithm, a full track can be read or written in slightly more that one rotation of a disk, the vendor said. The controller gives a sustained data rate of approximately 1.5M byte/sec. for reads and 1.1M byte/sec. for writes measured using a 2,048-byte block size with Fujitsu Ltd. 2333 disk drives. The unit costs $2,990 and will be available in the third quarter of 1985.

Dual Systems, 2530 San Pablo Ave., Berkeley, Calif. 94702.

DATA STORAGE

■ **Xylogics, Inc. has introduced two 32-bit bus products, the 751 VMEbus storage module drive (SMD) disk controller and the 772 VMEbus ½-in. tape controller that support VME 32-bit address and data.**

The 751 disk controller supports SMD interface drives up to and including the 2.4M byte/sec. Fujitsu America, Inc. Higher Storage Module Device. It has a direct memory access of 10M byte/sec., achieved via a pipeline architecture and two additional custom very large-scale integration circuits developed by Xylogics. Eight-, 16- or 32-bit modes can be selected in software.

A programmable throttle that controls the length of time the 751 remains on the VMEbus is another software-selectable option. The unit features a separate 2K-byte command buffer and an 8K-byte FIFO buffer. The unit costs from $1,600 to $2,700, depending on discounts.

The 772 controls any ½-in. tape with Pertec Computer Corp. formatted tape interfaces. It supports a variety of reel-to-reel streaming and ¼-in. cartridge tape drives from 12.5 in./sec. phase-encoded models up through 200 in./sec. group-coded recording drives.

The 772 costs from $1,100 to $1,800, depending upon discounts.

Xylogics, 144 Middlesex Tpk., Burlington, Mass. 01803.

TERMINALS

■ **Daisy Systems Corp. has introduced a workstation that is said to integrate Daisy's Personal Logician Dnix computer-aided engineering workstation with Intel Corp.'s Integrated Instrumentation and In-Circuit Emulator (I²ICE) workstation to design, develop and debug both hardware and software for microprocessor-based systems.**

The Personal Logician-Microprocessor Design Station (PL-MD) uses Daisy's Dnix operating system, which is said to be the company's implementation of AT&T's Unix. I²ICE is said to allow software developed on the PL-MD station to be debugged on target hardware. The PL-MD also suppports a set of Daisy microprocessor software development tools.

The basic PL-MD system includes the Personal Logician Dnix workstation with 1.75M bytes of memory and the I²ICE unit with 32K bytes of main memory for $37,000.

The probes range in price from $3,000 to $5,000. Up to two memory boards of 128K bytes can be added for $4,400 apiece. Language compilers for C, Fortran, Pascal and PL/M can be added for $1,000 to $2,000 each, the vendor said.

Daisy Systems, 700 Middlefield Road, Mountain View, Calif. 94043.

PRINTERS/PLOTTERS

■ **Output Technology Corp. has released its OT-777 printer, an addition to the company's 700 series.**

The OT-777 is a serial dot matrix printer that is said to print at 700 char./sec. It comes with parallel and RS-232 serial ports and an internal protocol device that allows direct interaction with IBM System/34, 36 and 38 computers. The unit features dual pass correspondence-quality printing at 350 char./sec., dot-addressable graphics capabilities and front-panel menu programming.

The printer costs $2,995 until Oct. 1, when the price becomes $3,195.

Output Technology, E. 9922 Montgomery Bay 33, Spokane, Wash. 99206.

■ **Intergraph Corp. has announced a photogrammetric engineering stereo plotter workstation that can be used for standard aerial photogrammetry projects and applications such as close-range industrial and terrestrial photogrammetry.**

The Intermap Analytic, up to four of which can be connected to Intergraph's Micro II data processing sys-

Continued on page 76

Realia COBOL.
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Until recently, you had to abandon the business computer language when you developed microcomputer application software. The available micro COBOLs were inadequate—too limited, too slow. The best alternative—the XT/370 or AT/370 using IBM's COBOL—was very expensive and still too slow. To get acceptable performance, you had to retrain your programmers in Pascal or C.

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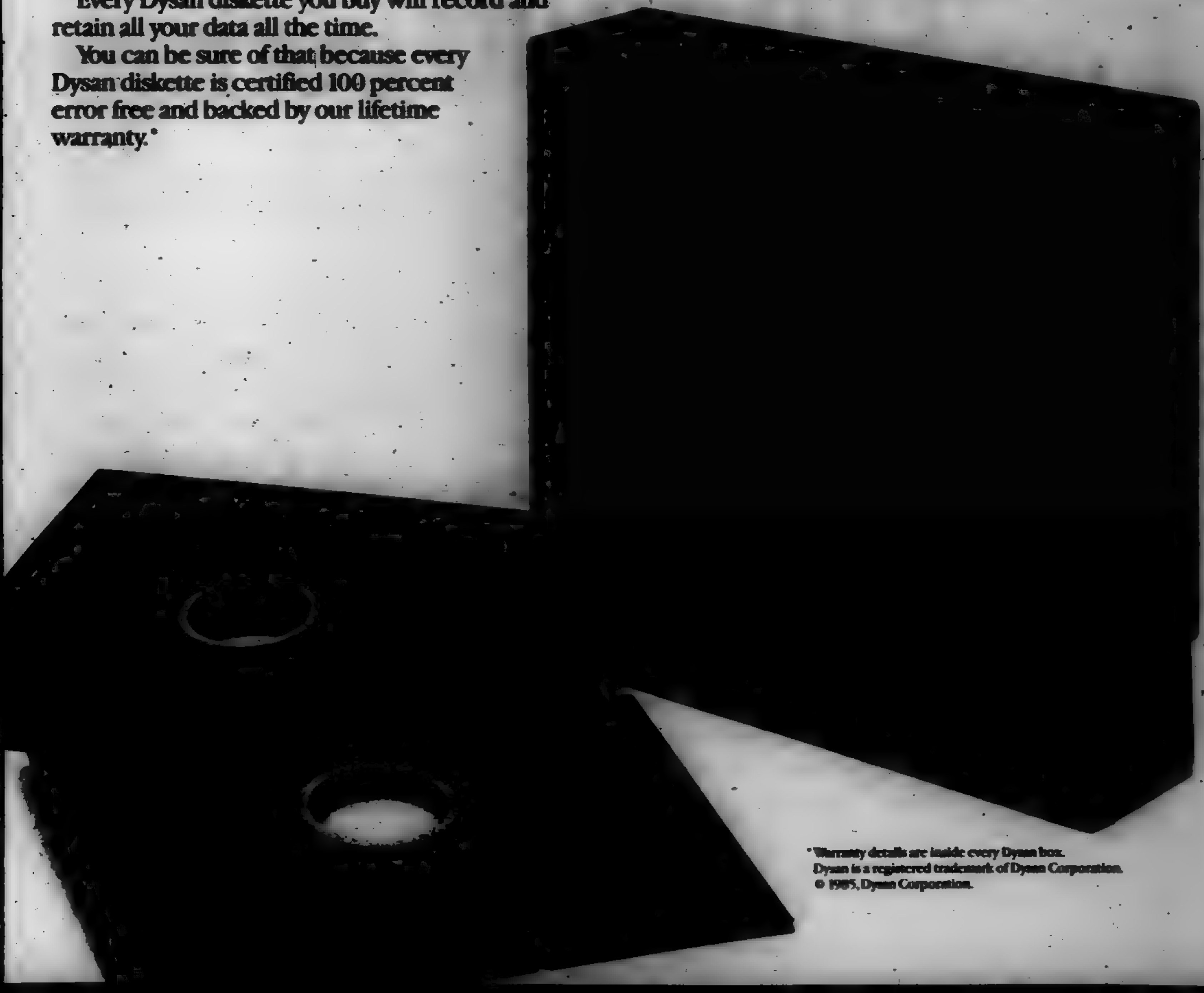

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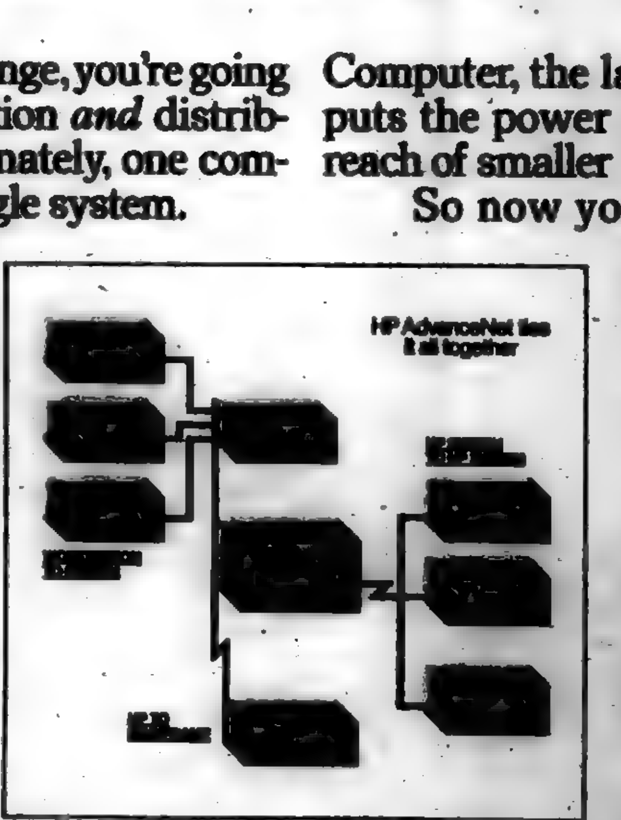

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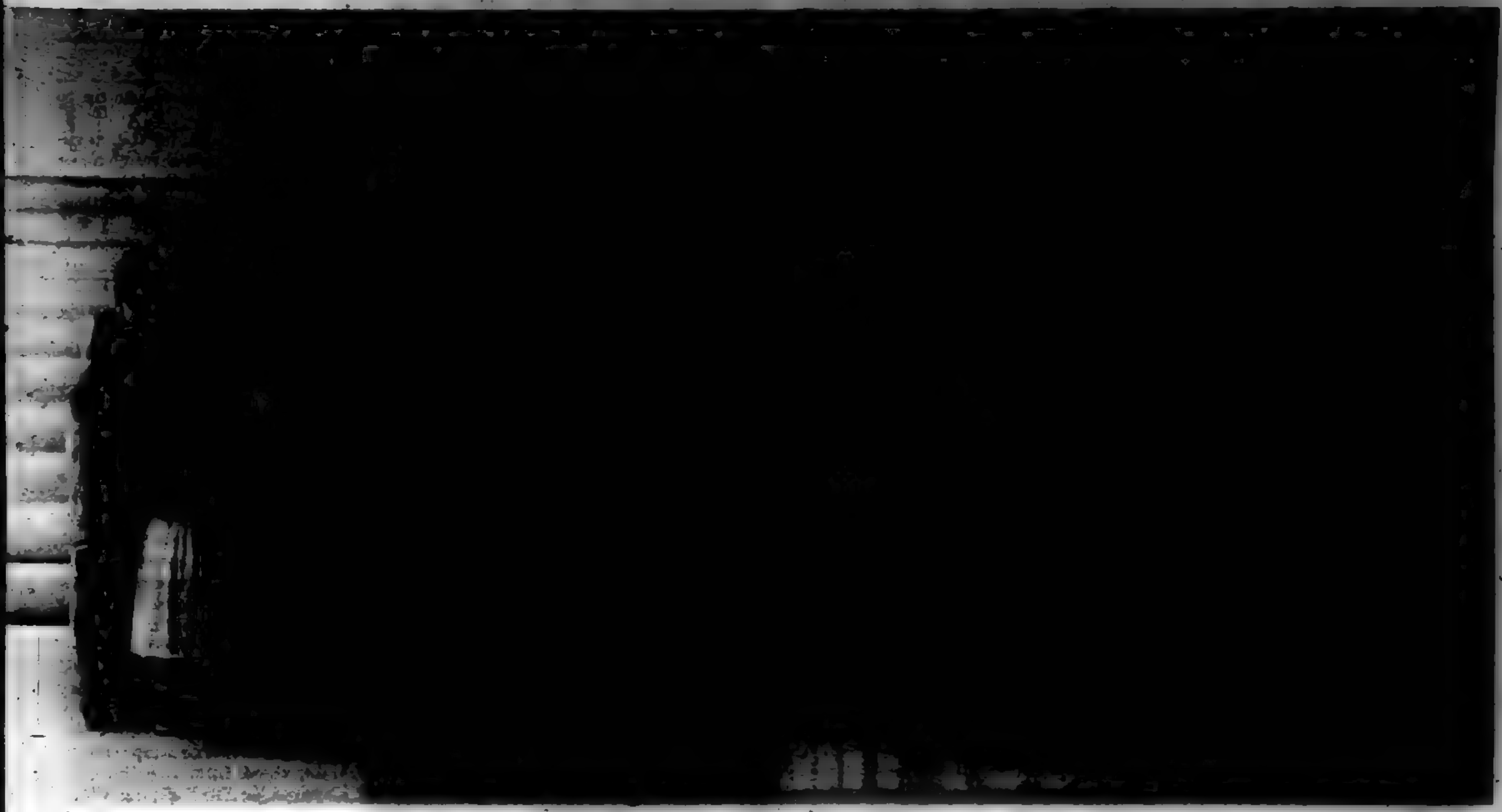

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HEWLETT PACKARD

[illegible]

Continued from page 72

tem, has a 15-in. super imposition monitor and a 19-in. color graphics terminal and reference display. This display carries the same view as the super imposition monitor when photogrammetry is in process.

The system includes a calibration software package, the Intergraph Aerial Triangulation package, and orientation software. It costs approximately $175,000.

Intergraph, One Madison Industrial Park, Huntsville, Ala. 35807.

POWER SUPPLIES

■ Topaz, Inc. has announced a line of Peak-Current Line 2 power conditioners for protecting micros from malfunctions caused by ac power disturbances.

Voltage is said to be corrected to within -8% and +4% of normal-rated voltage for input variations of 90 Vac to 138 Vac.

Prices range from $410 to $1,590.

Topaz, 9150 Topaz Way, San Diego, Calif. 92123.

■ International Power Machines has released power distribution units that are said to distribute electrical power to mainframe computers and their peripherals and eliminate the need for permanent wiring.

The power distribution unit is placed on the computer room raised floor, with cables, junction boxes and connections located beneath the floor. When equipment is relocated or when the power distribution unit is moved, the cables are adjusted to the new configuration.

Prices range from $7,000 to $22,000.

International Power Machines, 11534 Pagemill Road, Dallas, Texas 75243.

LEE

from page 69

said to be able to use up to eight colors.

When used in the asynchronous mode through a Lee Data 400 controller, the Model 2131 can emulate the Digital Equipment Corp. VT52, VT100 and VT132 terminals and can access up to 32 different asynchronous hosts. The Model 2131 color terminal with windowing capability costs $2,995 and with windowing and graphics capabilities costs $2,995.

Two graphics system printers — the Model 1361 Universal Printer and the Model 1362 Universal Color Printer — were designed for use with Lee Data series 300 and 400 (4.1 level) controllers and offer print rates of 400 char./sec. in draft quality and 100 char./sec. in letter quality, the vendor said.

The Model 1361 will cost $5,995, and the Model 1362 will cost $7,190 when they become available in September 1985.

More information can be obtained from Lee Data, located at 7075 Flying Cloud Drive, Minneapolis, Minn. 55344.

98X

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defined by the microcode sequencer. The company claims the system includes a pipelining feature that overlaps instruction unit and execution unit operations.

Each CPU contains 528 32-bit registers that are implemented in a stack configuration consisting of 16 levels of 32 registers each. There are also 16 global registers, the company said.

An I/O subsystem, consisting of an I/O processor, disk controller and up to four disk drives, supports a data transfer rate of up to 3M byte/sec. The 98X was designed to operate with the company's 32M byte/sec. message-based I/O bus called Xtend.

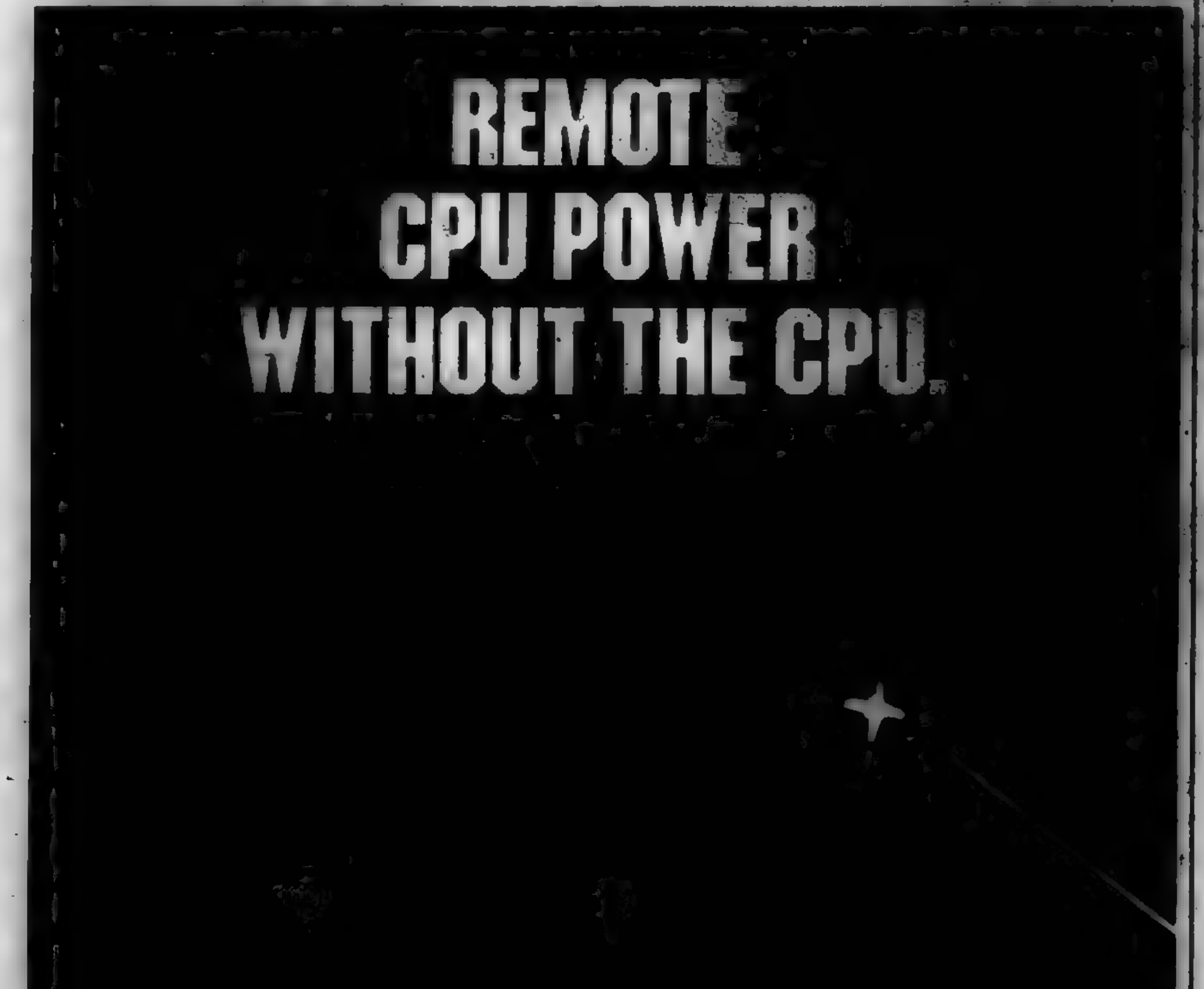
The Isoprocessor OSX operating system uses a proprietary semaphore mechanism to protect critical code sequences and control simultaneous access to kernel data structures.

This semaphore mechanism, the company said, was designed to allow the two CPUs in the 98X processor configuration to operate without major structural changes to the Unix kernel.

Available in October, the 98X Isoprocessor configuration costs from $260,000 to $600,000.

A typical configuration consisting of 8M bytes of main memory, two 470M-byte disk drives, a 6,250 bit/in. magnetic tape drive, 32 RS-232 ports, a color console and a 32-user license of OSX costs $307,000.

The vendor is located at 1295 Charleston Road, Mountain View, Calif. 94043.



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COMPUTER INDUSTRY

U.S. to probe SIA charge of Japanese trade barrier

By Clinton Wilder
CW Staff

SAN JOSE, Calif. — Responding to a recent trade complaint by the Semiconductor Industry Association (SIA), the U.S. government will investigate allegations of Japanese government and industry trade barriers to imports of U.S.-made semiconductors.

U.S. Trade Representative Clayton Yeutter announced July 11 that he will investigate the SIA's allegations and initiate talks with Japanese officials to discuss increasing Japanese market opportunities for U.S. chip makers.

Yeutter, who was recently named to his new position, is expected to submit a report to President Reagan by June 1986.

SIA President Thomas Hinkelman hailed the decision, saying, "Yeutter's decision to initiate this case as one of his first actions is a welcome demonstration of the priority the U.S. government is giving this issue."

Although some U.S. chip makers have urged limits on Japanese imports of chips into the U.S. [CW, June 17], the SIA's official position has been to lobby for actions that would increase the U.S. vendors' share of the Japanese market. Japanese sales accounted for 17.4% of the U.S. market in 1984, and U.S. sales accounted for just 11.4% of the Japanese market, according to Dataquest, Inc., a market research firm based here.

The discrepancy in certain specialized products was much greater. For example, Japanese vendors sold 67.9% of the 64K-byte erasable programmable read-only memory (Eprom) chips sold in the U.S. in 1984, while U.S. manufacturers sold no 64K-byte Eprom chips at all in Japan, according to Dataquest.

In a related development, the U.S. chip industry's woes showed little sign of abat-

See CHIPS page 90

Pitfalls of microcode romance

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Syncsort, Inc. President Aso Tavitian recently declared a victory over IBM and microcode [CW, July 15].

In Tavitian's view, IBM's June announcement of Release 7.1 of DFSort, a product Syncsort competes against, retracted previous claims that microcoded instructions in mainframes running MVS/XA improved performance of Release 7 over Release 6.

IBM sniffed at Tavitian's claim and responded that the initial February announcement of Release 7 had attributed performance improvements to use of additional virtual storage. That may be true, but it was certainly made much clearer with the June announcement that said, "Significant performance improvement . . . is realized through the automatic acquisition of additional virtual storage." The February announcement, after saying the microcode is used "to improve sort performance," a few paragraphs later noted the "capability to" access additional virtual storage.

Tavitian claimed that IBM's February announcement did not clearly tag performance improvements to additional storage, and statements made to users

See CODE page 90

Bank explores high-tech Europe trade

By Peter Bartolik
CW Staff

BOSTON — In this port city, from which Yankee clippers once sailed forth to wrench a dominant position in world commerce, a leading bank hopes to capitalize on Europe's seemingly insatiable demand for U.S. technology.

State Street Trade Development Co., Inc. (TDC) was formed in 1983 to exploit the export possibilities opened up by a 1982 law. TDC was specifically chartered by its parent company, State Street Boston Corp., to explore high-technology trade opportunities. State Street Boston is the holding company for the $4.5 billion State Street Bank and Trust Co.

"In 1982, when [U.S. Congress] passed the Export Trade Act, the intent was to reinvolve banks in the export process for the first time in 50 years," said Lawrence Meyers Jr., a managing director of TDC. That involvement can include actually taking title to goods and then shipping them overseas for resale, "much like the old Yankee traders," he added.

Alfred S. Woodworth Jr., another managing director, observed, "There just isn't the trading company tradition in the U.S. like there is in Japan." Although there are several established companies, they tend to be small scale and "not generally in the large trading company tradition that exists in other countries," Woodworth said.

The company, which in late 1984 was the first bank-affiliated trading firm to be granted an export distribution license by the U.S. Department of Commerce, has structured a variety of services to promote exports of smaller high-tech firms that cannot afford to create overseas distribution channels independently in the manner of IBM and Digital Equipment Corp.

It operates in three areas: planning and managing international distribution channels; administering master distribution contracts to move large quantities of

See EXPORT page 90

- To gain ground on IBM, micro and mini vendors are now targeting vertical markets/78
- Small companies are seen weathering industry shake-up, not shakeout/89
- Kaypro reports a third-quarter loss of $6.2 million/82

Lee Data wins rights to Visual Technology's micro system line

MINNEAPOLIS — Lee Data Corp., which earlier this year was unable to reach a merger agreement with Visual Technology, Inc., announced recently it had acquired exclusive technology, manufacturing and marketing rights to Visual Technology's multiuser microcomputer system line.

Lee Data said the Visual 2000, an Intel Corp. 80286-based supermicrocomputer, will be marketed as the Lee Data System 2000.

Last year Lee Data had reached a preliminary agreement to acquire Tewksbury, Mass.-based Visual Technology in a $16.8 million stock exchange [CW, Nov. 19]. Early this year, however, the deal was terminated [CW, Jan. 28].

In the recent announcement, Lee Data said the agreement with Visual Technology is valued at $3.1 million but that $3 million has already been paid to Visual Technology under an agreement reached in March for the firm to deliver finished products on an OEM basis to Lee Data.

The agreement provides Lee Data with all rights to the System 2000 on an exclusive basis under a 15-year license agreement along with the transfer of certain Visual Technology assets. Lee Data said it has formed a Computer Systems Division to be based in Massachusetts for design and marketing of the System 2000 and has made individual employment offers to 26 current Visual Technology employees. Former Visual Technology employees Jeff Herrmann and Jay Gehrig joined Lee Data as vice-presidents of marketing and engi-

See WIN page 90

Fujitsu Ltd.	1	2,757.6
IBM Japan Ltd.	3	2,182.0
Toshiba Ltd.	5	768.0
Oki Electric Co.	7	510.0
Burroughs Corp.	9	264.00

COMPUTER INDUSTRY

Vertical marts hold promise for micro, mini vendors

By Kathleen Burton
CW West Coast Bureau

MENLO PARK, Calif. — High-growth vertical markets will become targets of microcomputer and minicomputer vendors during the next five years as competitors overcrowd traditional horizontal markets, industry analysts say.

By 1989, U.S. computer manufacturers will ship $14.5 billion worth of minicomputers, up approximately 40% from 1985 shipments, and $8.2 billion worth of personal computer systems, up approximately 70% from 1985 shipments, to domestic vertical users, said Brian Jeffery, research director at International Technology Group, Inc. in Palo Alto, Calif.

According to Jeffery, companies like Digital Equipment Corp., Data General Corp. and Hewlett-Packard Co. now realize that their failure to establish a strong presence in mini and micro vertical markets has given IBM a two-year lead and substantial market share. "They're now trying desperately to decrease IBM's substantial lead in verticals," Jeffery said, adding that IBM now controls 20% of the mini and 40% of the personal computer vertical markets in the U.S.

Aaron Goldberg, a research analyst at International Data Corp. in San Jose, Calif., said 60% to 65% of multiuser computer systems installed in 1985 will directly target vertical markets. "Verticals are a way for vendors to sell systems and leverage their selling efforts in spite of increasing competition," he said.

Goldberg said vertical markets also enable vendors to establish valuable long-term relationships with value-added resellers, independent software vendors and OEM resellers. "[Value-added resellers] leverage selling efforts, add value to products and address wider markets by selling different solutions," he said. "Verticals will let companies enter areas they've never been in before."

Mike Gardner, marketing manager of HP's Information Systems Group, which targets vertical markets with HP 3000 products, said vertical marketing strategies, including solution selling, specialization and market differentiation are what HP "needs to learn as a company."

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> *Companies realize that their failure to establish a strong presence in mini and micro vertical markets has given IBM a two-year lead and substantial market share.*

According to Gardner, these concepts are being disseminated into traditionally nonvertical HP groups such as personal computing, medical instrumentation and applications productivity, each of which will establish vertically oriented sales districts sometime this year.

Gardner said vertical markets now represent 20% of HP's total commercial computing business, excluding personal computers and large accounts over $100 million.

Maynard, Mass.-based DEC is increasingly focusing on high-growth office automation vertical markets to leverage its expertise in sales and distribution, said Robert Thaler, industry marketing manager for DEC's legal, retail and construction vertical markets.

According to Hal Feeney, a researcher at Dataquest, Inc., a San Jose, Calif.-based market research firm, vertical markets currently represent almost 35% of DEC's overall business.

Although DEC has been involved in vertical marketing since the early 1970s, the company consolidated its vertical distribution channels under one vice-president last year, Thaler said. During 1985, DEC plans to expand several of its technically oriented vertical markets, including health care, to include business and collections, he said.

Sales representatives in DEC's vertical market and large-accounts divisions now often work together as strategic teams, Thaler added, and the relationship is "synergistic rather than competitive." For example, Thaler said, DEC's vertical legal skills are increasingly being used to help the company's direct sales staff sell to the legal departments of large corporations, with both groups often offering customers the same applications.

Robert Johnson, director of marketing support for the Information Systems Division of Westboro, Mass.-based DG, said the company is increasingly focusing on vertical markets because competition in other areas is getting stiffer, and corporate decision makers are looking for total solutions.

DG is now involved in 20 vertical markets, according to Johnson, including insurance, banking, brokerage firms, health care and telecommunications and is planning on increasing its commitment in these areas. Targeting these vertical markets, DG is heavily recruiting independent software vendors, who number approximately 95 companywide, Johnson said.

DG also recently initiated a pilot vertical marketing sales program that is being tested in New York. Under this system, a single DG sales team concentrates its selling efforts on specific banks or brokerage firms in the New York area, offering these customers any DG product or service.

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Small firms weather slump as giants remain vulnerable

By David C. Dykstra
Special to CW

Sales and income results for the first quarter of 1985 for publicly stock-traded computer companies reflected slowing growth in computer sales and weaker earnings in the computer industry. Forecasts and preliminary reports for the second quarter indicate a continuing slump.

The surprise is that the industry is having a shake-up, not a shakeout, and many of the smaller companies are weathering the storm better than the giants that many experts view as the survivors of the impending shakeout.

The quarter's results reflect the smallest growth rate in sales and the largest percentage decline in earnings during the last five years.

Only 7% increase

First-quarter sales in 1985 increased only 7% over the corresponding prior year's quarter. This compares with an average annual growth rate of 22% over the past five years.

First-quarter net income declined 22% from the corresponding prior quarter to a 5.6% net profit margin. This, however, is not disastrous when compared with the recently published Fortune 500 net profit margin of 4.9% for 1984.

Although many tout IBM's strength and ability to dominate the market, its profit margin vulnerability and its pressure to maintain market share are also evident.

In the first quarters of 1984 and 1985, with 29% and 28%, respectively, of the industry's total sales, IBM had 48% and 50%, respectively, of the industry's profits. IBM's profit margin as a percent of sales is more than double the average of all other computer industry companies. When IBM quivers, the industry shakes.

IBM's quarterly sales increased only 2% to $9.8 billion. Profits, however, declined 18% to $216 million.

The second tier

The second market tier under analysis consists of 33 companies, each with sales less than IBM's sales but greater than $150 million for the 1985 first quarter.

The sales of these companies grew 7.6%, which was greater than IBM's sales increase of 1.9%. Profits suffered more severely as this group's net profits declined 29% to a 3.8% net profit margin.

The profit impact was most severe on the companies that have increased their efforts to compete head to head with IBM in its various markets. Some of these companies are Texas Instruments, Inc., Control Data Corp., Tandy Corp. and Wang Laboratories, Inc.

Costs force profits down

Apple Computer, Inc. had a strong 45% sales increase from the Macintosh product line. But the costs associated with aggressively trying to penetrate increasingly competitive markets caused its net profit margins to shrink to 2.3%.

Some of the companies that maintained their market direction in niches away from the mass competition had very good performances. Telex Computer Products, Inc., a manufacturer of specialty terminals, had a sales increase of 82% and maintained a 9% profit margin. Automatic Data Processing, Inc. had a 16% sales increase and improved its net profit margin from 9.4% to 9.6%.

The 233 smaller companies, with average sales for the quarter of $26 million, had a greater sales growth rate and a less severe profit decline. Sales grew 14% while net income declined

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Dykstra is an independent data processing/office automation consultant, author and lecturer. He is president and owner of Dykstra Consultants in Newport Beach, Calif., and teaches at the Irvine, Calif., campus of National University.

COMPUTER INDUSTRY

12% to a 4.2% net profit margin.

There were numerous casualties, and the survival of many companies is in question. These companies include many in the IBM-compatible arena such as Eagle Computer, Inc., Fortune Systems Corp. and Vector Graphic, Inc.

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> *The keys to success, in both the good times and the bad times, especially for the smaller companies, have been to identify and serve market niches properly, not to try to be everything to everyone.*

Most of the strong performers in the smaller companies segment do not compete head-to-head with IBM and the other giants. Many of the stars, however, supply or support the IBM marketplace.

Strong first-quarter 1985 results were posted by a host of companies, including Apollo Computer, Inc., Ashton-Tate, Compaq Computer Corp., Computer Task Group, Cray Research, Inc., Cullinet Software, Inc., Software Publishing Corp., Sterling Software, Inc., Stratus Computer, Inc. and many others.

The number of successes as compared with the setbacks has taken a backseat in the news. Most of the successful companies are not high-profile companies; this suggests that the low-profile approach — for example, direct sales vs. mass marketing, customer service vs. stock market image, and so on — is a factor to success in a large, highly competitive market.

The outlook

The outlook for the computer industry continues to look strong. The buyers, however, are much more sophisticated than they were one year ago. These buyers are cautious, and they are placing increased demands on the sellers.

The keys to success, in both the good times and the bad times, especially for the smaller companies, have been to identify and serve market niches properly, not to try to be everything to everyone and to avoid mass advertising, IBM-commodity markets.

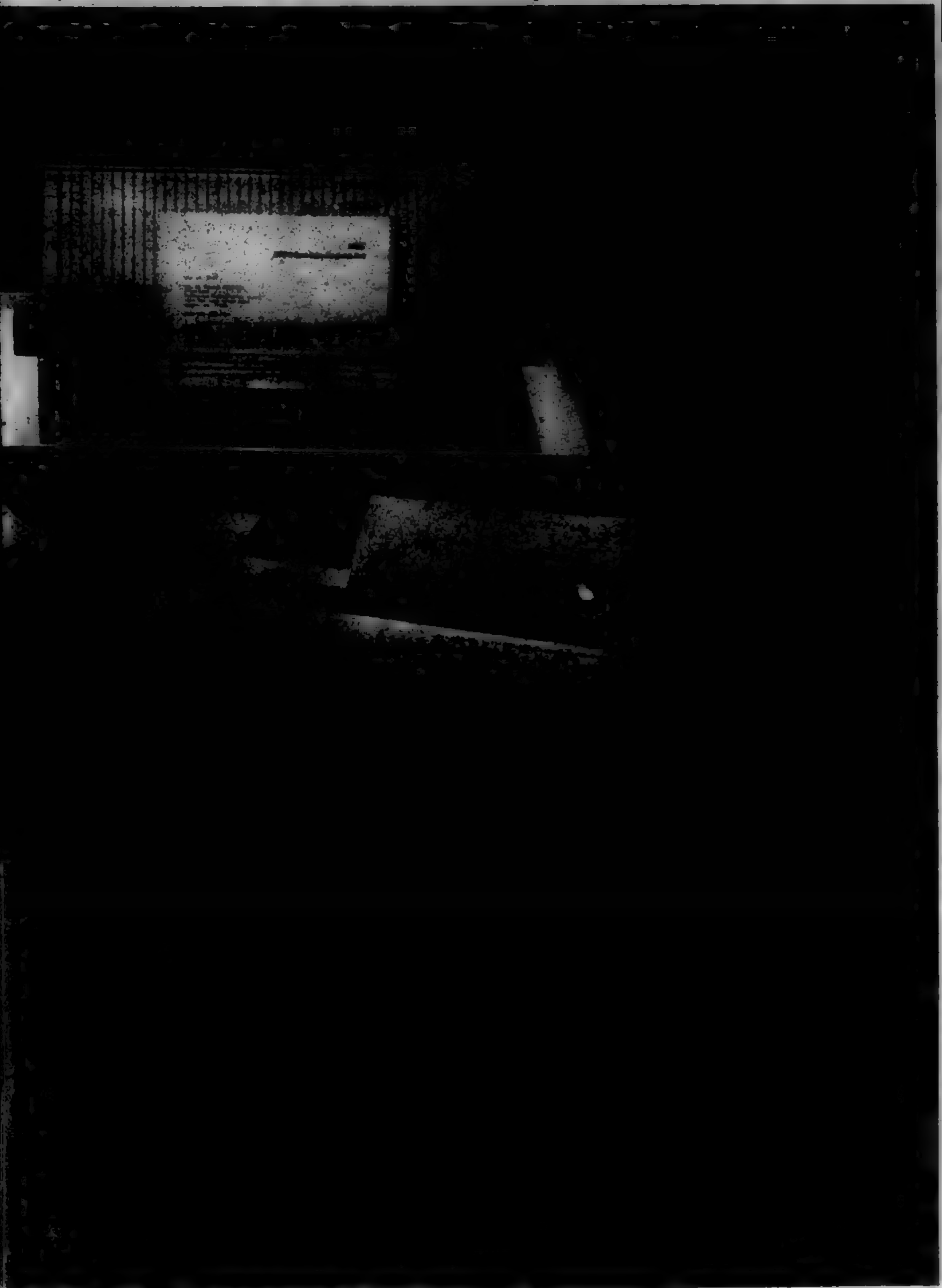
The largest companies in the computer industry serve the largest organization purchasers with the products that are the largest portion of these organizations' purchases. These, however, are the slowest growing as well as the most competitive markets.

Growth of niche marts

The smaller volume but more rapidly growing newer, niche markets provide greater opportunity for high profit margins and growth.

The demand for increased support and service related to specific needs will create even more varied products and vendors. The number of computer industry companies, in both the bad times and the good times, had grown and will continue to grow. The shake-up will continue.

The Dykstra Consultants' 75-page report, titled First Quarter '85, Public Computer Companies Results, *will be available shortly. The price is $195.*



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Kaypro posts $6.2 million third-quarter loss

SOLANA BEACH, Calif. — Kaypro Corp. announced it suffered a net loss of $6.2 million for the third quarter ending May 31.

The portable computer manufacturer said the loss resulted from a revaluation of its inventory. The company said the revaluation prompted a subsequent $9.8 million writedown.

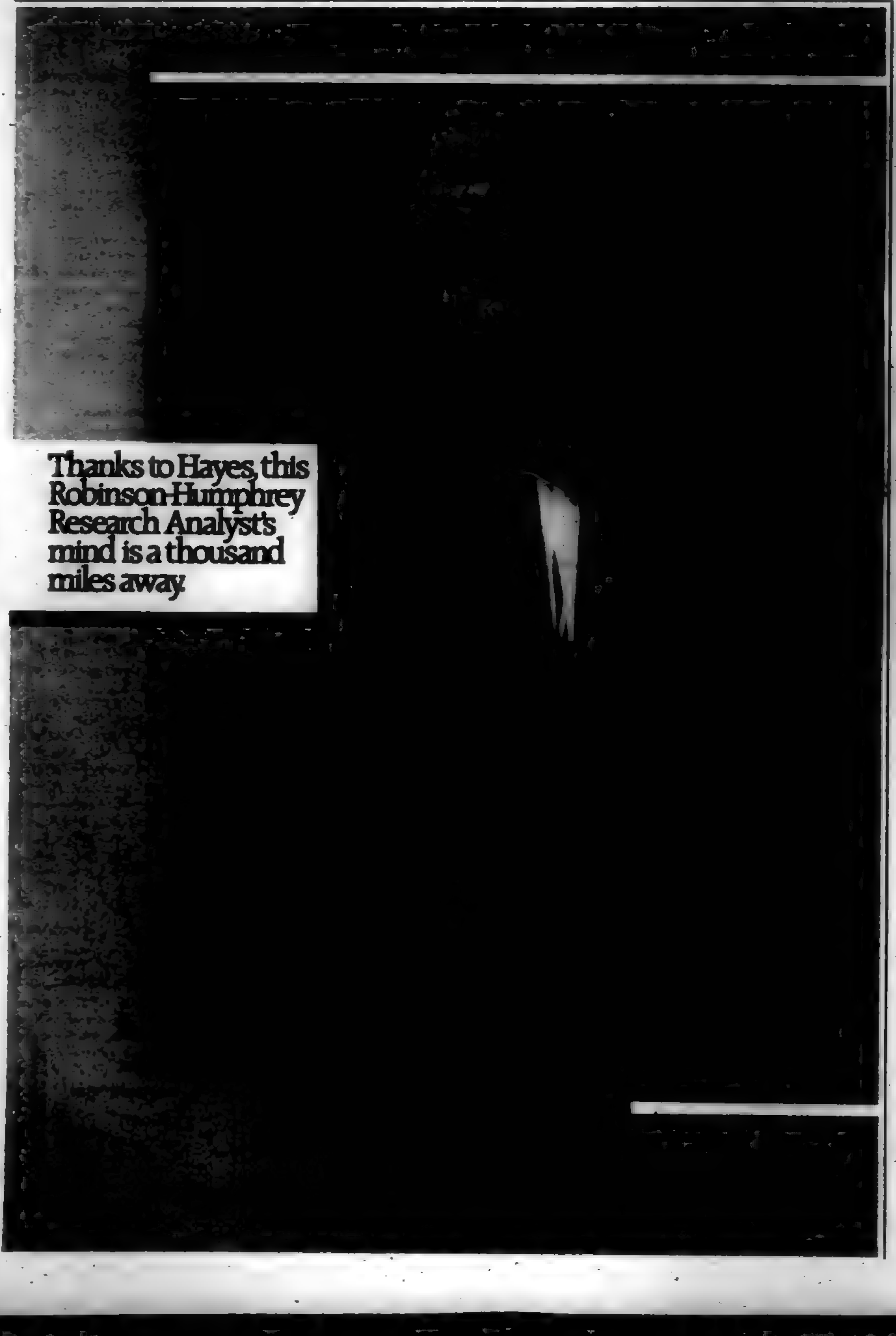
Sales for the quarter totaled $16.7 million, down 48% from $32.5 million one year ago. Profits for the same period last year were $3.2 million.

Robert Gorski, Kaypro's controller, said the generally sluggish computer market and the company's recent introduction of new-model 16-bit computers fueled the revaluation.

The company currently has assets of $38 million and liabilities of $13 million, Gorski said, and "will continue to be a significant player in the marketplace."

According to Gorski, the revaluation will make further adjustments for the rest of the year unnecessary.

Ken Lim, an analyst with Dataquest, Inc., a market research firm in San Jose, Calif., said "this recent loss continues a trend Kaypro has been on for several quarters. [The firm] alternates small losses with break-even periods." According to Lim, the company's problems are caused by having too many overlapping products in the marketplace.



Firm merges CAD/CAM subsidiaries

ANN ARBOR, Mich. — Schlumberger Ltd. recently announced the consolidation of two major units of its Computer-Aided Systems (CAS) group. It combined the operations of Applicon, Inc. and Manufacturing Data Systems, Inc. (MDSI).

Applicon, formerly headquartered in Burlington, Mass., manufactures computer-aided design products. MDSI, headquartered here, is a maker of computer-aided manufacturing products. Both companies were founded in 1969.

According to a Schlumberger spokesman, the combined companies will retain the Applicon name. The spokesman added that the firms will be headquartered here.

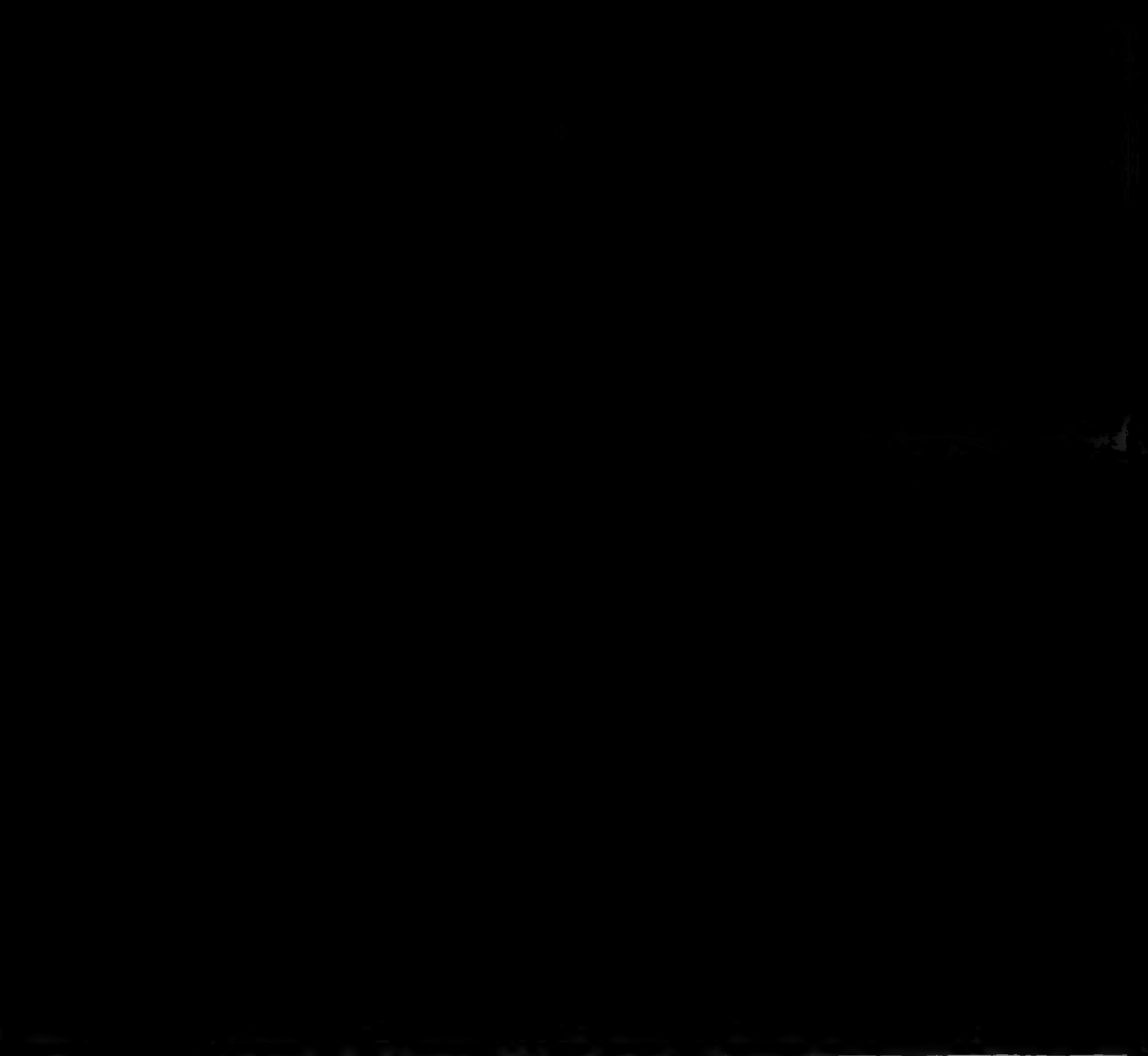
Sales arms left intact

Worldwide sales and service organizations of both companies will remain intact, Schlumberger said, and product development and manufacturing facilities in several states will continue operations.

Dick Morman, former general manager of MDSI, was named vice-president and general manager of the combined company. Alex Beavers, former president of Applicon, was named vice-president of marketing for Schlumberger's CAS group.

Additionally, Schlumberger announced the formation of the Electronic Design Automation group. The operations of the new group will encompass the very large-scale integration product line of Applicon and the automatic test generation facility efforts of Factron, another division of Schlumberger's CAS group.

How to find the formula.



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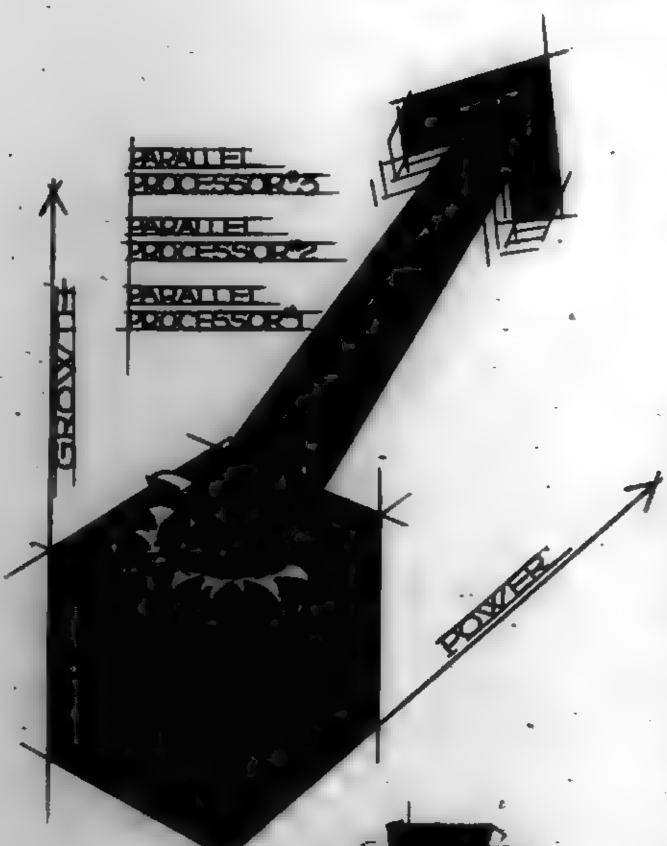

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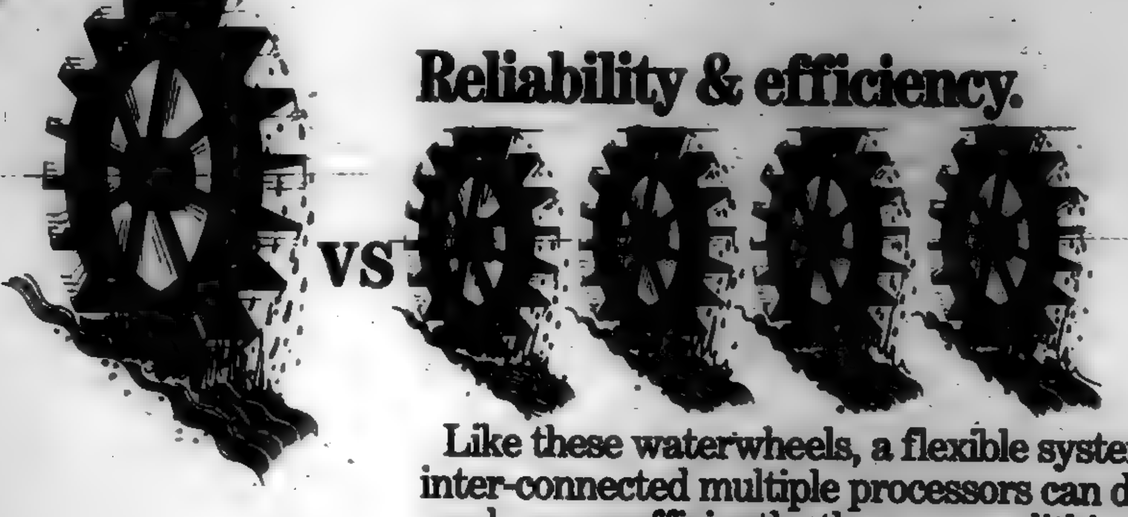

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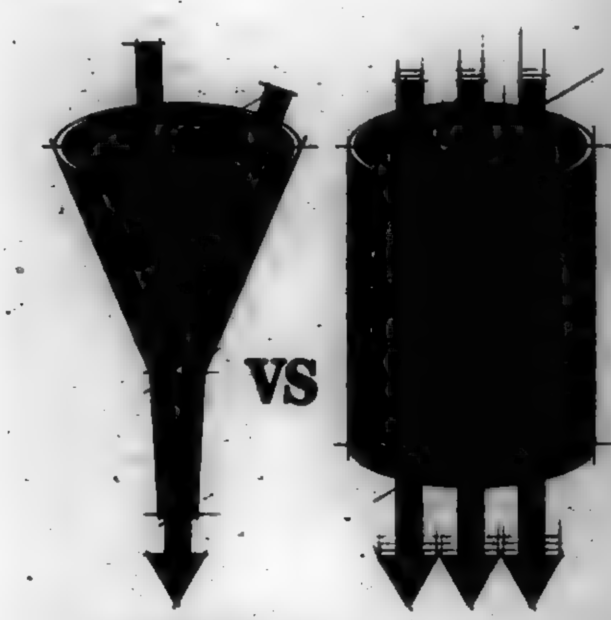

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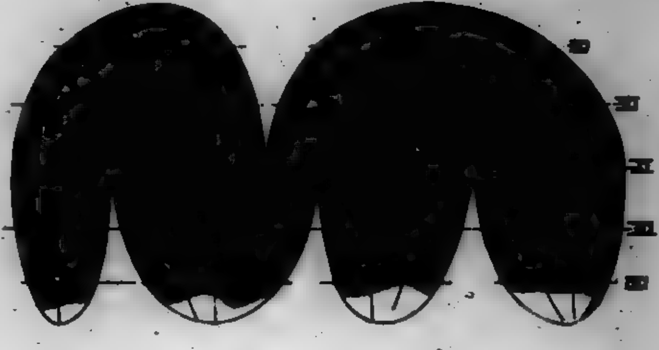

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COMPUTER INDUSTRY

NICKELS AND DIMES

Inmac Corp. reported revenue for the first quarter ended March 31 of $7.6 million, compared with $5.9 million for the first quarter of last year. Profits were $420,000, or 8 cents per share, compared with $247,000, or 5 cents per share, in the corresponding period a year ago.

■

Software Publishing Corp. announced revenue for the second quarter ended March 31 of $7.2 million, up 59% from $4.5 million in the comparable quarter a year ago. Profits were $972,000, or 14 cents per share, compared with $493,000, or 9 cents per share, in the same period a year ago.

■

AST Research, Inc. reported profits for the three months ended March 31 of $5.8 million, or 55 cents per share, compared with $1.5 million, or 19 cents per share, in the like period a year earlier. Revenue was $37.8 million, compared with $20.1 million in the comparable period a year ago.

■

Computer Consoles, Inc. announced revenue for the quarter ended March 31 of $25.9 million, down from $27.2 million in the same quarter a year ago. There was a net loss of $5.5 million, or 46 cents per share, compared with a net income of $1.3 million, or 11 cents per share, in the comparable quarter a year earlier.

■

Sanders Associates, Inc. reported revenue for the third quarter ended April 26, increased 14% to $219.8 million, compared with $192 million in the like period last year. Profits were $6.1 million, or 32 cents per share, compared with $13.7 million, of 72 cents per share one year ago.

■

Dataproducts Corp. announced revenue for the fourth quarter ended March 31 of $113.7 million compared with $126.4 million in the same quarter a year ago. Profits were $2.6 million, or 12 cents per share, compared with $10.6 million, or 51 cents per share in the comparable period one year ago.

■

Vector Graphic, Inc. reported a net loss of $1.4 million, or 19 cents per share, for the third quarter ended April 2, compared with a net loss of $2.7 million, or 44 cents per share, for the like period a year ago. Revenue was $903,000, compared with $3 million in the same quarter last year.

■

Wicat Systems, Inc. reported revenue for the fourth quarter ended March 31 of $9 million, up 53% compared with $5.9 million a year ago. Wicat posted a loss of $289,000, or less than 2 cents per share, compared with a loss of $6.9 million, or 34 cents per share, in the comparable quarter one year earlier.

■

Micom Systems, Inc. announced revenue for the fourth quarter ended March 31 of $51.5 million, compared with $44,9 million one year ago. Profits were $5.6 million, or 33 cents per share, compared with $6.4 million, or 37 cents per share, in the like quarter a year earlier.

■

Syntrex, Inc. reported revenue for the second quarter ended April 26 of $14.9 million, compared with $12.5 million in the same quarter one year ago. Profits were $56,000, or 1 cent per share, compared with $437,000, or 5 cents per share in the comparable period a year ago.

■

Anacomp, Inc. announced net income of $6.4 million, or 33 cents per share, on revenue of $31.8 million for the quarter ended March 31. A year earlier, the company reported a loss of $27 million, or $2.13 a share on revenue of $35.4 million.

■

Floating Point Systems, Inc. reported revenue for the second quarter ended April 30 of $30.2 million, compared with $29.1 million in the like quarter a year ago. Profits were $3.1 million, or 39 cents per share, compared with $3.6 million, or 41 cents per share a year earlier.

■

ITT announced profits for the first quarter of $113.3 million, or 75 cents per share, compared with $79.3 million, or 52 cents per share, in the same quarter a year earlier. Foreign exchange decreased earnings by 8 cents during the quarter, compared with a 12 cents per share negative impact in the comparable quarter last year. Revenue for the quarter was $4.7 billion compared with $4.6 billion in the first quarter last year. The communications operations and information services segment reported results similar to those for the comparable period last year.

■

Tandy Corp. announced revenue for the third quarter ended March 31 of $670 million, compared with $656 million in the like period a year ago. Profits were $21 million, or 25 cents per share, compared with $62 million, or 60 cents per share, in the comparable period one year ago.

■

Britton-Lee, Inc. reported revenue for the first quarter ended March 31 of $6.5 million, a 76% increase, compared with $3.7 million for the same quarter last year. Profits were $938,000, or 12 cents per share, representing income before extraordinary credit of $534,000, or 7 cents per share, and an extraordinary credit from using tax-loss carryforwards of $404,000, or 5 cents per share. This compares with net income of $386,000, or 6 cents per share, representing income before extraordinary credit of $212,000, or 3 cents per share, and extraordinary credit from using tax-loss carryforwards of $174,000, or 3 cents per share, for the quarter ended March 31, 1984.

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NICKELS

from page 86

Rand Information Systems, Inc. announced audited financial results for the fiscal year ended Feb. 24. The company reported a net loss of $1.2 million, or 60 cents per share, compared with net income of $10,000, or 4 cents per share, in the previous year. Revenue was $11.1 million, compared with $12.6 million a year ago.

■

BPI Systems, Inc. reported results for the three-month period ended March 31. The company reported a pretax loss of $441,000, and an after-tax loss of $211,000 or 4 cents per share, on revenue of $2.3 million. The results compared with a pretax loss of $617,000 and a combined after-tax loss of $660,000, or 12 cents per share, on revenue of $2.6 million in the corresponding period a year ago.

■

Dynatech Corp. announced revenue for the quarter ended March 31 of $54.3 million compared with $39.1 million a year ago. Before extraordinary gain, pretax income was $7.7 million, compared with $4 million for the like quarter a year ago, and income from operations was $4.4 million, or 45 cents per share, compared with $2.2 million, or 24 cents per share for the same period one year ago.

■

Gerber Scientific, Inc. reported revenue for the fourth quarter ended April 30 of $64.4 million, compared with $53.7 million in the like period a year ago. Profits were $6.5 million, or 38 cents per share, compared with $5.1 million, or 30 cents per share, one year ago.

■

Computer Memories, Inc. reported fourth-quarter revenue ended March 31 of $39.3 million, a 212% increase over last year's fourth-quarter revenue of $12.6 million.

Computer Memories' profits were $2.6 million, or 24 cents per share, compared with $412,000, or 4 cents per share, in the comparable period one year ago.

■

Continental Information Systems Corp. reported revenue for the quarter ended Feb. 28 of $75.6 million, compared with $29.7 million in the like quarter a year ago. Profits were $2.2 million, or 42 cents per share, compared with $1.7 million, or 32 cents per share, in the previous year.

■

Centronics Data Computer Corp. announced revenue for the first quarter ended March 31 of $63.8 million, compared with $39.5 million in the comparable period last year. Net loss for the quarter was approximately $1.3 million, or 11 cents per share, compared with a loss of $1.9 million, or 17 cents per share, in the like period a year ago.

■

Scientific Micro Systems, Inc. reported a net loss of $175,000, or 2 cents per share, on revenue of $8.7 million for the first quarter ended March 31. A year earlier, the company reported a net income of $950,000, or 18 cents per share, on revenue of $9.6 million.

■

Computer and Communications Technology Corp. announced revenue for the first quarter ended March 30 of $24.5 million, compared with $27.5 million one year ago. Profits before an extraordinary tax benefit were $137,000, or 2 cents per share, compared with $2.3 million, or 30 cents per share, for the first quarter a year ago.

An extraordinary tax benefit of $291,000, or 4 cents per share, increased the 1984 net income to $2.6 million.

■

Western Union Corp. has announced a net loss for the three months ended March 31 of $15.3 million, or 88 cents per share, compared with profits of $14.1 million, or 50 cents per share, in the like period a year ago. Revenue was $284 million compared with $261 million one year ago.

■

Computer Devices, Inc. reported a loss for the quarter ended Dec. 29 of $2.2 million, or 57 cents per share, compared with a loss of $9.4 million, or $2.39 per share, in the comparable period a year ago. Revenue was $1.5 million, compared with $1.7 million a year ago.

EXECUTIVE CORNER

James K. Dutton has been named president and chief executive officer of System Industries, Inc. Dutton's previous experience includes product marketing management at IBM and Storage Technology Corp. and serving as vice-president of marketing at Amdahl Corp. Most recently Dutton served as president and chief executive officer of Caere Corp.

■

Spectrum International, Inc. has announced the appointment of David W. Tuttle as president and chief operating officer, replacing John Zoellner who moves to chairman and continues as the company's chief executive officer.

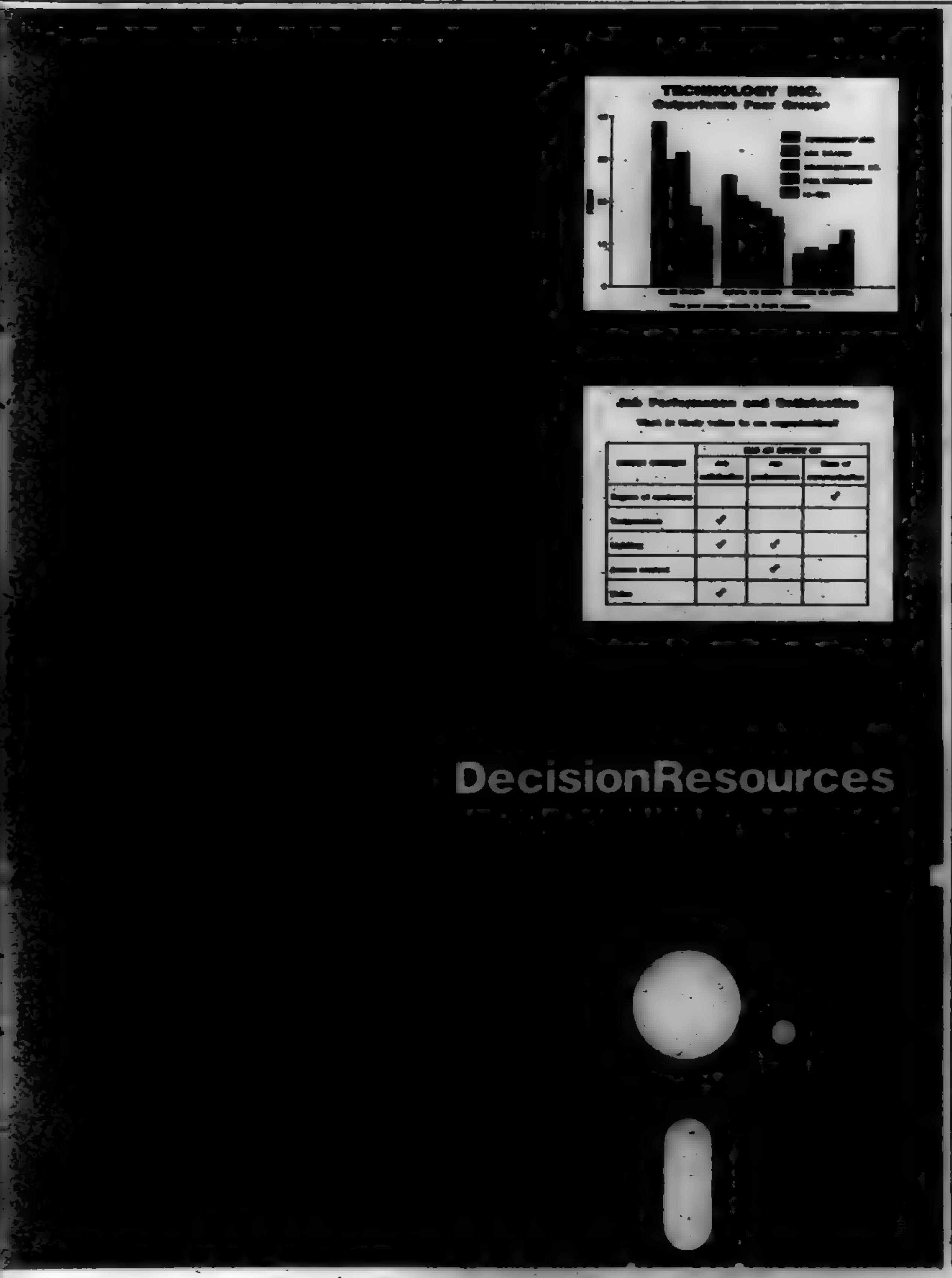
■

Pertec Computer Corp. has announced the appointment of Edward E. Hale to president. Most recently he was vice-president of marketing at Triumph-Adler North America. He has also served as president of Royal Business Machines.

■

Irwin Magnetics has elected Edwin F. Carlson as president and chief operating officer and to membership on the board of directors. Herbert S. Amster, who had been president and

See EXEC page 95



“Prom

With more than 70
and enhancements,
complete solutions

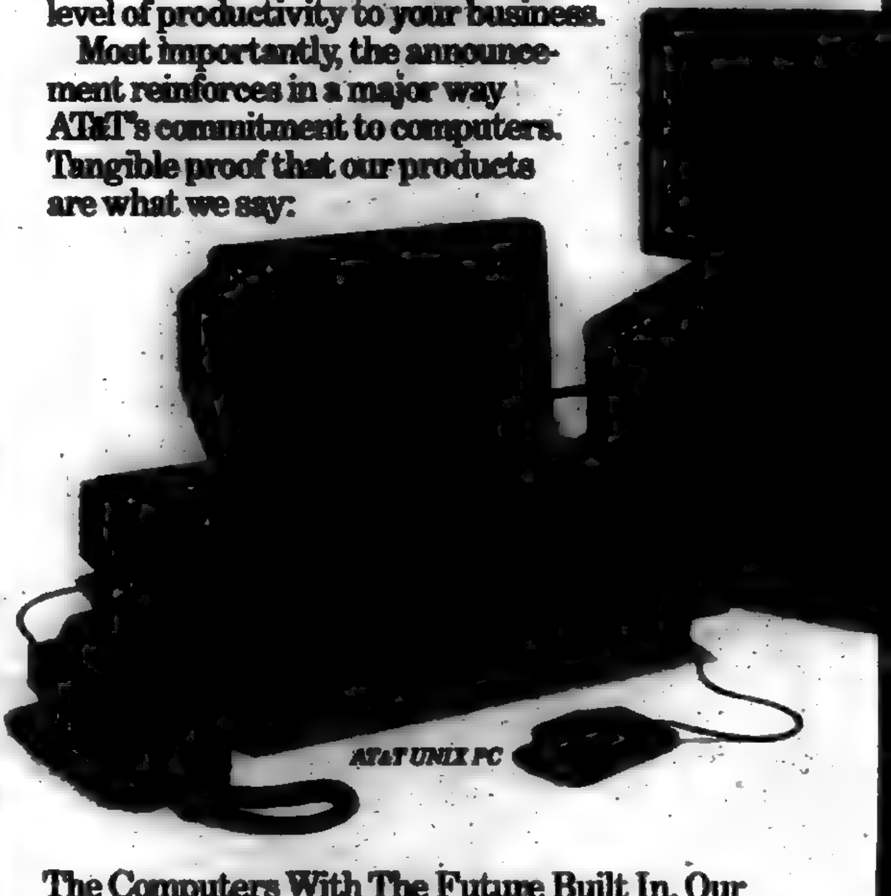
A few weeks ago, AT&T made a major computer announcement. Major in every way.

Certainly in the depth and breadth of the offering —which includes computers, peripherals, software, networking options, communications products and much more.

Major in terms of AT&T's growth as a force in the computer industry. Consider the new, enhanced and existing products. You'll find our line of integrated communications-based computers runs the gamut from PCs to superminis.

What's more, they can be connected easily to each other and to your mainframes. They're readily expandable, too, bringing a new level of productivity to your business.

Most importantly, the announcement reinforces in a major way AT&T's commitment to computers. Tangible proof that our products are what we say:



The Computers With The Future Built In. Our computer line now includes the following:

Computers: To serve an entire office, our recently enhanced line of AT&T 3B Computers puts the flexibility and power of the UNIX™ Operating System to work for you.

There are five models. Our new 3B2/400 can accommodate up to 46 different peripherals (terminals, printers, modems, etc.). The new 3B15 up to 128.

new computer products AT&T is now fully equipped to offer to your computer needs.

The 3B2/300 and 3B5 have both been enhanced with many features for better performance. The former can accommodate up to 18 different peripherals; the latter up to 128. The 3B20 has room for up to 256 peripherals.

The AT&T PC 6300 is for the single user in need of a superior MS-DOS* business computer. It can also run the Xenix* operating system.

For single or multi-user situations, the AT&T UNIX PC offers a unique combination of power, ease of use and advanced communications capabilities.

Communications: AT&T has always led the way in telecommunications. That leadership continues in computers. Our computers and communications products link together, allowing voice and data integration and shared information from PC to mainframe.

We now offer a complete line of low to high-end data communications products and service giving you complete control over the management of your data network.

Those with a major investment in mainframe computers can rest easy. Now you can enjoy complete end-to-end connectivity. We now support popular SNA and BSC protocols, which means our computers and systems can communicate and work with your mainframes. Your investment is protected.

Peripherals: We offer a full line of high-performance, highly reliable synchronous and asynchronous terminals and printers. They're highly compatible, too, with our own and other computers.

Software: Choose from a large and growing list of applications software based on UNIX System V. Some handle general business, such as word processing, financial spreadsheets, and business graphics. And some tackle specific needs of specific industries, including, accounting, automotive and retailing.

You'll also have the ways and means and tools to develop your own software.

The Future Looks Even Brighter

You'll find that all of these computer products are designed to work with your current system, while offering an almost unlimited variety and number of options for growth and change.

You know that when you buy an AT&T Computer product, you're making the right choice—and you're giving yourself more choice. Our flexibility gives you more options when the time comes to expand.

What's more, you'll find these high-quality products comparable, often superior, in price and performance. Which makes them an excellent investment.

AT&T also protects your investment by offering overall comprehensive service and support for computer hardware and associated software products.

This includes Customer Programming Services Centers, where we'll help you to develop your own software or customize existing packages. Implementation Services and Customer Training offer expert advice on the most efficient, productive use of your system.

Our National Software Support Center provides a 24-hour hotline for hardware and software support.

Our service options are another way we're working to help you pull the pieces together in a logical, coherent way.

In every way, we're working to make The Computers With The Future Built In work best for you.

For a more detailed look at what AT&T Computer products can do for you, just turn the page.

THE COMPUTERS WITH THE FUTURE BUILT IN

See how AT&T Computer products can make your system work as a system.

AT&T 4410 Terminal
AT&T 3B2/400
Computer

It's easy to get started putting AT&T to work for your business—in small easy steps or a complete system. These communications-based computer products are designed to work with each other, and with your existing system.

Start with the newly enhanced 3B2/300 or the new 3B2/400 to develop a distributed departmental system. Both are true 32-bit computers that run UNIX System V. The 3B2/400 offers full hardware floating point performance, streaming tape backup, and up to 4 MB of main memory. Supporting up to 10 or 25 users respectively, the 3B2/300 and 3B2/400 offer plenty of room for tape and disk storage growth.

For even higher storage capacity and performance, build your system around the enhanced 3B5 or the new 3B15 minicomputers.

The 3B15 is equipped with a high-performance WE™ 32100 microprocessor with main memory up to 16 MB. It supports up to 60 users on a number of configurations. Other features include demand paging memory management with file and record locking and standard floating point performance.

To over 500 tested software packages already listed in the AT&T Computer Software Guide, we're adding more applications programs, such as UltraCalc** and CrystalWriter.*** For systems developers, high level languages for 3B Computers such as UX-Basic† and Micro Focus Level II Cobol†† open the world to thousands of additional software applications running in the UNIX System V environment. And AT&T can address unique business needs with software solutions specifically for vertical markets such as accounting, real estate, and automotive industries. IBM††† mainframe VM users now have UNIX System V development capabilities through our System V-VM software.

AT&T 4410 Terminal
AT&T Model 4000
MODEM

Dataphone I Modems

It should come as no surprise that AT&T is the leading producer of advanced data communications equipment. To our already large and growing list we've added DATAPHONE* I, a complete line of synchronous, private line, analog, non-diagnostic modems with speeds from 2400 BPS to 14.4 KBPS. Also available is DATAPHONE I Plus Service Management, which provides you with private line network management through AT&T, eliminating the need for an in-house staff.

DATAPHONE II is a family of digital and analog modems, multiplexers, and diagnostic control devices for multilevel network management and control. To the family we just added the DATAPHONE II Model 2600 Digital Data Service Unit, an integrated DSU and Channel Service Unit in one compact, easy-to-install and operate unit. Plus, it is fully compatible with the DATAPHONE II equipment you're using now.

Our 3B Computers work with your IBM mainframes through connectivity products that allow full interactive communication using BSC and SNA/SDLC protocols. The new host connectivity products include the SNA/3270 Emulator + software which emulates a fully configured SNA IBM 3274 controller, and the BSC/3270 Emulator + which emulates the BSC IBM 3274 Cluster Controller. And C language programmers can use a library of AT&T Application Program Interface access routines to communicate directly with a host computer in a 3270 mode.

AT&T 3B5 Computer
AT&T 4410 and 4425 Terminals

Of course, one advertisement can't begin to do justice to the full line of AT&T Computer products. There's much more to talk about.

For more details, contact your AT&T Information Systems Account Executive, authorized AT&T Representative, or call 1 800 247-1212.

Do it today—and start building a completely integrated business communications system. With the one company that can pull it all together.

---

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**UltraCalc is a trademark of Olympus Software, Inc.
***CrystalWriter is a trademark of Syntactics Corporation.
†UX-Basic is a trademark of UX Software, Inc.
††Micro Focus Level II Cobol is a trademark of Micro Focus, Inc.
†††IBM is a registered trademark of International Business Machines Corp.

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EXEC from page 89

chief executive officer, has been elected chairman of the board.

■

Steve Tatum has been named president of Seiənar Corp. replacing Founder and former President **Barry Southard**, who moves into the position of vice-president of engineering. Tatum's most recent position was vice-president of sales and marketing for Televideo Systems, Inc.'s Terminal Division and has been employed at Acro, a division of C. Itoh Digital Products, Inc. and Beehive International, Inc.

■

Continental Telecom, Inc. has announced the appointment of **William Y. O'Connor** as president of its Executone, Inc. subsidiary. Also **Ronald E. Silverman**, Executone's current president, will join the parent company's headquarters staff as vice-president, planning of the corporation's business product sector. Both appointments become effective June 1.

■

John J. Schickling has been appointed president of Telesis Systems Corp. Schickling has held positions at General Electric Co. and Computervision Corp.

■

NBI, Inc. has announced the appointment of executive vice-president **Mark J. Stevenson** to the position of general manager of NBI's new office systems division.

■

Computer Communications, Inc. President and Chairman **Raymond E. High** announced that he will step down as president and chief executive officer effective Aug. 1, but will remain active in company affairs as chairman.

■

Charles Skibo has been named president of U.S. Telecom, Inc., succeeding **William Eavey** who will become president and chief executive officer of United Telecommunications, Inc.

■

California Devices has announced the following appointments: **Douglas Ritchie** to president and chief executive officer and **Wilmer Bottoms** to chairman of the board.

■

Gandalf Technologies, Inc. has announced the following appointments effective Aug. 1: **Desmond Cunningham** will assume the newly created post of chairman and chief executive officer, and **Colin D. Patterson** will become president and chief operating officer. Also announced were two appointments effective immediately: **Jan Bartl** has been appointed vice-president of product development, and **Brian K. Penney** has been appointed director of technology.

■

Honeywell, Inc. has named **Peter Dressen** vice-president of software development operations for Honeywell's large computer products division, headquartered in Phoenix.

■

Simon Hunt has been appointed president and chief executive officer of Apricot, Inc. Hunt was previously a partner at Peat Marwick, chartered accountants in England.

■

Scientific Micro Systems, Inc. has appointed **Charles Mathews** president and chief executive officer. Mathews succeeds **Hugh Kern**, who will retire after leading the company as president and CEO since 1972.

■

Edward Watson has been named president and chief executive officer of Higher Order Software, Inc.

■

Robert Stoeber has been appointed president of Digital Learning Systems, Inc. The company also announced that George Black and Ralph Stoeber have each been promoted to the position of executive vice-president.

MERGERS AND ACQUISITIONS

Interface Systems, Inc. and **Nematron Corp.** revealed several details of a financial agreement calling for an investment to be made by Interface Systems in Nematron. In return, Interface will be able to acquire all of the outstanding shares of Nematron by exercising a one-time option. Interface Systems manufactures computer printers that are compatible with IBM 3270 terminals and System/34, 36 and 38 minicomputer systems.

■

Information Solutions, Inc. and **Prime Computer, Inc.** have entered into a warrant purchase agreement. Under the terms of the agreement, Information Systems grants Prime a warrant to purchase 253,050 shares of Information Systems's common stock, representing approximately 10% of the firm's shares outstanding at the time the agreement was announced by the firms.

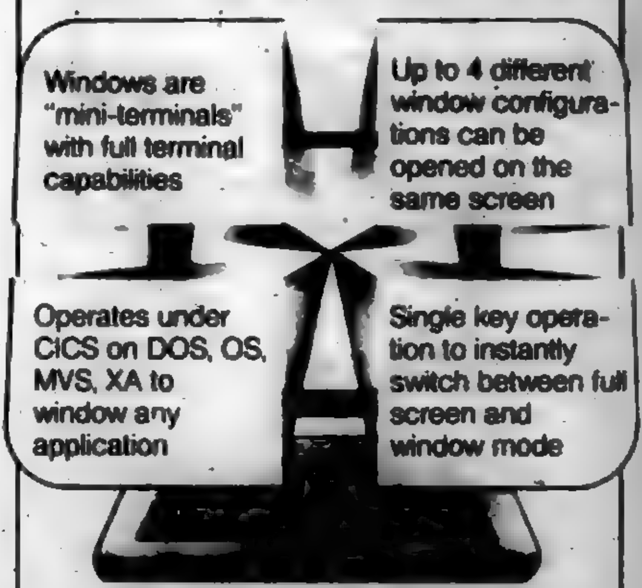
■

The Dun & Bradstreet Corp. has completed its divestiture of **TSI International Ltd.** to a group headed by **Vanguard Atlantic Ltd.** The name TSI International will be retained by the new company. Terms of the agreement were not disclosed.

■

Genisco Technology Corp. announced it has acquired the custom products operations of **Data Electronics, Inc.** of San Diego. The value of the total transaction was approximately $3.5 million, including certain prepaid royalties, licenses and other tangible and intangible items.

See MERGERS page 96



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MERGER

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Bankamerica Corp. announced the sale of **Decimus Corp.** to **General Electric Credit Corp.** of Stamford, Conn. Decimus, which finances high-technology equipment to major corporate customers, has been controlled by Bankamerica since 1969. It currently has an asset base of about $170 million.

■

Software Integration, Inc. announced that it has acquired Mountain View, Calif.-based **Infotools, Inc.** The price of the acquisition and other terms of the agreement were not disclosed.

■

Zenith Electronics Corp. announced that it has entered into a definitive agreement to acquire **Inteq, Inc.** of Herndon, Va., in exchange for Zenith common stock. The exact number of shares of Zenith stock to be issued could vary from 800,000 to 1 million, depending upon the average closing price of Zenith common stock on the New York Stock Exchange during an agreed base period.

■

Personal CAD Systems, Inc. of Los Gatos, Calif., has agreed in principle to sell its architectural, engineering and construction division to the Anaheim, Calif.-based **Calcomp Group of Sanders Associates, Inc.** in a transaction valued at almost $7.5 million.

■

Ameritech Development Corp. of Chicago announced it has purchased a minority interest in **Davox Corp.**, a privately-held developer and supplier of integrated voice and data workstation communications systems headquartered in Billerica, Mass., for an undisclosed amount.

■

Engineered Systems & Development Corp. of San Jose, Calif., has reached an agreement in principle to acquire the assets and business of the **Seaborn Division** of Santa Clara, Calif.-based **Xidex Corp.** Terms of the acquisition were not available.

■

Seagate Technology, Inc. of Scotts Valley, Calif., announced completion of the previously announced acquisition of **Grenex, Inc.** in exchange for 3.1 million shares of Seagate common stock.

■

Electronic Memories & Magnetics Corp. (EMM), Encino, Calif., and **Titan Systems International, Inc.**, La Jolla, Calif., jointly announced that they have entered into an agreement in principle for a merger of the two companies. The transaction will be structured as a pooling of interests, whereby approximately 4.2 million shares of EMM stock will be issued to Titan shareholders.

■

Computer Task Group, Inc. (CTG) and **Dataware, Inc.**, both based in Buffalo, N.Y., jointly announced they have reached an agreement for the sale of 100% of Dataware stock to CTG.

■

Martin Marietta Corp., Bethesda, Md., and **Verdix Corp.**, McLean, Va., announced that Martin Marietta has agreed to acquire a 10% equity interest and options to acquire up to 24% of Verdix, a company specializing in secure computer and communications systems as well as in software development systems for the U.S. Department of Defense's Ada programming language.

■

Bridge Communications, Inc., Mountain View, Calif., has acquired **Coherent Systems, Inc.**, a Bedford, Texas-based manufacturer of broadband radio frequency modems. Terms were not disclosed.

■

An agreement in principle has been reached that will merge **The Exchange System** with the one-year-old **Northwest Electronic Network**, Seattle. The merger is set to take place in phases over the next three years.

■

General Automation, Inc., Anaheim, Calif., has entered into an agreement in principle with **Helix Circuits, Inc.**, of Toronto for Helix to acquire the business of the National Technology division of Technology Circuit Design, Inc., a wholly-owned subsidiary belonging to General Automation.

■

Wyle Laboratories, El Segundo, Calif., has completed the acquisition of **Applied Research, Inc. (ARI)** of Los Angeles for an undisclosed number of shares of Wyle common stock. ARI has now become an operating division of Wyle's Scientific Services & Systems Group.

■

Ingram Software of Nashville, a division of Ingram Distribution Group, Inc., and **Software Distribution Services, Inc.**, Buffalo, N.Y., announced Ingram's intention to purchase all of the common stock of Wincorp, the parent company of Software Distribution Services, Inc., including Wincorp's 50% equity interest in **Aviva Software Corp., Ltd.** of Canada. The transaction is for an undisclosed amount of cash.

■

Softsel Computer Products, Inc., Inglewood, Calif., announced that it has signed a letter of intent to acquire **Intermicros, Inc.**, Key Biscayne, Fla., a supplier of personal computer software to Spanish-speaking countries.

■

Terak Corp., Scottsdale, Ariz., and **Sanders Associates, Inc.**, Nashua, N.H., announced that they have entered into an agreement in principle for the purchase of Terak by Sanders for approximately $3.7 million, or about 50-cents per share.

As part of the transaction, Sanders will assume Terak's business obligations. Terak has filed for reorganization under Chapter 11 of the U.S. Federal Bankruptcy Act.

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The Macwor [illegible] designed to fit yo [illegible] distributor, a retailer, a [illegible] cator, the three-day conferenc [illegible] designed for you.

Day one is for dealers, distributors, retailers [illegible] other third-party vendors to talk to Apple and the 100+ exhibiting companies about their products.

Days two and three are specifically geared for people interested in the Macintosh as a tool for business and anyone else interested in the Mac.

Continental Telecom, Inc. (Contel) and **Northern Data Systems, Inc.** (NDS) announced the execution of a definitive agreement under which Contel will acquire NDS in an exchange of stock.

Under the agreement, Contel will pay $11 in Contel common stock for each NDS common share. NDS has approximately 3,200,000 shares outstanding or subject to unexercised stock options.

■

An agreement in principle was announced by **Sperry Corp.** and **Formation, Inc.** for Sperry to acquire the **Southern Bell, U.S. Navy** and various other third-party computer service businesses of **Formation, Inc.** The businesses exceed $5 million in annual service revenues.

■

Soft-Switch, Inc., King of Prussia, Pa., announced the acquisition of **Network Applications, Inc.** of Austin, Texas. Soft-Switch, a privately held company, did not disclose the financial terms of the acquisition.

■

Intran Corp. of Minneapolis announced the sale of certain assets and related businesses of its information services group to **National Computer Systems, Inc.**, which took effect April 15, 1985.

Terms of the sale were not disclosed.

■

Pactel Info Systems, a subsidiary of Pacific Telesis Group, has signed a letter of agreement to purchase Portland, Ore.-based **Byte Shops Northwest, Inc.**

As part of the agreement, Pactel Info Systems will acquire the eight computer retail outlets and two corporate sales divisions currently being operated in Oregon and Washington by Byte Shops.

■

Database Technology Corp., a company specializing in systems software to improve data processing productivity, has been purchased by its president, **Donald Dean**, through a leveraged buyout.

■

Personal CAD Systems, Inc., Los Gatos, Calif., has agreed to acquire San Jose, Calif.-based **Assisted Technology, Inc.** (ATI) for undisclosed terms. ATI designs and sells CUPL, an industry-standard software package that is used to implement logic designs in programmable logic devices.

■

Resources, Inc., Falls Church, Va., has entered into an agreement to acquire **TKT Communications, Inc.** from **United Brands Co.** The leveraged buyout-type transaction cost Resources approximately $56 million in cash.

■

Central Data Corp., Minneapolis, has acquired **Computer Maintenance, Inc.**, a third-party computer maintenance vendor based in Denver. Terms of the agreement were not disclosed.

■

National Technology, Irvine, Calif., a manufacturer of multilayer circuit boards, has been sold by Anaheim-based **General Automation, Inc.**, to **Helix Circuits (USA), Inc.**, a wholly owned subsidiary of Helix Circuits, Inc., a Canadian corporation. Terms of the sale were not disclosed.

■

SUPERSHORTS

Hogan Systems, Inc. announced the organization of **Hogan Services Corp.** (HSC), a company owned by Hogan and BEI Holdings Ltd., parent of Atlanta-based Bank Earnings International.

HSC will provide those institutions that have licensed Hogan Systems' products with a single source for the resources needed to install and use their products.

■

IBM mathematician **Benoit Mandelbrot**, who originated a major development in 20th century mathematics — the theory of the Fractal Geometry of Nature — was awarded the Barnard Medal for Meritorious Service to Science by Columbia University. The medal is awarded on the recommendation of the National Academy of Sciences.

■

Martin Marietta Data Systems has formed a new business unit, **Mer-it Software**, as the direct marketing arm of the company to establish a business-to-business distribution channel for selling applicable Martin Marietta personal computer software products directly to purchasers and decision makers.

■

The Society of Telecommunications Consultants' Vendor Advisory Council named its 1985-86 officers at the society's spring conference.

The new council officers are **Jolene Witt**, president; **Virginia Murphy**, executive vice-president; **Phillip Kay**, vice-president treasurer; and **Joanne Schultz**, chairwoman of the education committee.

■

Control Data Corp. and **Financial Information Systems** of Richardson, Texas, have announced plans for CDC to provide nationwide on-site hardware and software support for users of FIS System 2001.

■

3M Corp. and **Informer Computer Terminals, Inc.** have signed an agreement for 3M's equipment and service and support division to service Informer 200 series workstations.

Terms of the agreement were not available.

■

See SHORTS page 98

computer show
the Macintosh™

Here are some of the companies who will be showing Macintosh products:

Advanced Logic Systems
Aegis Development
Ann Arbor Softworks
A+/Ziff-Davis Publishing Co.
Apple Computer, Inc.
Applied Logic Systems
Apropos Software, Inc.
Artline Industries
Assimilation, Inc.
Blue Chip Software
Boston Software
Brain Power, Inc.
Cadmus Computer Systems
The Cobb Group
Communications Packaging Corp.
Computer Additions
Computer Identics
Computer Learning Systems
Computer Shopper
Computer Software Designs, Inc.
The Computer Store
Corvus Systems, Inc.
Consulair Corporation/T/Maker
Creighton Development, Inc.
Diablo Valley Design
Diversions, Inc.
EDP Supply North
Enterset
Esoft Enterprises
ExperTelligence
Express Computer Supplies
First Byte, Inc.
Forethought, Inc.
Frontrunner Computer Industries
Future Design Software
General Computer Company
Haba Systems
Hayden Book Company
Hayden Software
Hayes Microcomputer Products
Hippopotamus Software
Icon Publishing
ICON Review/Mindwork
Infosphere, Inc.
InfoWorld
Innovative Technologies/Communications
Intermatrix, Inc.
Intersol
Iomega Corp.
The Kette Group
I/O Video
Kraft Systems
Layered, Inc.
Living Videotext, Inc.
Loki Engineering, Inc.
Lotus Development Corp.
Mac Packs, Inc.
MacTutor
MACWORLD
Micro Design
Micro Marketworld
Miles Computing, Inc.
Microsoft
MPH Computer Products
Mycroft Labs, Inc.
New Line 7
Odesta Corporation
Optimum Computer Luggage
Organizational Software Corp.
Palantir Software
Paradise Systems, Inc.
PBI, Inc.
Peripheral Computers & Supplies
Peripheral Systems
Personal Computer Peripherals
Prometheus Products, Inc.
ProVUE Development Corp.
Queue, Inc.
Scott, Foresman & Co.
Servidyne Micro Systems, Inc.
Sierra Information Systems
Silicon Beach Software
Small Business Computers of New England
SofTech Microsystems
Softidea
Software Arts, Inc.
SoftWeave
Softworks Limited
Stoneware
Sunol Systems
Systems Control
Tecmar, Inc.
Telos Software Products
Video 7
Warner Software

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MACWORLD EXPOSITION
BOSTON

SHORTS

from page 97

Fujitsu America, Inc.'s peripheral products division announced that **System Industries** has become a field service organization for the Fujitsu M304X line of band printers.

■

Tele-Terminals, Inc. announced that it changed its name to **Ameridata Systems, Inc.**, effective May 15.

Ameridata is headquartered in Minneapolis and has sales and service offices in Minnesota, Wisconsin, Iowa, Utah, Arizona, and North and South Dakota.

■

Cognos Corp. announced the opening of its first wholly owned subsidiary in continental Europe with the creation of Cognos-France Sarl in Paris.

■

American Channels, Inc., a newly formed publishing and distribution company for high-value engineering software, has announced the signing of a North American exclusive license for three mechanical engineering products developed by the CAD Centre Ltd. of Cambridge, England.

■

Wang Laboratories, Inc. announced the formation of its Communications Marketing Division, a new business unit dedicated to the communications marketplace. The unit, under the direction of Jim Harrison, general manager, and Ron Smith, vice-president of business development, is the first division of Wang's Business Development Group, which was formed last fall, to concentrate on new business ventures. The primary mission of the unit is to coordinate Wang's sales activities with the seven regional Bell companies, the 22 divested Bell operating companies and the major independent communications and interconnect companies.

■

Tektronix, Inc. has formed a new subsidiary called **Triquint Semiconductor, Inc.**, following approval by the Tektronix board of directors. Triquint, sponsored by the Tektronix Development Co., will manufacture and market ultrahigh-speed gallium arsenide integrated circuits, according to Tom Long, Tektronix Development's president, and vice-president and general manager of Tektronix's Design Automation Group.

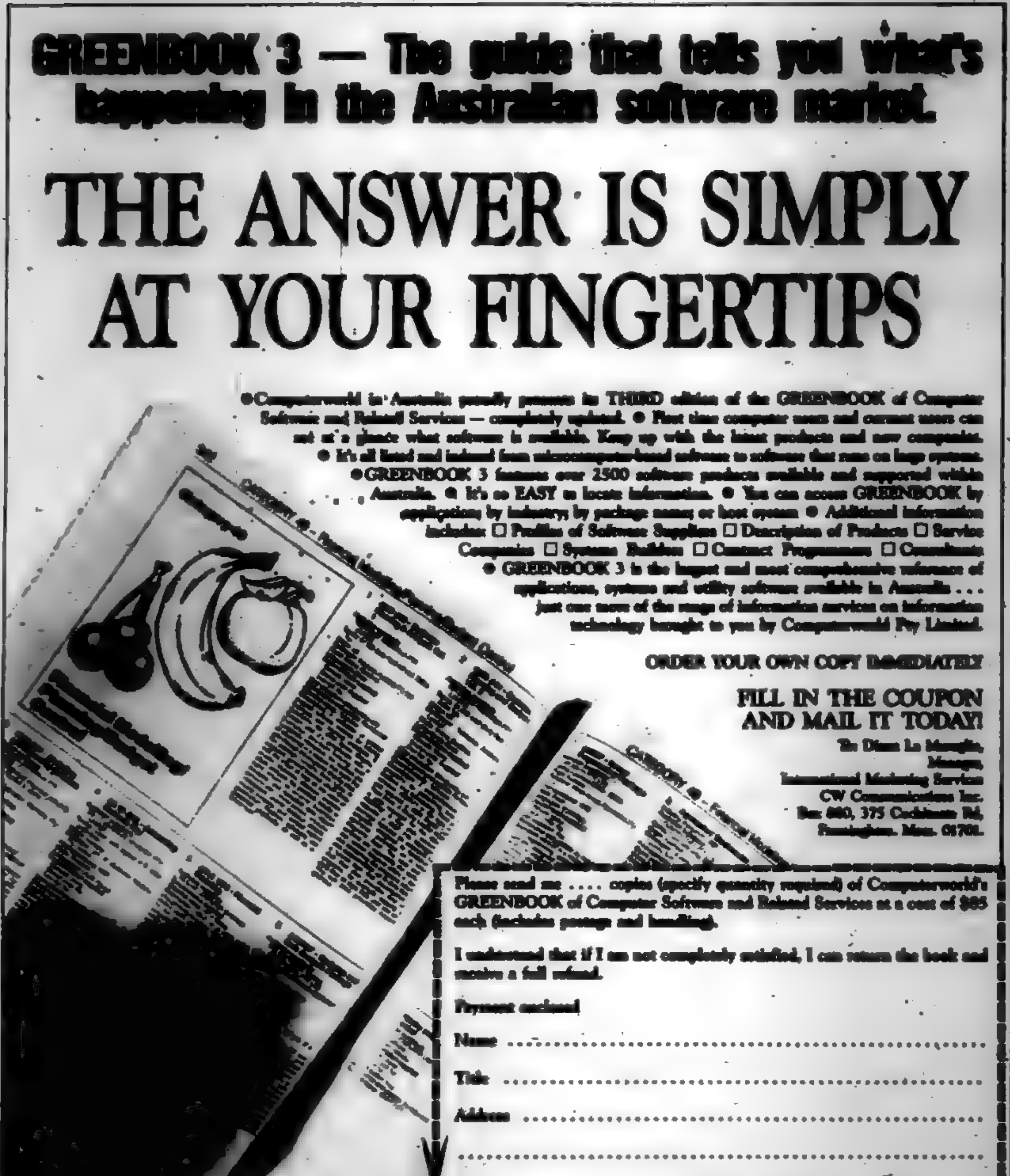
■

TSR, Inc. has signed a six-year facilities management agreement with **American Express International Banking Corp.** TSR will operate IBM computers at its Long Island, N.Y., data center for American Express International Banking. In addition, TSR plans to seek additional facilities management contracts from financial services industry firms.

■

QMS, Inc. announced that both the lawsuit filed by QMS against **Office Automation Systems, Inc.**, George H. Douglas, a former QMS employee and formerly a consultant to QMS, and the related suit filed by Office Automation Systems against QMS and **Merriwether Circuit Designs, Inc.**, have been terminated. James Busby, president of QMS, said, "We are satisfied with the terms of the judge's order in QMS's suit against Office Automation Systems, and we are pleased that the suit against QMS and Merriwether has been dismissed."

See SHORTS page 99



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CHIPS

from page 77

ing as the June ratio of new semiconductor orders to shipments, or book-to-bill ratio, held at .72, identical to the ratio in May. Average monthly orders from April through June fell 4.1% from the period from March through May to $506.6 million, and the figure for April through June was down 57.4% from the same period in 1984.

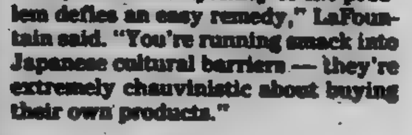
"The lackluster semiconductor orders picture is the result of continuing weak demand for the products manufactured by our end customers," Hinkelman said. "The situation may be stabilizing . . . [but] the signals remain mixed for the near term." Hinkelman predicted, however, that the industry's orders for 1985 will show a decline of less than 20% from 1984.

During the current industry downturn, some U.S. companies have charged that leading Japanese vendors are selling products below cost in the U.S. to gain market share for the future. If proven, the practice, known as dumping, would violate international trade regulations.

The SIA petition, filed June 14, requests that President Reagan adopt policies that would prevent dumping as well as equalize the U.S. and Japanese import market shares in each country by 1986. After that date, the SIA said the president should push for "a dramatic improvement in U.S. semiconductor sales in Japan commensurate with the demonstrated competitiveness of U.S. products in other world markets."

Semiconductor industry analyst A. A. LaFountain III, president of LaFountain Research in Bay Head, N.J., said Yeutter's decision to investigate the SIA charges was expected. He noted, however, that U.S. political pressure would have a minimal effect on opening Japanese markets.

"[The SIA] complaints are legitimate, but the complexity of the problem defies an easy remedy," LaFountain said. "You're running smack into Japanese cultural barriers — they're extremely chauvinistic about buying their own products."



"No, I wouldn't believe your boss laid you off until 11 o'clock to reduce inventory."

SHORTS

from page 98

Tymnet, Inc. has opened a network system support center, located in the Great Valley corporate center in Malvern, Pa. The new facility offers a centralized location to monitor the data communications operations of 19 of Tymnet's private network customers.

In addition to network supervision, the support center handles network management problems.

■

Xerox Corp. announced the formation of a computer science research facility. The Portland, Ore., facility is an extension of the System Concepts Laboratory within the Xerox Palo Alto Research Center (Parc) in California.

The facility, known as "Parc

See SHORTS page 102

EXPORT

from page 77

goods with mass appeal; and assisting comjnies in developing their own international distribution processes.

In its first full year of operations, focusing mainly on European distribution, the company expects to ship between $15 million and $20 million worthof goods "if we have a good year," Woodworth said.

Although foreign markets offer great potential, many young companies are resistant to export, according to Meyers and Woodworth. "There are a lot of U.S. high-tech companies with international potential, but those companies are not set up to take advantage of that potential, or they are too busy with the U.S. market," Meyers said.

Woodworth said many U.S. companies fail to recognize the value of building an early international presence. "One of the things the Japanese have been so successful in is recognizing the value of market share," he said.

U.S. companies need to invest in market presence for the future, according to Woodworth. "If they take the position that the dollar is too strong right now and they can come back in a year or so, well, that philosophy is not shared by the Japanese, and it's not shared by the Germans or the Koreans."

One company that has finalized a distribution agreement is Canaan Computer Corp. of Trumbull, Conn. Canaan spokeswoman Sherree Parke said the company deals through remarketers.

WIN

from page 77

neering, respectively.

In a prepared statement, Visual Technology President and Chief Executive Officer Clifford Zimmer said, "This is another significant step in our recovery program. It provides Visual with the ability to concentrate its management and other resources on its core businesses, particularly its recently announced [Digital Equipment Corp.] — compatible terminal product line." Zimmer was not available for further comment.

John Lee, chairman and chief executive officer of Lee Data, said, "Adding a supermicrocomputer division to Lee Data is an important diversification step for us that extends significantly the range of the markets we address."

CODE

from page 77

"attributed the improvements to microcode." Microcode is the big bugaboo of independent software developers that sell into the IBM world because it implies that only IBM-developed software will be able to achieve peak performance in IBM hardware.

In his view, it will never be possible to implement microcoded software fully because it would be practically impossible to maintain and update. "When you talk about microcode, what you are really talking about, in a majority of cases, is additional instructions added to the instruction set, not whole-scale movement of software into microcode," Tavitian said. "That is not economically feasible. It would be prohibitive to maintain because software constantly changes."

Tavitian said his recent campaign against IBM was designed to ensure that users have adequate information to make a decision. He is confident that when they are fully informed, they will opt for products developed by independents. "Our belief is that whenever IBM makes any sort of hardware enhancement, . . . every [independent] in the business . . . will find a way to take advantage of it better than IBM does."

■

If Coca-Cola users could do it, why not PCjr users?

Take note IBM, the consumer is aroused. There are a couple of hundred thousand orphaned users out there who are mad as heck and just won't take it any more.

The Coca-Cola Co. saw the light — or possibly the dollar signs — and decided that consumer bad will was too heavy a burden to bear into the next fiscal year.

If IBM is truly interested in the home arena at some point, as its investment in a videotex venture and more recent investment in MCI Communications Corp. would seem to indicate, then at some point it is going to have to deal with the ill will generated by the, ahem, halt in production of the PCjr.

There were close to 300,000 of the little peanuts sold when IBM, ahem, stopped production. And who knows how many of us out there have picked up, ahem, out-of-production models at bargain basement prices since then.

C'mon IBM. You sold the little devils with the promise of future attachments. So deliver. Bring out a "Jr. Classic," or there are going to be some 300,000 people out there that you'll never migrate to MVS/XA.

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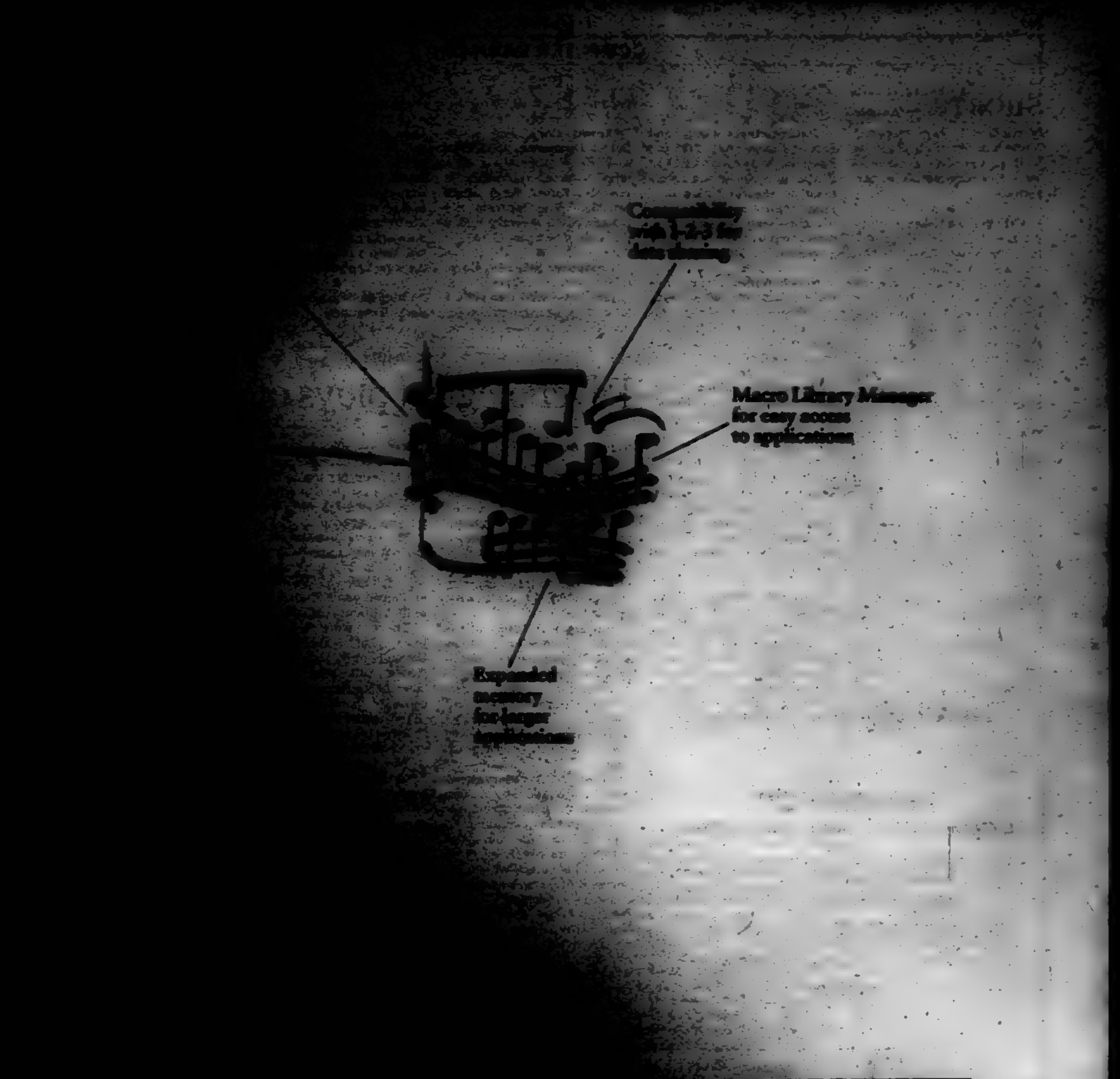
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SHORTS

from page 99

Northwest,'" will employ about a dozen researchers, as well as supporting management and administrative personnel.

■

CIE Systems, Inc., a subsidiary of C. Itoh Electronics, Inc., has consolidated its two multiuser business computer systems divisions serving the markets for AT&T Unix and Pick Systems' Pick operating systems, respectively, into a single new operating division called the Computer Systems Division.

Also, CIE Systems changed the name of its division that markets the CIE System family of IBM-plug-compatible terminals, controllers and printers to the Plug Compatibles Division.

■

Hayes Microcomputer Products, Inc. and General Datacomm Industries, Inc. jointly announced that Hayes will voluntarily withdraw, with prejudice, its action against General Datacomm in U.S. District Court in Atlanta.

In its complaint, Hayes alleged that a General Datacomm advertisement had contained false statements comparing a General Datacomm modem with a Hayes modem.

■

Dataproducts Corp. and Exxon Enterprises Printing Systems, a division of Exxon Corp., announced an agreement on the formation of a joint venture to design, manufacture and market business computer printers using advanced ink-jet technology.

■

Spectravideo, Inc. has reached an agreement with its unsecured creditors for the restructuring of approximately $2.4 million of Spectravideo's debt.

■

Rosscomp Corp. announced that it has discontinued the production of its 8-in. form factor tape drive, the Series 80, and has reduced its work force of 55 employees by 17 people. Rosscomp's 5¼-in. drives, currently produced for Rosscomp by its Japanese licensee, Nippon Columbia, will replace the 8-in. drives in all applications.

■

Attache Software Canada, Inc. and IBM Canada Ltd. announced the signing of an agreement that gives IBM Canada exclusive rights to market, distribute and promote a new Attache accounting software product. IBM Canada will market the product thoughout Canada.

■

Xerox Corp. has established **Optimem**, its optical disk drive operation, as a wholly owned subsidiary. It has also named **Peter Lloyd** president. The Optimem subsidiary most recently was a division of Shugart Corp.

■

Computer Sciences Corp. (CSC) and two French companies have agreed to form a joint venture company to cooperate in international data communications. CSC's partners in the venture are **Transpac S.A.**, which operates the French public data network, and **France Cables et Radio S.A.**, a supplier of telecommunications equipment and services. Both companies are owned by the French government, and together they will own a majority share of the new venture.

■

Digital Equipment Corp. and Trammell Crow Co. opened DEC's fifth data protection service center. The center, in Irving, Texas, stores magnetic tapes, disks, microfiche and paper and serves the Dallas/Fort Worth area. DEC also announced plans for opening data protection centers in Atlanta and Parsippany, N.J.

■

Telnet Corp. of Houston changed its name to more accurately reflect the company's products and services. The new name is **Microwave Networks, Inc.**

Psychological ploys of NCC booths

By Peter Bartolik
CW Staff

CHICAGO — IBM's booth at the National Computer Conference (NCC) here last week was practically guaranteed to turn off a "power buyer," but that was okay because the company's goal was to educate as many people as possible about IBM products.

But down the alley at the AT&T Information Systems booth, the goal was to identify as many "hot prospects" as possible, so quick interaction between showgoers and company representatives was deemed vital to weeding out the serious from the casual.

Those NCC observations were delivered by Allen Konopacki, an industrial psychologist and president of Chicago-based Incomm International. As psychologist to the stars at computer conferences, Konopacki's company counsels vendors' sales forces on the dynamics of trade show selling.

Among NCC exhibitors using Konopacki's tactics last week were AT&T, Hewlett-Packard Co., ITT, Honeywell, Inc. and Motorola, Inc.

IBM wants to educate, not sell

IBM was an Incomm customer, but according to Konopacki, the largest computer company did not require his services at this show. "IBM's real job here is to educate, not sell, sell, sell," Konopacki said during a floor tour with *Computerworld*. In fact, he said, when 90% of an audience turns away after the conclusion of a structured IBM presentation, the power buyer is likely to think most were disappointed. If the potential customer still is interested, he is likely to find himself competing for the IBM representative's attention with "the techie who wants to take off the back cover."

For those companies seeking to identify future sales prospects, rather than to educate the mass of "tire kickers," subliminal missteps can range from a slouching salesman to the wrong choice of carpet color.

Showgoers may not have realized it, Konopacki said, but the blue carpet lining the alleyways between booths was a psychological message to step into a booth.

But even blue carpet underfoot may have been preferable to stepping onto a light tan carpet if your mother nagged you about tracking in dirt, Konopacki said.

There were "invisible lines of demarcation" throughout the exhibit floors, but some vendors were using those lines to encourage potential buyers, while others were unwittingly using them to turn customers away, Konopacki said.

The high barrier surrounding much of Eastman Kodak Co.'s booth was an "innovative and gutsy" way of encouraging serious buyers and discouraging tire kickers, Konopacki said. But just down the way, a series of flashing lights bordering a light carpet intimidated most passersby and keep them passing by, he said.

A vendor representative filling out a visitor evaluation form could quickly determine who would merit further attention. But another representative eagerly trying to hand out emblazoned pens was telling prospects, "I'm here to hand out pens," Konopacki said.

A simple company logo served its purpose and told showgoers the company is present, but the cluttered copy adorning some signs would never be read by most people, he said. "Typically a person spends less than 10 seconds reading a sign."

Despite all the subtle and not-so-subtle signals that exhibits gave off, most decision making at trade shows was based on the interaction between attendee and vendor representative, Konopacki said. His counseling often runs into resistance from salesmen because he tells them to drop traditional hard-sell techniques, he said. Rigid eye contact will turn off most people, and an aggressive approach will kill any prospects, he said.

An ironclad rule to salesmen is "shut up and listen," Konopacki said. "The thousands of dollars a company spends on equipment here is irrelevant; it's what the attendee wants to tell them that is important."

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COMPUTER INDUSTRY

NICKELS AND DIMES

Hadco Corp. announced revenue for the second quarter ended April 27 of $24.7 million, compared with $34.8 million during the year-earlier period. This resulted in a net loss of $1.2 million, or 13 cents per share, compared with a net income of $2.3 million, or 20 cents per share, in the comparable period one year earlier.

■

Gandalf Technologies, Inc. reported third-quarter revenue of $21.4 million, up 23% from $17.4 million from the year-earlier quarter. Profits were $186,000, or 2 cents per share, compared with $1.4 million, or 14 cents per share, in the year-earlier quarter.

■

Point 4 Data Corp. announced revenue in excess of $19 million for the fiscal year ending March 31, 1985. "This represents a 27% increase over last year," said Bill Rigby, president and chief executive officer.

■

Intelligent Systems Corp. reported revenue for the fiscal year ended March 31 of $123.9 million. Profits were $1.8 million, or 16 cents per share, compared with $9 million, or 84 cents per share, in the year-earlier period.

■

General Automation, Inc. announced revenue for the quarter just ended of $13.6 million, compared with $19.1 million in the prior year. A net loss of $4.5 million, or $1.69 per share, was reported, compared with a net loss of $1.4 million, or 51 cents per share, for the comparable period last year.

■

Applied Materials, Inc. announced profits for the second quarter of $3.9 million, or 58 cents per share, compared with $3.1 million, or 48 cents per share, for the same quarter last year. Revenue totaled $49.5 million, compared with $39.2 million in the corresponding period one year earlier.

■

Banctec, Inc. reported revenue for the fourth quarter ended March 31 of $16.2 million, up 69% from $9.6 million for the same period last year. Profits were $345,000, or 8 cents per share, compared with a net loss of $3.5 million, or $1.05 per share, in the year-earlier period.

■

Volt Information Sciences, Inc. announced profits for the second quarter ended May 3 of $716,000, or 10 cents per share, compared with $3.2 million, or 42 cents per share, in the comparable period last year. Revenue was $100.7 million, compared with $99 million in the same quarter one year earlier.

■

Advanced Systems, Inc. announced that revenue for the second quarter was up 34% from 1984 to $11.5 million, and profits were $2.2 million, or 22 cents per share.

■

Micron Technology, Inc. reported revenue for the third quarter ended May 29 of $14.4 million, compared with $29.4 million in the prior year. The firm posted a net loss of $11.6 million, or 30 cents per share, compared with profits of $13.1 million, or 29 cents per share, in the comparable period one year earlier.

■

C3, Inc. announced revenue for the fourth quarter ended March 31 of $18.8 million, compared with $15.1 million last year. The company reported a net loss of $2.6 million, or 27 cents per share, compared with a net loss of $438,000, or 5 cents per share, for the fourth quarter last year.

■

Pansophic Systems, Inc. reported revenue for its fourth quarter ended April 30 of $18.1 million, compared with $15 million in the same quarter one year ago. Profits were $3.3 million, or 39 cents per share, compared with $2.2 million, or 26 cents per share, in the same quarter last year.

■

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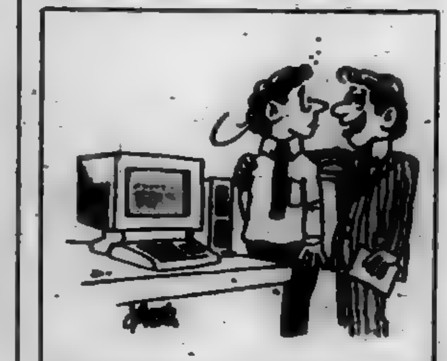

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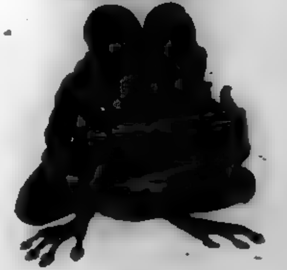

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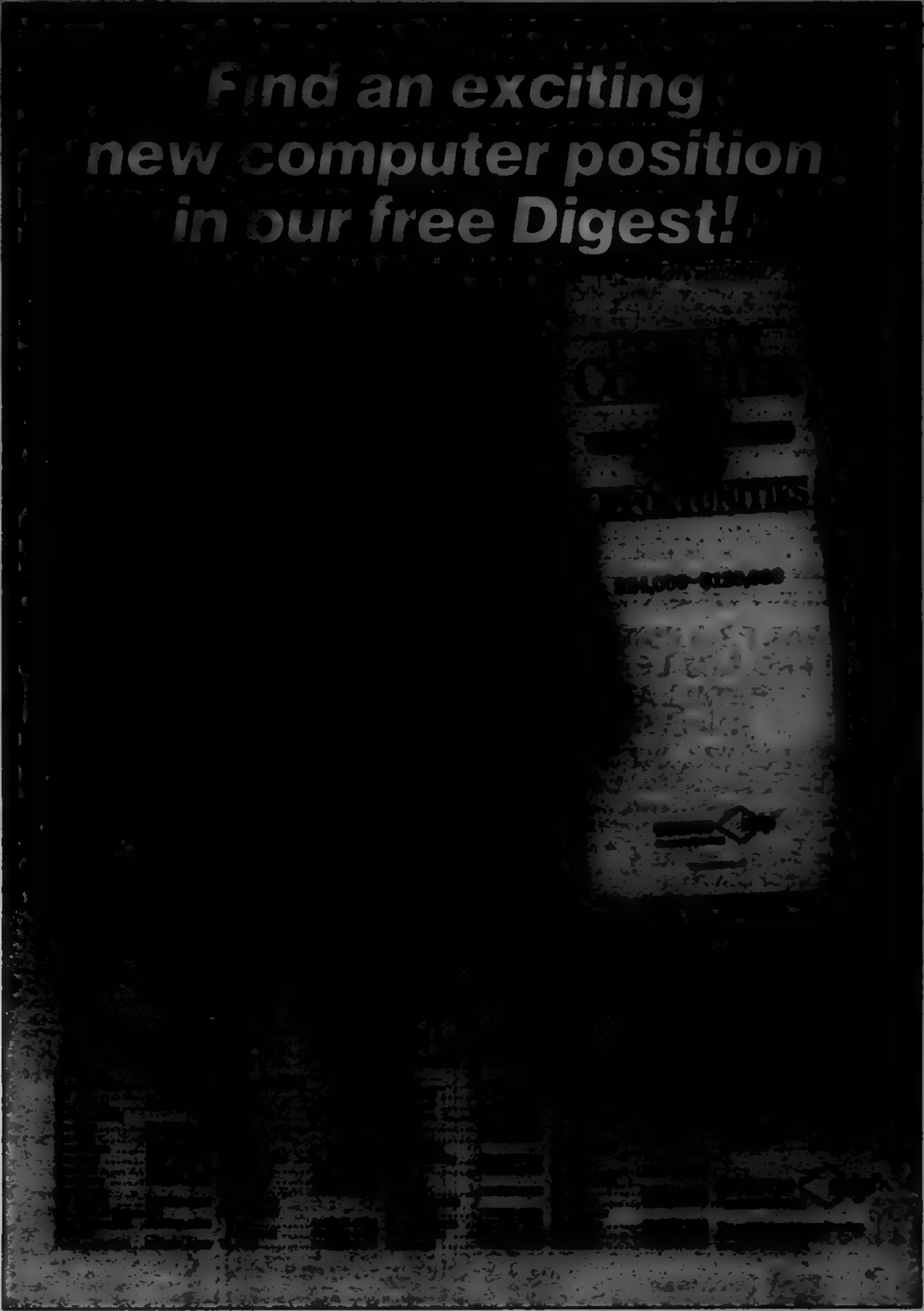

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We are seeking professionals at several levels to assist in the creation of a sophisticated interactive application development system. Depending on experience and career orientation, these individuals will be responsible for technical leadership, design, or programming, in company with a team of talented and highly motivated software engineers. The people we are seeking must have had substantial system software development experience in a variety of environments—particularly TSO, CICS, and CMS—using both assembler language and structured high-level languages such as C, PL/I, or PASCAL. A strong interest in state-of-the-art user interface technologies, including object-oriented concepts, is also important. Some areas of technical expertise which are especially desirable are:

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Please send resume to: MR. KIRK ALEXANDER, SUPERVISOR of APL & Computer Graphics Research, I.C.G.L., Engineering Quadrangle.

Princeton University
Princeton, New Jersey 08544

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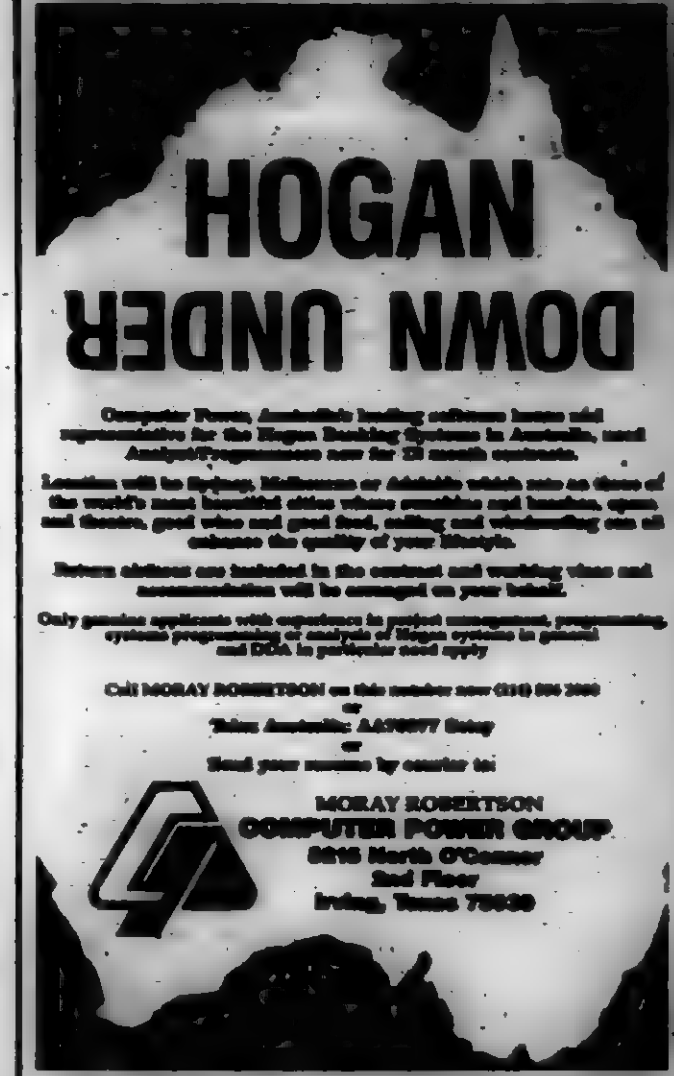

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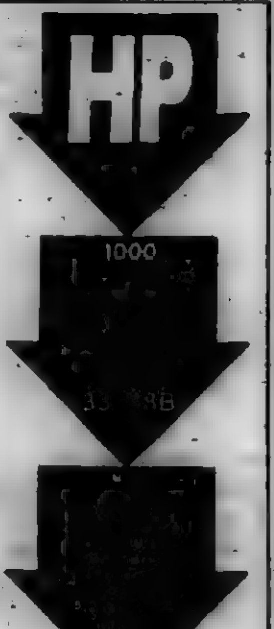

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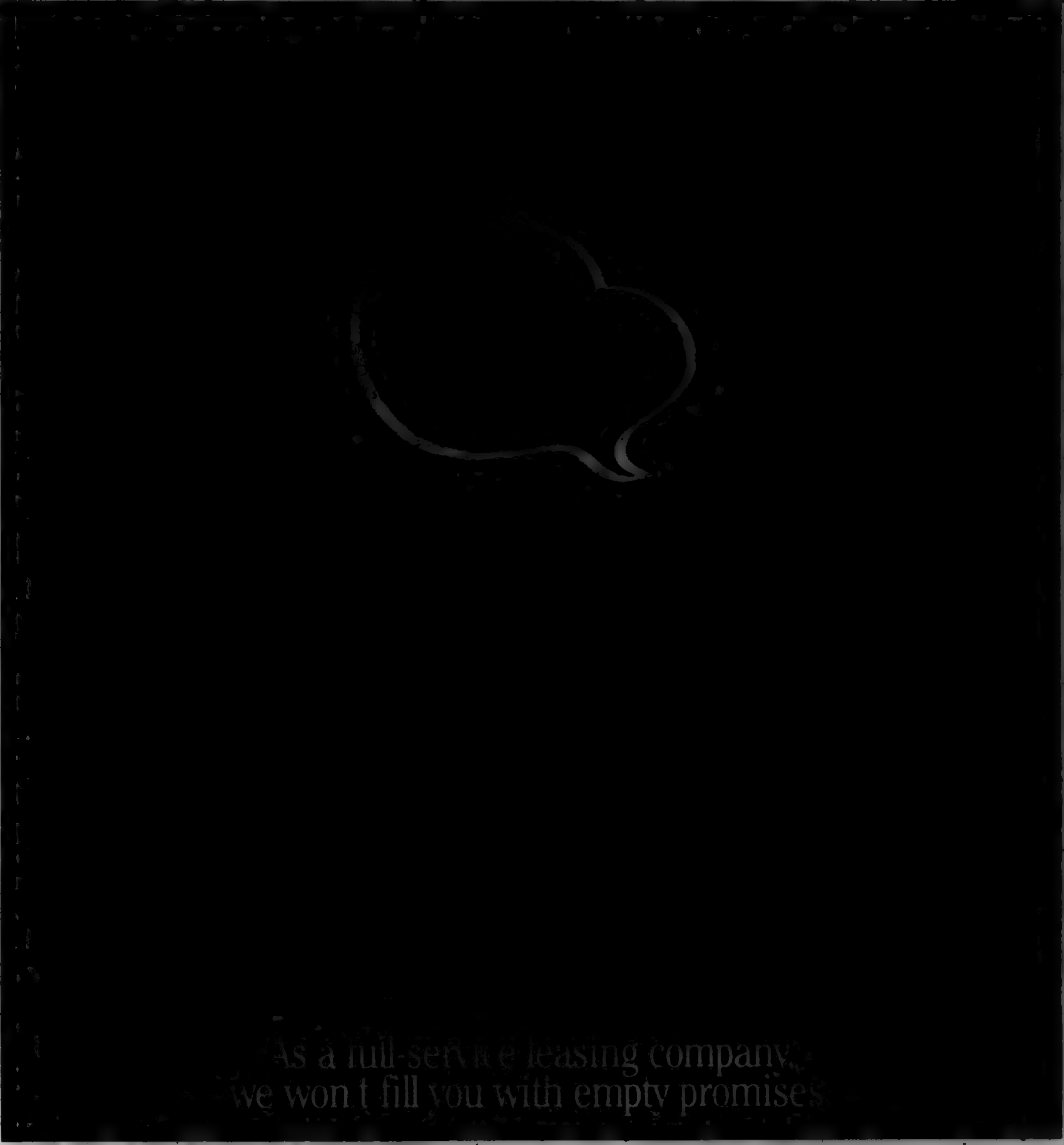
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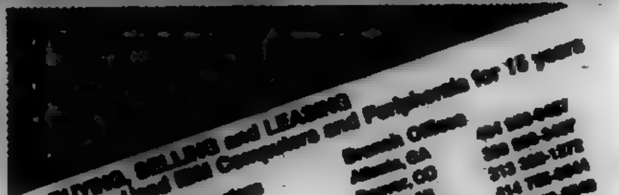

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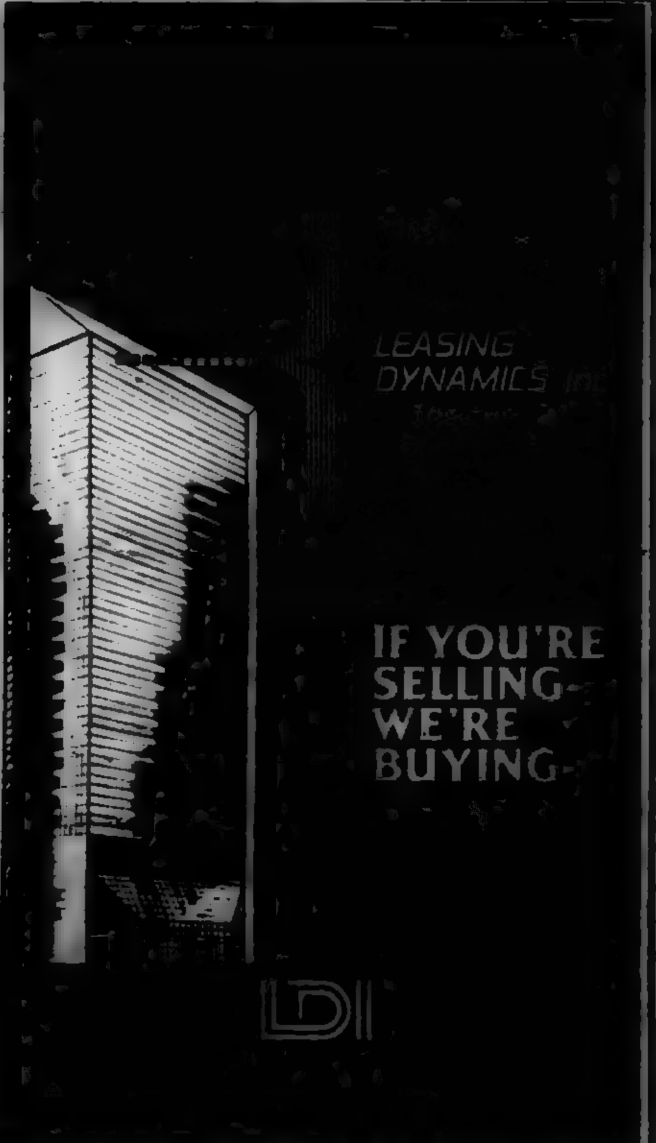

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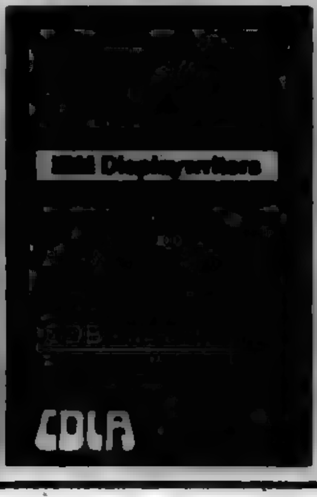

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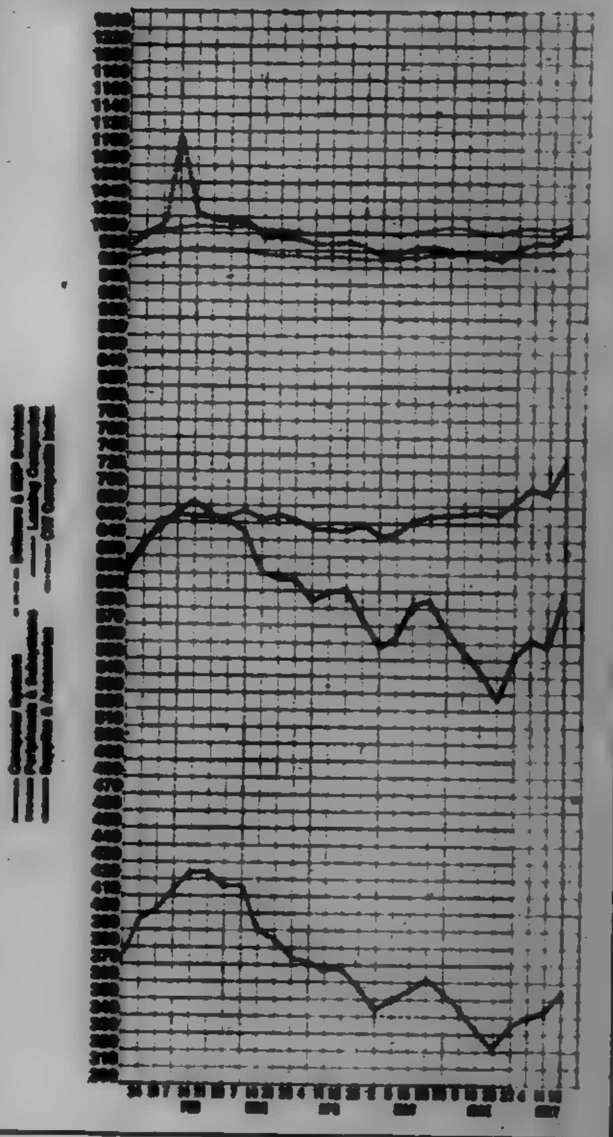

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IBM squelches PC2 rumors/37

Why goodbye?
John Cunningham looks back at Wang, ahead to CCI/71

Phone company readies high-speed ISDN trial

By Bob Wallace
Special to CW

New York Telephone Co. is planning to field-test an Integrated Services Digital Network that will use an interface different from the type used by most other former Bell operating companies.

New York Telephone's field trial will support the CCITT Primary Rate Interface. Pacific Northwest Bell, Mountain Bell, Illinois Bell and Southern Bell Telephone and Telegraph Co. are all planning ISDN tests supporting the CCITT's Basic Access Interface.

New York Telephone, however, is not the only former Bell operating company planning to support this interface. A spokesman for Bell Communications Research, Inc. in Livingston, N.J., said other telephone companies have plans to support the Primary Rate Interface, but he would not reveal their identities.

AT&T Communications — which has announced plans to offer ISDN capabilities to its customers by 1987 — will support the Primary Rate Interface. The company, however, has not announced support of the Basic Access Interface, a difference that might encourage users to bypass the local telephone companies.

The Primary Rate Interface specifies use of a 1.54M bit/sec. digital link that is subdivided into 24 channels that operate at 64K bit/sec. Voice, data or video can be carried on 23 of these channels, and the remaining channel is used to carry signaling information.

The Basic Access Interface scheme, also referred to as 2B+D, calls for a 144K

See ISDN page 12

Profits dive for most mini makers

By Peter Bartolik
CW Staff

Financial results reported by minicomputer manufacturers last week continued on a mostly downward trend, marked by greater than expected losses at Wang Laboratories, Inc. and Data General Corp.

Further demonstrating the downturn, Prime Computer, Inc. continued to buck the trend with respectable revenue growth but posted only a marginal increase in profits; Gould, Inc. said minicomputer sales were strong, but write-offs in the semiconductor business produced a loss of $126.8 million.

In a more specialized area, fault-tolerant mini vendor Stratus Computer, Inc. remained on its fast-growth track, while industry leader Tandem Computers, Inc. reported a slight revenue growth and a 74% drop in profits. In other areas, mainframe vendor Amdahl Corp. reported a slight upturn, and Storage Technology Corp. announced a 50% drop in sales from a year earlier.

■ **Wang.** Just a few days after founder An Wang resumed the title of president [see story page 71], the company reported a fourth-quarter loss, its first in 12 years, of $109 million, or 78 cents per share, compared with year-earlier profits of $73.7 million, or 52 cents per share. Compounding an 11% decline in revenue for the quarter were pretax charges of $137 million for the write-off of inventory accumulations and additional expenses relating to the recent termination of 1,600 employees [CW, June 10]. Revenue for the quarter declined to $635.2 million from $713.8 million a year earlier.

For the fiscal year, which began to sour in the second quarter, Wang reported a revenue increase of $2.35 billion, up 5% from

See FINANCES page 7

Apollo 68020-based units bow

By Tom Henkel
CW Staff

BOSTON — Apollo Computer, Inc., one of the first entrants into the now-crowded 32-bit engineering workstation market, last week upgraded its popular line with two models based on Motorola, Inc.'s 68020 microprocessor.

At the same time, Apollo introduced an open architecture concept that the company claims will enhance Apollo users' ability to access data in other vendors' systems. The architecture will provide Apollo users with a gateway to IBM's Systems Network Architecture and links to Digital Equipment Corp.'s VAX series superminicomputers and IBM Personal Computers.

The significance of the latter introduction is that users of Apollo's top-selling Domain product line — an estimated installed base of 734 end-user systems, largely used by architects and electrical engineers — now have direct access to the DEC and IBM machines. Previously, Domain users had to access other vendors' systems exclusively via Ethernet.

The workstations announced at last week's news conference are the monochrome DN330 and color DN560. The units incorporate Motorola's 12-MHz 68020 CPU, announced last year and recently released, thus making Apollo's one

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TOP OF THE NEWS

Casting a vote for standards, the Federal Election Commission is seeking hardware and software standards in vote counting units following allegations that they lack security. Page 2.

■

IBM's intent to establish a network standards research center indicates the firm is serious about developing protocols for interconnectivity, analysts said. Page 4.

■

Alliant Computer launched two processors said to combine vector and scalar processing capabilities. Page 10.

■

The head of Encore Computer said that Multimax, the company's first system, will vault the firm into the ranks of major supermini vendors. Page 11.

■

Despite Honeywell's reliance on NEC-provided mainframes, Honeywell has not reduced its own mainframe technology commitment. Page 23.

New life for aging micros

By Edward Warner
CW Staff

Old personal computers never die — they just get new owners.

That motto could be emblazoned on Rich Reed's office wall. Reed, manager of office systems at Cigna Corp.'s employee benefits and health care division in Bloomfield, Conn., said that as the division's 400 IBM Personal Computers get older, they are likely to get passed down to new and less experienced users.

Like Reed, most corporate microcomputer managers contacted recently by *Computerworld* said they will keep their personal computers despite the toll that several years of steady use has taken on their machines. Their strategy was summed up by Alan Gross, president of the New York-based Microcomputer Managers Association: "Most corporations are redeploying and reusing [personal computers] in other areas" of their firms.

Such a strategy reflects a trade-off, according to analyst Chris Christiansen of the Yankee Group, a Boston research firm. While the IBM Personal Computer, the corporate computing mainstay, grows cheaper by the month, the price of repairs on an old Personal Computer remains the same or grows. It costs an average of $400, he said, just to repair one diskette drive, the part of the computer that is often the first to fail.

"You're beginning to look at a machine that is increasingly costly to service," Christiansen observed. "When you have an old car, is it worth it to replace the transmission?"

The answer is yes as far as such firms as Cigna — an insurer — Merrill Lynch,

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NEWSPAPER

FEC moves toward standards

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The Federal Election Commission (FEC) next week is expected to take an important step toward establishing voluntary standards for hardware security and performance in computerized vote counting systems.

The action, mandated by the U.S. Congress, follows a series of lawsuits contesting elections and allegations that computerized vote counting systems lack adequate security control features, making them prone to failures and vote manipulation.

Last week, William Kimberly, deputy director of the national clearinghouse on election administration in the FEC, said in an interview that there is currently no uniform set of minimum performance criteria for computerized vote counting systems nationwide.

Kimberly said that, despite efforts to educate state election officials on the technology of computerized vote counting, the level of technical understanding at the precinct level has created "horror" situations.

The FEC does not investigate allegations of vote tampering or fraud involving computerized vote counting, Kimberly said. "This is a very muddy issue. Without a full investigation [of charges], it is very difficult to allocate blame. It is seldom possible to fix what or [find] who is responsible except that management errors are usually the cause," Kimberly said.

> ”
>
> *'It's not true that a programmer can manipulate the system undetected. There are all sorts of security controls.'*
>
> **— Jack Kemp**
> **Computer Election Systems, Inc.**

However, the FEC official said security features in vote counting systems currently on the market, especially when referring to operating system software, are "clearly the areas most vulnerable to attack." Kimberly said local election boards are free to buy and use any kind of vote counting software.

While the FEC's project advisory committee of state election officials is likely to adopt next week the draft hardware standard for the vote counting systems, a similar standard for software is at least one year away from adoption. The FEC recently awarded an $80,000 contract to Granite Creek Technology, Inc. in Scotts Valley, Calif., to produce a draft software standard.

According to Kimberly, once a set of hardware and software standards has been established, state legislatures will have to rewrite state election laws to require that any vote counting system sold to election boards be certified as meeting the standards. Adopting the standards will be a voluntary move by state election officials.

Computer Election Systems, Inc. (CES) in Berkeley, Calif., the country's largest vendor of punched card vote counting systems, counted more than 35 million votes in 40 states in 1984 presidential and local elections. The company said the hardware standards "are pretty stringent" and will raise costs of its Counting Multiplexer System for local jurisdictions.

CES has been named in three election-related lawsuits in West Virginia, Florida and Indiana. It has also been implicated in other contested elections in recent years by losing candidates. The charges assert that the security control features on the company's Votomatic punched card system have malfunctioned, been compromised or been subject to management errors that caused inaccurate vote tallies to be recorded.

CES President Jack Kemp last week defended the security control features of the company's punched card system, technology that he said was introduced to the market orginally in 1964. Kemp refused to discuss the specific lawsuits and allegations raised against the company but defended the security features of his company's punched card voting system. "It's not true that a programmer can manipulate the system undetected. There are all sorts of security controls present at the precinct level that would not permit this to take place," he said.

The FEC's Kimberly said that the majority of problems arising in punched card voting systems lie in the software's inability to handle exceptions to normal ballot counting routines, such as counting crossover votes and rejecting invalidly cast ballots.

In Carroll County, Md., a defeated candidate for the school board, Wayne Cogswell, contested a 1984 vote count where a CES punched card system was used. County election officials denied any problems. But when a consultant took the punched card ballots cast in the election and ran them through a neighboring county's similar CES system, a 13,000-vote adjustment was made.

Carroll County election officials subsequently admitted that a test tape operating system supplied by CES was inadvertently used to count the votes, and the tape did not accurately register the specific contests then under way in the county.

Emily Johnston, the computer consultant hired by Cogswell, said last week that it is possible for a programmer to turn off the CES system at any point when it is counting votes, insert an additional program control card containing vote adjustment totals and then restart the machine. "The subsequent printout of the program will never show that a change has been made," Johnston said.

NEWS SUMMARY

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IBM research center: commitment to net standards

By John [illegible]
CW Staff

IBM's recently stated intent to establish a research center to study network standards indicates the firm is serious about working toward the ability to interconnect different makes of computers, analysts said.

The IBM research center, to be built in West Germany, will be used by IBM to experiment with portions of standards that are still ill defined, according to one analyst. The center will be open to members of European academic and nonprofit research organizations free of charge.

The company marked the announcement of the center by saying it will finish development by year end on network protocols that conform to the middle layers — four (transport) and five (session) — of the International Standards Organization's (ISO) Open Systems Interconnect (OSI) seven-layer network reference model.

IBM also reported that it will evaluate OSI layers six (presentation) and seven (application) and will develop products to these standards — based on business decisions — as these standards are ratified. Only the first five layers have been fully specified by the ISO.

Most analysts viewed the announcement as further evidence that IBM is serious about standards. "IBM is as advanced in OSI as any other vendor, if not more advanced," according to Harold Foltz, executive director of Omnicom, a company in Vienna, Va., that advises industry on the application of OSI standards.

But OSI is not a panacea, warned Dale Kutnick, an independent communications consultant in Wayland, Mass. "Many users are under the misconception that if IBM adopts OSI and [Digital Equipment Corp.] adopts OSI that they will be able to connect their equipment," Kutnick said. "It may make it a little easier for that to happen, but it's not automatic."

The Heidelberg, West Germany, research center, called the European Networking Center, will house IBM and non-IBM processing equipment. It will be the company's European focal point for research and experimentation on network standards — particularly for higher layer protocols — and will be available at no cost to academic and nonprofit research outfits. All project results will reportedly be published and shared with appropriate standards organizations.

> *'IBM is as advanced in OSI as any other vendor, if not more advanced.'*
>
> — Harold Foltz
> Omnicom

"People are particularly serious about OSI in Europe," according to Ken Thurber, president of Architecture Technologies, Corp., a local network consultancy.

Today, IBM is delivering products that support the lower three levels of OSI through conformance to X.25, a CCITT standard that, according to an IBM spokesman, has been incorporated into OSI.

IBM products that support X.25 include the 4331 Model 2/11, 4361 and 370 mainframes; the System/36 mid-range system; the Series/1 minicomputer; both the 3705 and 3725 front-end processors; and a number of terminals and terminal controllers, including the 3274.

By the end of 1985, the spokesman said, IBM will have completed work on software that will provide IBM 370 support for two layers above X.25 — the fourth or transport layer and the fifth or so-called session layer. These OSI layers have reached international standard status, the highest form obtainable, according to John Heafner, chief of the systems and network architect division of the National Bureau of Standards.

Experimenting with prototypes

The uppermost two layers of the network reference model, the presentation layer six and application layer seven, are not yet fully specified. Until they are, IBM will experiment with prototypes at the research center, a spokesman said. Because there are so many options at these higher layers, IBM will have to gauge the potential business for each application before adapting its programs to work with OSI, the spokesman said.

IBM will not, however, discount Systems Network Architecture (SNA). "In Europe, people are trying to build to OSI," Thurber said, "so IBM has to support both SNA — which it clearly views as its future — and OSI because of the size of the European market."

In the opinion of Foltz, "IBM will evolve to OSI at a fairly good pace. Whether it migrates SNA completely to OSI or whether it offers OSI as an alternative is yet to be seen."

SNA is not that different from OSI now, according to Kutnick. "By 1986, perhaps 1987, SNA will be an implementation of OSI," the consultant said.

But perhaps the most important thing to keep in mind, according to Kutnick, is that "OSI in no way ensures that networks will work together. Implementations of OSI will be very different. OSI is a skeleton. There is no software. The software is still related to the operating system of each vendor."

OLD

from page 1

Pierce, Fenner and Smith, Inc. and accountants Touche Ross & Co. are concerned. Apparently, only when it is irreparably broken do corporations throw away a personal computer. And only when overwhelmed by charity, or when the machine is bypassed by the current technology, do corporations give personal computers away.

First to be outmoded for corporate use was the Apple Computer, Inc. Apple II line, the machines that originally brought desktop computing to some offices. Several corporations, including Cigna, reported giving their Apple machines to charity when they replaced the units with IBM Personal Computers.

Joe Brophy, vice-president of data processing at Travelers Insurance Co. in Hartford, Conn., estimated that a number of Travelers' 9,000 Personal Computers are reaching the end of what he called the three-year life span of the machine's parts.

So far, though, most corporations are hanging on to their Personal Computers. At Cigna's Bloomfield division, for example, all of the Personal Computers ever purchased, including the first bought 3½ years ago, are still in use, Reed reported.

The machines have held their ground, he said, because they are tough and need few repairs. Cigna employees, he joked, "are going to keep [the Personal Computers] going till they die." Until the Personal Computers wear out, that is.

Micros get organ transplant

Old Personal Computers also never die at Merrill Lynch's New York headquarters. But, they might get an organ transplant in the form of an add-in processor board. Such upgrade boards as the Orchid Technologies, Inc. PCturbo-186 replace the Personal Computer's Intel Corp. 8088 microprocessor with a faster and newer Intel chip like the 80186.

The boards might represent a cost-effective way to give power users more speed and power, but they are not without drawbacks, according to Carol Bass, Merrill Lynch's manager of the personal computer support center. The PCturbo-186, she said, has been proven to be cumbersome in tests at the support center.

One difficulty, she said, is that users must reboot such programs as Lotus Development Corp.'s Symphony integrated package when they want to switch from the standard 4.77-MHz speed to the 8-MHz speed of the board's Intel 80186 processor.

Bass said she has had to return four boards, all for faulty chips, and is turned off by the price of the boards, which retail at $895 for a base model with 128K bytes of memory.

'Two computers on one chassis'

In response, an Orchid product manager said the need to reboot some programs was to be expected because "what you've actually got is two computers on one chassis."

Merrill Lynch has not given away any Personal Computers, Bass said, but firms such as Travelers and Touche Ross have made donations of used personal computers.

Touche Ross, for example, has permitted its local offices to dispose of approximately 150 to 200 Apple Computer Apple II models in recent years, and some microcomputers have gone to charities, according to Jeff Knepper, director of advanced technology/taxation in the company's Washington, D.C., office.

Other working Apple IIs, he said, were sold to employees for personal use, a strategy that Travelers will soon take when it auctions off nearly 100 older Personal Computers to its employees in sealed bidding.

Tax deduction not a factor

Neither Knepper nor Travelers' Brophy cited the gain of a tax deduction as the main reason that their employers donated personal computers to charities. Brophy, in fact, said Travelers' was most interested in being a good corporate citizen.

The lack of interest in a tax write-off for their donations, though, may also come from the fact that, by the time the personal computer is ready to go to charity, it has already been heavily depreciated as a business expense, according to Woburn, Mass., attorney Edward Saltzberg.

In fact, he said, a business usually deducts 40% of the value of the personal computer in the first year of ownership alone. "You're inviting an audit if you're donating to charity and taking a full-value" write-off of the donation, he warned.

Charitable giving can make one popular, though. Brophy said he received about 5,000 letters requesting donations after an article mentioning Travelers' microcomputer donations appeared in a national computer magazine.

Brophy was quick to point out that he is not the person to whom requests for equipment should be mailed; Travelers operates its own charitable foundation for corporate giving.

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WHODUNIT

Sortland Yard warns against "Raffles-type sort programs."

Call (201) 568-9700.

Ask for Inspector SyncSort!

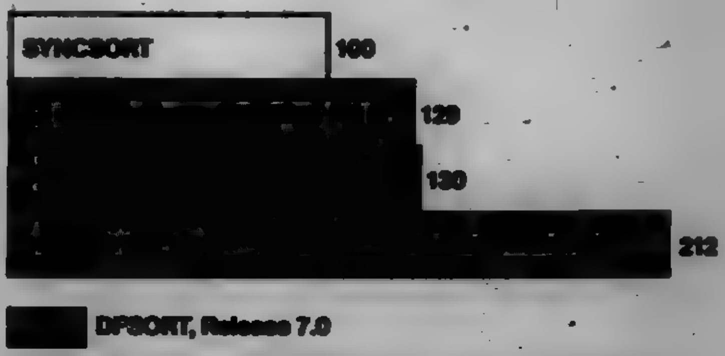
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Savile Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied, "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

syncsort INC.

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DEC builds Information Center from existing products

Analysts question system's ability to offer total solution

By Eric Bender
CW Staff

MARLBORO, Mass. — Digital Equipment Corp. last week rolled out the VAX Information Center, described as a portfolio of existing VAX products and services designed to support end users.

According to Rose Ann Giordano, DEC vice-president of large systems marketing, the offering is "a significant repackaging" of DEC hardware, software, communications and service products.

Based on VAXs, Decnet networking products and decision-support software, the VAX Information Center reportedly was designed to help MIS departments facilitate end-user computing while maintaining the integrity and control of the corporate data base.

The VAX Information Center can be run on VAX products ranging from the VAX/750 to an 8600 cluster or networked VAXs, according to DEC. The center reportedly can be centralized or distributed to multiple locations.

Components include the VAX Toolbox, with integrated software tools such as All-In-One, Datatrieve and Decgraph; personal computer interconnection products; Decnet-to-IBM Systems Network Architecture products; videotex systems; consulting services, training and seminars.

Third-party software products such as SPSS, Inc.'s SPSS-X statistical package and Evaluation and Planning Systems, Inc.'s FCS-EPS financial modeling package also may be integrated within the information center, according to DEC.

The VAX Information Center is one example of DEC's "increased thrust in commercial data processing," Giordano said. "With a business user, you have to make the computer a lot easier to use.

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> *'IBM coined the term information center, but [DEC] invented the concept. [DEC's] always had the idea of putting computer power as close to the user as possible.'*
>
> **— Rose Ann Giordano**
> **Digital Equipment Corp.**

"Personal computer users are one of the main reasons for an information center; they've often exhausted the potential of what they can do with the computer without having access to corporate data," she added.

"IBM coined the term information center, but we invented the concept," according to Giordano. "We've always had the idea of putting computer power as close to the user as possible."

Steps untaken

While the announcement is a logical move for DEC, it leaves some steps untaken on the road to a complete IBM-style information center, industry analysts commented.

"The information center has proved a very successful market for IBM, so why shouldn't DEC try it?" asked Steven Smith of Paine Webber, Inc. in New York. However, "I certainly don't see it as a big market for DEC," he said. The corporate data sought by end users is typically on an IBM mainframe, and the VAX Information Center does not provide new tools that ease the task of getting at that data, Smith noted.

"It doesn't really show a strategy for the information center," commented Peter Lowber of the Yankee Group in Boston.

"Whether at the mainframe or the departmental level, an information center has got to be [IBM] DB2 and SQL compatible. . . . I don't see DEC with a [VAX] 8600 cluster competing with IBM," Lowber said.

The VAX Information Center will be on display at the Information Center Conference and Exposition in Nashville, Aug. 18-22, according to the company.

Further information on the VAX Information Center is available from DEC, which is located in Maynard, Mass. 01754.

APOLLO

from page 1

of the first systems to incorporate the microprocessor. The Apollo workstations, which also incorporate a Motorola 68881 floating-point processor, are said to provide two to three times the internal performance of Apollo's Motorola 68010-based workstations, first introduced in 1980.

An Apollo spokesman told *Computerworld* that the company will continue to produce its entry-level 68010-based DN300 workstation but conceded the current 68010-based DN550 color workstation will probably be phased out. However, current users of 68010-based Apollo workstations can upgrade their systems to the 68020 models in the field. A company spokesman said the upgrades cost between $7,500 and $10,500.

The DN300 with 2M bytes of main memory, 17-in. 1,024- by 800-pixel bit-mapped display, two RS-232C serial ports, emulators for DEC VT100-type terminals and other basic prerequsites costs $15,900. The same unit with a 70M-byte removable media disk drive and mouse costs $26,800. The DN560 with 2M bytes of main memory, 1M byte of display memory, 19-in. 1,024- by 800-pixel bit-mapped display and basic prerequisites costs $35,500. The same system configured with a mouse and 86M-byte 5¼-in. removable media disk drive costs $46,400. Both will be available in September.

Apollo also incorporated the 68020 into a server processor called the DSP90. The workstation is also said to be two to three times more powerful than the DSP80A server processor, which uses a 68010. The DSP90 with 2M bytes of main memory, 64M-byte virtual address space, two asynchronous I/O ports and a network interface costs $18,000. It will also be available in September, the company said.

In announcing the 68020-based products, Apollo also lowered the purchase price of its top-end DN460 and DN660 workstations by up to 27%. It also cut its prices for main memory on the entire Apollo line to $3,000/1M byte. A monochromatic DN460 with 4M bytes of main memory, which used to cost $53,500, now costs $39,500. A color DN 660 with 4M bytes of main memory, which previously sold for $65,500, now costs $49,500, the company said.

The company also unveiled the MSD-86M-86M and the slave Add-86M disk drives for its mid-range DN550 and DN560 color systems. The 5¼-in. Winchester drives offer 86M bytes of storage. The MSD-86M-86M costs $12,500 and the Add-86M costs $4,500.

For additional information, Apollo is located at 330 Billerica Road, Chelmsford, Mass. 01824.

Apollo [illegible]

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FINANCES

from page 1

$2.18 billion the previous year, when it appeared that the company was well on its way toward the $3 billion mark.

The sudden reversal of Wang's seemingly inviolable 30% growth rate resulted in fiscal 1985 profits tumbling to $15.5 million, or 11 cents per share, compared with profits of $210.2 million, or $1.52 per share for the previous year.

An Wang, in a prepared statement, said the company's business plan had proved too aggressive in light of the rapid slowdown in demand and that cost-cutting measures have repositioned the company to achieve profitable performance.

■ **DG.** The firm reported a third-quarter operating loss, its first ever, of $16 million, compared with operating profits of $28.6 million a year earlier.

Unlike Wang, DG was able to utilize tax credits to reduce the net loss to $8.3 million, or 32 cents per share, compared with year-earlier net profits of $18.6 million, or 71 cents per share.

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> *The sudden reversal of Wang's seemingly inviolable 30% growth rate resulted in fiscal-year 1985 profits tumbling to $15.5 million, compared with 1984 profits of $210.2 million.*

One-time severance costs from the dismissal of 1,400 workers [CW, June 24] added $6.3 million to DG's quarterly expenses, and a write-down of inventory added $8.2 million.

Revenue for the quarter was $285.5 million, down 6% from a year earlier.

Edson D. de Castro, president of DG, said current business levels will produce a small profit or loss for the fourth quarter, and he said it is likely that some manufacturing operations will be shut down for up to two weeks in late August or early September.

■ **Prime.** After a contrarily strong first quarter that led the company, at its annual meeting earlier this year, to announce plans almost gleefully to hire 1,000 people, Prime said last week that it is curtailing discretionary expenses and that any nonsales hires will require approval by the board of directors.

The company reported that second-quarter revenue was $187.2 million, up 16% from $161.4 million a year earlier.

But profits showed only a "modest increase" to $13.1 million, or 27 cents per share, compared with year-earlier profits of $12.8 million, or 27 cents per share.

Prime President Joe M. Henson, however, said the company is pleased with its performance in light of the adverse reports from competitors.

■ **Gould.** This company reported that a previously announced write-off incurred by reducing its semiconductor operations amounted to $160 million, or $3.65 per share, and contributed to a second-quarter net loss of $126.6 million, or $2.87 per share. Excluding the write-off, the company had profits of $16.3 million, or 35 cents per share, compared with year-earlier profits of $22.8 million, or 50 cents per share.

The company said it has reduced expectations for the third quarter due to continued weakness for electronic components but added that its information systems products had performed strongly in the second quarter.

■ **Tandem.** The company reported revenue up slightly to $144.1 million, from $141.9 million a year earlier, while product sales declined by almost 2%.

Profits for the third quarter tumbled to $2.4 million, or 6 cents per share, from $9.2 million, or 23 cents per share a year earlier, so growth in expenses outpaced sales.

■ **Stratus.** In contrast, the challenger in the fault-tolerant arena reported second-quarter revenue was up 99% to $18.5 million, compared with $9.3 million a year earlier.

The company said OEM agreements with IBM and others contributed significantly to financial results, and quarterly profits were $1.9 million, or 10 cents per share, compared with year-earlier profits of $1.3 million, or 7 cents per share, which included a tax credit of $500,000.

■ **Amdahl.** This firm reported that second-quarter revenue was up almost 5% to $206.1 million, compared with $196.8 million a year earlier.

Profits were $5.1 million, or 11 cents per share, compared with year-earlier profits of $4.9 million, or 11 cents per share. The company said sales were up but not to the level of earlier expectations.

■ **STC.** The company, continuing reorganization under protection of Chapter 11 of the Federal Bankruptcy Act, posted a second-quarter loss of $15.9 million, or 46 cents per share, compared with a year-earlier loss of $4.8 million, or 14 cents per share.

The company said termination of a printer manufacturing facility in Palm Bay, Fla., contributed $3.5 million to the loss.

Sales revenue was almost halved to $84.1 million, from $161.4 million a year earlier, producing a slide in total revenue to $172.6 million, down 30% from year-earlier revenue of $247.1 million. The company said it had expected a greater loss than it reported.

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Edward H. Sussenguth

Chief architect of SNA

Edward H. Sussenguth headed up the IBM team that developed Systems Network Architecture (SNA) for the first 10 years of its existence. SNA, a de facto industry standard, is a strategic IBM product, central to the manufacturer's efforts to interconnect its product line. As the principal architect of SNA in its early days, Sussenguth has seen SNA evolve to accommodate changes in industry and technology. While at the National Computer Conference earlier this month, Sussenguth — now an IBM fellow — ruminated about the history of SNA and networking in general with Computerworld's *senior editor of communications, John Dix.*

Why was SNA developed?
There were three reasons in the beginning, all roughly equal. One was we were basically in a mess at that time. We supported a large number of different protocols and access procedures. That was wrong, it was wrong for us, and it was wrong for our customers.

The second reason is technical. In the early 1970s, the revolution of distributed processing became reality. You could put a minicomputer in a bank, whereas before, you only had dumb devices out there. The way you communicate with a dumb device is different than the way you communicate computer to computer. So we had to change. We had to invent new things in order to communicate with these new kinds of gadgets.

We also foresaw [network] growth, although probably not the rapidity of growth that has happened in the last 10 years. It was clear that the networks were going to get bigger and bigger and [before SNA], there was no way that we would be able to support the customer.

We knew the technologies were changing rapidly . . . and what we really needed was some semblance of structure in order to try to handle that change. That was the reason behind the concept of the [layered network architectures]. When you change something on one layer, you don't have to change everything on either side of it. That's not unique to us.

Is there anything you missed in the development of SNA?
If we missed anything, it was probably network management. I think we didn't realize how significant network management was to our customers, which is probably related to growth [in the] size of networks. If we had it to do over again, we probably would have done network management sooner but not necessarily better. But we've had to really catch up.

There has been a lot of criticism about the complexity of SNA.
Sure, SNA is complicated because it does a complicated thing. Chips are complicated — they do complicated things. The real question is, 'Is SNA overly complex for the level of function that it provides?' I don't believe so. I agree that as you look at it, it is complex, it's complicated. I don't think we have anybody who understands it all; I don't think we need to. As long as the pieces work together.

Do you think there will ever be a single networking standard?
Sure, it's in the best interest of customers to have standards. I can't plug my shaver in the wall in France. The thing that I think the standards community — and we who participate in it — have to be careful of is premature standardization. Premature standardization is likely to be worse than none at all.

I think the press does a disservice in giving people the impression that a standard is going to come about where I can prepare my document on processor X, transmit it to processor Y and then send it to processor Z to be handled. All of the editing commands and the data base [capabilities] that that entails are an awfully long time away.

Working our way gradually up the OSI [Open Systems Interconnect] model is the right thing for the industry to do, but one should be very careful about trying to be unreasonable about what can be expected.

Will SNA eventually be that standard?
No, I don't think so, I think IBM will continue on its own course with SNA, and other vendors will continue to develop their own internal architectures. At the same time, we will try to be sure that we match the international and national [standards].

Do you have any general prognostications about how networking might eventually take shape in the future?
The single-word answer to that is size. It seems fairly apparent that someday, we are going to get to the point where consumers have terminals. Maybe it will get as far as videotex and other things associated with home television sets; maybe it won't get that far.

When you start thinking about home banking, using your [personal computer] or your TV set, the network could be enormous, reflecting back on technical attributes like reliability and availability. [It would also require] more sophisticated mechanisms inside of the network like directory management, [finding out] where you are, [finding out if] you are eligible to receive this information.

Future networking will be end-user driven then?
I don't know how fast it is going to get to the real consumer, but it is already happening rapidly in the office. In Japan, Western Europe, the U.S. and Canada, we'll soon get to the point where there is a terminal for every two workers.

How close are we to that now?
Obviously, in this case, the cobbler's son has shoes. In IBM I would guess that we are approaching at least one terminal for every two workers today, if not one to one. Banking and insurance industries should approach that ratio.

I heard that PC Network came out of the Entry Systems Division in Florida with little or no interaction with the SNA folks in Raleigh, [N.C.].
IBM has separate business units that make decisions based on their general businesses. The chairman does not go up and shoot somebody if they come out with non-SNA-compatible products. We have guidelines where we try to tell people, 'We would like you to do it this way.' The [personal computer] guys did their own networking, but they didn't do it completely unbeknownst to Raleigh. It was a decision that was tactically best for the [personal computer] at that time and was done in such a way that would not dead-end itself.

Is SNA a strategic product for IBM?
SNA is clearly a strategic direction. What we are

See SNA page 9

Undefined upper layers reduce OSI's usefulness

Market fragmentation said to confuse users

By Paul Korzeniowski
CW Staff

"Despite what some companies are claiming, users are only being provided with four-sevenths of a solution," according to a speaker at a session on networks at this month's National Computer Conference (NCC).

Although the lower layers — one through four — of the International Standards Organization's (ISO) Open Systems Interconnect (OSI) network reference model have been specified, unclear standards for the upper layers — five through seven — are a concern to vendors and end users, said Leonard Magneson, marketing manager for OEM products at Intel Corp.

> *'Whenever a user wants to run a session, the network should identify the resources that are needed and establish the data path.'*
>
> — **Wendall Turner**
> **TRW, Inc.**

Magneson's remarks came at a technical session at NCC, titled "Communication Software for LANs."

The marketing manager stated that the local-area network market is fragmented, riddled with many vendors and has users so confused that they are reluctant to purchase products.

Magneson noted that the OSI lower level standards supply useful interconnection capabilities. However, because the upper levels are still undefined, there is little opportunity to integrate data on a network, according to Magneson. "The upper level layers do not effectively use network resources and permit limited data sharing," he noted.

A number of different net types

Despite vendor claims, there must be compatible equipment across the network for data to be effectively shared, according to Magneson. "When it was first proposed, many people thought that there would only be one type of network. Instead there will be a number of different types of networks," he predicted.

Wendall Turner, chief protocol architect at TRW, Inc., defined ISO networks as having a 1- to 10-mile diameter, being owned and operated by a single company, providing point-to-point communication and being self-contained.

Turner noted that physical connections between ISO model devices have been established, but how data moves through a network is unclear. "Whenever a user wants to run a session, the network should identify the resources that are needed and establish the data path," he said.

The protocol architect listed two methods of achieving this goal: One method would have a central server that would supply the names and addresses of each file.

"The problem with this approach is that there is no backup if the central server fails and data at the server has to be updated constantly," Turner stated.

A second method would work with a distributed design. A major problem with this type of design is that not every session would be able to respond to it, he said.

SNA

from page 8

trying to say with SNA is that we intend to use SNA as the main, but not only, vehicle for our set of communications products.

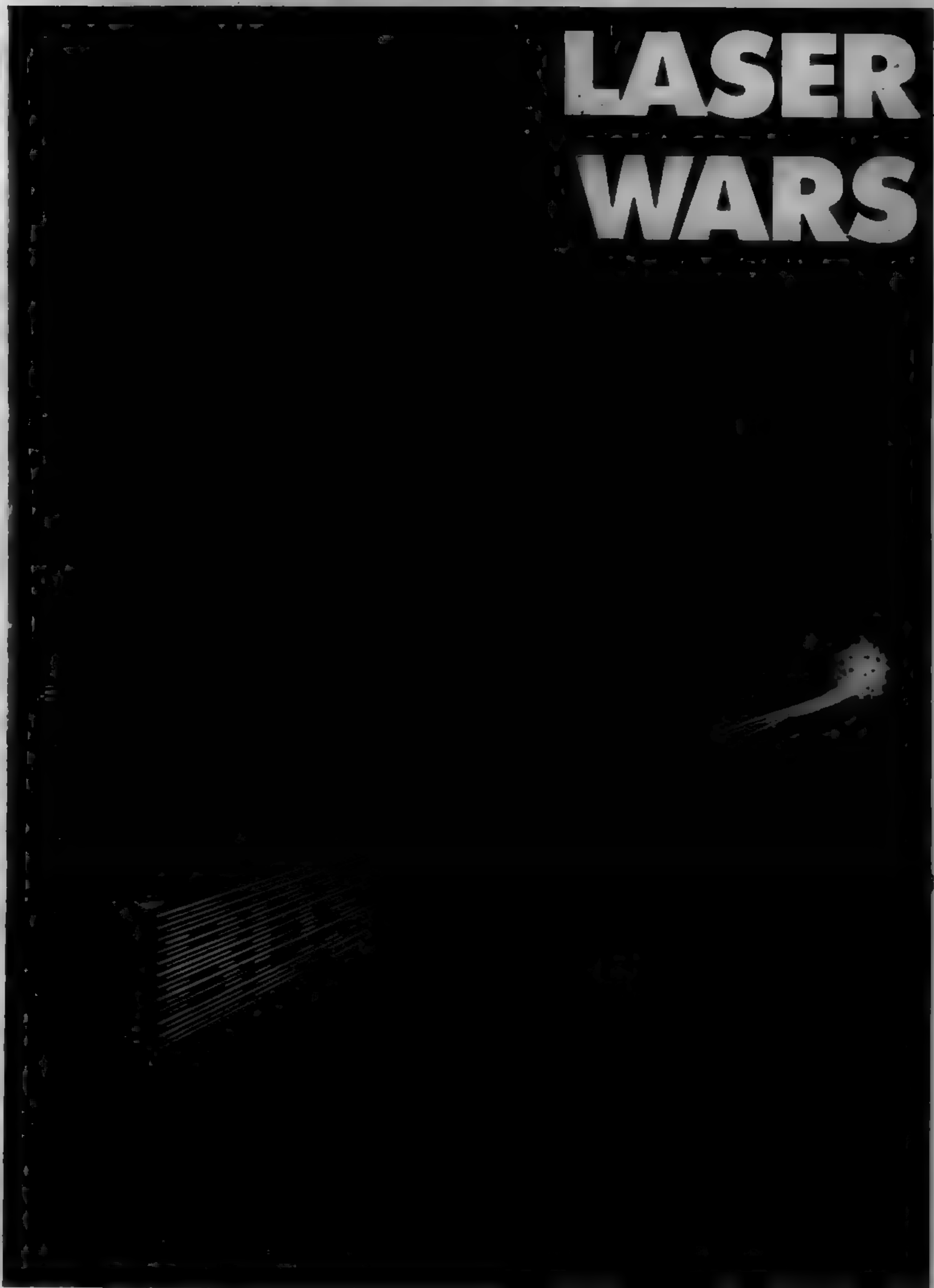
You said the chairman won't shoot product developers who don't embrace SNA. How does the process work?

Our job as architects is to try to anticipate the future needs of business and technology. As products near their announcement time, we have the opportunity to voice criticism of the product. If a product is to come out without SNA capability and the director of architecture thinks it should [support SNA], he would raise that to the executive in charge.

Turning from SNA, what are you involved with now as an IBM fellow?

As an IBM fellow, you have the opportunity to choose a project or projects of your liking and get a staff to assist you on it. I'm interested in high-speed communications. As you know today, telephone lines mostly communicate at 4.8K bit/sec., 9.6K bit/sec. or 56K bit/sec. In the U.S., Japan and some European countries, T1 speeds of 1.54M bit/sec. and 2.48M bit/sec. are starting to become prevelant.

In the future, when you begin to look at fibers, the numbers aren't one and two megabits; they're 100 and 200 megabits per second. . . . What in the world are we going to do with it and what does it do to our systems and what does it do the capabilities that computers can do for us? It is a fascinating business we are in, absolutely fascinating.



Alliant combines vector, scalar processing in releases

By Donna Raimondi
CW Staff

ACTON, Mass. — Alliant Computer Systems Corp. has launched two machines — an entry-level supercomputer and a superminicomputer — that combine both vector and scalar processing. The systems are geared toward the scientific and engineering fields.

The firm's FX/8 supercomputer is said to allow parallel processing, with up to eight processors working simultaneously on the same problem without programmer intervention. It is said to apply this parallel processing automatically to existing scientific and engineering software programs, including those that run on Digital Equipment Corp.'s VAX systems. The architecture bases the parallel processing control in dedicated hardware.

Each FX/8 CPU — which uses 8,000-gate Cmos gate arrays to implement a full scalar instruction set — also has an integrated vector instruction set, Institute of Electrical and Electronics Engineers, Inc. floating-point support, concurrency control and virtual memory management.

The company's FX/Fortran compiler is said to detect the potential for parallel and vector processing in standard Fortran programs. The C and Pascal languages are also supported by Alliant's Concentrix operating system.

The FX/8 — which costs from $270,000 to $1 million — starts with a base system that contains one CPU, 8M bytes of physical memory, one 64K-byte computational processor cache memory, one 32K-byte interactive processor cache memory, a 13-slot configurable Intel Corp. Multibus chassis, a 376M-byte Winchester-type disk, a tridensity start/stop tape drive, a 16-user Concentrix operating system license and an FX/Fortran license.

The system is reportedly expandable, without changes to existing software, to eight CPUs, which are called Computational Elements by the vendor; 12 I/O processors, called Interactive Processors by the vendor; 64M bytes of main memory; 128K bytes of I/O cache; and 128K bytes of cache memory.

In its highest expansion, the system is said to offer peak performance of 94 million floating-point operations per second (Mflops) or 35.6 million instructions per second. Running the Linpack benchmark from Argonne National Laboratories in full 64-bit precision, a fully configured FX/8 is said to deliver more than 12 times the performance of the DEC VAX 8600.

Concentrix, which is Alliant's implementation of the University of California at Berkeley 4.2 Unix operating system, is said to execute on the interactive processors while off-loading the computational complex for uninterrupted processing. The interactive processors handle all operating system tasks and device interrupts, freeing the computational complex for uninterrupted execution of compute-bound programs.

The system includes a diagnostic subset of Concentrix, called Diagnostix, which is said to support local and remote fault isolation and system configuration.

The Alliant FX/1 desk-high multiprocessing superminicomputer also incorporates vector processing, the company said. The system — which costs $132,000 — is said to be useful as a multiuser departmental system or as a computational server on a network of engineering workstations.

The FX/1 combines 8,000-gate Cmos gate arrays and vector processing to deliver peak performance of 11.8 Mflops. It includes a CPU to handle programs while the interactive processor executes user-intensive jobs, the operating system and all I/O, the vendor said.

The basic system includes one CPU, one I/O processor, 8M bytes of physical memory, a 32K-byte cache, a system floppy disk, a 67M-byte Winchester disk, a 5¼-in. cartridge tape drive, a six-slot Intel Multibus chassis, an 8-user Concentrix license and an FX/Fortran license. It can be expanded with an additional 8M bytes of main memory, one additional I/O processor and a full range of peripheral devices.

Both systems will be available in October.

Alliant is located at 42 Nagog Park, Acton, Mass. 01720.

Live Aid hunger fund profits from donated system's speed

By John Desmond
CW Staff

LONDON — The accountants for the Live Aid benefit concert for world hunger are being assisted in the quick collection of pledges — from some 180,000 donors in the UK — by a fourth-generation language and a Data General Corp. Eclipse MV/10000.

The computer system should allow the $5.5 million to $6.5 million in pledges in the UK to be charged to credit card accounts within a week, according to Bill Cadogan, region manager for Data General, Ltd. here. Estimates of worldwide pledges range up to $70 million from the 16-hour performance at John F. Kennedy Stadium in Philadelphia and Wembley Stadium in London.

According to Cadogan, the rapid processing will allow Live Aid to realize $350,000 in interest that would have been lost if collections had been processed manually.

Original projections were for 30,000 pledges. Cadogan said it would have taken 40 persons from three to five months to process that number manually. As it turned out, more than 180,000 pledges were received. "This place was a zoo," Cadogan said.

To process manually the number of pledges received would have taken well over a year.

The pledge processing program was written in three days using the Mephisto fourth-generation language from Interactive Computer Systems, Ltd. based here, Cadogan said. Just days before the daylong concert, he was approached about the computer processing by the accounting firm for the Band Aid Trust, which is overseeing fundraising from the Live Aid concert.

DG had 40 operators working the day of and the day after the concert to handle the pledges. Cadogan had four shifts of 70 persons each to wrap up the collections using an MV/10000 and an MV/8000. Each credit card company will be given a magnetic tape with a record of pledges charged to accounts.

DG donated the use of its equipment and its London office for the collections.

AP/WIDE WORLD PHOTO

Tina Turner and Mick Jagger join voices to help eliminate world hunger

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Encore seeks to get on supermini map with Multimax

By Tom Henkel
CW Staff

If the love of a challenge is the driving force behind the entrepreneur, Ken Fisher is in his glory.

Fisher's company, Encore Computer Corp., came to this month's National Computer Conference (NCC), with the sole intention of showing off its latest product: the Multimax, a superminicomputer based on a multimicroprocessor architecture that some industry observers believe will be widely incorporated in the next generation of scientific-oriented computer systems.

But the 10-CPU Multimax operating at the National Semiconductor Corp. booth, along with systems from other start-up vendors using National Semi's 32032 microprocessor, is more than another box on display for the hoards of NCC tire kickers. To Fisher, the system is vital to launching Encore and its product line from the ranks of start-up firms to the level of a real player in the highly competitive superminicomputer marketplace.

Even though Encore is currently singing the praises of its Multimax to anyone willing to listen, the product will not make its official debut — that is, complete with solid pricing and delivery dates — until the Federal Computer Conference in Washington, D.C., this fall. The company's presence at NCC, Fisher said, is an attempt to generate some interest in the Multimax CPU, the company's Hoststation line of workstations and its Ally software.

Fisher conceded that luring potential customers away from well-established supermini vendors such as his own former company, Prime Computer, Inc., will be difficult.

However, Fisher contended that the relatively new architecture employed by the Multimax and the highly scientific bent of Encore's target audience will help ease the economic and competitive obstacles.

"When I, and my associates, built Prime, we got it rolling in a recession," Fisher said, noting that there are always potential customers, regardless of the economic climate. In fact, Fisher said, a slow period in the market can sometimes be a benefit to a start-up firm because small firms do not have to sell large numbers of systems to turn a profit.

> ***'When I, and my associates, built Prime, we got it rolling in a recession.'***
>
> — Ken Fisher
> Encore Computer Corp.

But, Fisher said, the current downturn in computer sales is different from the 1974 recession during which Prime Computer was founded. This time, Fisher said, only the computer market is depressed. In 1974, the whole domestic economy was slow, consequently companies were freely spending money on computer systems believing that improving systems resources would generate a boost in corporate productivity.

"Everywhere I go I still find three-year backlogs," Fisher said, insisting that in spite of soft supermini sales during the past seven months, there are still potential customers who will jump at the chance to buy a system based on a relatively new architecture, such as the Multimax, if the company can prove the system offers better performance.

In fact, Fisher believes Encore will be able to convince enough users of the Multimax's performance advantages that the Wellesley, Mass., firm will be able to move a significant number of Multimax systems into the market in the next year.

Many of Encore's potential sales, however, may hinge on the firm's sealing a deal with Sperry Corp. to supply Multimax systems on an OEM basis. Encore and Sperry reached a tentative agreement whereby Sperry would have the option to buy up to 80% of Encore's first year's production of Multimax systems. Sperry's right to buy large numbers of Multimax systems would decrease in subsequent years.

But the tentative agreement has become snarled by details that are tying up its official signing. One of the details being debated is how many systems Sperry will buy on a volume basis.

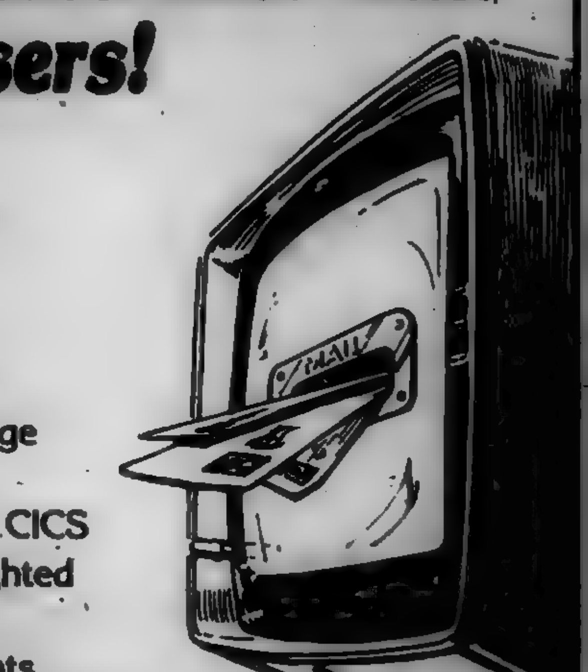
"Sperry is a way to get a fast start, but it is not our only hope," Fisher said. "We would value Sperry as a customer, but it's not a determining factor [in Encore's success]."

Info center meet planned

NASHVILLE — More than 65 sessions on information center-related topics, including strategic planning, resource management, training and staffing, will be featured at the Second Annual Information Center Conference and Exposition to be held at the Opryland Hotel here Aug. 18-22.

The conference is designed for people who plan and manage end-user computing, including information center managers, MIS directors and other corporate directors. Scheduled speakers will include Shaku Atre, president of Atre International Consultants, Inc., and Larry English, senior consultant with Performance Development Corp. Author and futurist David Pearce Snyder is slated to give the keynote address.

Conference registration is priced at $580. More information is available from the Conference Registrar, Information Center Conference, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.



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WEST COAST UPDATE/JEFFRY BEELER

SACRAMENTO, Calif. — The state legislature is studying a proposal that would strengthen the warranty protection available to Californians who buy or lease computer products.

A.B. 1507 would require California-based hardware and software vendors to furnish with each of their products an implied warranty of merchantability — their ability to sell — and an implied warranty of fitness for a specified application.

The legislation would thus prohibit all advertising disclaimers to which such warranties have traditionally been subject, according to Alma Martinez, assistant to Assemblywoman Gloria Molina, the bill's sponsor.

A.B. 1507 would also require all California-produced hardware and software products to be accompanied by an express warranty that makes vendor advertising claims legally binding, Martinez said.

The provision referring to express warranties applies only to written, not oral, advertising claims. "I wish the bill did cover statements that are made orally because that's where most of the problems are," Martinez said. "But oral statements by advertisers would be almost impossible to monitor."

Under the bill, if a computer product fails to perform as advertised, a user would have up to six months to notify formally the vendor of the merchandise's shortcomings. The customer would then have the right to return the allegedly defective product to its developer and to demand a full refund.

California's hardware and software suppliers flatly oppose the bill. Through the Association of Data Processing Service Organizations, Inc., the vendors this month issued a statement criticizing the legislation, charging that it unfairly tries to make them the sole guarantors of a product's effectiveness.

Users as well as developers should bear at least part of the responsibility for ensuring that installations succeed, the statement issued by Adapso said.

Having recently passed the California Assembly, A.B. 1507 now goes to the state Senate's Insurance Claims and Corporations Committee. If the bill wins approval there, it would then move to the full Senate floor, back to the Assembly for concurrence on any interim amendments and on to the governor, who would have to decide whether to sign it into law.

■

HAYWARD, Calif. — Is bankruptcy contagious? Sleuths at the Center for Disease Control in Atlanta would probably scoff at such a notion. But executives at Viasyn Corp. here are taking no chances.

In early July, shortly after relocating to new corporate headquarters, Viasyn conducted a mock exorcism to rid the building of any troubled spirits that might have been left behind by its previous occupant.

As the multiuser microcomputer company's work force watched with varying degrees of amusement, a local entertainer masquerading as a medieval wizard launched into an elaborate ghost-busting routine that ended with the ritual banishment of an imaginary evil spook nicknamed "Bad Bit."

Viasyn's tongue-in-cheek housewarming was nothing if not unconventional. On the other hand, the firm's newly occupied headquarters has an unusual, even unsettling, history. The building's former tenant was none other than Osborne Computer Corp., which pioneered the portable microcomputer business and then, with equal fanfare, filed for protection under Chapter 11 of the Federal Bankruptcy Act.

DEC registers first new chip

WASHINGTON, D.C. — Digital Equipment Corp. last week registered its Microvax II chip set with the U.S. Copyright Office, becoming the first vendor to file a new product under the Semiconductor Chip Protection Act of 1984.

The Microvax II microprocessor chip is also the first 32-bit chip to be registered. Along with its floating-point coprocessor, the chip was developed in about 20 months to drive the Microvax II supermicrocomputer [CW, July 15].

Approximately 20 chips, including those from leading vendors like Motorola, Inc. and Harris Corp., have been previously registered under the act, according to Daryl Hatano, manager of government affairs for the Semiconductor Industry Association.

Those products had been commercially available before the law took effect last November and thus are only partially protected.

Protected for 10 years

The Microvax II chip's specific pattern of layered metallic, insulating and semiconductor materials will be protected from reproduction by other vendors, including those based in Japan and the UK, for 10 years.

Previously registered computer chips may continue to be imported or distributed by other organizations for an additional two years in exchange for royalties.

The protective legislation, signed by President Reagan last October, created the first new category of registered property since the Trademark Protection Bill of 1870. Lobbyists for the semiconductor industry had argued that, because of their unique nature, chips did not receive adequate protection under then-existing copyright and patent laws.

FCC to ease limits?

WASHINGTON, D.C. — The Federal Communications Commission last week proposed to relax existing structural separation requirements barring the seven regional holding companies and AT&T from combining computer-enhanced services to underlying communications offerings.

In opening a Third Computer Inquiry, the FCC is proposing to permit services like protocol conversion, co-location of computer processing equipment with transmission facilities and the provision of an integrated services digital network.

The Third Computer Inquiry, according to the FCC, will decide such questions as whether the divested Bell operating companies can provide data communications services and whether AT&T can offer an unregulated protocol conversion service.

ISDN

from page 1

bit/sec. link that is divided into two 64K bit/sec. channels for voice/data transmission and one 16K bit/sec. channel for signaling and low-speed data transmission.

To support interface if market need exists

Dick Snowden, director of service concepts for AT&T Communications, said, "We are prepared to support the basic interface if we find a market need for it. It is not something we see much of a need for."

Snowden added that he expects to see the divested Bell operating companies implement both the Basic Access and Primary Rate interfaces over time.

New York Telephone spokesman John Quinn said the company's test would begin in the laboratory in the first quarter of 1986 and would be extended to a field test at a later date.

Wallace is a staff writer with On Communications *magazine.*

Courses out for IBM systems

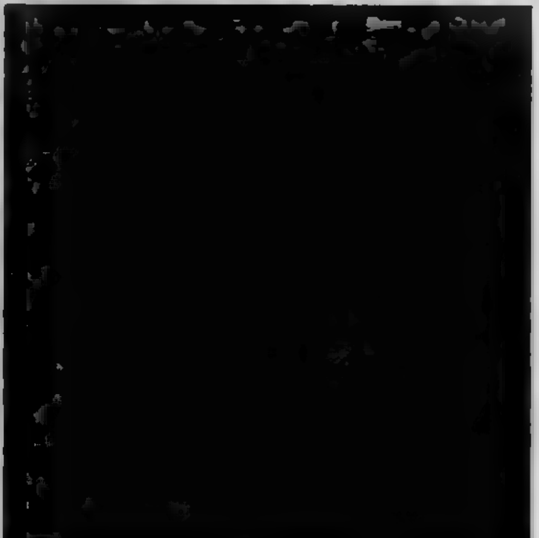
ARLINGTON HEIGHTS, Ill. — Advanced Systems, Inc. has introduced four computer-based training courses, two for the IBM Personal Computer and two for use on IBM mainframes. It has also introduced two management courses, which are presented on videotape.

Two of the computer-based training courses, MVS/XA: Basic JCL and MVS/XA: Production JCL, reportedly are for use on the user's IBM Personal Computer attached to a laser disk player, which is not included. The video portions of the course are recorded on the laser disk, which interacts with the software on the Personal Computer to provide the instructional program. The basic JCL course reportedly defines the role of JCL in job processing, among other features. The Production JCL course outlines advanced JCL techniques.

Another of the new computer-based courses is Xedit For New Users, which reportedly teaches Xedit commands needed to create a file and modify data. It runs under all IBM mainframe operating systems.

The IDMS/R Education Series and Reference Library, a 26-unit series of videotape lessons, was reportedly designed for data base administrators and information processing professionals. The courses reportedly teach the concepts of data base design and the Automatic System Facility of IBM's IDMS/R, among other topics. They are offered on ½-in. videotape and in ¾-in. tape. The MVS/XA: Basic JCL and MVS/XA: Production JCL courses are licensed beginning at $90/mo per module. The Xedit for New Users course is priced from $800 for a 3-mo license to $4,000 for a perpetual license. Modules in the IDMS/R Education Series and Reference Library are priced beginning at $50/mo.

Advanced Systems is located at 155 E. Algonquin Road, Arlington Heights, Ill. 60005.



Oregon VDT legislation vetoed

Governor cites existing means to ensure safety

By Maura McEnaney
CW Staff

SALEM, Ore. — The progress of VDT legislation in this state came to a grinding halt recently after Gov. Victor Atiyeh (R-Ore.) vetoed a bill establishing guidelines for the purchase and use of VDTs here.

In a July 12 letter vetoing the bill — which passed the Oregon Senate just one vote short of unanimous and later cleared the House of Representatives by a 31:28 vote [CW, June 24] — Atiyeh reiterated his long-held position on the issue.

Atiyeh said that while no safety and health risks have been connected to VDT use, "state government already has in place a means to monitor work sites and health and to enforce compliance when specific hazards are identified."

Legislation's requirements

The Oregon VDT legislation called for the development of purchasing specifications for VDTs and workstations for inclusion in bid proposals issued by public agencies.

The bill required the director of the state's Worker's Compensation Department to set up ergonomic guidelines for VDT users working at terminals more than four hours a day.

It also required the establishment of an education and consulting program about VDT health and safety issues.

Committee examined VDT safety

During the last biennial legislative session, the state established a committee to examine safety issues surrounding VDTs in the workplace.

That committee, made up of people both in support of and opposed to VDT legislation, recommended that the state introduce legislation addressing the ergonomics of VDT use, according to Chuck Mendenhall, government relations director for the Service Employees International Union (SEIU) Local 503.

The SEIU has been a proponent of VDT legislation throughout the country this year.

When the Oregon VDT legislation attracted national attention, heavy lobbying efforts got under way to kill the bill, Mendenhall said.

In June, the margin of approval was reduced in the House of Representatives on a vote of 31:28. Much of the lobbying effort came from the governor's own Washington County, Mendenhall said, and soon, "The governor was convinced that he would be the bottom line for the legislation."

Requiring safety and health guidelines as well as purchasing specifications for VDTs "only creates obstacles to a flexible enforcement policy which should be directed toward the greatest needs," according to the governor.

Issco revamps graphics aids for 32-bit units

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — Integrated Software Systems Corp. (Issco), whose graphics programs have traditionally operated only on medium- and large-scale mainframes, is now reportedly making its full product line available on selected 32-bit workstations.

As part of an effort to broaden its target market, Issco has adapted its existing Tell-A-Graf, Tellaplan and Disspla software offerings to run on the Digital Equipment Corp. Microvax II. The programs also reportedly work with the Hewlett-Packard Co. HP 9000 and its Apollo Computer, Inc. rival.

Although all three packages can now reside on a single-user system, Issco claimed they provide the same functions as their mainframe-based counterparts. In addition, the workstation-resident products sell for less than one-tenth of what they would cost on a large-scale VAX machine, according to Issco's newly appointed president, Meldon Gafner.

Coupled with a 32-bit processor, the company maintained that the programs will allow users to create graphics locally, dump the results temporarily to a low-cost printer and later make any necessary revisions. Using the established communications links between, for example, a Microvax II and full-scale VAX system, users can upload the finished graphs to a central mainframe and take advantage of its shared, high-quality output devices, Gafner said.

In quantities of one to nine, the workstation versions of Issco's Tell-A-Graf business graphics package, Disspla technical graphics system and Tellaplan project management products are available immediately for a one-time fee of $3,600 per module. Each product also entails an annual renewal fee ranging from $288 to $3,600 per package.

Issco is headquartered at 10505 Sorrento Valley Road, San Diego, Calif. 92121.

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Conference attendees eye optical disk technology

By James Connolly
CW Staff

CHICAGO — Optical disk storage was the hot technology, the products in demand were networks and the key issues centered on personal computer management.

Those were some of the points made by attendees at the recent National Computer Conference (NCC) here in conjunction with a *Computerworld* sampling of opinions. Questionnaires distributed at NCC and returned by conference attendees also revealed the following:

- The primary purpose for attending NCC was to learn about new technologies, followed distantly by equipment shopping and job hunting.
- More than half of the attendees representing user organizations said they plan to acquire mainframes or superminis in the next year.
- Interests in software focused on data base management and artificial intelligence, including expert systems applications.
- Attendees were split on whether the economy has impacted their hardware acquisition plans, citing more negative than positive results, but they felt strongly that software acquisition was unaffected by a national economy that they said will improve in the next year.
- Microcomputer acquisition was almost evenly divided among MIS/DP and end-user departments, with MIS/DP holding the slight edge in authorizing microcomputer purchases:

> *'It seems that optical disks would be superb for sending out data bases to our clients.'*
>
> — Bryan Kocher
> Digital Research, Inc./McGraw Hill, Inc.

- Dealing directly with the manufacturer is the preferred method of acquiring microcomputer software, as cited by twice the respondents than those who chose the second favorite source, retail stores.
- The preferred sources for system maintenance are vendors, followed by in-house and third-party maintenance firms.
- Most respondents have forsaken name-brand microcomputer software in favor of low-cost alternatives, while emphasizing the need for the alternatives to be reliable.
- Attendees feel software piracy is an overblown issue.

Optical disk storage systems and media were most commonly cited when attendees — including DP managers, computer users, vendors and consultants — listed the products and technologies that they wanted addressed in NCC technical sessions or displayed on the show floor.

"I think there was an adequate amount of technical information available regarding optical storage. Optical is pretty much coming out from under the covers," observed Bryan Kocher, a manager with Digital Research, Inc./McGraw Hill, Inc. of Lexington, Mass.

Kocher, who is exploring the possibility of moving Digital Reseach's economic data base to optical disk for use by existing time-sharing customers on personal computers, said that NCC '85 featured more optical media vendors than NCC '84 and that prices have dropped, in one case from $800 to $350 per 12-in. disk. He noted that at least one NCC exhibitor plans delivery of erasable 3½-in. disks within a year.

"It seems that optical disks would be superb for sending out data bases to our clients. We could put the data on at a central site and put the disks in express bags for overnight delivery," he added.

John R. Pearson of the State of Illinois Information Resource Management Office said of his interests, "Video/laser disks. There are no other new products or technologies."

Several attendees who expressed interest in optical storage also mentioned local-area networks for personal computers and laser printers.

A quarter of the respondents said they were looking at networking or personal computer communications solutions, while several more listed micro-mainframe links as their key interests.

Europe's micro purchases jump 57% in first half of 1985

By Clinton Wilder
CW Staff

The volume of microcomputers purchased by Western European users grew 57% in the first half of 1985, according to Intelligent Electronics Europe (IEE), a Paris-based market research firm.

In presenting its latest market figures and predictions, analysts from the 3-year-old firm contrasted the continued strong growth of the European market to flagging U.S. demand in the last year. "In Europe, we've been bombarded with news of the personal computer shakeout," IEE analyst Gordon Curran said. "But we can assure you that the European market is alive and well."

Curran predicted that the total sales of personal computers in Western Europe would increase from $2.9 billion in 1984 to $4.5 billion this year. He said four nations accounted for three-quarters of the sales in 1984, with British users buying 24% of the micros sold; West German users, 23%; French users, 17%; and Italian users, 10%.

The outlook through the end of the decade in Europe continues to be encouraging, according to IEE. The firm's projections show the current installed base of nearly 3 billion units growing steadily to 11.9 billion units by 1990.

The European market's relative infancy accounts for the growth potential, IEE analyst Brigitte Morel said: Less than 5% of Western Europe's white-collar work force currently use micros, but Morel predicted a 22% penetration rate by 1990.

Small business market share

Small businesses accounted for 37% of European micro sales in 1984, falling just short of the 39% share of the market held by large corporations. Morel said the vast number of shopkeepers and artisans on the continent represent vast growth potential in the single-unit, small business market sector.

"There are 50 million small shopkeepers in Europe, and these are people with a great need for help and assistance from computers," Morel said. She said such demand would be especially evident in less industrialized nations such as Spain and Greece. In Spain, IEE predicted shipments would nearly double this year from the 26,000 units purchased in 1984.

In IEE's vendor breakdown, the IBM Personal Computer continues to gain market share for Big Blue. IEE said IBM's domination will jump from 1984's 28% to a 36% market share this year. The firm predicted Italian vendor Ing. C. Olivetti & Co. will displace Apple Computer, Inc. for the No. 2 spot in 1985, its second year in the market.

"The strength of Olivetti's partnership with AT&T has helped them," Curran said. "And their growth is a good reflection of the strength of the market, because almost all of their sales are to new customers," he added.

Troubled Apple will see its share drop from 17% to 10% this year, IEE predicted. Although Apple continues to lead in the French market, Morel said, the firm has been badly hurt overall by the uncertain positioning of the Macintosh. "The price of the Macintosh has put it out of reach [for] many private users . . . and is clearly not accepted by medium- to large-size companies because of its incompatibility and lack of communications features," she said.

In micro software, Morel said, native firms in several non-English-speaking countries dominate the word processing market, but U.S. leaders such as Lotus Development Corp. and Ashton-Tate have maintained their stranglehold on other applications. Only three small European vendors sell data base management programs, for example, and no European vendor has a significant presence in spreadsheet or integrated packages.

Chip vendor representatives wield claims at NCC session

By Tom Henkel
CW Staff

CHICAGO — "My chip is better than your chip," was the thrust of a highly marketing-oriented session on up-and-coming microprocessors at the National Computer Conference this month.

Each of four panelists — representing National Semiconductor Corp., Zilog, Inc., AT&T and Motorola, Inc. — promised that firm is committed to providing the highest performance microprocessor on the market, and each either flatly stated or strongly implied that his microprocessor was better than that of his competitors.

Session leader Richard Mateosian, representing National Semi, set the tone for the session when, in presenting details of National Semi's 32332 microprocessor, he used several charts that claimed the 32332 was 1.06 times faster than Motorola's just-released 68020. Mateosian said the 32332 would be shipped to sample customers in December.

Clara L. Serrano, the panelist representing Motorola, disagreed with Mateosian's performance claims and said Motorola could produce similar charts that indicate the 68020 is faster than the 32332. She added that she did not come to the session with specific information comparing the 68020 with other vendors' microprocessors.

Serrano, in giving a general overview of the 68020, said the microprocessor offers at least four times the performance of the older 68000. She claimed the 68020 offers performance of roughly 2 to 3 million instructions persecond (Mips). She also pointed out that the 12-MHz version of the 68020 is available in volume quantities now and that the chip has already been shipped.

Benjamin Ng, one of the microprocessor architects at AT&T, presented details of that company's 32100 chip set. Ng said the CPU in the 32100 chip set offers roughly the same internal performance as the 68020, in the the 2- to 3-Mips range. He said the CPU is immediately available.

In presenting details of Zilog's Z80000 microprocessor, company representative Robert Anderson said that microprocessor will offer performance ranging from 1.1 Mips for a 10-MHz version to 4.7 Mips for the top-end, 25-MHz model. Anderson said sample quantities of the Z80000 will be available in the fourth quarter.

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The ORACLE relational database management system is fully compatible with IBM's SQL/DS and DB2. SQL/DS and DB2 represent IBM's latest generation of database management technology for IBM's largest computers. ORACLE's capabilities and user interface - the SQL language - are identical to those of SQL/DS and DB2. Programs written for SQL/DS and DB2 will run unmodified on ORACLE.

PORTABILITY

SQL/DS and DB2 run only on IBM mainframes; ORACLE runs on IBM mainframes, DEC, DG, AT&T, HP, STRATUS, and several other manufacturers' minicomputers, and on a wide range of microcomputers including the IBM PC/XT and PC/AT. All versions of ORACLE are identical and include a complete implementation of SQL – not a subset.

CONNECTABILITY

Having the same software running on your mainframe, minis, and micros greatly simplifies the task of connecting your machines into a network. ORACLE's network software allows microcomputer users to directly access data stored in the shared database on the mainframe or minicomputer, or copy that data into the database on their micros and operate independently.

Oracle introduced the first relational DBMS and the first implementation of SQL back in 1979. Today, eight of the ten largest U.S. companies use ORACLE. In fact, INC MAGAZINE ranks Oracle as the fastest-growing software company in the USA. Surprised? Don't be. ORACLE is the number one relational DBMS, with thousands of installations on IBM mainframes, DEC, DG, AT&T, HP, STRATUS and most other vendors' minis and micros. Even the IBM PC.

To attend the next free, half-day seminar in your area or receive additional information, write Oracle Corp., Dept. C4, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350. Following is the ORACLE seminar schedule:

ORACLE Seminar Schedule

Albany	Sept 19
Albuquerque	Sept 19
Anchorage	Aug 29
Atlanta	Jul 25, Sept 18
Austin	Aug 6
Boise	Jul 30
Boston	Jul 16, Aug 14, Sept 17
Chicago	Jul 17, Sept 19
Cincinnati	Sept 10
Cleveland	Aug 6
Dallas	Jul 16, Aug 8, Sept 11
Denver	Jul 18, Aug 13, Sept 19
Detroit	Jul 23, Aug 20, Sept 24
Greensboro	Aug 1
Houston	Jul 30, Aug 28, Sept 24
Huntsville	Jul 31
Indianapolis	Sept 17
Kansas City	Sept 12
Los Angeles	Jul 25, Aug 27, Sept 26
Minneapolis	Aug 1
New Orleans	Aug 13
New York City	Jul 31, Aug 14, 28, Sept 11, 26
Newport Beach	Aug 14, Sept 17
Oklahoma City	Sept 17
Omaha	Aug 7
Orlando	Jul 17
Philadelphia	Jul 18, Sept 18
Phoenix	Aug 6
Portland	Aug 6
Rochester	Jul 23
Sacramento	Aug 8
St. Louis	Aug 8
Salt Lake City	Jul 16, Sept 24
San Diego	Sept 10
San Francisco	Aug 1, Sept 5
San Jose	July 25, Aug 15, Sept 26
Tulsa	Aug 15
Washington	Jul 25, Aug 8, Sept 12, 26

Chicago: 312/726-1167 **San Francisco: 415/541-9400** **Washington: 301/951-9190**

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WORLD DIGEST

CW International News Network

TOKYO — At a recent press conference here, Fujitsu Ltd. announced that future production and development of its microcomputer systems will be converted from Digital Research, Inc.'s CP/M to Microsoft Corp.'s MS/DOS operating system. Fujitsu's line of 16-bit personal computers will continue to use the Intel Corp. 8086, 80186 and 80286 microprocessors but will now run MS/DOS Version 3.1 and compatible software. Fujitsu has also announced plans to incorporate Microsoft's Xenix on some hard-disk models in order to support environmental applications development.

DARMSTADT, West Germany — At a recent conference here, more than 300 members of Computer Professionals for Peace and Social Responsibility met to discuss the U.S.-planned Strategic Defense Initiative (SDI) and to propose resistance, much like their counterpart organization in the U.S., Computer Professionals for Social Responsibility in Palo Alto, Calif.

In a letter to West German Chancellor Helmut Kohl, the computer professionals explained that the security required for the SDI project could not be positively attained due to the magnitude and intended purpose of the project. The professionals, gathered from several European countries, also claimed that the drain on brain power and financial resources for SDI could not be justified.

MUNICH, West Germany — Members of the Open Unix Group — Groupe Bull, ICL Co., Nixdorf AG, Ing. C. Olivetti & Co., N. V. Philips and Siemens AG — who recently chose AT&T's Unix as the European Standard programming language, have summarized their efforts at standardizing Unix in a "Portability Guide," which should be available in September.

The reference work is based on AT&T's System V Interface Definition and will incorporate all the work the group has done since their founding in November 1984. The report will provide the suggested guidelines for future software development. Along with such problems as a common Unix floppy disk format, the group has tackled some problems typically not encountered in the U.S., such as the language — Unix is documented in English and the character set used is English.

STUTTGART, West Germany — IBM Deutschland GmbH here announced a major reorganization of its marketing sales divisions. Two areas that had been divided since 1981, Information Systems/Projects and Information Systems/Applications, have been rejoined; all dealer activities have been incorporated into the Dealer Marketing & Sales division; and there are now only five regional directors for West Germany — in Hamburg, Dusseldorf, Frankfurt, Stuttgart and Munich.

The reasoning behind this, IBM said, was to shorten the decision-making and reporting process. Industry insiders say that the measures reflect developments in the U.S., where the Personal Computer divisions, operating in the red, are being integrated into the rest of IBM — and kept on a shorter corporate leash.

SYDNEY, Australia — Repeat business, continuing for 15 years, has finally accumulated in an order worth $25.5 million for ICL Australia Ltd. The contract, signed by Woolworths Ltd., is for the supply of seven of ICL's Series 39 mainframes, formally released here two weeks ago, plus 150 supermarket scanning systems. It follows an initial order by Woolworth's last April for 50 of the same systems to be used in pilot sites. Woolworth's has been an ICL user since 1970.

CALENDAR

WEEK OF AUGUST 25

AUGUST 25-30, DALLAS — **Systems Development: Design Phase.** Contact: Arthur Young & Co., Arthur Young Education Center, 1950 Roland Clarke Place, Reston, Va. 22091.

AUGUST 26, NEW YORK — **CICS/VS Application Programming — Command Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 26-30 in Atlanta and Aug. 28 in New York.

AUGUST 26-27, DALLAS — **The Information Center.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

AUGUST 26-27, ARLINGTON, VA. — **Networking the IBM Personal Computer.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 28-29 in Hasbrouck Heights, N.J.

AUGUST 26-27, SAN ANTONIO — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 26-27, ST. LOUIS — **Unix/Xenix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 28-29 in Philadelphia.

AUGUST 26-28, CHICAGO — **Audit and Control within IBM's VM Operating System.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

AUGUST 26-28, CHICAGO — **IBM's SNA: Security and Audit Concerns.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

AUGUST 26-28, CHICAGO — **Testing Computer Software.** Contact: U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

AUGUST 26-28, HARTFORD, CONN. — **Office Automation.** Contact: The Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 26-28, LONG ISLAND, N.Y. — **PBX/CBX.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 26-28, MEMPHIS — **Data Communications Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 26-28, MONTREAL — **Local-Area Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 26-28, NEW YORK — **The IBM Personal Computer.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

AUGUST 26-28, SAN DIEGO — **The IBM Personal Computer.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held in Cherry Hill, N.J.

AUGUST 26-28, PARSIPPANY, N.J. — **Vsam in Cobol.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

AUGUST 26-29, DENVER — **CICS/VS Application Design.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 27 and 29 in New York.

AUGUST 26-29, FORT LEE, N.J. — **IMS/DB (DL/1) Application Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 26-29, FORT LEE, N.J. — **Vsam: Its Structure and How to Use It.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held in Los Angeles.

AUGUST 26-29, NORFOLK, VA. — **Using Microcomputers in Government.** Contact: U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

AUGUST 26-29, SAN FRANCISCO — **Integrated Information Technology Conference and Exposition.** Contact: Jill Nieman, National Trade Productions, Inc., 2111 Eisenhower Ave., Alexandria, Va. 22314.

AUGUST 26-30, HOUSTON — **Analysts' Skills Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

AUGUST 26-30, LOS ANGELES — **CICS Application Programming — Macro Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 27-29, HOUSTON — **SAS Basics Course.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 27-29, CARY, N.C. — **SAS Applied Time Series Analysis and Forecasting Course.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 28-29, SAN ANTONIO — **Recovery/Restart.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 5-6 in Fort Lee and Chicago.

WEEK OF SEPTEMBER 1

SEPTEMBER 3, NEW YORK — **VSAM: Its Structure and How to Use It.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 5, 10 and 12 in New York.

SEPTEMBER 3-4, CHICAGO — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 3-4 in Fort Lee.

SEPTEMBER 3-6, ATLANTA — **Vtam: From Start to Finish.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 3-6 in Denver.

SEPTEMBER 3-6, FORT LEE, N.J. — **IMS/Data Communications Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 3-6, SAN ANTONIO — **CICS/VS Logic and Debugging.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 3-6 in Fort Lee.

SEPTEMBER 4, NEW YORK — **CICS/VS Application Programming — Macro Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 6, 9, 11 and 13 in New York and Sept. 9-13 in San Antonio.

SEPTEMBER 4-6, LOS ANGELES — **Information Systems Architecture.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

SEPTEMBER 5-7, SAN FRANCISCO — **Third Personal Computer Faire.** Contact: Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

WEEK OF SEPTEMBER 8

SEPTEMBER 8-11, CAMBRIDGE, MASS. — **1985 Society of Manufacturing Engineers (SME) World Congress on the Human Aspects of Automation.** Contact: SME, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

SEPTEMBER 8-12, BOSTON — **Managing the Explosion: End-User Computing and Emerging Technologies.** Contact: Kimberly Gandia, Society for Information Management, Suite 600, 111 East Wacker Drive, Chicago, Ill. 60601.

SEPTEMBER 9-10, ATLANTA **Principles of Prototyping.** Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

SEPTEMBER 9-11, VANCOUVER, B.C. — **International Communications and Computer Exhibition.** Contact: Tracon Exhibitions, 202-535 W. 10th Ave., Vancouver, B.C., Canada V5Z 1K9.

SEPTEMBER 9-11, WASHINGTON, D.C. — **Federal Computer Conference.** Contact: Federal Computer Conference, P.O. Box N, Wayland, Mass. 01778.

SEPTEMBER 9-11, WASHINGTON, D.C. — **The Data Entry Management Association's (Dema) Ninth Annual Data Entry Management Conference & Exhibition.** Contact: Marilyn S. Bodek, Dema, P.O. Box 16711, Stamford, Conn. 06905.

SAS Institute Inc. Announces

Lattice C Compilers for Your IBM Mainframe

Two years ago...

SAS Institute launched an effort to develop a subset of the SAS® Software System for the IBM Personal Computer. After careful study, we agreed that C was the programming language of choice. And that the Lattice® C compiler offered the quality, speed, and efficiency we needed.

One year ago...

Development had progressed so well that we expanded our efforts to include the entire SAS System on a PC, written in C. And to insure that the language, syntax, and commands would be identical across all operating systems, we decided that all future versions of the SAS System—regardless of hardware—would be derived from the same source code written in C. That meant that we needed a C compiler for IBM 370 mainframes. And it had to be good, since all our software products would depend on it.

So we approached Lattice, Inc. and asked if we could implement a version of the Lattice C compiler for IBM mainframes. With Lattice, Inc.'s agreement, development began and progressed rapidly.

Today...

Our efforts are complete—we have a first-rate IBM 370 C compiler. And we are pleased to offer this development tool to you. Now you can write in a single language that is source code compatible with your IBM mainframe and your IBM PC. We have faithfully implemented not only the language, but also the supporting library and environment.

Features of the Lattice C compiler for the 370 include:

- **Generation of reentrant object code.** Reentrancy allows many users to share the same code. Reentrancy is not an easy feature to achieve on the 370, especially if you use non-constant external variables, but we did it.
- **Optimization of the generated code.** We know the 370 instruction set and the various 370 operating environments. We have over 100 years of assembler language systems experience in our development staff.
- **Generated code executable in both 24-bit and 31-bit addressing modes.** You can run compiled programs above 16 megabytes in MVS/XA.
- **Generated code identical for OS and CMS operating systems.** You can move modules between MVS and CMS without even recompiling.
- **Complete libraries.** We have implemented all the library routines described by Kernighan and Ritchie (the informal C standard), and all the library routines supported by Lattice (except operating system dependent routines), plus extensions for dealing with 370 operating environments directly. Especially significant is our byte-addressable Unix®-style I/O access method.
- **Built-in functions.** Many of the traditional string handling functions are available as built-in functions, generating in-line machine code rather than function calls. Your call to move a string can result in just one MVC instruction rather than a function call and a loop.

In addition to mainframe software development, you can also use our new cross-compiler to develop PC software on your IBM mainframe. With our cross-compiler, you can compile Lattice C programs on your mainframe and generate object code ready to download to your PC.

With the cross-compiler, we also offer PLINK86™ and PLIB86™ by Phoenix Software Associates Ltd. The Phoenix link-editor and library management facility can bind several compiled programs on the mainframe and download immediately executable modules to your PC.

Tomorrow...

We believe that the C language offers the SAS System the path to true portability and maintainability. And we believe that other companies will make similar strategic decisions about C. Already, C is taught in most college computer science curriculums, and is replacing older languages in many. And almost every computer introduced to the market now has a C compiler.

C, the language of choice...

C supports structured programming with superior control features for conditionals, iteration, and case selection. C is good for data structures, with its elegant implementation of structures and pointers. C is conducive to portable coding. It is simple to adjust for the size differences of data elements on different machines.

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The competition...

If you would like to compare, the other vendors of 370 C compilers are: AT&T, Whitesmiths, Ltd., WATCOM Products Inc. (CMS only), Oracle Corp., Amdahl Corp. (UTS only), and IBM Corp. (VM/IX only). We think you will choose the Lattice C compiler from SAS Institute.

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EDITORIAL

The rollover in retrospect

Statistics and surveys are wonderful things. Datapro Reserach Corp.'s most recent statistical effort, for instance, produced some numbers that may help to shed light on what has been happening to hardware manufacturers' own numbers.

Each year for the past six years Datapro has canvassed the user community, and each year around National Computer Conference time, *Computerworld* has published charts and a story about Datapro's results.

And each year the headlines and stories recount user satisfaction with their systems. Despite the occasional piece of bad news, the numbers tend to confirm a long history of user satisfaction with their hardware systems.

But this year Datapro's statistical picture is significantly different in one key aspect. Although a clear majority of users surveyed continued to express satisfaction with their systems and had no reservations about recommending their systems to prospective buyers, one row of Datapro numbers changed dramatically. This, in turn, changed the story and changed the headlines. The row in question contained the average-age-of-system numbers and showed that the majority of respondents had obtained their systems during the past year.

The year 1984 appears to have been a very active one for Datapro's respondents — busy with trading, buying and upgrading of their systems. Of the more than 900 systems managed by the Datapro sample, the average system age was 9¼ months. A year earlier, the Datapro average-age-of-system row had shown that of 1,000 systems reported in the survey, the average age was more than 3 years.

Besides indicating that there was a widespread rollover in mainframe hardware last year, what else did the Datapro survey reveal?

- Systems overwhelmingly met user expectations. This indicates that the purchasers were generally well informed about their systems' capabilities, and the systems lived up to the sales departments' representations.
- Outright purchase was the preferred acquisition method.
- Respondents were generally willing to recommend their vendors' systems to others. The one dip below the 90th percentile occurred in the anonymous "other" column.
- The respondents, on the average, indicated that their systems performed well — not excellently, not poorly, but well.

How does all this stack up against previous years? About the same. There should be no great surprises involved in using mainframe systems, and the respondents indicated that there were none for them.

When combined with the fact that these appear to be new systems under review, the similarity of this year's responses with those of previous years, covering older systems, indicates that mainframe vendors have achieved a consistency of product quality. A good mechanic makes a good machine. The surveys show that user satisfaction decreases as system life cycles come to an end, but users' attitudes toward the vendors have remained consistent even as the systems changed with time.

One question remains, however. Is the massive rollover in systems that occurred in 1984 a cyclical phenomenon? The numbers for previous years back to 1980 revealed no similar pattern, but those years saw businesses in the U.S. emerge from a major recession. We'll just have to wait until the current systems are 3 years old. The year 1987 may be another boom year for the computer industry.

LETTERS

Copy protection seen as nuisance

The passing of Visicalc [CW, June 17] alerts us to the inherent hazard of copy-protected software: If my program diskette becomes unreadable, where do I go?

Whatever software I depend upon, I must be able to use it indefinitely in my own machine, without reliance on a vendor that may charge any price at any time or may cease to exist. Therefore, I treat my store-bought original software diskettes like photographic negatives — I only run from "prints."

Sometimes this requires a "copy-cracker" to circumvent vendor copy-protection schemes. I think this nonpiracy use of copiers is justified, but it is a big nuisance.

Copy protection is an expression of pernicious greed by vendors. I have no doubt that some software marketers would love to encrypt our very eyeballs and charge a pound of flesh royalty for every instance of use of their precious code. It needn't be this way. We can stop this nonsense if we all boycott copy-protected software.

Peter F. [illegible]
Golden, Colo.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or fewer. Letters may be edited for the purposes of clarity and brevity. Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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VIEWPOINT

Customer satisfaction in the data business

THE DATA CENTER
John P. Murray

How many data center managers are really concerned about the perception of the value of their operations to their client community? Of those who do have such a concern, how many are actively engaged in measuring and improving their data center service levels?

I suspect the answer to the first question is "many." I suspect the answer to the second question may well be, "not very many." A number of data center managers seem to feel that if the phone is not ringing madly with complaints from clients, everything must be going fairly well. In fact, it may be that the clients have become so frustrated they simply no longer bother to complain about poor data center service. You can be certain, however, they are complaining to someone.

The data center, like it or not, is a service business. The continued good will and support of clients — its users — are key to both the acceptance of the data center effort and the career progression of the management team. Because the data center manager ultimately stands to gain or lose more than anyone else in the handling of this issue, the climate relative to the clients should be of paramount interest.

Some have taken steps to gauge clients' opinions of the data center service level. Some have used surveys designed to gather various types of data about the different aspects of the center's function. That data is then used to judge how well data center managers are doing and to identify those areas that may require additional attention to improve the overall service level.

Data base of survey results

Building a data base of survey results provides a means of developing trends that can highlight those areas that may be improving or deteriorating. Using that information can assist in building strategies that will effect improvements. It can also be used to refute arguments about the decline in service levels if such is not, in fact, the case.

So, the use of these surveys does help. The problem is that the process of sending out a data center survey to clients only can be rather one-dimensional. This is because these surveys only usually ask the clients to rate the current level of service from their particular perspective and are based on a narrow range of issues — these questionnaires often contain fewer than 20 questions.

Although a well-designed survey, even of this limited size, can provide significant information about the preceptions of the clients, they do have several faults when you think about it. In addition to asking specific questions, these surveys attempt to elicit only cursory information about additional changes or improvements clients would like to see. They usually do not provide any way to determine the perceptions of those who work in the data center relative to their view of the service level.

At least one organization has developed a method that can be used to provide a much more comprehensive approach both to judging and increasing client satisfaction levels. I became aware of this approach when I saw a presentation by Richard Mathews, president of Mathews & Co.

Improved communication between MIS, clients

It was Mathews' contention that use of his system establishes improved communication between MIS and its clients. He also stated that use of the process will assure increased quality of the MIS product. In fact, he maintained that his company "does not know of a single case where our system failed to improve dramatically [information systems] service to customers while producing significant savings in time and dollars."

There are two aspects of this system that set it apart and probably make it more effective than the "roll your own" survey many currently conduct. First, it is a comprehensive survey, consisting of more than 90 questions, conducted by a third party who can bring objectivity to the task. It also provides the basis for matching the results of the survey against the Mathews & Co. composite data base of other organizations it serves. This helps address the "Compared to what?" issue that can arise when surveys present information based upon one installation.

As I understand the process, the people who work in the data center are asked to rate the service they provide on the same basis as the clients. According to Mathews, sometimes the disparity between these two views of the service level can make a significant contribution to opening lines of communication. If nothing else, the data center employees can also fill out the survey the next time there is an in-house survey. The results of such an effort could prove interesting.

This is not necessarily an exclusive endorsement of Mathews & Co. — there may be other firms that provide such a service. The point is that we need to take advantage of every opportunity to improve our service in the customer's view.

Murray is director of management and information services for American Breeders Service, a DeForest, Wis., division of W. R. Grace & Co. and is the author of Management Information Systems as a Corporate Resource.

Controlling change from a practical perspective

READER'S PLATFORM
Brooks W. Johnson

Nearly everyone responsible for the development of systems has experienced the frustration associated with change during the development process. The inability to limit this change results in missed target dates, ineffective use of resources, reduced morale and cost overruns. It is imperative, therefore, to limit change wherever possible.

The classic approach to controlling change has been succinctly stated by the maxim "Freeze the specification." This approach dictates that after obtaining the necessary user sign-offs, the specifications are cast in concrete and cannot be changed.

If change is effectively outlawed, it cannot be a problem. However, in systems of only moderate complexity, many months may pass between these sign-offs and actual implementation. In these cases, freezing the specifications is not simple; it is simplistic. The specifications cannot be frozen any more than the business itself can be frozen.

Changes to the business during the development of large systems is inevitable. It is equally inevitable that some of these changes will directly affect the system.

Management will necessarily require that the changes be incorporated into the system, but not restricting change would be opening a Pandora's box making a successful implementation virtually impossible. The first step in limiting change is to classify each request as either a change *to* the specification or a change to the scope.

Changes to the specifications are those items that directly affect the logical design and viability of the system. These changes must be made for the system to remain functional.

Changes to the scope are those items that can be done independently of the system even though they may be dependent upon the system. This is not a contradiction; the distinction is whether the system is dependent upon the change or whether the change is dependent upon the system. Once this categorization has been made, the second step is to freeze the scope of the system.

The simplicity of freezing the scope is obvious, yet it is often overlooked. This is partly because changes to the specifications are usually imposed by the user, but changes to the scope are often initiated and condoned within the MIS department.

It is extremely tempting even in the early stages of development to expand upon the initial project scope. This is not to imply that the initial analysis be restricted to the original project definition.

This amplification of the scope of the analysis should not, however, be translated into a corresponding expansion of the project definition. If there are justified reasons for increasing the scope, all phases of the development need to be redefined. This includes new project definitions, resource requirements and schedules.

Changes during early phases

Changes in the scope during the early phases usually result in extended deadlines and additional resource requirements. It is those changes that occur later in the development process that present problems. These changes, or enhancements, are often the result of increased awareness of the system potential by the user. It is compounded by a corresponding increase of the user's needs by the MIS department.

These changes are often casually mentioned by the users and generally accepted into the specifications because they are easy to accommodate.

In many small shops where there is direct contact between programmers and users, the changes may even be incorporated without the knowledge of MIS management. Usually, however, the MIS management accepts the enhancements to improve the reputation of the department with minimal effort.

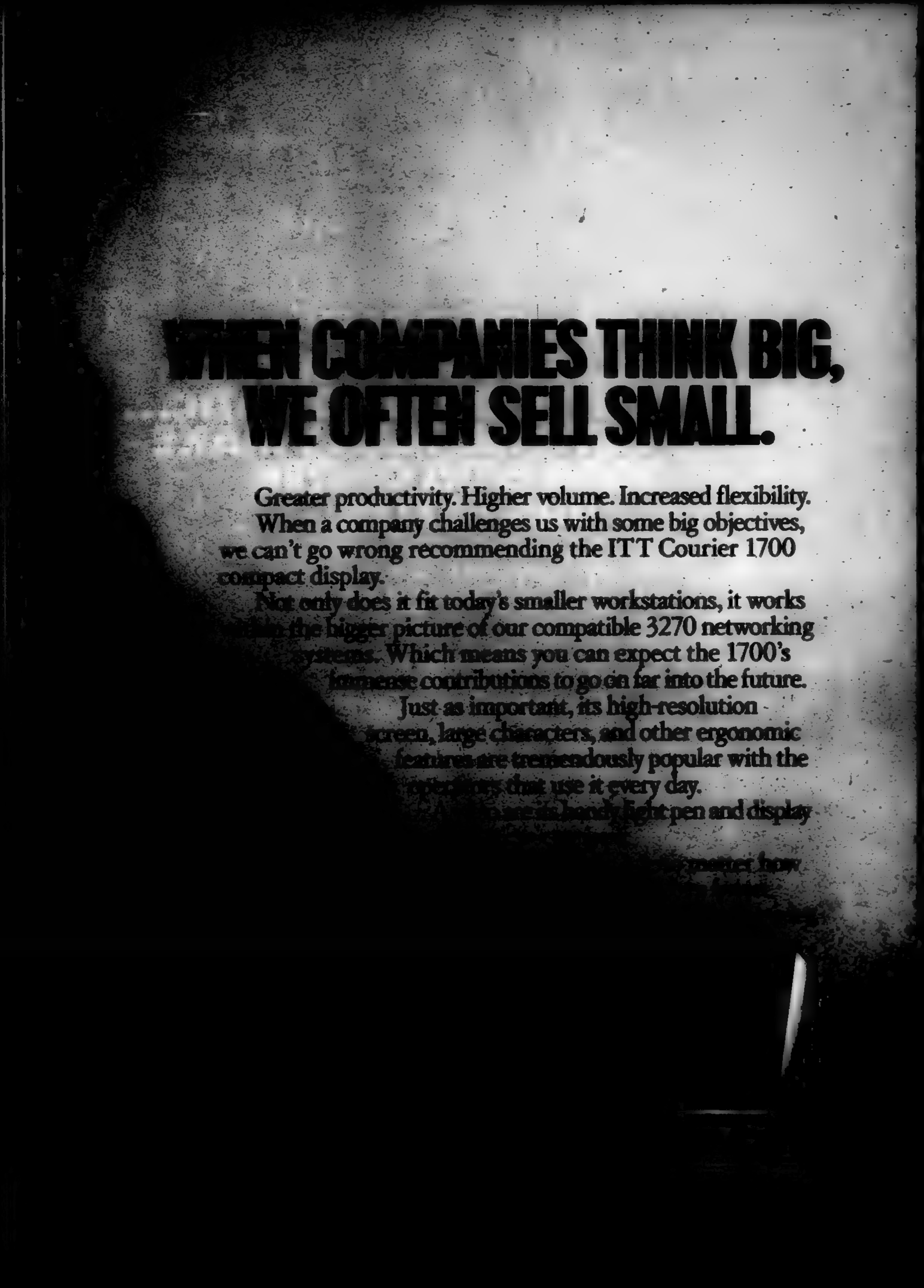
Although many of the changes can be easily accommodated, problems soon arise when what at first appeared to be simple, suddenly becomes complex. Because these enhancements rarely have the benefit of thorough analysis, it is often only after considerable resource expenditure that the complexity of the request is discovered.

The user soon becomes frustrated with the failure of MIS to accommodate what appears to be a simple addition. To save departmental reputation and to reap some benefits, additional resources are used to complete the change.

Expansion of the project scope, especially outside of the formal request procedure, is playing with fire. Changes to the specifications will provide more than enough complications to the project. In those few cases where the requirements are misjudged, the results will be disastrous.

The best course is to resist the temptation and treat all changes in scope as separate projects. This will allow both proper study and allocation of resources to each request. The way to ensure a positive perception of the MIS department is to provide systems that perform tasks as originally defined and to produce these systems within the budget and on schedule.

Johnson is a Albemarle, N.C.-based DP manager.



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Incompatible systems exchange E-mail

Sears uses Disoss, Profs to network subsidiaries

By John Desmond
CW Staff

NEW YORK — At Sears Communications Network, Inc., users of two incompatible IBM office system software products, the Professional Office System (Profs) and the Distributed Office Support System (Disoss), are sending electronic mail to each other via a custom interface.

That method of overcoming product limitations is typical of the way Sears Communications is stretching the capabilities of IBM's office system software. The company is using Disoss in an electronic mail network that includes Sears Communications, the Allstate Insurance Co. and the Sears Merchandise Group.

Gerard R. Weis, vice-president of Data Communications and Software Service with Sears Communications Network of Arlington Heights, Ill., said, "From a standpoint of communications technology, the advantage of using Disoss is that it provides within the IBM product set a common denominator to facilitate the exchange of electronic messages and revisable form documents."

Speaking at a recent Yankee Group seminar on office automation here, Weis detailed how Sears uses the IBM hardware and Systems Network Architecture (SNA) network it has in place for electronic mail and library functions between its five business groups. Sears Communications provides communications services for Allstate; Coldwell Banker Group, a commercial and residential real estate firm; Dean Witter Reynolds, Inc., a brokerage and financial services company; Sears Merchandise, the retail and catalog merchant; and Sears World Trade, which is involved in international merchandise trade.

Combined, the network encompasses 110 mainframes; 137 IBM 3725-type communications controllers; 34,500 3270-type terminals; 28,500 point-of-sale terminals linked to IBM Series/1 minicomputers; 168,120 circuit miles of AT&T-type wiring; and a $50 million-plus annual operating budget.

Of the five, only Dean Witter currently has no plans to use Disoss. Coldwell Banker and Sears World Trade are just beginning to use the product. No corporate mandate requires use of Disoss or any other product; each business group makes its own buying decisions, Weis said.

Sears Communications' office automation strategy is to provide services for document preparation, filing and retrieval; messaging, document and file distribution; and professional support such as calendaring, Weis said.

See SEARS page 24

- Martin Marietta Data Systems unleashed Ramis II interfaces to IBM's DB2 and SQL/DS and added decision support capabilities to its MAS-Manufacturing System software/24
- Shopsmith unveiled Shopmon, a performance monitor for IBM MVS data centers/24
- Litton Computer Services will provide access to Management Science America's accounting software via its remote computing service/24

Ramis II, Natural branching out

SOFTALK
John Desmond
CW Senior Writer

If fourth-generation languages are ever to outdistance Cobol, the products must be useful to a wider range of users than that third-generation mainstay.

For two major fourth-generation language vendors, the road to wider acceptance leads in opposite directions. Martin Marietta Data Systems has a loyal information center following for the former Mathematica Products Group, Inc.'s Ramis II fourth-generation language. The challenge for it is to have Ramis II accepted in mainstream DP shops, as opposed to end-user-oriented environments. Software AG has a loyal professional programmer following for its Natural fourth-generation language. The challenge for it is to tap the end-user applications development market.

Users in both environments would benefit from the two vendors' success in implementing their strategies. As information centers expand and become more closely tied to central MIS, end users need the ability to produce applications that support large numbers of users. The increasing power of personal computers is challenging software vendors to offer products such as full-function fourth-generation languages to satisfy end users.

MARTIN MARIETTA

software AG OF NORTH AMERICA, INC

Both companies contend that fourth-generation languages are being accepted in mainstream DP environments for developing production applications, not just ad hoc reporting or one-time applications. Richard Cobb, former president of Mathematica and now head of Martin Marietta's Information Technology Division and the acknowledged founder of nonprocedural languages, told Ramis II users at a recent meeting in Washington, D.C., that 95% of IBM sites are expected to have a fourth-generation language installed by 1989.

Martin Marietta research on how fourth-generation languages are used shows that 68% of users employ their

See LANGUAGE page 31

Programming teams: On the way out?

By Edward Warner
CW Staff

CHICAGO — Large programming teams composed of dozens of workers will in 10 years go the way of the steam engine and the nickel cigar, according to Nicholas J. Marselos, a consultant in AT&T's Network Software Center.

Marselos presented his thesis — that "programming teams are on the way out" — in a panel discussion on the future of programming teams at the recent 1985 National Computer Conference here. Software teams are threatened, Marselos explained, because of rising labor costs and the existence of fourth-generation languages that automate the production of code.

The situation, he observed, is analogous to that faced by the American auto industry. If automation advances, such as robots, are going to be used to produce cars because of high labor costs, "I say we are headed to where the robots manufacture software," Marselos said.

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Litton, MSA ink accounting software marketing pact

WOODLAND HILLS, Calif. — Litton Computer Services has reached an agreement with Management Science America, Inc. (MSA) to market MSA's line of accounting software to Litton's remote computer services customers.

According to a spokesman, Litton will maintain most of the MSA product line, including accounts payable and receivable systems, fixed assets accounting, general ledger, purchasing, payroll/personnel, facilities for micro-mainframe links and MSA's Information Expert system.

Litton said it expects the MSA products to be available by the end of the year. Users will have two payment options: a base charge plus a 30% royalty or a one-time fee based on the client company's annual revenue. Companies with $20 million or less in revenue pay a 5% license fee, companies with $50 million or less in revenue pay a 10% fee, and companies with more than $50 million in revenue pay a 15% fee. Users who buy the MSA software outright would pay approximately $1 million.

Litton Computer Services, part of the Mellonics Systems Development division of Litton Systems, Inc., operates data centers in the New York, Los Angeles and Washington, D.C. areas.

Litton Computer Services can be reached through P.O. Box 4040, Woodland Hills, Calif. 91365.

Martin Marietta introduces optional Ramis II interfaces

PRINCETON, N.J. — Martin Marietta Data Systems has announced optional Ramis II interfaces to IBM's DB2 and SQL/DS data bases. Ramis II is Martin Marietta's fourth-generation language.

A spokesman said that the interfaces facilitate the automatic conversion of Ramis II nonprocedural requests into SQL commands. As with other Ramis II external file interfaces, identical Ramis II commands are used regardless of the data source. Initially, Ramis II support for DB2 and SQL/DS provides report generation, graphics and relational capabilities.

The DB2 and SQL/DS interfaces feature the following: automatically built dynamic SQL requests that prevent unexpected full file searches; a menu-assisted facility that extracts a table description from the DB2 or SQL/DS catalog where authorized, automatically generates an equivalent Ramis II external file description and permits modification to the description; and all Ramis II data analysis capabilities.

The Ramis II DB2 and SQL/DS interfaces will be available in September. Prices will range from $3,375 to $6,750, depending on host CPU.

Martin Marietta Data Systems, a branch of Martin Marietta Corp.'s Information Technology Division, can be reached through P.O. Box 2392, Princeton, N.J. 08540.

IBM systems monitor debuts

DAYTON, Ohio — Shopsmith, Inc. has announced Shopmon, a performance monitor for IBM and IBM-compatible MVS systems.

Shopmon uses cross-memory services to provide wait analysis, address space analysis, disk and tape analysis and systems analysis, including CPU plots, real storage usage, paging and swapping and master console support, according to the vendor.

With the product's optional interface to Cullinet Software, Inc.'s IDMS data base management system, Shopmon can gather information from the address space where IDMS is executing without signing on to IDMS. Active tasks, systems statistics and data base statistics can be viewed online and in real time.

Shopmon provides visual access to all areas available through the use of standard IDMS commands for data base areas, storage pools, program and reentrant pools, program definitions, memory displays and IDMS region maps.

Shopmon for MVS is priced at $15,500, and the IDMS interface is priced at $6,500, according to the vendor.

Additional information is available from Shopsmith, which is located at 6640 Poe Ave., Dayton, Ohio 45414.

Decision support tool bows

GREENBELT, Md. — Martin Marietta Data Systems has announced MAS-Decision Maker, software that provides decision support capabilities for the company's MAS-Manufacturing System software. The product runs in IBM's MVS and DOS/VSE environments.

MAS-Decision Maker runs with the company's MAS data bases, written in the former Mathematica Products Groupe, Inc.'s Ramis II fourth-generation language. MAS-Decision Maker is said to aid non-DP professionals in solving problems, answering ad hoc questions and anticipating changes on the shop floor without technical assistance.

MAS-Decision Maker is available for use with the six modules of MAS-Manufacturing, including the following: master production scheduling, inventory control, cost control, manufacturing control, engineering control and purchasing. The product will be integrated into all of Martin Marietta Data Systems' IBM-based MAS applications software products, including MAS-Financials, MAS-Payroll, MAS-Personnel and MAS-Material Lot Tracking.

MAS-Decision Maker is priced at $30,000.

Martin Marietta Data Systems is located at 6303 Ivy Lane, Greenbelt, Md. 20770.

SYSTEMS SOFTWARE

■ **Advanced Systems Concepts, Inc. has announced that its Status/38 resource accounting aid for the IBM System/38 has been enhanced with IBM's CPF operating system accounting code and the ability to produce invoices for chargebacks to user departments.**

Status/38 now runs independently of the system history file by making use of CPF journaling facilities. The product provides inquiries, reports, graphs and charts of data accumulated by itself and the CPF operating system.

The chargeback system, which allows users to be billed for use of system resources, allows variable rates based on job name and type. A series of fixed charges can be included, and charges can also be shared between several groups or individual jobs.

Status is available for a one-time fee of $1,500.

Advanced Systems Concepts, Suite 8, 1350 Remington Road, Schaumburg, Ill. 60195.

■ **Morino Associates, Inc. has announced the Mics Mazdamon Component for the MVS Integrated Control System network management product line. Mics Mazdamon Component runs in IBM MVS environments.**

The product supports Mazdamon, the Vtam network monitor developed by Mazda Computer Corp. of Ontario, Canada. The data summarization and processing capabilities of Mics allows users to summarize network data to the degree required for analysis. The product also provides access to high-volume network data.

The Mics data validation process is said to ensure the integrity of network data. Support of Mazdamon by the Mics Installation Accounting Component permits billing of network resources at the user and terminal level for IBM TSO sessions and at the terminal level for other interactive sessions. Mics Mazdamon data can also be used for network capacity planning.

Mics Mazdamon Component is priced at $3,900 for the initial year and $1,300 for the first renewal year. The standard license fee for the prerequisite Mics base set is $37,900 for the initial year and $9,800 for the first renewal year.

Morino Associates, 8615 Westwood Center Drive, Vienna, Va. 22180.

■ **Lawson Associates, Inc. has announced Access/38 and Access/DB systems software for IBM System/38 users.**

Access/38 allows users to define and execute their own on-line inquiries and to generate reports using standard System/38 data. Access/DB enables data processing professionals to create on-line interactive RPG-III programs allowing for additions, changes and deletions to the data base.

According to a spokesman, the two modules may be used separately or together, with Lawson and other types of software.

The Access/38 module is priced at $9,000, and the Access/DB module is priced at $4,000.

Lawson Associates, 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.

APPLICATION PACKAGES

■ **Trax Softworks, Inc. has introduced Version 3 of its Electronic Spread Sheet (ESS) for IBM mainframes under IBM's VM/CMS and MVS/TSO.**

ESS Version 3 allows users to create a three-dimensional spreadsheet. Pages have been added and the spreadsheet size extends to the virtual storage on the IBM system, the vendor said.

ESS now includes a natural recal-

Continued on page 36

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Netec International, Inc.
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214 [illegible] • Telex [illegible]

Continued from page 24

culation capability. The product can determine the order for recalculating the spreadsheet by analyzing the references in each formula, the vendor said.

ESS Version 3 is priced at $12,000.

Trax Softworks, 10801 National Blvd., Los Angeles, Calif. 90064.

■ **Tower Systems International, Inc. has announced Release 5.3 of Omnicalc, its electronic spreadsheet for IBM mainframes. The product runs in IBM's VM/CICS, VM/CMS and MVS/TSO operating environments.**

Release 5.3 features menu prompting for all spreadsheet commands. The feature allows for the execution of all Omnicalc commands from the menu. On-line Help screens are said to enable users to create spreadsheets without having to study the manual and memorize commands. The spreadsheet menu facility uses the same tree structure as Lotus Development Corp.'s 1-2-3 spreadsheet program.

Release 5.3 of Omnicalc also has enhanced its command structure to include cell range execution for most commands. Cell ranges can span through two or three dimensions. Release 5.3 allows a spreadsheet size of 255 columns, 32,767 rows and 25 planes.

Other features include three-dimensional modeling, multiple spreadsheet consolidation and on-line Help files.

For a two-year lease, Omnicalc 5.3 for CICS and CMS is priced at $1,995 each year; the TSO version is priced at $1,995 for both years.

Tower Systems, 19782 MacArthur Blvd., Irvine, Calif. 92715.

■ **Visual Engineering, Inc., has introducted three-dimensional scene modeling software for Digital Equipments Corp. VAX and Pyramid Technology Corp. superminicomputers running under the AT&T Unix operating system.**

Visual:Genisys includes a hierarchical data base and simulated camera and lighting control facilities. A rendering package allows 3D objects and scenes to be generated from 3D data, the vendor said.

Ray-traced images can be produced in constant time, and images can be computed using less powerful minicomputers or workstations. Visual:Genisys also offers wire-frame, facet-shaded and smooth-shaded rendering styles.

Visual:Genisys is priced from $10,000 to $75,000, depending on configuration.

Visual Engineering, Suite 200, 2580 N. First St., San Jose, Calif. 95134.

■ **Mass Systems Co. has announced a Lumber and Building Materials Distribution Management (LBM/DM) system for the IBM System/36 and the recently introduced System/36 Personal Computer.**

LBM/DM is designed for wholesalers and retailers of building materials and lumber. The LBM/DM comes with five modules: order entry, billing, inventory control, accounts receivable and sales analysis. The product includes point-of-sale support, such as price quotations, credit control capabilities and units of measure facilities. LBM/DM is priced at $10,000 for the System/36 Personal Computer and $16,000 for the System/36.

Mass Systems, 28 Edgehill Road, Waltham, Mass. 02154.

■ **Signal Technology, Inc. has announced Version 4 of its Smartstar development and information management software for Digital Equipment Corp. VAX processors.**

Smartstar Version 4 includes a Relational Query Processor interface to VAX RMS files. Smartstar consists of two components. The first component contains an application design interface, a data updating and retrieval interface and a general report writer. The second consists of Smartcall, which allows users to integrate screen-driven processes into applications, and Opal, an interface for relational queries and reporting to RMS and RDB files.

Smartstar options include Request, a relational report and query system for a nonprocedural Interactive Query Language. Request supports RMS file access and RDB/VMS relational data base access. Smartstar is priced from $3,500 for the Microvax to $25,000 for the VAX 8600.

Signal Technology, 5951 Encina Road, Goleta, Calif. 93117.

■ **Superset, Inc. has announced Postraster, a graphics image postprocessor, for its Professional Graphics Mainframe workstation.**

Postraster allows the user to produce special effects design work automatically. A color averaging feature controls components of the raster or pixels to create stylized graphics.

Other capabilities include texturing, overlay, image insertion, edge detection and nonproportional text and image scaling, the vendor said.

Postraster is priced at $3,000 until September 1.

Superset, 11025 Roselle St., San Diego, Calif. 92121.

■ **Gateway Design Automation Corp. and Elxsi International have announced a parallel processing version of Gateway's Aidsim concurrent fault simulation program for the Elxsi System 6400 multiprocessors.**

Aidsim-A operates on up to 10 processors and is said to provide an increase in processing speed. Aidsim-A is supported by up to 192M bytes of physical memory and provides speed and capacity for fault simulation of logic networks of more than one million gates.

Aidsim-A is priced from $100,000 for one CPU up to $350,000 for 10 CPUs.

Gateway Design Automation, 235 Great Road, Littleton, Mass. 01460.

■ **The Wheatley Group, Ltd. has announced an applications package for reinsurance companies that provides on-line calculation for reinsurance policies.**

Wins-RE for the IBM System/38 includes capabilities for processing claims, contract syndicates, quota share and treaty abstracts. The package includes on-line update and ad hoc reporting facilities. The system can calculate reinsurance, retrocession, reinstatement and conduct automatic currency conversions on-line, the vendor said.

Wins-RE is priced at $175,000.

The Wheatley Group, One Huntington Quadrangle, Melville, N.Y. 11747.

■ **J. L. Ham & Associates, Inc. has announced Release 3 of its Fixed Asset Control One System for the IBM System/38.**

According to a spokesman, features in Release 3 include expanded asset identification fields, a restructured calculation cycle, support for additional levels of totals, facilities to consolidate reporting from multiple companies, support for recording and reporting of asset transers and an additional set of reference fields.

Release 3 of the Fixed Asset Control One System is priced at $6,000 per CPU, including source code.

J. L. Ham & Associates, Maple Professional Building, 693 Maple St., Plymouth, Mich. 48170.

■ **Gary Brown Associates, Inc. has announced an on-line Accounts Receivable Management System (Arms/OL) for the IBM System/36.**

Arms/OL includes support for up to 999 divisions. A System Control File permits the specification of divisions, receivable classes and statement messages. Users can customize discount information and incorporate late charge restrictions and percentages and aging criteria for customers through a customer master file. The package allows credit memos to be posted to invoices by the system or by the user. Other features include monthly or daily late-charge posting and the ability to interface with invoicing systems through a batch-post input file.

Arms/OL costs $3,500.

Gary Brown Associates, Suite 2, 322-B Edwardia Drive, Greensboro, N.C. 27409.

■ **Cericor, Inc. has announced that its CDA-5000 software now runs on Data General Corp.'s Distributed Systems engineering workstations.**

Also available on a variety of workstations, including systems from Apollo Computer, Inc., Sun Microsystems, Inc. and Masscomp, the CDA-5000 software is a design automation package that can be used to create and simulate the operation of schematic diagrams.

Design functions include interactive logic design and simulation and design capture, which can be performed with menus, mouse controls and windowing functions.

The Cericor CDA-5000 products are priced from $15,000 to $19,900, depending on configuration.

Cericor, Lakeside Plaza One, 5225 Wiley Post Way, Salt Lake City, Utah, 84116.

■ **Kone Systems, Inc. has introduced a fixed asset tracking and accounting control package for Digital Equipment Corp.'s VAX processors.**

Maps/FA provides accounting control of acquisitions, maintenance and transfer and retirement of corporate assets, the vendor said. The product includes four depreciation methods and pro rata convention capabilities. Maps/FA can be

Continued on page 28

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TELEGENIX

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modified in accordance with changing business and regulatory requirements.

Maps/FA can be integrated with other Ross application packages, including its general ledger. By validating entries through Maps/GL, calculations and period-end depreciation entries are automatically posted. Pricing for Maps/FA ranges from $11,000 to $21,500, depending on the VAX model.

Ross Systems, Suite 210, 1860 Embarcadero Road, Palo Alto, Calif. 94303.

■ Xerox Computer Services, Inc. has announced Version 3 of its Accounts Payable system for the IBM 4300 series mainframes.

The enhanced version features expanded invoice entry and control options, an added invoice history file, improvements in batch numbering and the ability to identify accounts by purchase order number. The product also includes the ability to calculate due dates and discounts, the vendor said.

Accounts Payable Version 3 is priced at $25,000.

Xerox Computer Services, 5310 Beethoven St., Los Angeles, Calif. 90066.

■ Mentor Graphics Corp. has introduced simulation tools for use with its Idea series of engineering workstations for computer-aided engineering.

The Quicksim products allow users to perform logic and fault simulation and timing analysis from one application interface, the vendor said.

Quicksim for Logic Simulation gives users 12-state simulation capabilities. Simulation support includes 96 classes of models as well as the Mentor Graphics Hardware Modeling Library and Behavioral Language Models. It is priced at $14,500, according to the vendor.

Quickfault includes a concurrent algorithm that provides fault analysis and graphic display of fault detection as well as undetected faults and fault blockages. It is priced at $16,500.

Quicktime provides capabilities for worst-case timing modeling functions and allows users to incorporate the same display format as other Quicksim functions. Quicktime costs $14,500.

Mentor Graphics, 8500 S.W. Creekside Place, Beaverton, Ore. 97005.

■ Informatics General Corp. has introduced a Word Processing Interface (WPI) for use with its Basis data base management system on Wang Laboratories, Inc. VS systems.

Basis WPI, designed for use by law firms and corporate legal departments using Wang's word processing systems, allows documents compiled on the Wang system to be loaded into user-selected data bases. Word processing files that have been converted to data base files can also be retrieved and converted back into document form.

Basis WPI costs $15,000. The Basis data base management system is priced at $70,000.

Informatics, 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

■ Tom Software, Inc. has announced that its line of accounting and vertical market business software now runs on Digital Equipment Corp.'s Microvax II.

The company also announced that its Tombasic Basic II language interpreter will run under DEC's Ultrix operating system.

Tom Software, 127 S.W. 156th St., Seattle, Wash. 98166.

■ Intergraph Corp. has introduced the Robot Modeling and Programming System for its Digital Equipment Corp. VAX-based computer graphics system.

According to the vendor, the product can be fully integrated with Intergraph software and includes project management capabilities as well as graphics libraries that allow users to link descriptive information and engineering data to individual components.

The software can solicit and store information, including the robot's coordinate system, motion type and degree of freedom. The Robot Modeling and Programming system costs $30,000.

Intergraph, One Madison Industrial Park, Huntsville, Ala. 35807.

■ Vertex Information, Inc. has announced Release 2 of Harvey, its on-line health insurance claims processing system for use under IBM's DOS/VSE operating system.

A flexible option file, extended claims processing capabilities and additional inquiry screens have been added to the release, the vendor said. Harvey 2 is written in Cobol and runs on IBM 4300 series mainframes running CICS.

Price of the product including source code ranges from $60,000 to $180,000.

Vertex Information, 2205 Fortune Drive, San Jose, Calif. 95131.

■ CAE Systems, Inc., a division of Tektronix, Inc., announced that its computer-aided engineering (CAE) design software is now available for Digital Equipment Corp.'s Microvax II.

CAE 2000 VAX/VMS is a hierarchical software system that incorporates schematic capture, logic and circuit simulation capabilities, the vendor said.

Prices begin at $16,000.

Tektronix, 1333 Bordeaux Drive, Sunnyvale, Calif. 94089.

See TOOLS page 31

You could win $1000 in the first international computer-generated art contest

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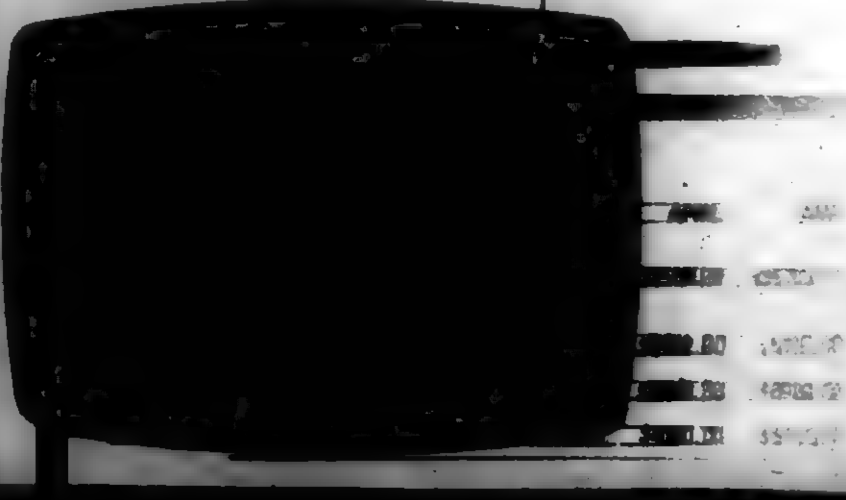

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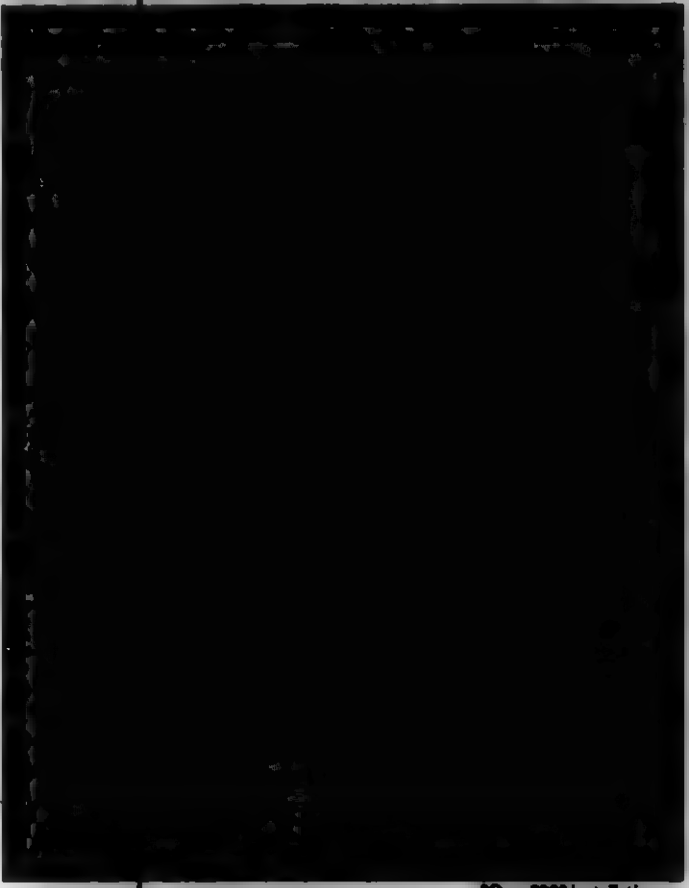

*Over 3000 installations.

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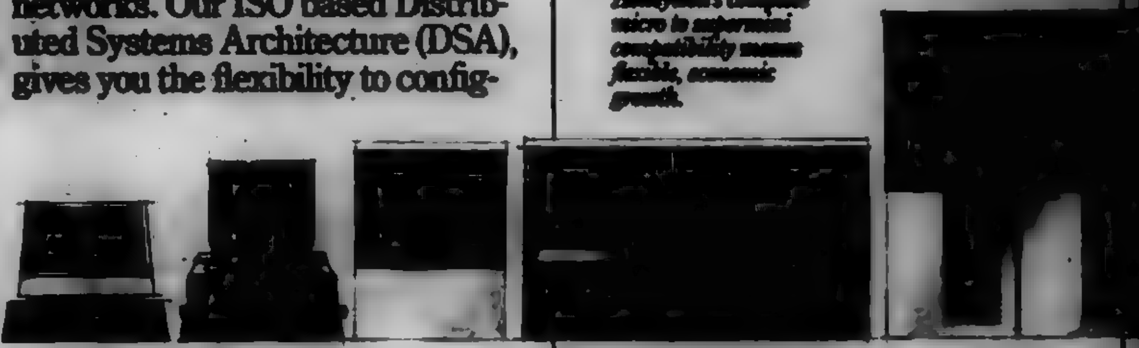

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TOOLS from page 28

■ Independent Computer Systems, Inc. has announced the ICS Inventory Management system for the Honeywell, Inc. DPS 6 minicomputer.

ICS is an on-line, menu-driven application aimed at allowing non-data-processing users to manage and control inventory information, a spokesman said. The package assists in recording inventory movements and balancing carrying costs with the stock necessary to service internal or customer orders.

In the ICS system, inventory information is retained at the inventory item, location and detail transaction levels. The system supports various costing methods, including standard, average, last-in, first-out and first-in, first-out methods.

Optional interfaces to the ICS Order Entry, Purchase Orders, General Ledger and Preventative Maintenance Systems are supported.

The ICS Inventory Management system costs $14,500.

Independent Computer Systems, Suite A-201, 10640 N. 28th Drive, Phoenix, Ariz. 85029.

■ Mentor Graphics Corp. has enhanced the logic and fault simulators within the Quicksim family of simulation tools for its Idea series of engineering workstations.

The Quicksim packages offer design engineers logic and fault simulation, as well as worst-case timing analysis. The packages include the Quicksim logic simulation package, the Quickfault interactive fault simulation package and the Quicktime timing analysis package.

Quicksim provides interactivity of stimulus and probes and 12-state simulation for accurate MOS verification. Mixed-mode simulation allows switch, gate, functional, behavioral and physical models to be used by the simulator.

Quickfault's concurrent algorithm provides fault analysis and a graphical display of cumulative fault detection, undetected faults and fault blockages. Quicktime provides worst-case timing and timing using the same stimulus and display formats as all Quicksim family functions.

Customers who have Mentor Graphics' logic and simulation package will receive free upgrades. Upgrade options for the Design Station, including Quicksim logic simulator and Quicktime timing analysis, cost $14,500.

Quickfault fault simulation upgrades for the Idea workstation cost $16,500. All the Quicksim family products are scheduled for August availability.

Mentor Graphics, 10200 S.W. Nimbus Ave., G7, Portland, Ore. 97223.

LANGUAGE from page 23

fourth-generation language for ad hoc reporting, 67% use it for applications development by professionals, 53% use it for applications development by end users, 46% use it for information center purposes and 37% use it for decision support. Accounting, marketing, sales and personnel departments all employ the product, the company claimed.

But the major stumbling block to making Ramis II useful for production environments, according to users interviewed at the meeting, is the product's inability to support concurrent data base updates. The limitation makes use of Ramis II in large shops impractical. Aware that the restriction is hindering Ramis II's growth, the company promised an updated Data Base Manager for Ramis II, for fourth-quarter delivery, that supports concurrent updating.

Admitting past failures to meet certain deadlines, Martin Marietta adopted an apologetic stance at the users group meeting and promised to improve. "We are hopeful that problem is behind us. We're better organized and have increased staffing," Cobb said.

At Software AG's users group meeting in Nashville, Chairman of the Board John Maguire said, "More and more of our new products are moving into end-user areas." The big announcement at the meeting, the alliance of Software AG and Ashton-Tate, backed up that direction. The alliance is expected to tie Software AG's Natural/Connection micro-mainframe link and Ashton-Tate's Dbase II data base management system and Framework spreadsheet products.

Software AG's long-term strategy outlined by Maguire — a familiar one in the industry — is to provide "one-stop shopping for all software and information services needs." To be implemented over five years, the strategy will involve office systems, third-party agreements and customized applications.

From its established position in the MIS world with the Adabas data base management system, Software AG Executive Vice-President Peter Page argued that Software AG has an advantage in extending to end users, such as in offices. Stuart Miller, president and chief executive officer of Software AG, said the shift toward end-user computing is a natural one for the company. "People who've used our products have always been MIS people, technical people. But as the technology has advanced, and the availability of more comprehensive tools for end users has increased, this is a more appropriate direction for us to take," he said.

Which company is in the better position? Users would do well to compare their own needs with the traditional strengths of each product.

TEAMS from page 23

To build a programming team that works well together, Marcelos advised his listeners to do the following:

■ Provide team management that is neither too domineering nor too passive. To lean in the former direction will make the team too dependent, to lean to the latter will create a team with too many chiefs, he said.

■ Never give awards to only one team member. If the entire team does not share successes, individual rivalries will arise.

■ Choose team members who are competent but who do not aspire to superstar status. Programming superstars can be too individualistic, he said.

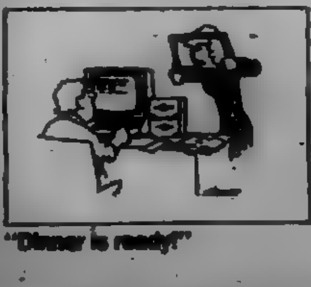
■ While teams composed of dozens of programmers will fade away, the small, specialized programming team will remain, Marcelos predicted. The small teams, he added, will be composed of a few highly skilled programmers who will work with sophisticated development tools to produce applications that are too complex to be created through automation advances.

While he did not agree with Marcelos' prediction of a limited, 10-year life expectancy for the programming team, co-panelist Prof. J. Daniel Couger, distinguished professor of computer and management science at the University of Colorado, noted that computer professionals' personalities make them unlikely candidates for membership in a team of any sort.

Pointing to research he conducted on what motivates computer professionals, Couger reported that computer professionals have a high need for career advancement and challenging work and a low need for social interaction on the job.

The need for growth, he elaborated, means that "they want measurement of their own progress. The ambiguity that occurs [in a group] is sometimes distasteful to them," he said.

Personality issues are one of the reasons that work groups will become an endangered species, Marcelos elaborated. Often the wrong people — people who are too aggressive or with skill levels that are too low — are chosen for team membership. "The whole human relationship system is often forgotten in team building," he said.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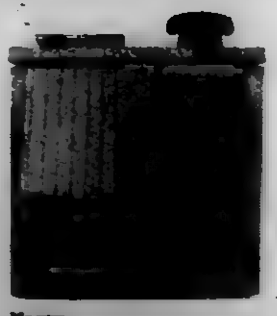

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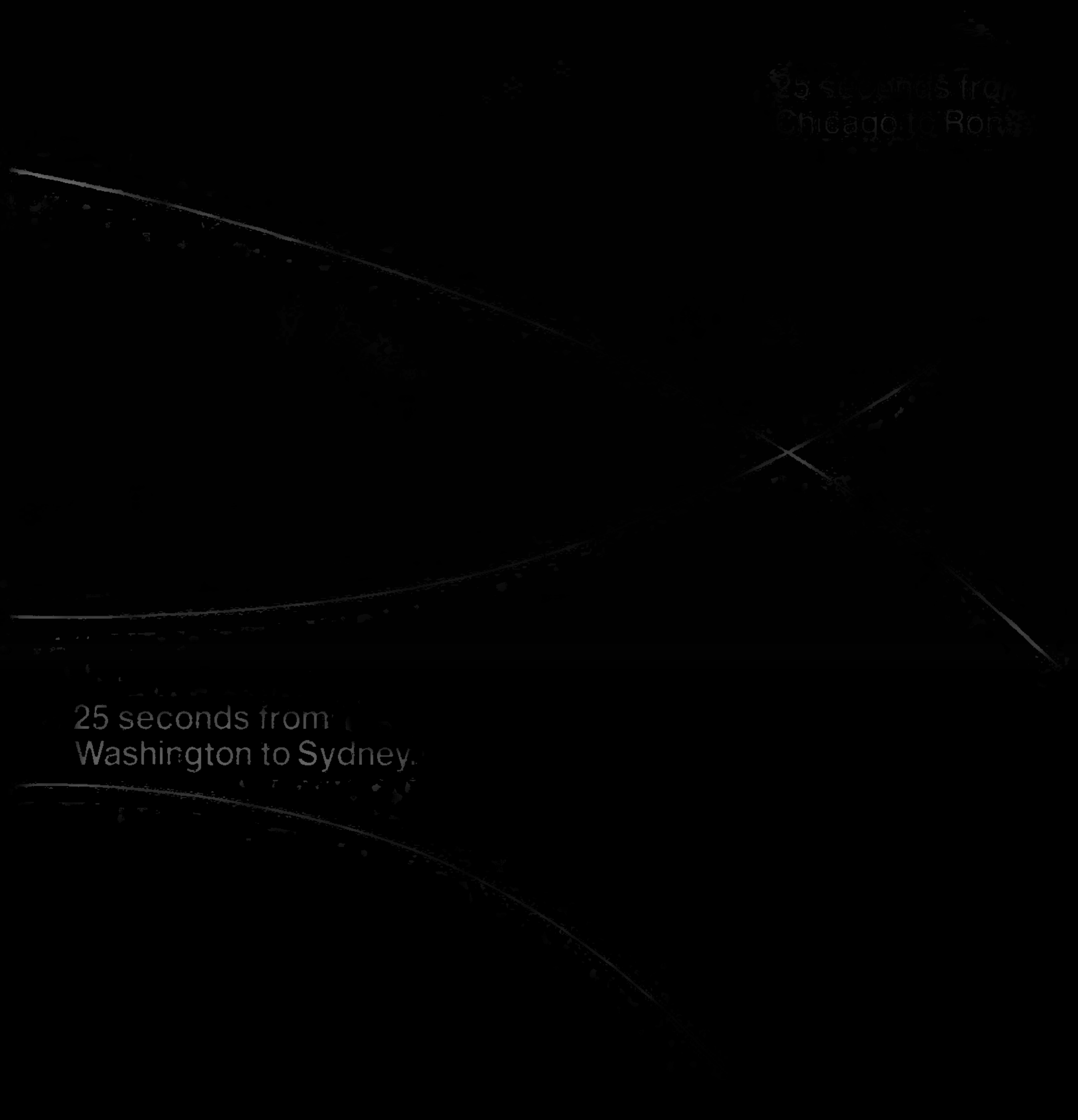
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SEARS

from page 23

"It was very natural for us to look at Disoss," specifically Disoss Version 3 Release 2, Weis said. Sears runs four copies of the product, two in the Sears Merchandise group. "With the architecture we have in place today, we can decide to run additional copies of Disoss if the network volume reaches a point where that's a good economic trade-off," Weis said.

The combined companies have more than 2,000 enrolled Disoss users. Of those, more than 700 are also users of Profs. Other external users, who are not enrolled with identifications on Disoss, are bridged to Disoss via custom interfaces.

Products the company supports with Disoss include the IBM Displaywriter, the 5520 Administrative System and 8100/Distributed Office Support Facility systems. The network supports approximately 215,000 Disoss transactions per month and has 45,000 documents stored in Disoss libraries.

Sears uses IBM's Application Program Interface (API), a tool provided with Disoss, to build bridges from Disoss to other programs or applications such as Profs.

API allows users to author CICS transactions such as those for fetching a document from a library, storing a document in a library and distributing a document.

Sears also uses API to link Disoss with an internal communications subsystem, dubbed Senden, used to send messages and collect and transmit data in bulk. The company has more than 6,000 Senden users, with many different types of hardware.

> **"**
>
> *'The general reaction with the business groups that have installed the product has been favorable.'*
>
> — Gerard R. Weis
> Sears Communications Network, Inc.

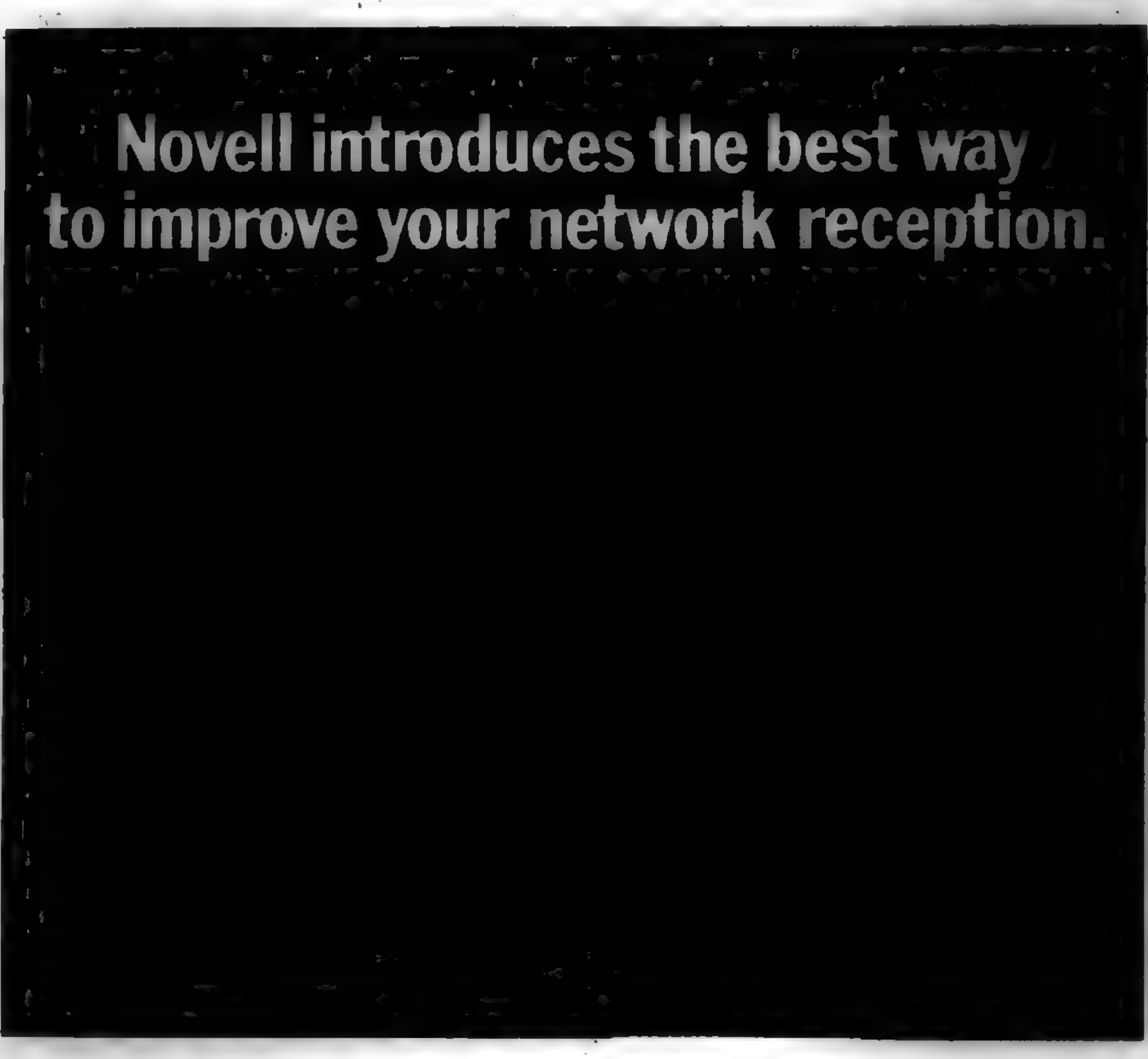
Weis said he plans to install Disoss 3.3 at Sears Communications when it becomes available, but he is not sure the IBM-coded connection between Profs and Disoss that the release would provide will meet all his requirements. He noted that the ability to send revisable text between Profs and Disoss is not being offered in the release.

For the future, Weis hopes IBM will offer Personal Computer/LU6.2 SNA support, improved systems utilities, cross-systems usability such as the Profs-Disoss link, a workstation strategy and a focus on strategic subsystems such as System/36.

A key consideration for companies considering widespread Disoss implementation is user training, Weis said.

"It is clearly a complex product, and it takes the right level of technical skills to install. All the business groups have found it requires an effort to train the users and enforce the discipline within their groups to effectively use the [Disoss] functions. There is no substitute for adequately planning" the implementation of Disoss, Weis said.

Characterizing his company's experience with Disoss, Weis said, "The general reaction with the business groups that have installed the product has been favorable. I think the resources it consumes are reasonable for the work people are getting done with it. Except for the usual types of problems you have with products, it's been a positive experience."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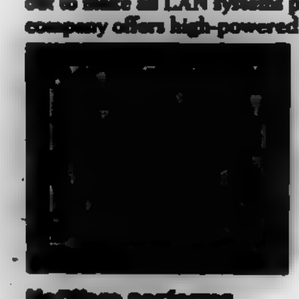

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*LAN Benchmark Report, May, 1985, Novell, Inc. and "Software, Not Hardware Key to LAN Performance," *PC Week* 1/15/85.

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MICROCOMPUTERS

Notes from a quiet NCC '85

SMALL TALK
Eric Bender
CW Senior Editor

Although any National Computer Conference (NCC) can generally be described as a bear of a show, this year's version was more like a giant sloth — big, slow and sleepy.

The busiest booth at Chicago's McCormick Place — IBM's — did not showcase any new products, and frequently, the action on the floor seemed as lazy as the sailboats idly tacking on the blue waters of Lake Michigan just outside.

Most major microcomputer hardware and software vendors were conspicuous by their absence.

Some interesting products — such as Plus Development Corp.'s Hardcard, a 10M-byte hard disk drive on an IBM Personal Computer expansion card — made their first appearance at a major trade show, and some significant communications products debuted, but that was about it.

The following are some notes and quotes from the Second City's latest NCC:

- "We expect to see prices of MS-DOS computers drop below $1,000 in the next year to year-and-a-half," accelerating the move toward local-area networks, said Eileen Easterbrook, Software Publishing Corp.'s product manager for new products.

Like other microcomputer software vendors, Software Publishing "is in the process of getting [its] ducks in a row" on network applications, with the most difficult questions centering on pricing. The company intends to emphasize technical rather than legal safeguards in future site license deals.

"We're not interested in contractual arrangements and enforcement, we're interested in shipping products," Easterbrook commented.

- David Melin, Microsoft Corp.'s product manager for MS-DOS 3.1 and Microsoft Networks, cautioned against expecting a "messiah-type product" such as [Lotus Development Corp.'s] Visicalc for networks. He also noted that plummeting costs of peripherals have

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■ Digital Communications Associates' new Smart Alec product links IBM Personal Computers with System/34, 36 and 38 midrange machines/44

■ NEC Information Systems has introduced a local-area network, a 20M-byte hard disk and other products for use with its personal computers/44

■ Analytica has dropped the copy protection on its Reflex software and will offer site licenses/46

■ 3Com has announced the 3Server70, a high-end server for the firm's personal computer local-area networks/46

INSIDE

Systems/46
Printers/Plotters/51
Board-Level Devices/51

High-quality graphics devices land on desktops

Price drops aid spread of laser, ink-jet printers

By Edward Warner
CW Staff

Personal computer graphics users can expect 1985 to be the year that high-quality output devices, including laser and ink-jet printers, become inexpensive enough to be used on desktops, said graphics industry analyst Alan Paller in a presentation earlier this month at the National Computer Conference.

The accessibility of high-quality output, added Neil Kleinman, president of Pacific Technology Associates, will make the use of graphics for reports and meetings the dominant use of graphics within two years. Kleinman, a fellow industry analyst who spoke at that session, said that personal computer graphics currently are rarely used for reports and presentations because of low quality.

That will change, however, as desktop laser printers come into wider use, said Paller, the president of AUI Data Graphics/Isaco in Arlington, Va. Driving the spread of laser printers, he predicted, will be continuing price reductions — some now cost as little as $3,000 — and the fact that most computer graphics are reproduced onto paper. At present, paper is the medium chosen for output by 60% of graphics users, he said, adding that "I believe that is a figure that will go up. We're a paper society."

Laser printers will likely be bought for their ability to reproduce high-quality text, he explained, but once the laser printers are purchased, "it will be such a small, marginal cost to [output] graphics" that users will reproduce both text and graphics using them. Paller acknowledged that software that integrates both text and graphics currently causes a laser printer to run slowly, but, he added, that hurdle will be overcome as graphics software vendors recognize the spread of laser printers and enhance their products for greater speed.

Another output device set to make big strides in price and performance, Paller observed, is the ink-jet printer. Currently, he noted, one vendor, Hitachi Ltd., offers

See GRAPHICS page 51

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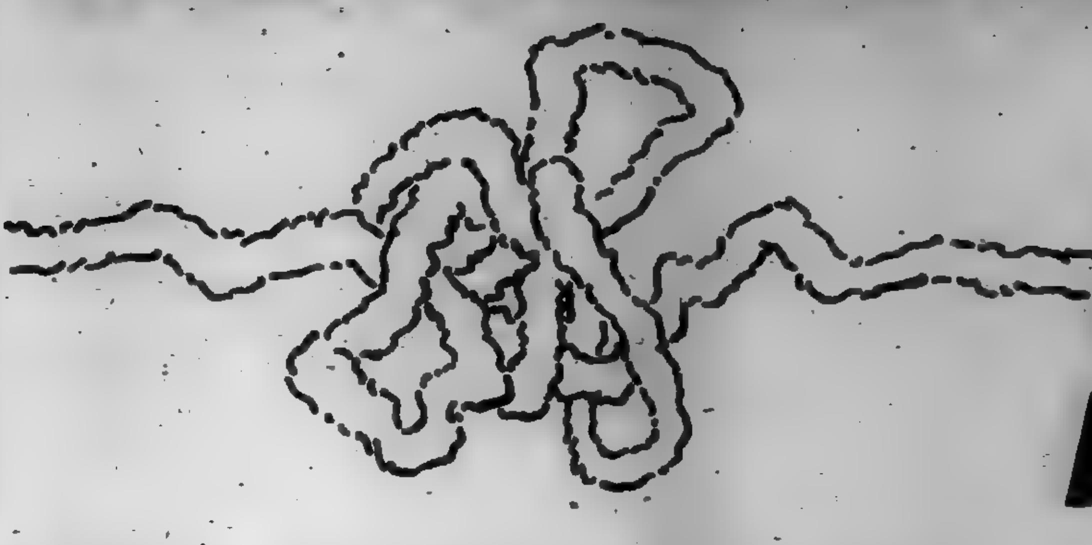

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Choices limited for micro natural language interfaces

By Eric Bender
CW Staff

CHICAGO — "As micros proliferate, there are more and more people who need to access data bases without programming," but there is almost no choice among commercial products that meet this need, according to Martha Evens, a researcher with the Illinois Institute of Technology.

Evens, who chaired a session earlier this month at the National Computer Conference said that, among software vendors, "the cast of characters in this area is changing as quickly as the technology," with many firms apparently putting the brakes on their development efforts.

Among these, Evens mentioned Artificial Intelligence Corp., a vendor with a successful track record in natural language on mainframes. Last fall, the firm was enthusiastic about taking part in the session, but it canceled plans to participate after putting its micro project on the back burner. She also noted that one high-profile start-up, Symantec, Inc., has failed so far to deliver a commercial product.

The session, titled "Microcomputer Data Bases That Understand English," did feature a discussion of one natural language project that Evens described as highly promising. Frederick Thompson of the California Institute of Technology described the effort to move the Natural Access System software — developed by himself and his wife, computer linguist Bozena Thompson — from larger machines down to an IBM Personal Computer AT.

As Thompson outlined it, Natural Access System is a large and ambitious software system designed to integrate a natural language interface with text, graphics and image processing and to allow flexible extensions by end users and programmers.

The system has been compiled to approximately 1M byte of Pascal-code and is being ported to a Personal Computer AT with 640K bytes of internal memory through the use of an elaborate paging scheme tightly linked to the language processing, Thompson said. The version currently is being beta tested and will be demonstrated publicly in September.

Running on Motorola, Inc. 68000-based systems, Natural Access System software has demonstrated performance "that is very reasonable in terms of human response," with answers to some queries available in 3 or 4 seconds, Thompson said. Work to date suggests that use of the AT will cut response time by about one third, he added.

Thompson discarded the suggestion that the program falls under the heading of artificial intelligence. "We don't see ourselves as a part" of the artificial intelligence community, he said.

Erickson discusses Clout

Also at the session, Wayne Erickson, Microrim, Inc. chairman, discussed his firm's Clout software, a natural language package whose artificial intelligence capabilities were heavily promoted during its introduction last year. Erickson commented that some relatively simple features, such as a spelling checker, turned out to have a high payoff. "Little things like that can be really important to reduce the level of frustration," he said.

Another important feature is to let the user know, during a lengthy query, that the machine is still working on the request. "When people ask questions in natural language, they always expect to see the answer come back instantly," Erickson pointed out, so a screen display showing progress on the request is appreciated.

Erickson noted that many users would like to be able to update their data bases through a natural language interface. However, he pointed out that "updates have to be done with a lot more care" than queries in order to safeguard the data base's integrity. Additionally, he said, such queries might overload a micro's memory and processing capabilities.

Asked why there are so few choices in microcomputer natural language interfaces, Erickson responded that "natural language is nontrivial software." Most natural language systems, written in traditional AI languages such as Lisp and Prolog "end up requiring more resources than the [micro] has," he added. "We used Fortran and developed a lot of techniques to shoehorn our software into the [micro]."

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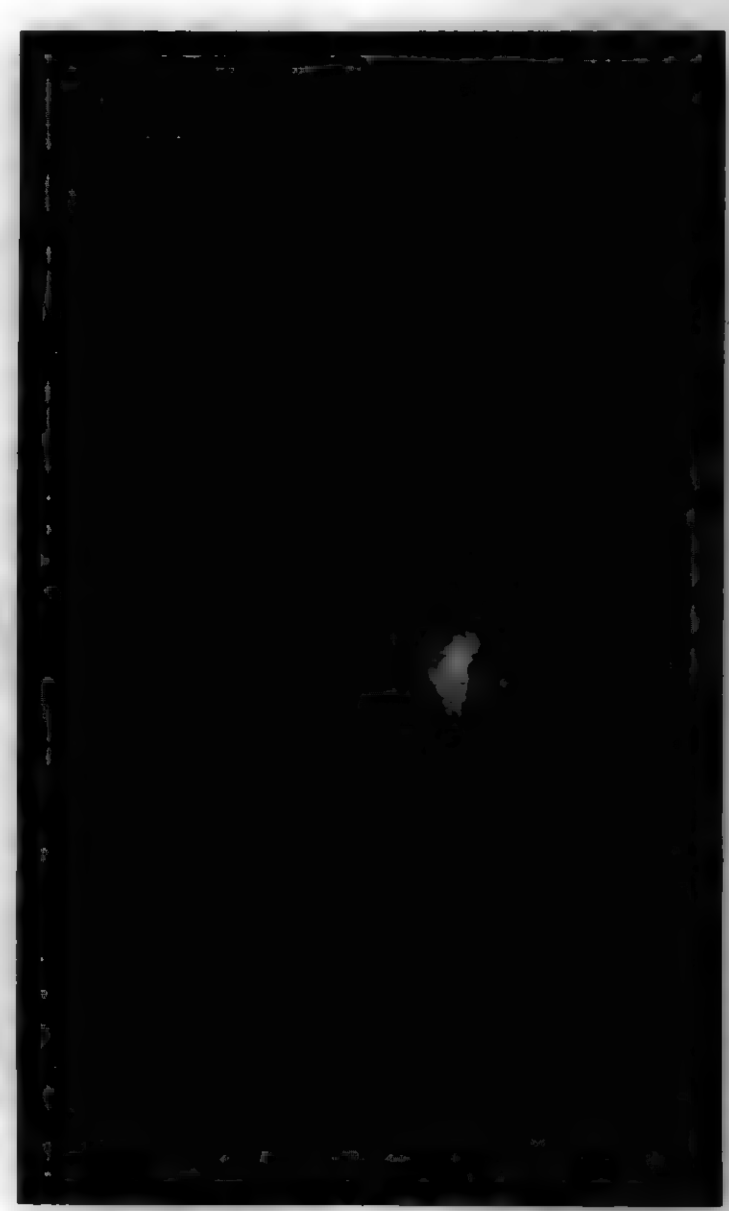

Throughout the history of the software industry, proponents of one database architecture after another have promoted their respective systems as the sole solution to a company's application backlog problem.

The early debate centered on hierarchical versus network architecture. Advocates of inverted file entered the argument in the 70's. And today, relational is the architecture of choice.

While this discussion about architecture is interesting, it's just not the issue.

Database management systems, beginning with the very first, were created to do one thing and one thing only —they were created to build better applications. *Building applications—efficient, online applications, faster, with fewer people—is the only real issue.*

Today corporations have a huge backlog to contend with. And the applications they need to develop have different characteristics. Some may be retrieval only. Some may be heavy on update. Some will run the company, and will require professional development. Some can be created by end users to satisfy their own needs.

It is extremely important to have a database management system that can handle all applications. *It is essential* that a database include tools rich and comprehensive enough to accommodate both the professional developer and the end user. It's the richness and power of these tools that's critical to the successful implementation of highly responsive fourth generation applications. What's demanded, in fact, is software that goes a *step beyond* today's conventional relational database systems.

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Chairman of the Board

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The only database management system worth buying is one that meets these six requirements.

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2. End-User Application Development Facilities

Because Cullinet recognizes the difference between production and end-user applications, as well as the need for both to share common data, we provide an easy to use end-user oriented development and inquiry system. The Automatic System Facility of IDMS/R is a non-procedural, menu-driven tool designed for end-users. Once data tables are defined, an application is automatically generated. The query facility of IDMS/R provides menu-driven query capability and full online help, so end-users can build working applications in minutes and get reports easily and efficiently.

3. Relational Architecture

IDMS/R allows for the definition of databases using the relational data model. Data tables and associated user views are easily defined online. Additionally, any number of key fields may be defined. IDMS/R also supports advanced relational features including referential integrity and domain definition. This architecture provides the capability to address all application requirements.

4. High Performance Database and Application Tuning Facilities

IDMS/R is a full multi-tasking, multi-threaded system providing for concurrent processing of online and batch, update and retrieval applications. Additionally, tuning facilities provide efficient indexing techniques, space management, page management, and buffer management. No conventional relational DBMS has these capabilities.

5. Dictionary Driven DBMS

Data integrity and data independence are essential in a DBMS environment. The dictionary actively controls the source and use of all data. Data definitions, data validation criteria, data formats and security are all defined within the dictionary and exist only once, eliminating redundancy and ensuring integrity. This information is then automatically used throughout the system. Examples of the functionality of this facility include never needing to define output formats for query; never needing to define field attributes for screens; never needing to code validation and editing criteria when using ADS/OnLine. Only IDMS/R provides this level of dictionary integration.

6. Open System Architecture

With the unique Open System Architecture of IDMS/R you can maximize your investment in existing software. IDMS/R accepts data from outside the database environment with direct access to VSAM files. In addition, applications written to access other databases like IMS, DL/1, TOTAL, or VSAM can directly access IDMS/R without modification. IDMS/R is designed to work in virtually all IBM mainframe operating systems and teleprocessing monitor environments.

IDMS/R: More than a relational DBMS

Cullinet

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Net, disk drive, board top NEC micro line additions

BOXBORO, Mass. — NEC Information Systems, Inc. has announced a local-area network, an external 20M-byte hard disk drive and the Software Library Expander, all for use with machines in its Advanced Personal Computer line.

It has also introduced two new printers and a product that reportedly provides color printing of output from an Apple Computer, Inc. Macintosh.

The Vianet local net reportedly supports up to 64 personal computers, peripherals and telecommunications devices communicating over twisted-pair wiring at a cost of $525 per node. The local-area network, a peer-to-peer network, handles all command interpretation, message routing, data formatting and error checking between the application program, the operating system and the local net protocol. Vianet is said to offer record locking but does not require a dedicated disk or file server station.

The 20M-byte, 5¼-in. hard disk, meanwhile, was introduced for use as a peripheral to the NEC Advanced Personal Computer (APC) III. Also announced for the APC III was the Software Library Expander, which reportedly permits users to run such software as Lotus Development Corp.'s 1-2-3 spreadsheet and Ashton-Tate's Dbase III. The Software Library Expander consists of a plug-in circuit board, software and documentation.

The new printers include the NEC Spinwriter, e.l.f. 360 for use with IBM Personal Computers and compatibles. The unit reportedly provides printing at up to 190 word/min. Also introduced was the Pinwriter Model P5, a dot matrix printer that reportedly operates at 53 db and offers letter-quality printing at 100 char./sec. and draft quality at 220 to 290 char./sec.

Also introduced was the Colormate software package for the Macintosh, a product that reportedly allows users to print in eight different colors. To print in color with Colorwriter, users need a NEC Pinwriter Model P2-6, P3-6, CP-2 or CP-3, priced at $795, $1,095, $1,095 and $1,495, respectively.

Vianet costs $525 for each interface board. The Software Library Expander is $150. The 20M-byte disk is priced starting at $1,495, without a controller. The Pinwriter Model P5 costs $1,445 and the e.l.f. 360 is priced at $545. Colorwriter consists of a diskette, interface cable and documentation and is priced at $99.

NEC Information Systems is located at 1414 Massachusetts Ave., Boxboro, Mass. 01719.

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Picking knowledge systems

High-payoff, low-risk applications ideal

By Eric Bender
CW Staff

CHICAGO — Getting started with knowledge systems "is not that tough, but it's not that easy either," according to John Spencer, vice-president for marketing and sales at Teknowledge, Inc., a knowledge systems software vendor.

Speaking here earlier this month at a National Computer Conference session on personal computer-based artificial intelligence, Spencer listed several recommendations for companies studying the potential payoffs of knowledge systems.

Heading the list, he said, is picking suitable early candidates for knowledge systems, and companies should look for high-payoff and low-risk applications.

"Don't pick some project that's going to take two years to pay off, because management will get very impatient," Spencer advised. He noted that most Teknowledge customers currently are building knowledge systems for tasks where there is a single correct answer rather than a range of responses.

Another important point, Spencer said, is "when you get into a jam, use some outside resources." He also suggested that companies focus on applying technology rather than developing it and to "expect that opportunities will far exceed your ability to respond."

Spencer added that "we spend a lot of time with people on what we call 'expectation management.'" For example, he said, Teknowledge cautions customers against expecting a system to be right 100% of the time, just as a human expert is not always right.

Another session panelist, Wanda Rappaport, director of software sales and marketing at General Research Corp., agreed with Spencer that some current packages are advanced enough to permit end users to generate knowledge systems.

Software can provide guidance for human experts who lack computer expertise to create knowledge systems, Rappaport said. "For most well-structured fields [of knowledge], that's not a problem," she said.

The panelists also agreed that personal computers will play useful roles in both developing and delivering knowledge systems.

"In the near future, personal computers probably will be used largely in experiments," predicted session chairman David Brodwin, a consultant with Arthur D. Little, Inc. "Ultimately, most of the activity will be in AI computing as part of larger systems."

Asked about limitations on microcomputers, Rappaport pointed out that "the primary limitations are size and speed — the size of the knowledge base and the speed with which you need an answer.

"A borderline case would be an expert system that held more than 500 rules," she suggested. However, she noted that 500-rule systems can be networked together to create a large system.

DCA introduces Smart Alec for IBM micro-mini emulation

ALPHARETTA, Ga. — Digital Communications Associates, Inc. (DCA) has announced a micro-to-minicomputer communications product that reportedly allows IBM Personal Computers, Personal Computer XTs and ATs to communicate with IBM System/34, 36 and 38 minicomputers.

Dubbed Smart Alec, the product allows Personal Computers to emulate an IBM 5251 Model 11 or 5292 Model 1 terminal. When used with a modem, the product can provide remote attachment to an IBM 5294 workstation controller or an IBM 5251 Model 12. Smart Alec comes bundled with file transfer software that allows users to transfer files between the personal computers and the IBM System/34, 36 and 38, the vendor said.

Smart Alec includes a printed-circuit board that reportedly can be installed into any full-length slot, a splice box that can manage the twinaxial cable connecting the personal computer and IBM minicomputers and bidirectional file transfer software for the Personal Computer and IBM minis.

The product reportedly allows users to run three simultaneous host sessions. Users can perform a file transfer, print session and host session at the same time. They can also send print jobs directly to the PC printer, by allowing the PC printer to emulate an IBM 5256 printer, the vendor said.

Smart Alec, including the file transfer software, costs $995. An enhanced version of the File Transfer software, which includes record and field selection capabilities, costs $1,295.

The product will be shipped next month.

DCA is located at 1000 Alderman Drive, Alpharetta, Ga. 30201.

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Tecmar unwraps modem

SOLON, Ohio — A 2,400 bit/sec. internal modem for the IBM Personal Computer has been introduced by Tecmar, Inc. The Phonegate 2400 modem, which fits into one of the Personal Computer's full-length slots, is priced at $789 and comes with two software packages.

The first package is Software Synergy, Inc.'s Respond data communications package, which offers file transfer and emulation of the Digital Equipment Corp. VT52 and VT100 terminals, as well as the IBM 3101 and Hewlett-Packard Co. 2621V terminals and standard TTY devices.

Also included is Tecmar Telephone Management Software, which reportedly causes a list of recently called numbers or a personal telephone directory to be displayed when the telephone's receiver is lifted from its cradle.

Phonegate is also said to offer Touch-Tone decoding, under which its software keeps track of all incoming and outgoing telephone calls placed from the user's telephone or the computer's directory.

Phonegate reportedly can communicate at 2,400, 1,200, 600, 300 and 110 bit/sec., according to Tecmar. It can display messages on the status of outgoing calls and permits the user to switch a person-to-person call to computer-to-computer status.

Tecmar is located at 6225 Cochran Road, Solon, Ohio 44139.

3Com boosts net server line with 70M-byte high-end unit

MOUNTAIN VIEW, Calif. — 3Com Corp. has introduced the 3Server 70, a high-end addition to its family of local-area network servers. It reportedly features a 70M-byte hard disk drive with a storage capacity expandable to 420M bytes.

Priced at $8,995 and available immediately, the system supplements 3Com's 3Server, which was introduced in January and which comes with a 36M-byte disk drive.

While both products reportedly can support up to 50 network users in productivity applications and up to 16 users in transaction processing applications, the 3Server 70 was designed for customers with higher storage requirements, according to 3Com. The 3Server 70's disk drive provides average access time of 28 msec, 3Com said.

3Com also introduced the 70M-byte Expansion Disk, an external disk drive that reportedly works with either server and costs $4,995. Up to five Expansion Disks can be added to the 3Server 70 for the 420M-byte total.

3Com can be reached through P.O. Box 7390, 1365 Shorebird Way, Mountain View, Calif. 94039.

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Analytica drops Reflex software copy protection

FREMONT, Calif. — Analytica Corp. has dropped the copy protection on its Reflex data base software for the IBM Personal Computer. It will also begin selling site licenses of Reflex through its dealers.

Removal of the copy protection will permit the software to be copied more easily and installed in hard-disk systems, Analytica said.

Registered Reflex users reportedly will receive the unprotected version of the software free in the mail. Unprotected versions of Reflex will be available in stores this month. The package remains priced at $495.

The Reflex site licenses will be sold in quantities of 100, 500 and 1,000 units, priced respectively at $30,000, $120,000 and $200,000. Users will be provided with several master diskettes from which they can copy the program up to the specified number of copies permitted in their license, the vendor said.

Documentation reportedly will also be included with each site license at a rate of 10 Reflex manuals for every 100 copies of Reflex permitted under the site license.

Analytica is located at 3155 Kearney St., Fremont, Calif. 94538.

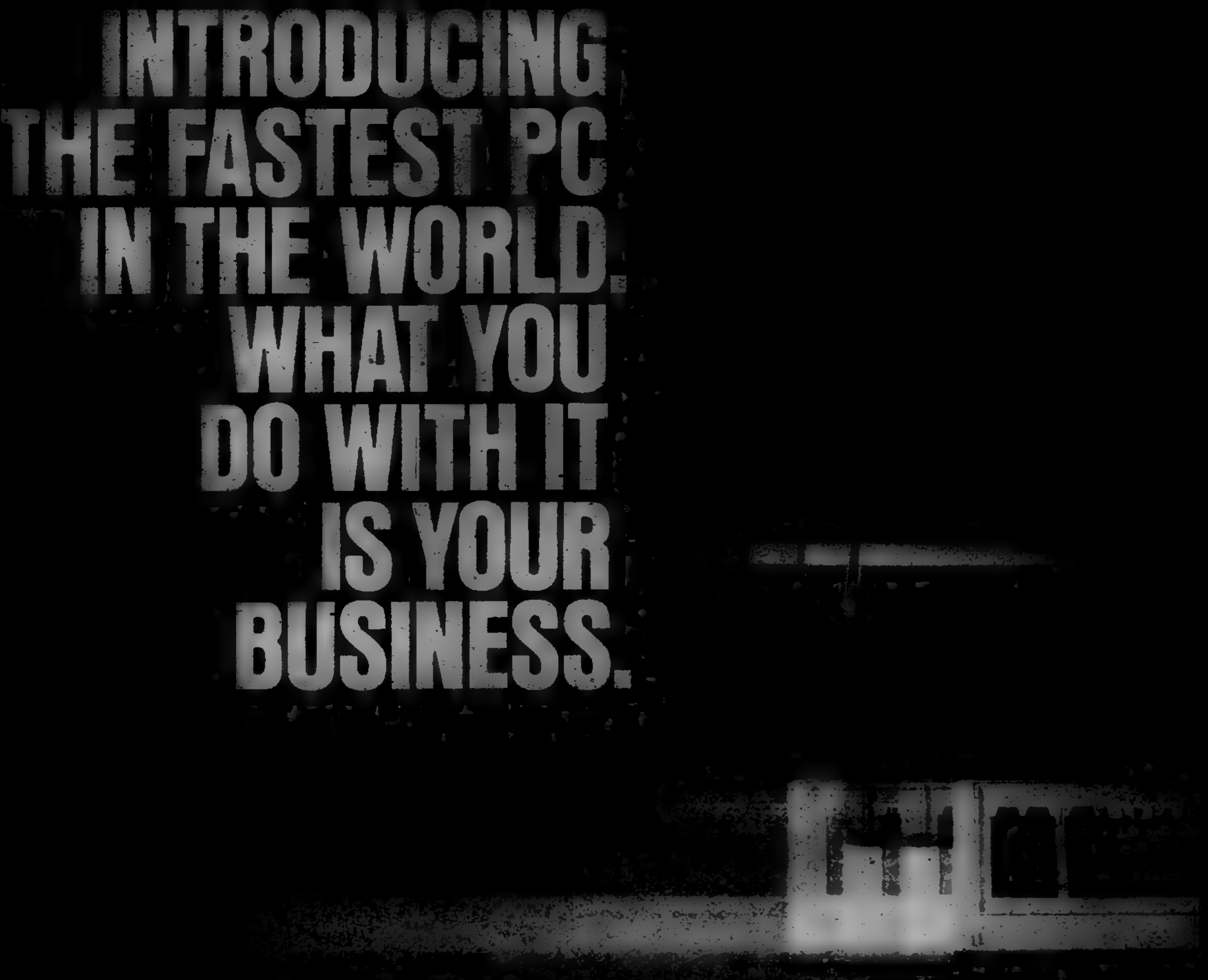
SYSTEMS

- **Megadata Corp. has introduced its Model Seven, a portable supermicrocomputer based on the Motorola, Inc. 68000 microprocessor and running the AT&T Unix operating system.**

The latest addition to the multiuser 8300 series, the Model Seven reportedly includes 1M byte of memory, a 26M-byte hard-disk storage unit, a 1M-byte diskette drive and two RS-232 parallel ports. Weighing 18 lb, the Model Seven is field upgradable to a total of eight serial ports.

The expansion board costs $650 with 512K bytes of additional memory and $990 with another 1M byte of memory. The Model Seven costs $4,399.

Megadata, 35 Orville Drive, Bohemia, N.Y. 11716.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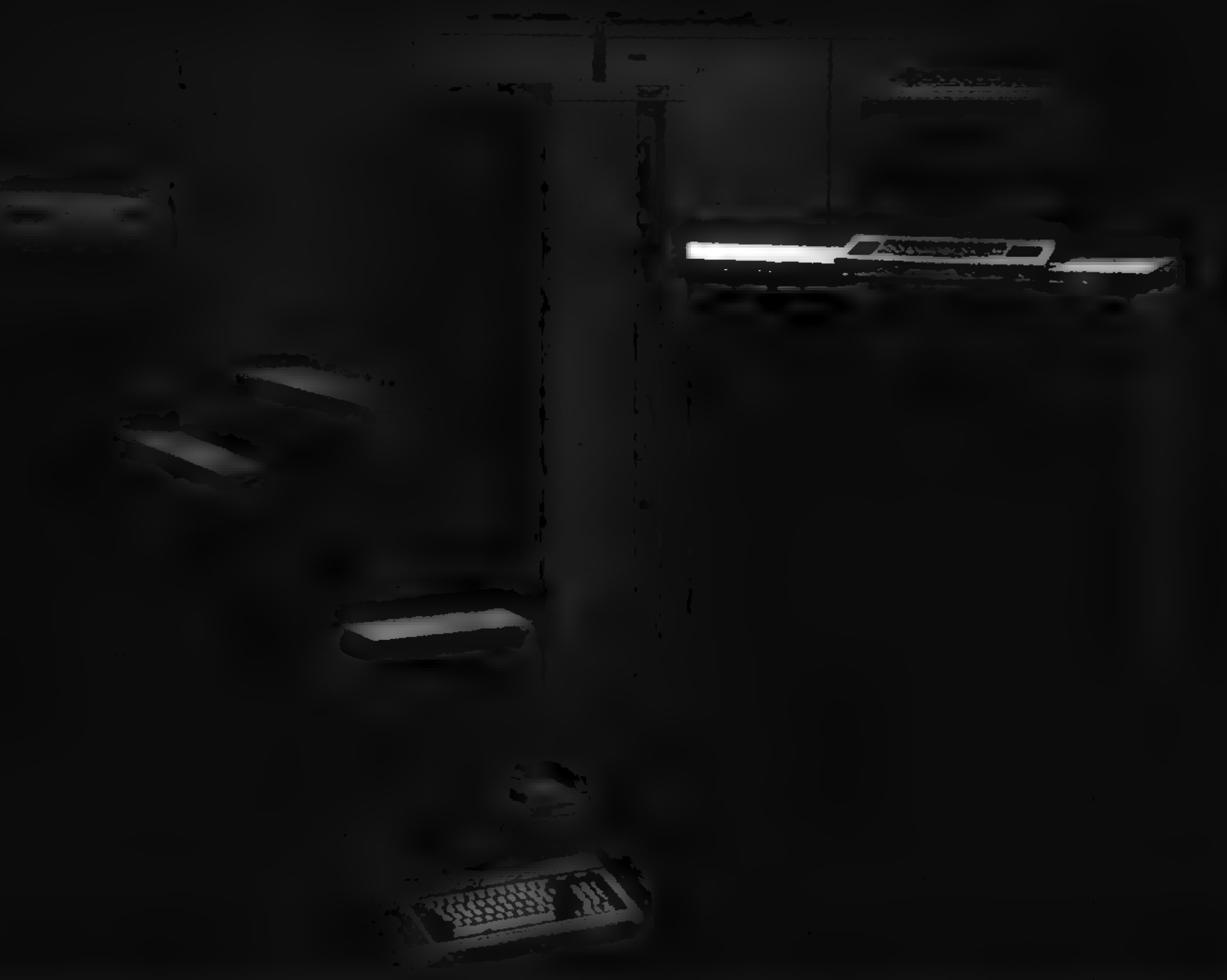

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SPERRY

PRINTERS/ PLOTTERS

■ **Televideo Systems, Inc. has introduced a low-end terminal for use with personal computers.**

The Model 905 is a 14-in. terminal designed for office automation applications. It is reportedly compatible with the Televideo family of products and with the Applied Digital Data Systems Viewpoint A2 terminal.

It costs $1,495 and will be available in September.

Televideo Systems, P.O. Box 6602, 550 E. Brokaw Road, San Jose, Calif. 95150.

BOARD-LEVEL DEVICES

■ **Direct, Inc. has introduced the PC102 interface, which provides IBM Personal Computers with Digital Equipment Corp. VT100, VT52 or VT102 terminal emulation capabilities.**

The PC102 combines a display enhancement adapter card and software and reportedly provides the Personal Computer with the same video display capabilities as the DEC terminals.

The interface is said to provide the Personal Computer with 80- by 132-col. screen presentation, all DEC VT102 character sets and attributes.

The product costs $595, the vendor said.

Direct, 4301 Burton Drive, Santa Clara, Calif. 95054.

■ **Kamerman Labs has announced the Excelerator add-on board that reportedly increases processing speed of the IBM Personal Computer and Personal Computer XT four times.**

The product was designed around a 10-MHz Intel Corp. 8086 chip and includes up to 640K bytes of high-speed random-access memory (RAM).

Excelerator users can reportedly return to the machine's original speed with a manual hardware switch or through software commands.

The board includes an optional battery-powered clock and calendar, serial port and parallel printer port.

The board is priced at $1,095 for 128K bytes of RAM, $1,340 for 256K bytes and $180 for each additional 128K bytes. The other options are available for $295.

Kamerman Labs, 8054 S.W. Nimbus Ave., Beaverton, Ore. 97005.

■ **STB Systems, Inc. has announced Chauffeur, a video board for the IBM Personal Computer, Personal Computer XT and AT.**

The product is said to convert any IBM-compatible color graphics display into a full screen format compatible with the IBM monochrome monitor.

In graphics mode, the board reportedly supports IBM standard resolutions of 640 by 200 pixels with two monochrome shades and 320 by 200 pixels with four monochrome shades. The board includes drivers supporting high-resolution displays for Lotus Development Corp.'s 1-2-3 and Symphony and Ashton-Tate's Framework software.

In text mode, Chauffeur produces 80- by 25-line displays, according to the vendor. The product is said to provide 16K bytes of display memory in text mode.

Chauffeur is priced at $395.

STB Systems, Suite 125, 601 N. Glenville, Richardson, Texas 75081.

■ **Viasyn Corp. has introduced a color graphics board for its Compupro 286 multiuser personal computers.**

The PC Video board reportedly takes full advantage of the computer's Intel Corp. 80286 microprocessor and is said to be compatible with such software as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase II. Up to eight of the boards can be daisy-chained to support a group of graphics users.

It costs $495.

Viasyn, 3506 Breakwater Court, Hayward, Calif. 94545.

SMALL

from page 37

tended to undermine shared resources as the driving force for buying personal computer nets. In one example, the typical price of a 10M-byte hard disk drive has slid 83% since 1982, while cost of a 3Com Corp. network card has dropped only 35%, he pointed out.

Bill Osborne, IBM's product manager for broadband network products, agreed with Melin that information sharing now provides a stronger rationale for acquiring a microcomputer network. He predicted, however, that "we'll see another class of expensive resources coming in," particularly high-end net servers. These new systems will help to support the trend toward larger nets, Osborne added. "[Personal Computer] nets grow as quickly as rabbits do, once you get them installed," he said.

■ Explaining why shipment of 3Com's Ethermac local-area network software has been delayed from June to September, product manager Derek Brown highlighted some of the frustrations in moving the Macintosh into a multiuser environment. "Spooling to the Laserwriter from the Mac is damn near impossible," he said.

■ General Research Corp.'s The Intelligent Machine Model (Timm) expert system shell is a spin-off from work on battlefield surveillance for the U.S. Army, and development of Timm/PC arose rather casually as the company prepared for an artificial intelligence conference, according to Wanda Rappaport, director of software sales and marketing.

"We found no way to use a terminal to our [Digital Equipment Corp.] VAX computer, so we put it on a personal computer," she said. "Most of the market research was done at the conference." There was talk of calling the new microcomputer version Tiny Timm, Rappaport said, but cooler heads prevailed in the end.

■ Among a host of optical memory devices on display, the most interesting was a prototype erasable 3¼-in. drive from Verbatim Corp. The company expects to begin volume production in fourth-quarter 1987, offering 40M-byte and 100M-byte models. Senior Vice-President Geof Bates said OEM costs will be approximately $300 for the drive and $30 to $35 for the removable disks.

■ Karl Sterne, senior vice-president for marketing at Viasyn Corp., had a quick explanation of why that company changed its name from Compupro Systems, Inc., last year: "There are 136 companies which start with 'Compu,' and we were always being confused with two or three of them in Chapter 11 [of the Federal Bankruptcy Act]."

PC2

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with limited expansion capabilities.

Separately, IBM announced a limited recall program for the Personal Computer AT's hard disk drive adapter card. "A random, intermittent type of problem" has cropped up.

Affected customers soon will receive a notification letter from IBM that includes a test diskette. If the system fails the test, customers should notify the vendor that sold them the machine, for free, on-site repair.

Serial numbers for the machines that may be affected are 5019001 through 5141250 for the base AT model and 0054001 through 0146900 for the enhanced version.

GRAPHICS

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an ink-jet printer with a resolution of 4,000 dot/line and a price of $15,000. Such resolution, he said, might previously have cost as much as $200,000. While even $15,000 is too much to pay for a stand-alone machine, he said, it is a reasonable cost for a printer that is to be used in a personal computer network.

As for the role of the mainframe in this new world of high-quality personal computer graphics, Paller said he does not expect large-scale processors to be completely supplanted. For one thing, the mainframe, not the personal computer, is the best machine on which to base a corporationwide, networked graphics application. In addition, the mainframe is attached to top-quality output devices that are too expensive for stand-alone use.

In that latter case, Paller predicted that the mainframe will become a "network peripheral." Under such a system, micro users could upload spreadsheet files to a mainframe-based graphics package, interact with the mainframe graphics software to produce a chart, then output the chart on high-resolution plotters and printers serving the mainframe.

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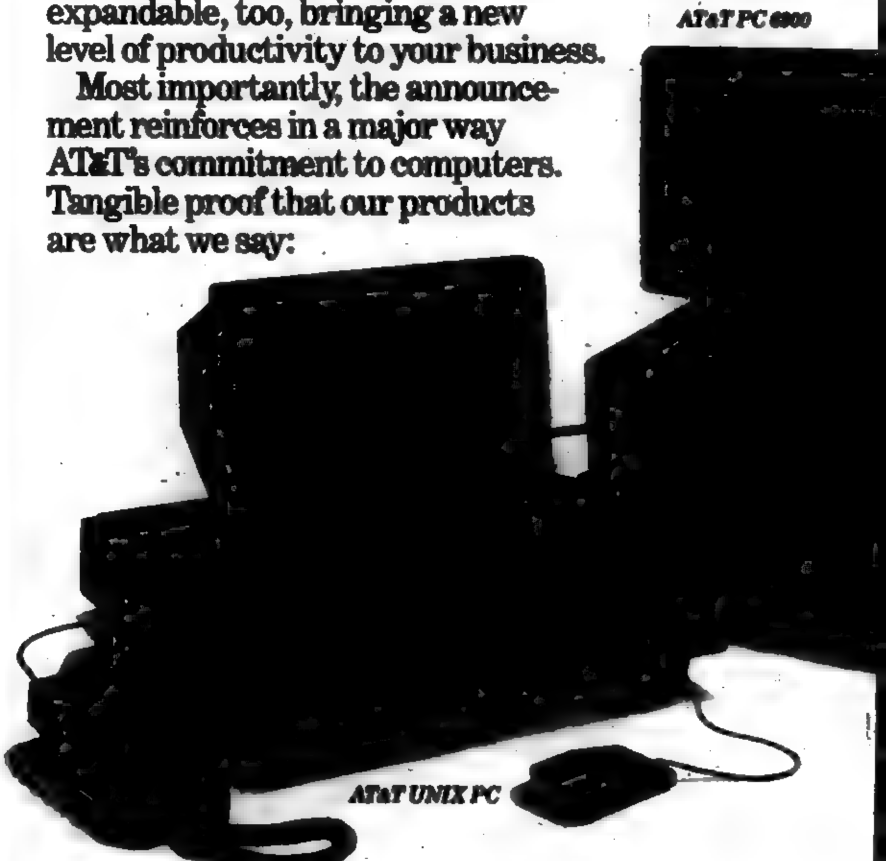

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Those with a major investment in mainframe computers can rest easy. Now you can enjoy complete end-to-end connectivity. We now support popular SNA and BSC protocols, which means our computers and systems can communicate and work with your mainframes. Your investment is protected.

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AT&T 4410 Terminal
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AT&T 3B5 Computer
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COMMUNICATIONS

SNA architects outline probable enhancements

By John Six
CW Staff

A panel of IBM representatives outlined the future needs of the company's Systems Network Architecture (SNA) earlier this month at a National Computer Conference session called "IBM's SNA — Meeting the Challenge of Change," and discussed an existing product that can be used in network planning.

The session was chaired by Edward H. Sussenguth, who headed up IBM's SNA development team from the time of its inception in 1974 until last year, when he became an IBM Fellow. SNA is now used in more than 20,000 IBM 370-architecture host computers, Sussenguth said.

> *No one expected SNA to be accepted so quickly, nor did the architects anticipate that networks would get so large.*

No one expected SNA to be accepted so quickly, nor did the architects anticipate that networks would get so large. A large corporate network may have 12,000 to 15,000 terminals, 10 IBM 30 series host processors, 30 4300-type CPUs, 100 IBM Series/1 minicomputers and 30 to 100 front-end processors. A network supporting banking or point-of-sale terminals may have 60,000 terminals, Sussenguth said.

To accommodate the advent of such large networks, IBM was forced to increase network addressing from 16 bits to 23 bits, a modification that is representative of changes made to SNA to keep up with industry and network advances, he added.

Some of those changes were outlined by Robert J. Sundstrom, manager of communications systems architecture with IBM's Communications Products Division.

According to Sundstrom, the first SNA product was the 3600 banking system, supported with a CPU running Vtam with a channel-attached 3705 front-end processor running the Network Control Program.

Today Vtam networks serve as backbones, and Sundstrom said he can foresee the day when network addressing will have to be extended from 23 bits to 48 bits.

Other changes the manager anticipates include a reduction in required maintenance, reduced network definition procedures, the ability to support peer-to-peer communication among low-end processors, local network support and increased availability.

Reducing scheduled maintenance will enable 24-hour network availability, Sundstrom said. Similarly, the need to increase availability during working hours is encouraging development of alternate routing to bypass failed net components. Availability also forces the issue of dynamically changing networks.

Sundstrom noted that SNA will be upgraded to reduce the definition or system generation procedures required when systems are added or deleted from a network.

To support small systems outside the domain of the Network Control Program, IBM developed a node type called Physical Unit 2.1. This was complemented with the creation of Advanced Program-to-Program Communications or Logical Unit Type LU6.2. IBM will extend this support to many of its small systems, Sundstrom said.

As these small systems are supported on local networks, there is a growing need to modify SNA to support local network clusters, the architect said. Key to local network support is the ability to integrate network management with that of the backbone network.

Ideally, SNA will someday be able to use

See SNA page 60

WIRE TAP
Daniel Minoli

Planning cuts net setup costs

Effective planning and coordination between data communications network designers and implementation groups can reduce the overall cost of installing or modifying a network and increase end-user satisfaction and uptime.

Several tips based on experience are highlighted below to sensitize potential users and managers to some of the issues involved. These suggestions apply whether the implementation is carried out by a separate implementation group or is handled by a multipurpose corporate communications group.

It is important to avoid the situation known as "customer not ready," where a service supplier comes to install a circuit but is denied access or cannot pinpoint the location. These situations can also be encountered by a vendor trying to install data terminals or communications equipment upon finding that power, cabinet space or other prearrangements have not been made.

Surprisingly, customers often are not prepared to receive products and services. International record carriers, for example, average two to five such situations per installation attempt. This writer has seen a customer turn a vendor away seven times. Since rescheduling visits normally requires at least one week, this translates into delay.

See DELAY page 60

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

Indesys' one-way message service melds micros, radio

CHICAGO — Indesys, Inc. unveiled an electronic message delivery service here at the recent National Computer Conference that combines satellite distribution and FM radio delivery technology.

Indesys is backed by printer maker Epson America, Inc.; ABC Video Enterprises, Inc., a division of American Broadcasting Companies, Inc.; a venture capital firm called The Hillman Co.; and the Indesys Management Group.

The company will provide one-way message distribution services to personal computers equipped with an integral, proprietary Indesys receiver card or to specially equipped printers. An antenna will also have to be installed at each receiving site.

In practice, users create messages on a computer and, after finding the published address of the intended recipient, enter one or more addresses to which it is to be sent. The message is then transmitted at 300, 1,200 or 2,400 bit/sec. through a local ABC station, which routes the call to a computer at Indesys' headquarters in Mountainview, Calif.

Indesys' computer converts the public identification code into a private address code and forwards the message via a 38.4K bit/sec. microwave link to a satellite earth station. The earth station bounces messages off of a satellite down to affiliated radio stations.

These stations, in turn, broadcast the message on a subcarrier frequency along with their normal commercial radio broadcast. While largely unused today, FM subcarrier radio waves — which are not detected by common FM radios — are used to broadcast services such as Muzak of Philadelphia's subscription background music.

Indesys customers are assigned a unique address, and their receiving equipment collects only those messages addressed to it. Because FM subcarrier transmissions, like standard FM radio, blanket all receiving equipment in a given radius, only the receiver addressed can decode its messages.

For additional security, Indesys can change the private addresses of receiver equipment frequently. A receiver may have as many as 64 subaddresses to support multiple users. The computer stores incoming messages keyed to separate passwords for each subaddress.

The Indesys' receiving card for personal computers contains a decoder and a buffer. If the computer is turned off, the receiver can store and buffer up to 100 pages of text. The Indesys board is compatible with Epson's QX-16 micro or IBM's Personal Computer. Locations that do not have personal computers can use properly outfitted Epson smart printers.

Offering several services

Several service tiers will be offered, including Maxmail, guaranteed one-hour delivery at 20 cent/page; Digitext, same-day delivery (typically within four hours) at 15 cent/page; and Nitetext, guaranteed overnight delivery by 8 a.m. for 10 cent/page. There are no monthly minimum charges.

Indesys will initially transmit data to locations in New York, Los Angeles, Chicago, Dallas and San Francisco through these respective FM radio stations: WPLJ, KLOS, WLS, KTKS and KOME.

The company said it expects to support several other major markets beginning in 1986.

Indesys is located at 2425 Garcia Ave., Mountain View, Calif. 94043.

In a Control Data Computer System you're free to crunch anybody's numbers.

[illegible]

CONTROL DATA

SNA

from page 57

all types of communications facilities — including local networks, leased and dial-up lines and X.25 networks — regardless of node type.

Gauging effect on net operations

To help gauge how these new SNA capabilities will affect network operations, IBM offers the System Network Analysis Program/Simulated Host Overview Technique (Snap/Shot).

Snap/Shot is a discrete simulation modeling tool, according to Bud Gross. Gross is a manager of design and analysis tools with IBM's Telecommunications Products Organization.

Snap/Shot was developed in conjunction with SNA and was initially intended to show performance differences between SNA and IBM's Binary Synchronous Communication and start/stop protocols.

Used for benchmarks

Today, Snap/Shot is used in place of benchmarks to gauge how changes made to a network will affect net performance.

Benchmarks are time consuming and cost roughly $250,000, almost 20 times what it costs to model with Snap/Shot, Gross stated.

Snap/Shot is completed in a week and offers results that are said to be nearly as accurate as actual benchmarks.

Studying net changes

Snap/Shot can be used to study net changes on I/O, host processors or terminal populations and is recommended for use in capacity planning, in the consideration of data base management systems and configuration analysis.

It is not recommended for the analysis of batch-only applications or for determining factors such as the size of Vtam buffers, Gross said.

Model output is created in terminology and forms that users are accustomed to, the design and analysis manager noted.

John Link, a senior planner for communications programming with IBM's communications products division, concluded the session by saying that the overall intent is to increase the availability of SNA networks by reducing planned and unplanned outages.

The largest vulnerability of SNA nets — and thus the greatest need for enhancement — is in software, Link said.

DELAY

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Many customer-not-ready situations, particularly those related to access and awareness of the customer contact, can be avoided easily. The customer should know the service contact point locally, but more important at the remote site, where customer-not-ready situations are more common.

Second, the contact individuals should be clearly informed about the upcoming installation, the vendor, the desired location and the preliminary tasks to be performed.

Third, the approximate date of installation should be communicated to the contact individuals.

Customer-not-ready situations and ensuing delays can occur at all stages of a project.

In some cases, physical installation of the local loops and end-to-end testing are done in two phases, such as with installation of international circuits that require space segment allocation. A customer delay for such services may require having to back out of the satellite, again resulting in major delays.

Most vendors cancel an order after finding the customer is not ready a number of times, typically four, after which users must reenter the order.

Limiting problems

One way to limit this situation is to give vendors enough time to deliver the desired product.

A reasonable interval between the ordering date and the due date should be factored into the plan.

While users may occasionally be forced to push a vendor for early delivery of one or two units, if a large number of units is required, 45 to 60 days is reasonable.

High-speed digital services may, on the other hand, require three to 12 months to deploy; if the service is needed sooner bypass alternatives should be explored.

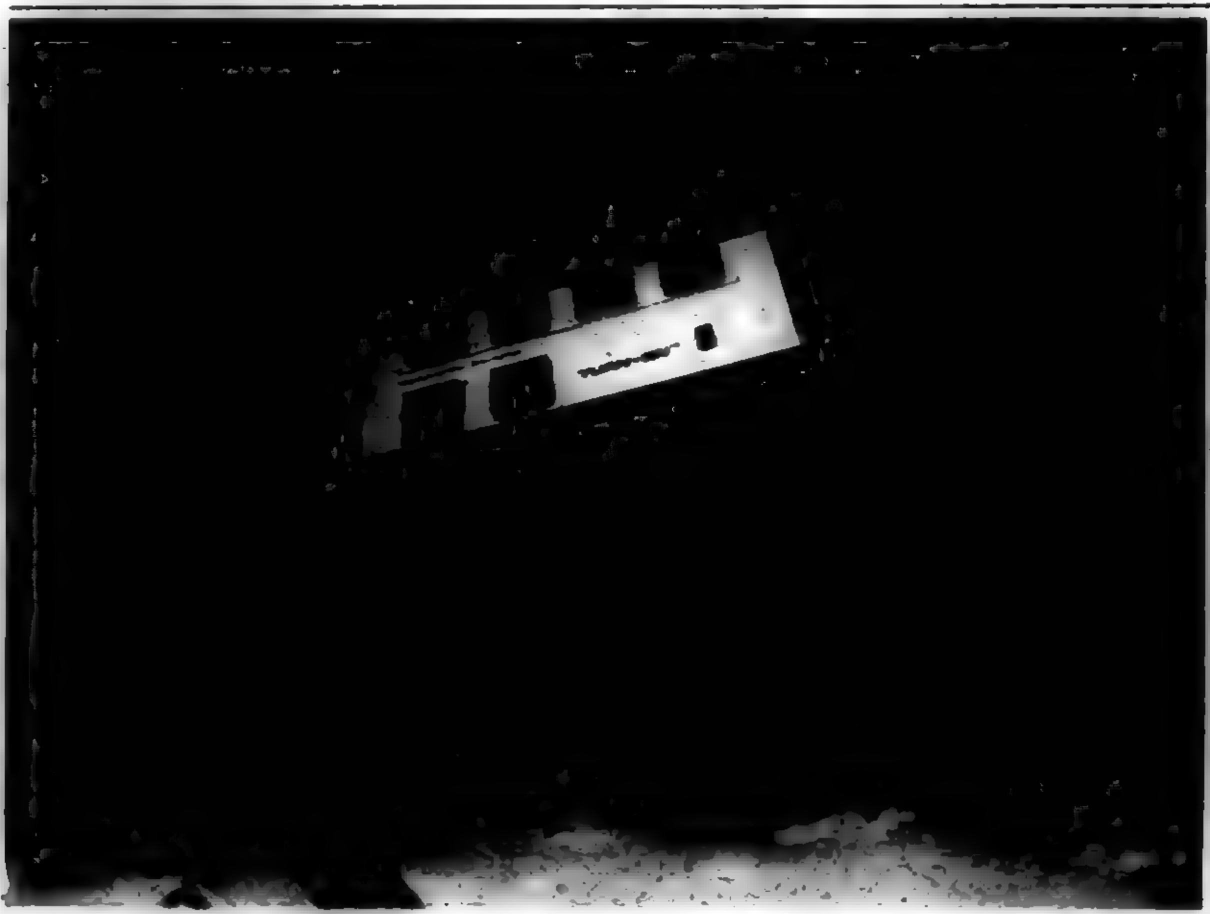
Allow enough time for unit and integration testing. Don't discount Murphy's Law.

One may buy a component that, according to specifications, should integrate into an overall system. But time and again the user finds himself chasing an unexpected bug. Even the most minute task can translate into a problem.

Pursue validation testing with the vendor before bringing the equipment in-house.

The system may have worked well at another installation, but how it will work in your application, which may have a different load, is another consideration.

The above are only a few examples of issues that must be properly addressed at planning and implementation time to achieve smooth and cost-effective network deployment and service initiation.



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The System/36 is a well-rounded business and office computer system with a library of more than 3,000 proven applications covering a wide range of businesses.

For example, IBM software like DisplayWrite/36 and Personal Services/36 provides text processing, calendaring and scheduling, message and mail handling to help you create a hardworking office system.

PC Support/36 lets personal computers access System/36 disk storage and printers.

As a central processor, the System/36 can help pull a company together—it can connect PCs to mainframes. And the communications capabilities of the System/36 allow people throughout an organization to share information and resources to handle almost any job, anytime, from IBM Personal Computers or System/36 terminals.

In addition to its text and office function and its communications capabilities, each System/36 offers business graphics and general accounting applications, making it a truly integrated solution to the problems of running a business.

Introducing the IBM System/36 PC.

This new IBM computer marries the System/36 and the IBM Personal Computer to give you the best of both worlds. With a price starting at $5,995, the System/36 PC is an affordable standalone system for a small business. And it can be used in a larger company where multiple unit installations offer the best solution.

The System/36 PC is made up of a 5364 processor attached to an IBM PC, PC XT or PC AT. And you can connect up to three more of these personal computers. Or you can connect terminals such as System/36 printers or displays.

The System/36 PC comes with a 1.2 MB diskette drive and either 40 or 80 MB disk storage, depending on your information storage needs.

The System/36 model 5362.

The middle-sized System/36 processor, the 5362 can support up to 22 local IBM Personal Computer terminals and up to 64 remote terminals. With 1 MB of main memory and 120 MB of disk storage, the 5362 is powerful for its size—about as big as a two-drawer filing cabinet. And, you can add memory and additional features with plug-in modules for easy growth.

The System/36 model 5360.

The largest of the System/36 Family, the 5360 has 1.75 MB of main memory, with disk storage capacity up to 800 MB. Working as the computer solution for many businesses, the 5360 can support up to 36 personal computers or local terminals and up to 64 personal computers or terminals remotely.

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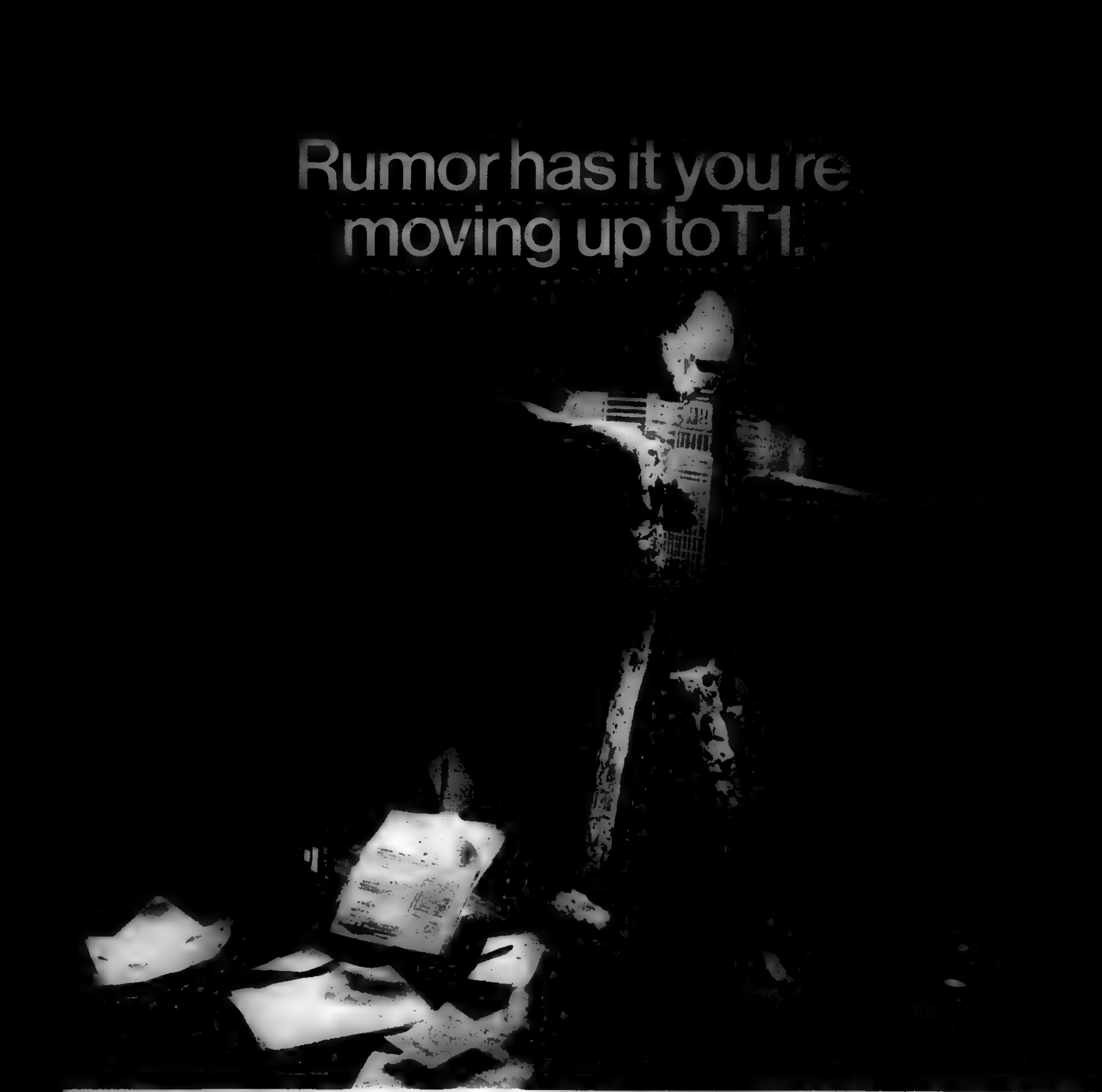

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SYSTEMS & PERIPHERALS

INSIDE
Terminals/70

Honeywell true to CPUs

Exec reaffirms staying power in mainframe area

By Peter Bartolik
CW Staff

Despite its reliance on NEC Corp. for a high-end mainframe, Honeywell, Inc. has not reduced its commitment to mainframe technology, according to the top executive of the Information Systems division.

William Ray, who earlier this year was appointed executive vice-president of Information Systems, spoke with *Computerworld* during the recent National Computer Conference and directly addressed the company's staying power in the mainframe area.

The company's next generation of mainframes is currently in the research and development stage and will be made by Honeywell, Ray said.

Ray was appointed to his current position during a reorganization that saw Honeywell Vice-Chairman James Renier relinquish his position as president of Information Systems and move up to share the chief executive office with Chairman Edson Spencer. Like Renier, Ray moved over to Information Systems after heading the industrial controls groups.

That reorganization, Ray conceded, "did send a signal that some people interpreted to mean that Honeywell will emphasize controls over computers." But that is the wrong impression, he asserted.

Honeywell for too long operated its computer and controls divisions as separate companies. Integrating those businesses provides added strength, particularly in high-growth areas such as factory automation and networking, Ray said.

See CPU page 70

COM print system out

CHICAGO — Bell & Howell Co.'s Computer Output Microfilm (COM) Division introduced a COM print and duplicating system at this month's National Computer Conference here for medium- and low-volume DP centers.

The COM Print 6000 system for in-house fiche printing is said to cost about $80,000, according to the company.

The system, which receives input from IBM or IBM plug-compatible mainframe computers, looks like a printer to the host computer.

Job setup is performed on the host using Bell & Howell setup software for subsequent storage in the system library.

Effective image reduction of 48:1

The system has a 128-char. set; 105mm unsprocketed roll, emulsion-in, dry-silver film type; and a magazine capacity of 200 ft of master and 100 ft of duplicates. The effective image reduction is 48:1, according to Bell & Howell.

Ten copies of a 2,000 page report can reportedly be produced on the COM Print 6000 in less than an hour on eight fiche weighing less than two ounces per copy.

According to the vendor, the total cost for printing and duplicating that report would be $4.88.

More information can be obtained from Bell & Howell at the COM Division, 16691 Hale Ave., Irvine, Calif. 92714.

Elite supermicro unveiled

WICHITA, Kan. — Elite Computer Systems has announced the Expert 32, a supermicro based on multiple National Semiconductor Corp. 32032 microprocessors.

Users can attach up to six CPUs in a tightly coupled configuration. The system was designed to run the company's ECS PVS operating system.

A basic Expert 32 system, including a CPU, 2M bytes of main memory, 32K bytes of cache memory, a 60M-byte hard disk drive, a peripheral interface card, four RS-232 serial interfaces, a disk controller, a Centronics Data Computer Corp. parallel interface and 12 expansion slots, costs $18,900.

Elite Computer Systems is located at 4129 May St., Wichita, Kan. 67209.

The tangled web of micros, minis, mainframes

SHOP TALK
William Inmon

Ask DP managers if they know the difference between a mainframe and a microcomputer and the response will probably be: "Of course I know the difference. What a silly question!" Ask a salesman if an IBM 3081 is a mainframe or if an IBM XT/370 is a micro, and you will probably get the same response.

Indeed, the DP community has a strong intuitive notion of the boundaries that define a mainframe, mini or microcomputer. But upon even a superficial analysis, it is clear that the real differences between the types of processors are blurred. In fact, commonly used methods for differentiating between the various processor groups, such as the millions of instructions per second (Mips) measure, add to the confusion.

Classifying processors is important to many people. For example, market researchers must have a way to break down the marketplace for analysis. There are different forces which drive the mainframe, minicomputer and microcomputer marketplaces. Fundamental to understanding those forces is the ability to define solidly how the marketplace is segmented.

DP managers are also affected by the differences between processors because they have to make daily decisions on whether their companies are heading in the right direction.

For a long time, Mips was the primary

See DEFINE page 66

William Inmon is a director at Coopers & Lybrand in Denver and a noted author on the subject of data base design.

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DEFINE

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criterion by which the market could be divided. A mainframe was a processor with an instruction rate higher than N Mips, and a minicomputer was a processor that ran slower than N Mips. And for a while, this distinction had a certain amount of validity. It has rapidly become obsolete.

One reason for this obsolescence is that mainframe Mips are not necessarily equivalent to minicomputer Mips. For example, a mainframe is usually capable of accomplishing a task in a given number (N) of instructions, while a minicomputer takes more instructions (N+M).

A second factor that makes it difficult to compare minicomputer and mainframe Mips is that in certain environments, such as on-line situations, the capacities of the two machine types become saturated at different levels.

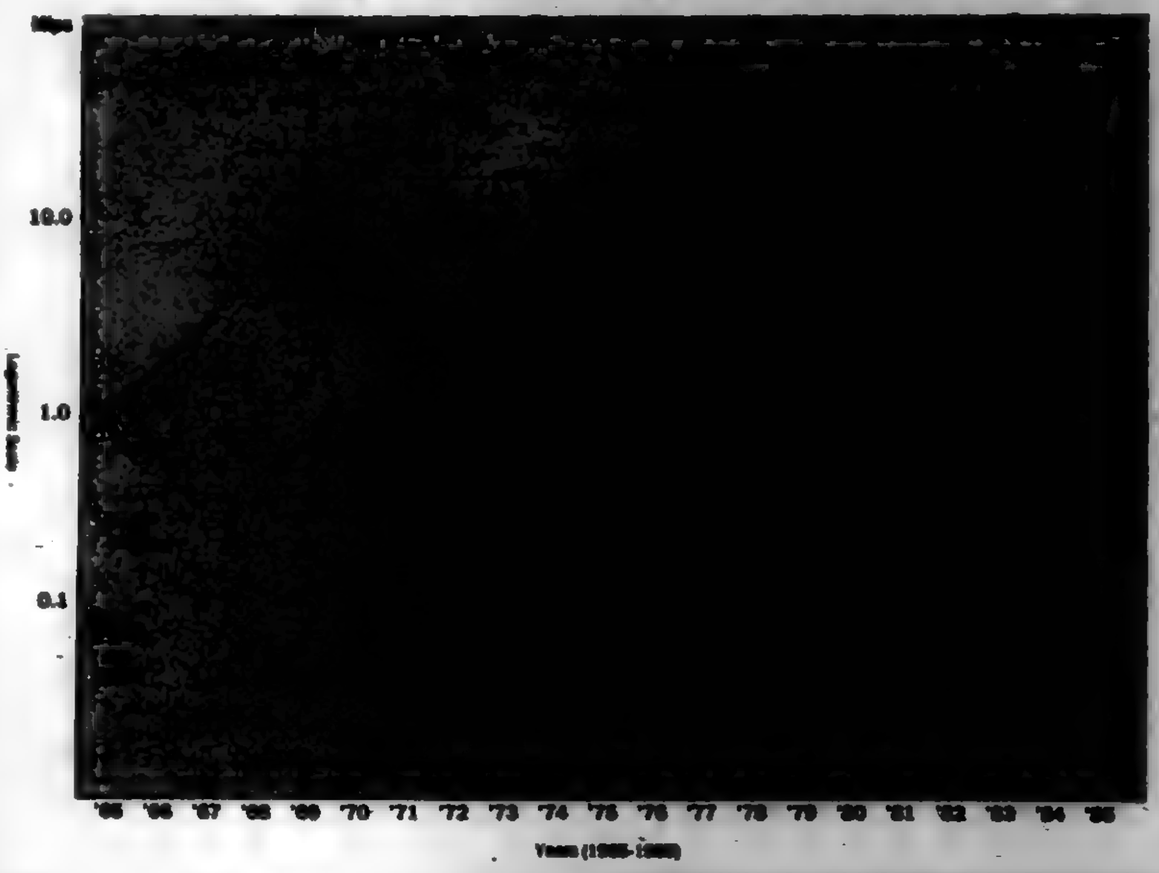
Another problem with Mips is that the criterion is often a moving target. In the early 1960s, a mainframe processor typically fell into the .04- to 1-Mips range. In the late 1960s and early 1970s, the mainframe range was between 7 Mips and 12 Mips. Now, mainframes generally fall in the 8- to 25-Mips range.

When the mini came on the scene in the mid-1970s, it created new types of processing and new markets. Digital Equipment Corp.'s first processor operated in the .05- to 1.5-Mips range.

By the early 1980s, minicomputer manufacturers introduced more pow-

See DEFINE page 70

The million instructions per second (Mips) rating of some different machines vs. their announcement dates



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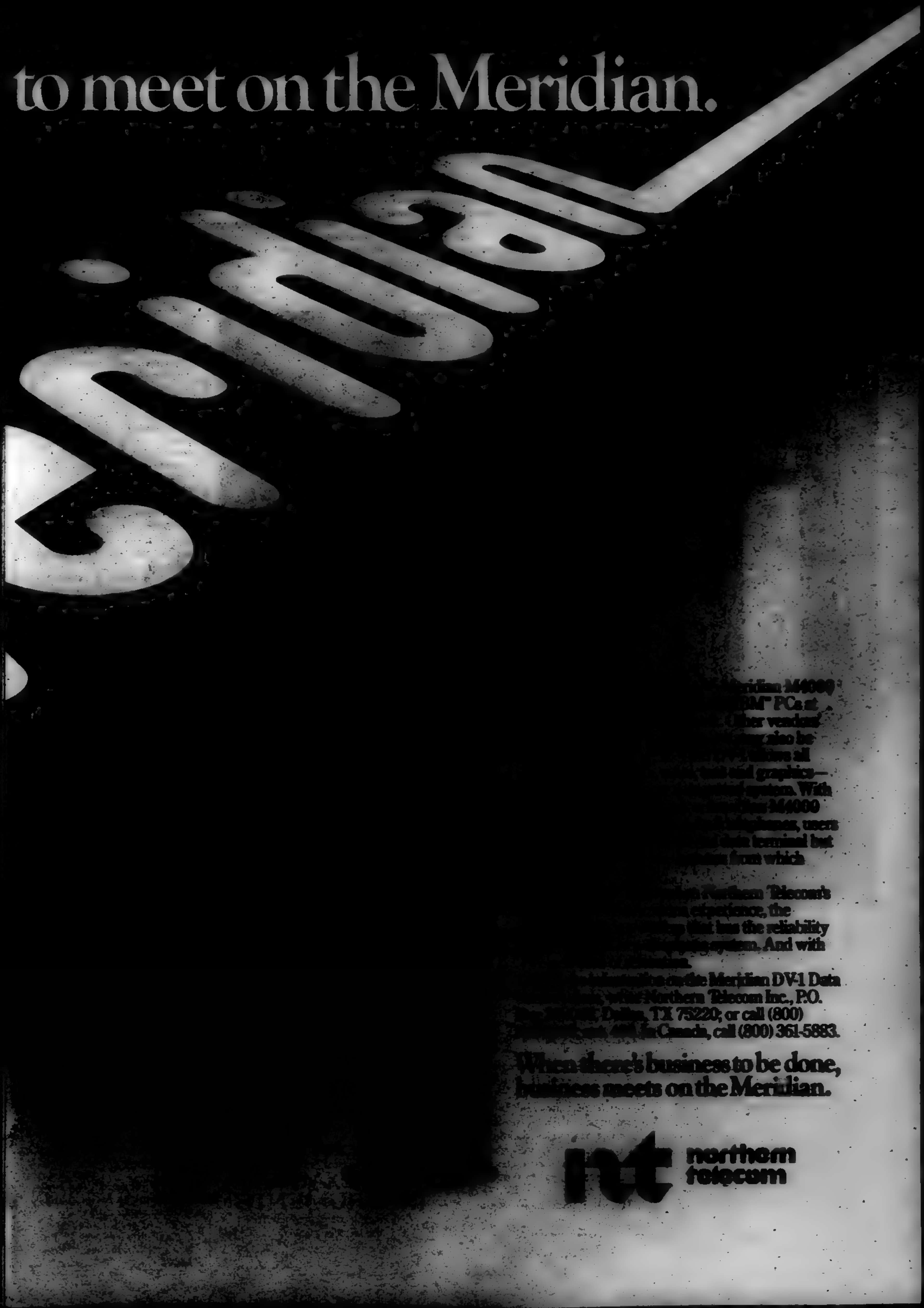

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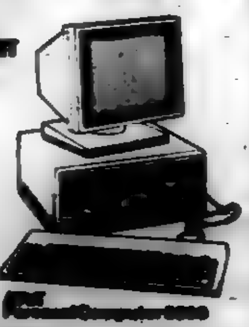

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SYSTEMS & PERIPHERALS

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erful processors, in the 0.7- to 1.5-Mips range. In the late 1970s and early 1980s, the microprocessor appeared on the scene. The first microprocessors were small machines operating at about .01 Mips. Today, more powerful ones have appeared.

The problem with using this moving Mips scale is that there are many overlapping areas.

Based on historical information, it is a safe bet that by the 1990s, a mainframe may be a processor operating at greater than 30 Mips; a mini will operate at between 5 Mips and 30 Mips; and a microprocessor will operate at less than 5 Mips.

It is also a good bet that if Mips is used as a dividing line, the distinction between processor classes will become even more blurred.

Another problem is IBM's coupled processors. IBM has developed dyadic processors, and the possibility exists that it could also bring out triadic or quadratic processors. Is a quadratic processor made up of four 10-Mips uniprocessors in a 40-Mips machine? Or is it four 10-Mips machines?

Consequently, any confidence the average DP professional can place in using Mips to distinguish between mainframes, minis and micros is not justified.

But the intuitive basis for system classification probably comes from more than just size. It also stems from historical market activity.

In the 1960s, IBM introduced the general-purpose 360 series, with a single instruction set usable on multiple models. As the demand for more processing power grew, IBM increased the size of its mainframe processors.

In doing so, IBM left a niche in the market that was filled capably by DEC, Data General Corp. and others. The real growth of the mini manufacturers did not come until the mid-1970s.

The minicomputer has grown in power since then and is projected to grow even more.

The intuitive basis for processor classification appears to be a combination of Mips, historical market activities, price and a series of other constantly changing factors. Consequently, the same criteria for classification are seldom defined the same way by any two sources.

Thus, the real differences between processors is in their use and the functions they perform. Admittedly, the differences in use are not as great between a mainframe and a mini as between a mini and a microprocessor. But there are significant differences nonetheless.

CPU

from page 65

According to Ray, Honeywell's "primary objective is to support its customer base." The company sees its role as implementing greater integration of equipment through distributed processing networks.

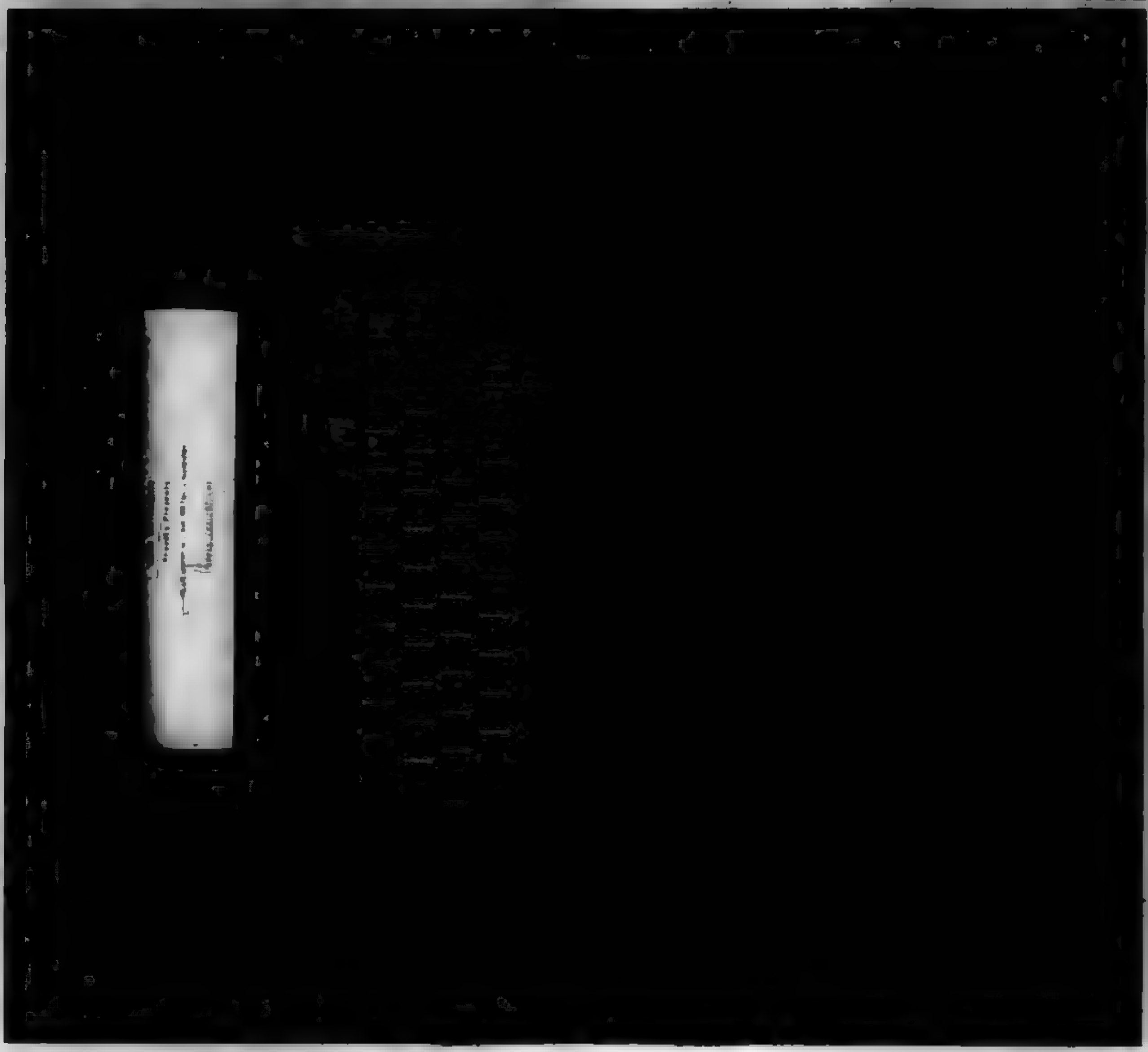
TERMINALS

■ **Lear Siegler, Inc. has unveiled the ADM 3E, a 14-in. CRT terminal.**

The unit is available with a green or amber screen and seven programmable keys that are shiftable for 14 nonvolatile functions. Other features include dynamically allocated function-key memory, basic editing capabilities and an optional bidirectional printer port.

The ADM 3E costs $399.

Lear Siegler, 901 E. Ball Road, Anaheim, Calif. 92805.



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COMPUTER INDUSTRY

Top spot at Wang eluded Cunningham

By Clinton Wilder
CW Staff

ROCHESTER, N.Y. — Wang Laboratories, Inc. and Computer Consoles, Inc. (CCI): a tale of two computer companies. A $2.5 billion office automation giant and a $130 million specialized minicomputer upstart, with nothing in common except rapidly declining profits — and John F. Cunningham.

Last week, the 42-year-old Cunningham put CCI on the industry map by becoming its chairman and chief executive officer, departing the presidency at Wang after a 17-year climb to almost the top rung of its corporate ladder. Make that "almost" with a capital A, because he clearly wanted to be the boss. That desire led Cunningham, who has been courted for presidential openings at Apple Computer, Inc., Prime Computer, Inc. and Apollo Computer, Inc., to choose a relatively obscure niche company with, in his words, "outstanding technology."

"The current industry slump presented an unusual opportunity," Cunningham said on his second day on the job at CCI here. "In the jobs that went to John Sculley at Apple, Joe Henson at Prime and Tom Vanderslice at Apollo, I essentially saw no real opportunity for real capital appreciation in the five- to 10-year time frame. The stock and equity [were] overvalued."

> *'I didn't want 35% or 40% shareholders looking over my shoulder. I wanted to run the show myself. It should be fun.'*
>
> — John Cunningham
> Computer Consoles, Inc.

Cunningham considered other small companies but found exactly what he wanted at CCI. "Not many small foundation companies have the technology behind them to be long-term survivors," he said. "[CCI] also presented an unusual opportunity because the current chairman, [Herman A. Affel Jr.], is 65, and there were no other major individual holdings in the company. I didn't want 35% or 40% shareholders looking over my shoulder. I wanted to run the show myself. It should be fun."

Ironically, Cunningham joins the company as it faces a smaller scale version of a major Wang problem: bloated expenses. CCI recently reported a second-quarter pretax loss of $12.4 million or 40 cents per share, on $35 million revenue, down from a $2.8 million profit on sales of $36 million a year ago. CCI spends twice as much — about 20% of its revenue — as the industry average on research and development, according to Omri Serlin, president of Itom International, a research and consulting firm in Los Altos, Calif.

Cunningham, who presided over the release of 1,600 Wang employees earlier this

See [illegible] page 76

- Digital Research cut its work force by 25% and wooed Northern Telecom and Motorola as investors/72
- Lexisoft, charging illegal bundling of its software, sued Eagle Computer for $100 million/72
- Uccel acquired Corodale, Inc. for $10 million/73

Backlog-driven micro price slashing predicted

By Kathleen Burton
CW West Coast Bureau

An estimated inventory backlog of more than one million personal computers will cause prices to plummet by the year's end, according to microcomputer industry analysts.

Vendors and major retail chains denied an inventory problem, but the analysts predicted price slashing during the pre-Christmas sales season.

"Because of the excess inventory, plummeting prices will be widespread, and the consequences could be disastrous," said Ken Lim, an analyst with Dataquest, Inc., a market research firm in San Jose, Calif. Manufacturers and retail dealers will attempt to dispose of inventory through gray market discounters, initiating a price war later in the year, he predicted.

Lim said the industrywide inventory buildup is due to the deflated personal computer market, which is predicted to grow 23% this year, compared with 80% last year and 300% in 1983.

Brian. Jeffery, vice-president of research at International Technology Group in Palo Alto, Calif., asserted that the industry's total personal computer inventory runs into the millions of units.

Backlog running IBM micro strategy

Jeffery said that IBM's inventory of various models is currently over the half-million unit mark. "The inventory backlog is running IBM's personal computer strategy," Jeffery claimed, "and it could delay the introduction of IBM's PC2 computer." IBM recently denied the existence of a PC2 product.

IBM uses subcontractors for many of its manufacturing and assembly operations, said Michael Murphy, publisher of the "California Technology Stock Letter" in San Francisco. "This makes it difficult for IBM to turn down the manufacturing spigot, compared with other vendors like [Apple Computer, Inc. that] have total manufacturing control," Murphy said.

Besides IBM's backlog, Lim said there are also half a million personal computers stockpiled by Personal Computer-compatible manufacturers. According to Lim, the companies most affected include Corona Data Systems, Inc. in Westlake Hills, Calif.; Eagle Computer Corp. in Garden Grove, Calif.; ITT Corp. in New York; Wang Laboratories, Inc. in Lowell, Mass.; and Televideo Systems, Inc. in Sunnyvale, Calif.

The only major IBM Personal Computer-compatible vendor not affected by excess inventory, Lim said, is Houston-based Compaq Computer Corp. Compaq has not had sufficient production capability to

See BACKLOG page 73

Slump prompts belt tightening

With mid-year financial results demonstrating a continued sales slump, several companies have implemented a variety of cost-cutting measures in recent weeks.

Companies that have implemented actions ranging from layoffs to plant shutdowns represent a broad spectrum of the computer industry. In recent weeks the following measures have been announced:

■ Burroughs Corp. said some 300 middle-management and secretarial positions will be eliminated under a reorganization that places overall responsibility for development and implementation of all product business plans under a new Corporate Program Management Group.

The group, headed by company Vice-President Fred R. Meier, formerly of the Systems Products division, will absorb the company's various prod-

See SLUMP page 72

A few winners weather storm

Two software companies, a supercomputer vendor and a maker of engineering workstations were among those weathering the second-quarter storm of bleak computer industry news with recently announced profit and revenue gains.

■ Cray Research, Inc. of Minneapolis last week reported that second-quarter revenue almost doubled over the year-earlier period, and profits tripled.

Supercomputer manufacturer Cray said revenue for the quarter ended June 30 was $77.2 million, up from $42 million a year earlier. Profits were $13.6 million, or 90 cents per share, up from $4 million, or 27 cents per share.

Cray Research Chairman John A. Rollwagen said the company installed 13 new systems in the first half of the year and expects to install an additional 17 systems in the second half.

See WINNERS page 76

Chip makers post operating losses

Intel Corp. and Advanced Micro Devices, Inc. (AMD) both recently reported operating losses for the quarter just ended as sales slumped from the previous quarter.

Separately, Seeq Technology, Inc. announced the departure of two top officers and a third-quarter loss of $3.8 million.

Intel, of Santa Clara, Calif., reported a second-quarter operating loss of $8 million, although it was able to report net profits of $9 million, or 8 cents a share, by reversing a first-quarter tax accrual of $5 million.

That figure was down from year-earlier profits of $55 million, or 47 cents per share. Revenue for the quarter just ended was $360 million, down from $410 million a year earlier, the company reported.

For the first six months of 1985, Intel reported

See CHIP page 73

Cash-short Digital Research cuts staff, seeks investors

By Kathleen Burton
CW West Coast Bureau

MONTEREY, Calif. — Digital Research, Inc. recently announced that it will lay off 25% of its work force and is seeking equity investment from two customers.

Chief Executive Officer John Rowley said the company is taking steps to increase its cash reserves, which have been depleted by the high costs of new product development.

Under an agreement presently being negotiated, Rowley said, OEM customers Northern Telecom, Inc., based in Ontario, Canada, and Motorola, Inc., based in Schaumburg, Ill., would acquire minority equity positions in Digital Research. The companies will launch several joint development projects over the next several months if the agreements are approved by Digital Research investors, Rowley said.

A spokesman for Northern Telecom said an alliance with Digital Research would benefit the company because it would enable Digital Research's Concurrent PC-DOS operating system and Graphics Environment Manager (GEM) software to be used with its multiprocessor Meridian DV-1 data/voice system. Motorola would not comment on a possible alliance with Digital Research.

Several top Digital Research executives have recently resigned from the financially beleaguered firm. Rowley took over the CEO title from company chairman and founder, Gary Kildall, who left the company on June 28 but remains chairman of the board. In other moves, Steve Maysonave, vice-president of marketing and world trade, and Bruce Cohen, vice-president of U.S. sales, also left the company at the end of June.

The layoffs will affect 75 sales, marketing, engineering and support workers at the company's headquarters here, said John Meyer, Digital Research's director of marketing.

Meyer blamed the layoffs on weakening orders from OEMs, which represent 80% of the company's sales. However, Meyer said, revenue from the sale of the GEM program and the Concurrent DOS and Concurrent CPM 86 operating systems will increase later in the year.

Over the past year, cutbacks have reduced the total number of Digital Research employees from over 600 last year to less than 300. But, analysts said, that even with these cutbacks, the company will need additional help from strategic partnerships to stay in business and will post annual revenue at least 30% below last year's $55 million.

"[Digital Research's] cash flow problems are severe," said Paul Cubbage, an analyst at Dataquest, Inc., a market research firm in San Jose, Calif.

However, Cubbage added, "Rowley is making all the right moves to keep the company afloat." Rowley is trimming expenses, negotiating with potential partners and focusing the company's product line on graphics applications and systems software, its strongest suits, Cubbage said.

Digital Research's troubles began three years ago when the company tried to enter too many diverse markets, said Richard Matlack, a vice-president at Infocorp, a market research firm in Cupertino, Calif. In 1983 and 1984 the company tried to market several new product lines. According to the analyst, "[Digital Research] just lost focus."

Lexisoft files bundling suit against Eagle

DAVIS, Calif. — Lexisoft, Inc. earlier this month filed a $100 million lawsuit alleging copyright infringement of its Spellbinder word processing program by Eagle Computer, Inc.

The Lexisoft suit charges that Eagle, a hardware manufacturer based in Garden Grove, Calif., continued to distribute Spellbinder with its computers after its contract to do so expired in February 1984. Since then, Eagle has continued to bundle the software without paying Lexisoft any licensing fees.

Filed in U.S. District Court in San Jose, Calif., the suit also named the Bank of America National Trust and Savings Association in San Francisco. Lexisoft claimed that the bank, an Eagle creditor, began administering funds for the financially troubled company last fall but did not ensure that its debts to Lexisoft were paid.

The Lexisoft suit also names Gerald L. Kappenman, Eagle president, and Ronald N. Mickwee and Charles Kappenman, past presidents of Eagle, for civil conspiracy and violation of California's Unfair Practices Act. This law forbids a firm from giving away another company's products.

A spokesman for Eagle denied the claims. He said the company has had an ongoing OEM arrangement with Lexisoft to distribute and bundle the Spellbinder program since 1981. According to the spokesman, Eagle has complied with the financial arrangements and has paid Lexisoft over $250,000 in royalty payments.

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According to International Data Corporation, the world's leading information industry research firm, the Chinese computer market is growing at an annual rate of 30 percent. China is opening its market to foreign computer suppliers and annual DP expenditures are expected to reach the multi-billion dollar range by the end of the decade.

China Computerworld represents the first joint venture in the People's Republic of China between a foreign publishing company, CW Communications/Inc., and the government. *China Computerworld* is published twice a month and reports on computer hardware and software technologies. The total paid circulation is 66,000. Total readership is estimated at 2,000,000, with total distribution of 100,000 copies per issue.

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SLUMP

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uct management functions, which are currently dispersed throughout Burroughs, according to Chairman and Chief Executive Officer W. Michael Blumenthal.

The company had earlier announced it had experienced a slight decline in profits from the year-earlier period.

■ Control Data Corp. said it will shut down six minicomputer assembly and test plants for 11 days later this year. The closings, scheduled for the end of August, end of November and end of December, will impact 4,000 employees of the company's computer systems group who are involved in manufacture of superminicomputer products.

"Because we do not see any immediate resurgence or strength coming from the computer industry, we are taking precautionary steps to ensure that our operations are in line with our markets," said L. E. Jodsaas, president of the computer systems group.

CDC, which later announced a $24.9 million operation loss for the group, said that the decision will balance inventories with projected sales.

■ Hewlett-Packard Co. said it will shut all U.S. manufacturing and administrative facilities for one or two days each month at least through October and that it has cut pay by 5% for 14,000 domestic sales and service employees and by 10% for 27 top management personnel. Additional production halts are possible during the Thanksgiving and Christmas holiday periods, according to the company.

"We hope we can return to a full schedule before the end of the year, but we are also prepared to continue expense-reduction measures beyond 1985," said Dean O. Morton, executive vice-president and chief operating officer.

■ Winchester disk drive manufacturer Computer Memories, Inc. of Chatsworth, Calif., said it dismissed 300 workers, or 29% of its domestic manufacturing work force. The company said the layoffs were a result of increased offshore manufacturing capacity; it employs 900 workers in Singapore.

■ Disk drive manufacturer Atasi Corp. layed off 62% of its work force, or 164 employees out of a total of 264. The company said that it is seeking a new lender because a $6 million line of credit was canceled earlier this year.

■ Semiconductor equipment manufacturer Varian Associates, Inc. instituted a six-month freeze on pay raises and terminated 300 contract workers and 60 permanent employees; the company had previously announced its intent to cut 1,700 jobs from its 15,500 work force and said it will reach that goal with an additional round of layoffs in September. The company also said it will shut down production for 10 days later this year and has eliminated incentive bonuses for top executives.

■ Microcomputer manufacturer Intertec Data Systems Corp. of Columbia, S.C., announced it has ceased all manufacturing and marketing activities and laid off about 40 of its 52 employees.

The company said it will concentrate its remaining resources on development of products and that it will continue to provide factory warranty repair service and that additional service will be provided through its dealer network.

Uccel acquires Corodale assets

DALLAS — Uccel Corp. announced recently that it has acquired for $10 million cash the assets of Corodale, Inc., a Boston-based vendor of IBM DOS/VSE systems software.

According to a Uccel spokesman, Corodale has some 1,200 U.S. installations of its products, designed for tape and disk management and job scheduling. The spokesman said the move strengthens Uccel's position in the DOS/VSE marketplace.

Corodale, which the spokesman said has experienced annual revenue growth of about 35% in recent years, will operate as part of Uccel's Systems Software Division.

[illegible]

Rolm Corp. announced the formation of Rolm Europe Ltd., a wholly owned subsidiary, and plans to establish a development and manufacturing facility in the UK.

The telecommunications products developed by Rolm Europe will meet European specifications, and Rolm will procure a substantial number of components and subassemblies from firms throughout Europe. Final assembly and testing will be done in the UK.

Frank Onians has been appointed president and managing director of Rolm Europe. Onians was the former managing director of Philips Electrical Industries in the UK.

■

Execucom Systems Corp. announced that it has joined Microelectronics and Computer Technology Corp. as an associate member of that group. Execucom is the first software company to join the research organization.

■

Members of the Central Office Machine Dealers Association and the Texas-Oklahoma-Louisiana-Arkansas Office Machine Dealers Association have approved a proposal to merge the two respective organizations.

Both groups are regional affiliates of the National Office Machine Dealers Association, the national organization of independent business equipment and systems retailers.

BACKLOG from page 71

build excess machines, Lim said.

The manufacturers themselves, however, deny there is an inventory problem. "Our inventory is manageable," an IBM spokeswoman said. Representatives from Digital Equipment Corp. in Maynard, Mass., Hewlett-Packard Co. in Cupertino, Calif., Televideo and Apple made similar claims.

"Earlier in the year, we had a glut of Apple II computers, but we closed production plants, laid off workers and brought our production in line with demand," an Apple spokeswoman said. A DEC spokesman said the firm has no backlog of its traditionally slow-moving Rainbow computer.

Retail chains and independent dealers contacted by *Computerworld* also denied there is excess inventory.

CHIP from page 71

revenue of $735 million, down from $782 million in the first half of last year.

According to Gordon E. Moore, chairman and chief executive officer of Intel, "OEM customers have reduced their semiconductor component consumption rates, which is stretching our original estimates of the time required [for those customers] to work off excess inventories."

AMD announced an operating loss of $14.4 million for the first quarter of fiscal year 1986. However, the company was able to post a net profit of $739,000, or 1 cent per share, due to $15.5 million in tax credits. Those results compared with year-earlier profits of $38.2 million, or 66 cents per share. In the fourth quarter of 1985, the company posted profits of $25.7 million, or 44 cents per share.

Sales for the semiconductor manufacturer tumbled to $150.5 million, compared with $234.2 million a year earlier and $201 million in the fourth quarter of fiscal year 1985.

"AMD is finally feeling the full impact of the recession that has afflicted our entire industry since last fall," said W. J. Sanders III, AMD's president and chairman. He added that the company does not expect any increase in demand during the current quarter and said AMD has preserved jobs while controlling expenses.

At San Jose, Calif.-based Seeq, a manufacturer of nonvolatile semiconductor memory devices, the company's president and chief executive officer, M. R. MacPherson, and chief financial officer, Donald T. Aanestad, resigned. The company announced the formation of an office of the president composed of acting CEO E. Floyd Kvamme, a Seeq board member and general partner with the venture capital firm of Kleiner, Perkins, Caulfield and Byers; Gerald A. Robinson, vice-president of operations; and J. Daniel McCranie, vice-president of sales and marketing. Named chief financial officer was Patrick B. Brennan, former vice-president and treasurer with National Semiconductor Corp.

Seeq announced that third-quarter revenue slumped to $8.1 million from $13.8 million a year earlier and from $9.1 million in the second quarter of the current fiscal year.

The loss of $3.8 million, or 33 cents per share, compared with year-earlier profits of $509,000, or 4 cents per share, and a second-quarter loss of $4 million, or 30 cents per share.

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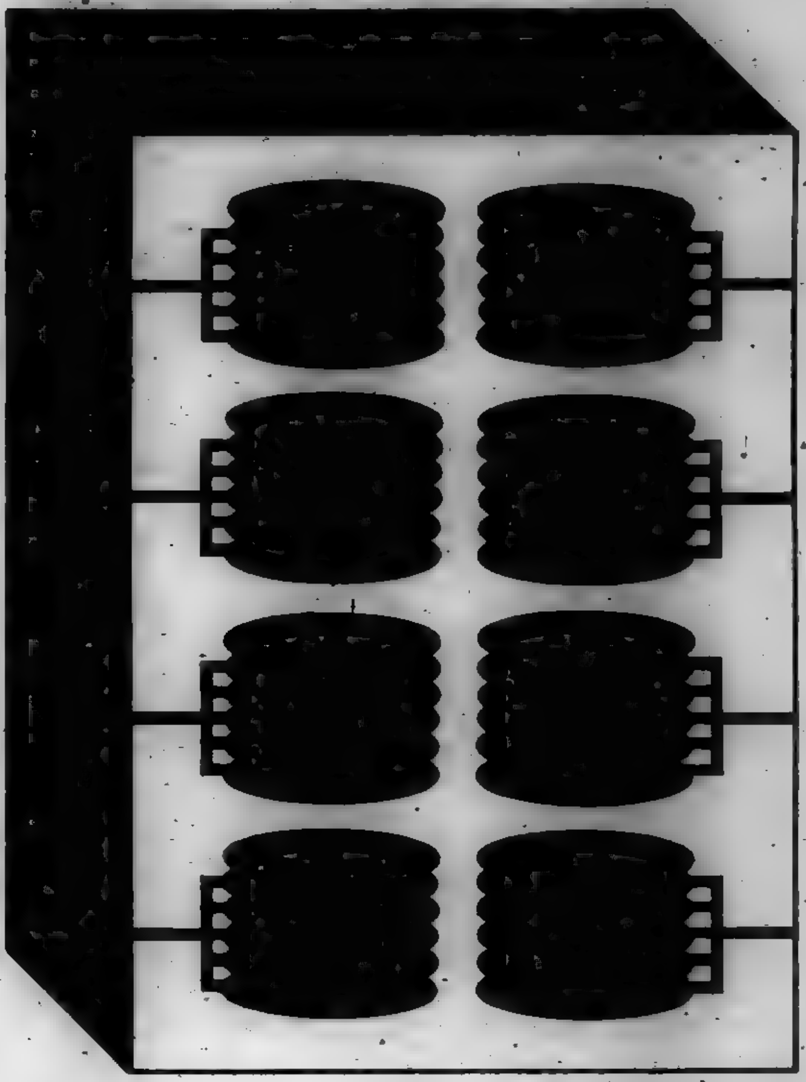

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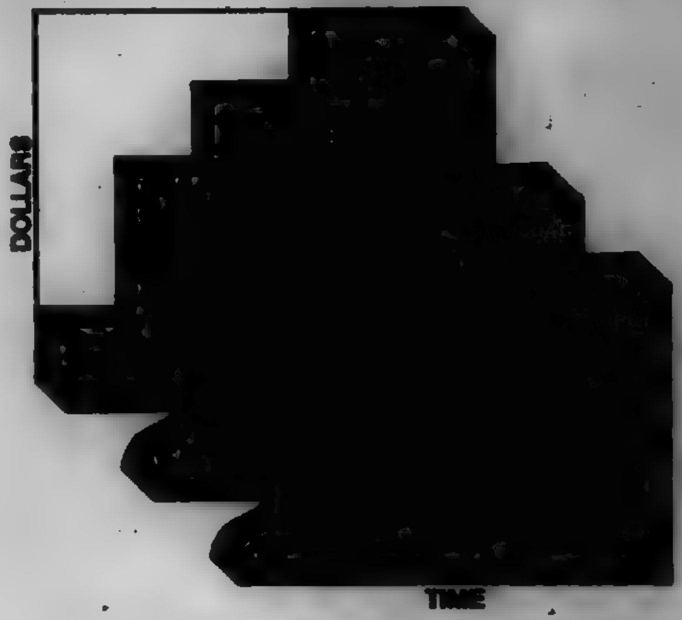

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TANDEMCOMPUTERS

RESIGN

from page 71

year, may administer similar medicine to CCI. "One of my first goals is to get expenses in line with the current size of the business," he said. "There has to be belt-tightening across the board, and they haven't faced up to it yet. It will affect the employee side, because that accounts for 60% to 70% of expenses."

CCI is known as a technology company, Cunningham as a marketing man. "I think it's a perfect balance for my skill sets," Cunningham said.

Cunningham said he will try to focus CCI's direct sales force on turnkey office systems for such vertical markets as the legal and financial profession, while hoping to parlay his corporate contacts into big-ticket deals with large OEMs and value-added resellers. Other items on the Cunningham agenda include a potential move into the private branch exchange market to continue sales to the divested Bell operating companies, whose past purchases of CCI's Directory Assistance Systems fueled the company's growth in the 1970s. Cunningham will also be looking for other corporate partners — but for bigger fish than Boulder, Colo.-based NBI, Inc., whose announced merger with CCI collapsed earlier this year [CW, Feb. 18].

"I've spent a reasonable amount of time looking at foundation companies and concluded that not a lot would help us," he said. "But alliance with larger organizations is very possible."

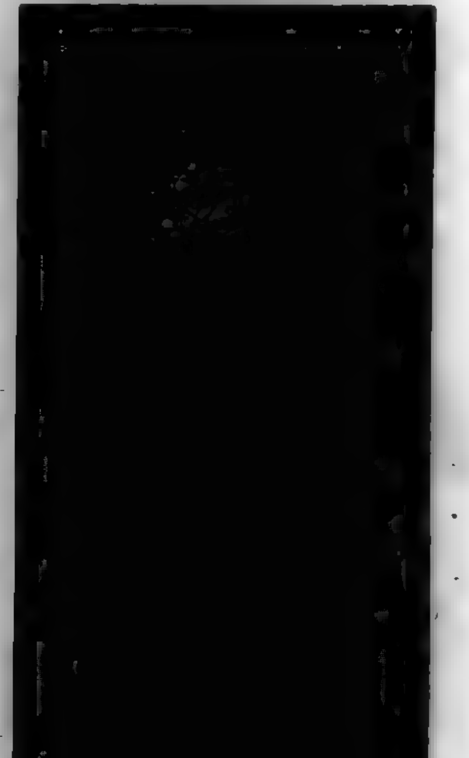
As the largest individual shareholder of CCI with 400,000 shares, Cunningham clearly has a vested interest in returning the company to profitability. The firm has already projected a substantial loss for 1985, and opinions vary as to when things will turn around.

"Cunningham is absolutely the best news CCI and its stockholders have had in at least three years," Itom's Serlin said, "but he can't do it by himself. Their problem is a lack of focus; they have four major product thrusts, all of them based on a different version of [AT&T's Unix], all of them really unrelated. There's no marketing structure that connects these things together."

While Cunningham replaces a 65-year-old chairman at CCI, another 65-year-old chairman, An Wang, has resumed the president's chair at the company he founded. Cunningham downplayed the rumored personality clashes among top Wang management prior to his resignation, stressing that the company had outgrown him.

"It was a difficult and emotional decision, and Dr. Wang was very supportive; he knew it was what I wanted," Cunningham said. "I think I enjoyed the 1973-81 period the most. One of the frustrations in a larger organization is losing contact [with employees] ... 30,000 is a tough number. There was less drama [to my departure] than people are writing into it. It was really a personal decision on my part."

Several observers of Wang feel many Cunningham loyalists will soon follow him out the door, perhaps not by their own choice, at the middle-management level. "Several changes have to be made at Wang, and this is just the first of them," said Vincent Flanders, associate editor of *Online Data Access*, an Austin, Texas-based independent magazine for Wang users.



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WINNERS

from page 71

- Apollo Computer, Inc. of Chelmsford, Mass., also reported an almost twofold increase in revenue. Apollo said revenue for the second quarter ended June 29 was $87.5 million, up from $46 million a year earlier. Profits were $7.3 million, or 21 cents per share, up 43% from year-earlier profits of $5.1 million, or 17 cents per share. In the first quarter of the current fiscal year, Apollo reported revenue of $118 million and profits of $44 million.

Apollo President and Chief Executive Officer Thomas A. Vanderslice expressed caution about prospects for the remainder of the year due to concern about the flow of orders from OEM and system builder customers. "Our ability to maintain present levels of profitability in the second half of 1985 will depend on the overall state of capital spending," Vanderslice said.

- Lotus Development Corp.'s second-quarter profits jumped 40% from the same period one year ago. The Cambridge, Mass.-based micro software leader earned $10.7 million, or 65 cents per share, compared with $7.6 million, or 48 cents per share, one year ago. Revenue soared 82% to $59.3 million from $32.6 million in the year-earlier quarter.

Lotus Vice-President of Finance and Administration Mead Wyman attributed the increase to continued strong demand for the firm's IBM Personal Computer-based products, 1-2-3 and Symphony. The first shipments of Jazz for the Apple Computer, Inc. Macintosh were also strong, but Wyman said it is too early to judge the product's market success.

- Management Science America, Inc. (MSA) announced that net income from continuing operations more than quadrupled from $717,000, or 4 cents per share, a year ago to $3 million, or 17 cents per share, in the second quarter of this year. Atlanta-based MSA had posted an actual loss of $1.6 million in the second quarter of 1984, reflecting the $2.4 million divestiture of its Peachtree Software division to Intelligent Systems Corp.

MSA's revenue in the recent quarter climbed 34% to $38.1 million, up from $28.5 million a year ago. A spokesman said the introduction of MSA's fourth-generation language-based Information Expert helped spur a 44% gain in revenue from support agreement fees during the quarter.

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The Board of Trustees has approved a comprehensive plan to accommodate and effectively apply appropriate student computing resources to maintain the leadership role of the college. Phase II seeks forward-looking professionals who will fill key positions in the continuing implementation of this plan.

USER CONSULTANT FOR ADMINISTRATIVE SERVICES

Requires experience in business administration, instruction or educational offices as well as experience in business, payroll, personnel or financial systems; [illegible]. Initial salary will be commensurate with experience and education, in the range [illegible].

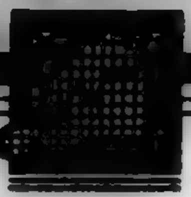
PROGRAMMER/ANALYST FOR ADMINISTRATIVE SERVICES

Requires experience in programming and program design and analysis, with [illegible] COBOL and IMAGE database [illegible]. Initial salary will be commensurate with experience and education, in the range [illegible].

Excellent health and welfare benefit package covering employee and eligible dependents over $[illegible] annually.

A DISTRICT-SUPPLIED APPLICATION FORM is required and must be received in Personnel by August 16, 1985. To obtain a district application contact:

Personnel Services
Pasadena City College
1570 E. Colorado Blvd.
Pasadena, CA 91106
(818) [illegible]
EOE/AA



WE'VE GOT YOU COVERED

with opportunities to match your ambitions

Fireman's Fund, a major financial services organization, has terms broad enough to meet your professional goals. We're one of Northern California's largest IBM shops and we're embarking on numerous new application development projects for our state-of-the-art, multiple IBM 3081 MVS/XA shop which includes DB2, IMS, CICS, TSO and VTAM.

This growth, in the high visibility setting of our Marin County Office, combines with room for achievement and an easy commute to round out our base of opportunity. The result is a company wide enough — and flexible enough — to keep the professional ambitions of goal-oriented, self-motivated individuals covered.

We have the following openings:

Lead Systems Analyst

We are seeking a Lead Systems Analyst who will provide technical design consulting to multiple project teams to develop an integrated systems architecture using mainframes, minicomputers and intelligent workstations. Candidate should have 8+ years of progressive application development experience preferably in insurance or financial services systems. (Respond to LG1-LM)

Sr./Lead Data Analyst

We are seeking a Sr./Lead Data Analyst to support major development projects. Must be familiar with entity/relationship data modeling and logical data design. Experience in supporting application development by working with conceptual data model through logical data design preferred. (Respond to LG1-AP)

Sr./Lead Data Base Analysts

We are seeking Sr./Lead Data Base Analysts to support a variety of new applications development projects. Must have 3+ years experience in application and physical data base design. (Respond to LG1-TT)

Sr./Lead Systems Programmers

We are seeking Sr. and Lead Systems Programmers with problem determination/resolution performance analysis/tuning, and software installation experience. Lead positions require planning and leadership skills. TSO, JES2, DFHSM, SMPE and Security knowledge are desirable. (Respond to LG1-SA)

We offer an excellent salary and benefits package. For immediate consideration, please send resume with salary history to: Fireman's Fund Insurance Companies, Property & Liability, Systems Division, Personnel Dept. LG1, 1600 Los Gamos Road, San Rafael, CA 94911. An equal opportunity employer.

FIREMAN'S FUND
INSURANCE COMPANIES

MIDWEST'S FINEST

INDIANA - ILLINOIS

Since 1966 many of the nations finest organizations have turned to INDECON for the finest in consulting and systems development. INDECON MEANS RESULTS TO OUR CLIENTS. We have immediate openings for:

- **PROGRAMMER ANALYSTS** - to design and program New Systems utilizing COBOL or PL1 in IBM/MVS environment. IMS or IDMS is a plus.
- **PROGRAMMER ANALYSTS** - Major development effort involving Honeywell GCOS mainframe. Selected candidates will be experienced in Honeywell GCOS, COBOL and IDS II or TP.
- **IMS DBA'S** - Total responsibility for the DBA function including Sysgens, Logical and Physical Design, Backup, Recovery, Tuning and Security.
- **REAL-TIME MICRO'S** - Degreed professional with 1+ years experience DESIGNING & PROGRAMMING REAL-TIME ASSEMBLER software at module level. Experience with Automotive or Engine Control Systems is a plus.

Send resume including salary requirements and location preference to:

Mr. R. Johnson
Indecon, Inc.
Box 82058
Indianapolis, Indiana 46282

Relocation assistance will be provided.

SOFTWARE ENGINEERS

COMPUTERPEOPLE is a rapidly growing software services and consulting firm with offices in major U.S. cities. We have an immediate need for experienced mini/micro specialists to support client applications in telecommunications technology, telephony, and process control.

We require a B.S. degree in Computer Science, Math or Electrical Engineering and three to five years of practical experience. An M.S.E.E. or M.S.C.S. degree is desirable. Applicable skills include:

- VAX C and UNIX
- Intel Assembly language
- Telephony hardware/software design
- Pascal or Fortran
- Color Graphics
- Synchronous/Asynchronous communications

We are looking for talented new employees, but will consider qualified subcontractors. Columbus and southern east coast cities. For additional information, call or send resume to:

COMPUTERPEOPLE
DATA SERVICES DIVISION

[illegible] Corporate Exchange Dr.
Suite 100
Columbus, Ohio [illegible]
(614) [illegible]-7386

INSURANCE OPPORTUNITIES

A national financial services corp. is developing a marketing operation for a $[illegible] million dollar insurance agency headquartered in Dallas, Texas, offering personal lines and life insurance products. Candidates are being considered for the following positions:

MIS DIRECTOR

Duties include establishing and managing a new DP environment. Must have 5 years experience in the VM, VS, IBM environment. Must also have insurance and supervisory experience with strong expertise and/or training in accounting.

PERSONAL LINES UNDERWRITING MANAGER

Duties include managing the underwriting staff and working with insurance companies to coordinate underwriting criteria and claims problems. Must have 10 years insurance experience on a nationwide basis and expertise in agency public relations, management and product development, and strong exposure and/or training in automation.

INSURANCE MARKETING MANAGER

Duties include all marketing activities including telemarketing and direct mail techniques. Must have 10 years national insurance marketing experience with knowledge of telemarketing, direct mail and exposure, and/or training in automation.

These positions offer an excellent salary and benefits package. Please send resume with salary history to:

[illegible]
P.O. Box 7794
Van Nuys, California 91[illegible]

SYSTEMS ADMINISTRATOR - To write systems utility programs, assist in hardware and software installation, troubleshooting, research, purchasing and repairs; assist users to become familiar with operating systems. Must be familiar with video lottery programming. Salary - $25,000 per year. Must have 6 months experience in job offered or 1 year experience as programmer. B.S. degree in Business or Computer Science required. Apply with resume and proof of experience to Georgia Department of Labor, 1275 Clarendon Avenue, Avondale Estates, Georgia 30002. Control #GA[illegible].

NEW START UP System-Programmers

Billion $ corporation seeks several fast-track programmers for this ground-floor opportunity.

Must have 2+ yrs. on any of the following: MVS, NCP/VTAM or CICS. Will train in XA.

If you're serious about a career move, call collect Robert Montgomery at (919) 872-[illegible]. Over 6 yrs. exp. specializing with systems programmers.

3001 [illegible] Court
P.O. Box [illegible]
Raleigh, NC 27[illegible]

fox-morris

IMS/DB SPECIALIST

Howmet Turbine Components Corporation has an immediate opening on its Data Base Administration staff for a person with experience in the administration and support of IMS Databases. This position offers a challenging opportunity for a qualified individual to get in on the ground floor of the development of database standards and procedures in a dynamic data processing environment.

This person will report to the Data Base Administrator and have primary responsibility for establishing IMS databases, developing database backup, recovery, logging procedures, and monitoring database usage and performance. The ideal candidate will have a BS/BA degree and 3-5 years DP experience with a minimum of 2 years maintaining IMS/DB database definitions and recovery procedures in a CICS environment.

Howmet is a leading manufacturer of investment castings for turbine engines. Located in scenic western Michigan near the shores of Lake Michigan, our state-of-the-art data processing environment includes: IBM 3083, MVS, TSO, CICS, IMS/DB, and Datacom/DB. We offer an attractive salary as well as liberal employee benefits. Please send detailed resume and salary history in confidence to:

Walter B. [illegible]

HOWMET TURBINE COMPONENTS CORPORATION

UNIVERSITY OF PETROLEUM & MINERALS
DHAHRAN, SAUDI ARABIA

RESEARCH INSTITUTE

The Research Institute has immediate openings in the following area:

DATA BASE SPECIALIST

M.S. Degree with an Energy Economics background and 5 years experience in a research environment.

Minimum regular contract for two years, renewable. Competitive salaries and allowances. Free air transportation to and from Dhahran each year. All earned income without Saudi taxes. Ten and half months duty each year with 45 days vacation with salary plus other fringe benefits as per policy.

Apply with complete resume on academic, professional and personal data, list of references and with copies of certificates, diplomas and degrees. Include home address and telephone number for contact to:

UNIVERSITY OF PETROLEUM & MINERALS
HOUSTON OFFICE, DEPT. 229
5718 WESTHEIMER, SUITE 1550
HOUSTON, TEXAS 77057 USA

Screening to take place first week of October.

SENIOR AUDITOR-EDP

We have an immediate opening for an experienced Senior Auditor-EDP. The successful candidate must possess a Bachelor's degree and at least 3-5 years' prior experience in EDP auditing, preferably in a manufacturing environment.

Will be responsible for review and audit of all computer usage within company, including distributed sites, dedicated sites and personal computer usage to ensure proper procedures are followed. Will also assist with financial and operational audits. Experience with IBM mainframes and data base systems will be helpful. Some travel may be involved.

If you have the qualifications we seek, we can offer you a competitive compensation and benefits package. For immediate confidential consideration, please forward your resume to:

Manager, Personnel
Williams International
P.O. Box 200
Walled Lake, MI 48088

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We seek HIGHLY EXPERIENCED TO MID-LEVEL data processing professionals who possess a minimum of 2-3 years hands-on experience for permanent, full-time or subcontracting positions. Independents are welcome. Of special interest are backgrounds in the following:

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- •ASSEMBLER
- •UNIX/"C"
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- •COBOL
- •PL/1
- •CICS
- •TANDEM (Tal or Pathway-COBOL)

For information on opportunities in ANY of our geographical areas and the excellent compensation and benefits plan we offer, including PAID OVERTIME, PROFIT SHARING, RELOCATION ASSISTANCE, RETIREMENT, PAID VACATION and more, call or rush your resume to: Personnel Recruiter, COM-PRO, (813) 875-7866, 6420 Bay Center Drive, Suite 100, Tampa, FL 33609. eoe m/f

COM-PRO

NEW ENGLAND

BOSTON
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Established mfr. seeks astute pro to lead new H/S planning & implementation. Smaller DP environ., req. prev. mfg. sys. develop. Prefer DEC VAX or PDP-11 + micros exp. $36,000.

BOSTON
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HP3000 - Well estab. BOSTON fin'l. svcs. firm seeks user-oriented P/A for growing dept. Environ. is HP3000 QUIZ PC's. Oppty. to develop fin'l./acctg. apps. w/hi vis. to financial execs. $28,000.

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Learn S/38 & RPGIII through 1985 conv. Immediate assignment is to supv. 1 operator & do all production support for fin'l. apps. in SYS-36 RPGII, OCL, SEU, SDA, DFU environ. Expanding dept. needs sharp upward mobile pro for RTE. 128 sub. facility. $27,000.

HARTFORD
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Design/develop the latest fin'l. sys. & work w/software vendors in installing the latest on-line apps. Highly visible corp. environ. using CICS, IMS & PC's in a TP link. Challenging growth position. Salary to $33,000.

HARTFORD
SYS. PROGRAMMER
NE oppty. for IBM/MVS indiv. w/ exposure to CICS and/or VTAM. Client offers full reloc. + car! Salary to $60,000+.

PROVIDENCE
SYSTEMS ANALYST
Consumer goods mfr. seeks Sr. Sys. Analyst to handle proj. mgmt. respons. Supv. prog. & analysts on major mfg. apps. devel. Proven sys. analysis skills & leadership pot. key requirements. $33,000.

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900 Turks Head Bldg., Providence, RI 02903
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We are looking for experienced and motivated professionals with qualifications that match the positions listed below.

DIRECTOR OF TELECOMMUNICATIONS TECHNOLOGY AND APPLICATIONS PLANNING

5-10 years experience and a successful track record in managing a sophisticated telecommunications network and complex systems environment. A Bachelor's degree with strong statistical and analytical background is required.

MANAGER, INTER-PLAN USER SYSTEMS

5 or more years experience in management of information system developments, from specification through implementation. IBM system and database system experience. A B.S. degree in Computer Science is required. MBA or Master's degree in Information Systems desirable.

MANAGER, APPLICATION SYSTEMS

7-10 years experience in designing, developing, and implementing application systems in an IBM environment. 2-4 years hands-on supervisory experience and a college degree required. Exposure to CICS or DB/DC would be desirable.

SENIOR TELECOMMUNICATIONS SYSTEMS ANALYSTS

5 or more years in the design and development of large telecommunications systems. College degree or equivalent work experience is required.

SENIOR CONSULTANT/CONSULTANT, INTER-PLAN USER SYSTEMS

3 to 5+ years experience in systems analysis and development of computer-based information systems, including hardware and software. Experience in business analysis of user requirements. A B.S. degree in Computer Science is required. MBA or Master's degree in information systems for senior position is desirable.

SENIOR ANALYST/ANALYST, APPLICATION SYSTEMS

5 to 7+ years system development experience in an IBM mainframe environment. Knowledge of COBOL, OS JCL, TSO/SPF, and either CICS or DB/DC required. A B.S. degree in Computer Science is desirable.

SPECIALIST, INTER-PLAN ON-GOING OPERATIONS

3 or more years experience in performing data analysis, documentation editing, project or function coordinator and Wang Word Processing system. College degree highly desirable.

ANALYSTS, COMMUNICATIONS BASED APPLICATION SYSTEMS

4 or more years experience working in a TANDEM, TAL non-stop environment. Familiarity with X.25 and communication protocols required. A college degree is highly desirable.

We offer highly competitive salaries and an excellent benefit package that includes fully paid health care, dental and prescription drug coverage, contributory pension plan, 401K, tuition reimbursement, and an in-house corporate fitness center.

Please plan on attending next Wednesday & Thursday. You'll have the chance to discuss our opportunities and your career with our systems management. If you cannot attend, have any questions, or wish to schedule a private appointment, please call Peggi Sturm at (312) 440-6412, Monday-Friday, 8:30am to 4:30pm.

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An Unprecedented MIS Career Opportunity

We need an innovative professional to assist us in the state-of-the-art redesign of our administrative/management information systems. Our Systems Modernization Plan calls for complete replacement of existing software/hardware and data communications without disrupting the current ADP operation.

SALARY:

$44,400-$57,700

Full Government Benefits
U.S. Citizenship Required

MIS NETWORK MANAGER

Job Requirements

- Professional experience at a senior level within the past 5 years preferred in:
  - —analysis, design, development and implementation of local area networks and wide area networks.
  - —application of data communications using asynchronous, SNA and X.25 protocols, integration and testing, data and voice switching and trouble shooting.
- Ability to lead/guide data communications tasks including planning, requirements analysis, and contract development administration/implementation in a multi-project environment.

Social Security Administration, Woodlawn, MD
An Equal Opportunity Employer

To apply, or for more information, call 301/594-3528 before August 7, 1985.

EDP PROFESSIONALS

GROWMARK, Inc., a large agri-business firm, has immediate openings for qualified professionals seeking careers in a number of areas within Data Processing. We can offer challenging opportunities in the following areas.

MINICOMPUTER SPECIALIST

Responsibilities will include new development projects in addition to support of existing applications which utilize Honeywell DPS/6 equipment and software. An ideal candidate would have prior experience with DPS/6 hardware and software including the MOD-400 operating system. COBOL programming skills are required.

PROGRAMMER/ANALYST

Responsibilities include programming in support of new development projects in addition to maintaining existing applications. An ideal candidate would possess at least two years' experience in a Honeywell environment, have the ability to write COBOL programs and possess knowledge of structured programming.

APPLICATION SPECIALIST

Responsibilities include system design and complex programming assignments in support of new development projects and existing applications. An ideal candidate would possess strong programming skills and/or design experience in addition to Honeywell background. Prior experience in data base and online transaction processing is desirable.

Located in Bloomington, Illinois, an individual can enjoy the advantages of living in a two university community with excellent schools, shopping, recreational and cultural opportunities. In addition to a competitive salary, we offer an attractive benefit package. Interested candidates should send resume and salary requirements to:

GROWMARK, Inc.
Manager, Corporate Personnel
1701 Towanda Avenue
Bloomington, Illinois 61702-2500
AN EQUAL OPPORTUNITY EMPLOYER

GROWMARK

ASSISTANT DIRECTOR

The Computing Services Office at the University of Illinois is seeking an Assistant Director to take responsibility for management of basic campus services. The office has several large CDC and IBM machines as well as a variety of medium scale systems. Together they support about 600 simultaneous users. The Assistant Director will be responsible for systems operations, programming, user services, and other aspects of support. Approximately 30-40 people report through this position.

CSO also has groups responsible for campus data networks, personal computer support, operational support of a national supercomputer facility based on a CRAY X/MP, and several facility management services. Total staff is in excess of 100.

Computing is a major and growing activity at this campus. It supports a research program in excess of $100 million per year and a student population of 35,000. This position requires good management skills, a familiarity with instructional and research use of computers, and the ability to deal imaginatively with a diverse and rapidly changing environment. University experience and/or an advanced degree are desirable. Starting date is as early as possible. Salary will be competitive, based on qualifications. To assure full consideration, resumes should be sent by September 1, 1985 to Joyce McCabe, Computing Services Office, 150 Digital Computer Laboratory, University of Illinois, 1304 W. Springfield, Urbana, Illinois 61801.

The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

SENIOR SYSTEMS PROGRAMMER DATA COMMUNICATIONS

Our expanding IBM data communications environment requires an experienced senior level data communications systems programmer. If your background includes good *ACF/VTAM, ACF/NCP* and SNA technical skills, we'd like to talk with you.

We offer a challenging opportunity to improve your technical skills in an expanding IBM 3080 MVS environment. Our current division communications network links 26 manufacturing plants and seven sales offices to our Hazelwood data center utilizing SNA and digital circuits. Plans include the implementation of a backbone network connecting the division's data center to other major installations within the corporation, development and implementation of formal network performance monitoring and capacity planning functions and participation in corporate-wide network administration.

This position requires a four-year B.S. degree and a minimum of three years data communication experience in an MVS environment, with solid knowledge of IBM SNA architecture, protocol, and troubleshooting techniques. Demonstrated skills with *ACF/VTAM, ACF/NCP* and 3725 hardware internals are also required, as is experience with MSNF.

As the key data communications specialist with the division, you will install and support all data communications software, troubleshoot network problems and develop necessary support utilities. You will also actively participate in network hardware/software/topology planning, evaluate new technologies, prepare strategic recommendations to management and participate in inter-divisional networking projects.

Boise Cascade Composite Can Division manufactures composite cans and plastic bottles. Our division headquarters is conveniently located in northwest St. Louis County, which offers excellent schools, a comfortable suburban lifestyle and a friendly midwestern atmosphere which is second to none. We offer a comprehensive benefits package including relocation assistance and the opportunity to work with a superior group of EDP professionals.

This position offers the *right* candidate an outstanding opportunity for technical and professional growth in an exciting, state-of-the-art environment. For consideration, please forward your resume, including salary history, in confidence to:

Gary C. [illegible]
Systems Programming Manager
Boise Cascade
Composite Can Division
13300 Interstate Drive
Hazelwood, MO 63042
An Equal Opportunity Employer M/F/H
No phone calls please

---

500 DP Openings

[illegible]

[illegible], CPC ([illegible]) [illegible]
Corporate Personnel Consultants, Inc.
3705 [illegible] Drive, Suite 310
Charlotte, N.C. 28211

CAROLINAS & VIRGINIA LOCATIONS LET'S GET SPECIFIC

My clients have a need for personnel with specific skills. I'm prepared to discuss the following positions in detail with you so you can determine if they are a match for your career goals. One phone call could make you aware of an opportunity you wouldn't want to miss. LET'S TALK!

SYSTEMS PROGRAMMER ([illegible]) to $[illegible]
SYSTEMS PROGRAMMER (IDCS OR VTAM) to $[illegible]
SYSTEMS PROGRAMMER (VM) to $[illegible]
PROGRAMMER ANALYSTS (VM/CMS, NOMAD, or SQL) to $[illegible]
SYSTEMS ANALYSTS (VM/CMS, NOMAD, SQL, or [illegible]) to $[illegible]

CALL ASAP
BRENDA CAREY, C.P.C.
919-684-5501

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P.O. Box 1816
BURLINGTON, NC 27216-1816

SENIOR SYSTEMS ANALYST

Join Coulter Electronics, a respected world leader for over 25 years in the design and manufacture of biomedical instruments. We are currently searching for a Senior Manufacturing Systems Analyst who has heavy systems design and user interface experience in a manufacturing environment.

Position requirements include MRP experience, B.S. degree in Computer Science, or equivalent, plus 5 years systems design experience utilizing Cobol, CICS, RPG 2, Vollie and large IBM mainframes. System 38 and RPG III is desirable. Responsibilities include system design/modification to solve business problems once they are defined, as well as, install new/modified system.

If you are interested in an excellent salary and a comprehensive benefits package, please mail resume to: Marsha Kellstrom, Professional Recruiter, COULTER ELECTRONICS, INC., 690 West 20th Street, Hialeah, Florida 33010. Equal Opportunity Employer.

COULTER ELECTRONICS, INC.
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SKILLS REQUIRED INCLUDE:
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LOGICAL OPTIONS
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[illegible], San Francisco, CA [illegible] • ([illegible]) 777-[illegible]

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2 yr assignments in either McLean, Va., Phoenix, Az. or Connecticut Area

Honeywell tech support DPS/8. 3 yrs min GCOS & GMAP. Communications a plus. For further information, call Maggie Liptak,

212-307-0939

or submit resume to:

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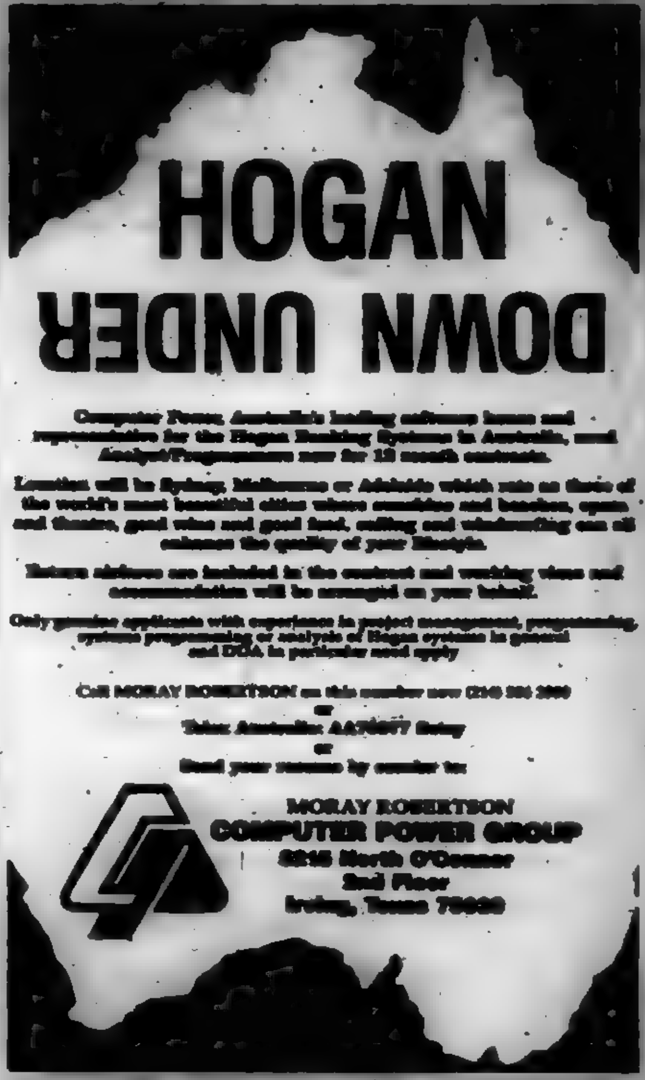
Major health care firm headquartered in Minnesota has exceptional opportunity to move into data base, data communications, and systems software. Requires 3-4 years IBM/MVS and assembler programming experience. Call Mark David or Tim Smith at (612) 339-9001.

[illegible]
[illegible]
3535 IDS Center
Minneapolis, MN 55402



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Computer Power, Australia's leading software house and representative for the Hogan Banking Systems in Australia, need Analyst/Programmers now for 12 month contracts.

Location will be Sydney, Melbourne or Adelaide which rate as three of the world's most beautiful cities where sunshine and beaches, sports and theatre, good wine and good food, sailing and windsurfing can all enhance the quality of your lifestyle.

Return airfares are included in the contract and working visas and accommodation will be arranged on your behalf.

Only genuine applicants with experience in project management, programming, systems programming or analysis of Hogan systems in general and DDA in particular need apply

Call MORAY ROBERTSON on this number now (214) [illegible]

or

Telex Australia: AA[illegible] Sydney

or

Send your resume by courier to:

MORAY ROBERTSON
COMPUTER POWER GROUP
5215 North O'Connor
2nd Floor
Irving, Texas 75039

COMPUTER SPECIALISTS

CH2M HILL, an employee-owned, multi-discipline consulting engineering firm with regional offices throughout North America and overseas, has several staffing opportunities. Positions are all related to the firm's expanding in-house, nationwide computing network utilizing VAX/VMS systems of all sizes.

Minimum requirements for all positions are a BS in Civil or Mechanical Engineering, Computer Science or related field. Two years of experience required.

Positions are:

- ***VAX system Managers***
- ***Computer Aided Engineering Analysts and/or Applications Specialists. Intergraph experience preferred.***
- ***Applications Programmer/Analysts specializing in engineering or business systems.***

Salary commensurate with experience, flexible benefits. An Equal Opportunity Employer. Qualified applicants (no agencies or telephone inquiries please) send resume, geographic preference and salary history/requirements, in confidence, to: ***Manager of Recruiting GEN/CSI, CH2M HILL, P.O. Box 428, Corvallis, OR 97339-0428.***

MIS OPPORTUNITIES

Carolina Freight Carriers Corporation is seeking qualified MIS professionals for our expanding Data Services Division. Headquartered in Cherryville, North Carolina, we are the largest subsidiary of Carolina Freight Corporation which is a $400 million dollar per year motor transportation company listed on the New York Stock Exchange.

Due to our continued growth and leadership in the motor transportation industry, we currently have openings in the following areas:

COBOL PROGRAMMERS	– The ideal candidate will have a minimum of 2 years of solid COBOL programming experience.
PROGRAMMER/ANALYSTS	– The qualified individual should have a minimum of 4 years of COBOL programming experience with 50% of the last two years' work experience devoted to analysis.
SYSTEMS ANALYSTS	– The successful applicant should have a minimum of 5 years' experience in systems and programming with the last 2 years devoted to systems analysis.

On-line experience is desired, especially on a Honeywell system running GCOS. We offer an excellent benefits package. For confidential consideration, please send letter or resume, including salary history and willingness to relocate to Cherryville, NC, to:

Mac Beasley
Director of Personnel
Carolina Freight Carriers Corporation
P. O. Box 697
Cherryville, NC 28021

An Equal Opportunity Employer - M/F

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Apply knowledge of computer graphics, and 2-dimensional and 3-dimensional Geometric Modeling to design and evaluate CAD/CAM (Computer Aided Design/Computer Aided Manufacturing) systems; and apply knowledge of Computer Aided Architecture Design, floor layout, space planning, and architecture design to devise and develop computer drawing systems for architecture use. Require a Master's Degree in Computer Science or Architecture. Education at Master's level should include at least 1 course in Computer Graphics and Geometric Modeling, Computer aided design, and Computer aided architecture design. 40 hrs./wk, 8 a.m. - 5 p.m., $28,000 yr. Send resume and transcript of academic record to:

7310 Woodward Ave.
Rm. 415,
Detroit, Michigan 48202
Reference# [illegible]
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To $35K

Leading international manufacturing firm — corporate just relocated to Twin Cities — seeks systems analyst to lead all applications areas in development of Xerox manufacturing software. Requires 2+ years Xerox experience. Call Mark David or Tim Smith at (612) 339-9801.

ROBERT HALF
OF MINNEAPOLIS, INC.
3838 IDS Center
Minneapolis, MN 55402

Systems Analyst

WESTINGHOUSE TURBINE COMPONENTS PLANT, a modern, innovative high technology manufacturing facility, located in Winston-Salem, N.C., is currently seeking a Systems Analyst.

Qualified candidates will be responsible for operating system of IBM 4300, generating and maintaining VM/CMS, DOS/VSE, CICS, SAS, GDDM, DL/1 and other system components, and evaluating and recommending hardware and software for the IBM environment. A BS in Computer Science or Engineering related is required along with a minimum of 2 years systems experience with DOS/VSE and CICS.

This is a challenging and rewarding opportunity with a world leader in the turbine industry. Salary is commensurate with experience and ability, and an excellent benefits package is provided. For consideration, please submit a resume, with salary requirements, in confidence to:

John Pavlosky
Human Resources Associate
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If a 1,000 mile communications network linking 13 major sites with 3 computer systems [illegible] the University of Alaska Computer Network would like to hear from you. We have openings for programmers and analyst/programmers to do administrative applications development and enhancements on an IBM 4381-II running MVS/XA, SPF, and [illegible]. Our data base is Cullinet's IDMS/R release 10.0 and support software consisting of ADS On-Line, Automatic System Facility, On-Line Query, and Culprit. Programmer and user workstations are IBM PC's [illegible] [illegible] and advanced Decision Support Systems software. We are looking for experienced people who have the [illegible] ability to be productive quickly in this environment in support of the installation and [illegible] of [illegible] Student Information System and Human Resource System, and in [illegible] existing financial systems to the IBM 4381 mainframe. If the challenges of working on the frontiers of business application technology are what you seek, address a letter of application describing your accomplishments in data base or on-line applications, your resume and three references to us.

MINIMUM QUALIFICATIONS

Candidates for both the Programmer and Analyst/Programmer positions must have a demonstrated proficiency with IBM 4381 or equivalent mainframe running OS; OS JCL; IBM system utilities; programming on-line applications and COBOL.

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General knowledge of systems analysis and a strong working knowledge of programming; ability to independently test and debug programs and prepare documentation; to translate detailed logic flow descriptions into coded computer program instructions; to modify existing programs to accommodate changes in system requirements for equipment configurations; to design detailed record and form layouts; to prepare comprehensive computer functional descriptions; and to communicate well verbally and in writing.

ANALYST/PROGRAMMER (annual salary $37,316 to $43,492):

Knowledge of applications analysis and programming; methods to utilize languages, hardware and tools in developing, coding and implementing applications; ability to work with client personnel to determine solutions and type of data to be processed; to analyze solutions in terms of operating system requirements and modify design to get maximum advantage of existing equipment; to establish efficient and effective procedures in support of automated systems; to work under limited supervision; to write, test and maintain computer programs; to devise data verification methods and standard system operational procedures; to prepare problem definitions and recommendations of equipment needed; to prepare detailed logic flows and machine instructions; and to communicate verbally and in writing.

Send application material to:

Statewide Office of Human Resource Development
University of Alaska
Room 1, Butrovich Building
Fairbanks, Alaska 99701

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Data Processing

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First Atlanta offers an attractive salary/benefits package, commensurate with skills and experience. For consideration, call (404) 231-6639 or forward resume with salary requirements to: **FIRST ATLANTA CORPORATION**, J. Cronin, Technical Recruiter, 2000 Piedmont Rd., Mail Code 2341, Atlanta, GA 30324.

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The City of Keene will accept letters of interest and resumes for the position of DATA PROCESSING DIRECTOR until 5pm, Monday, August 12, 1985. The Data Processing Director is responsible for the overall management and development of the City Data Processing system. The City currently utilizes jointly with the Keene School District, a Digital PDP 11/44 running Basic under the RSTS/E operating system. Many applications are written with [illegible] data management software. Applicants in addition to having professional knowledge of and experience with this type of system should have the ability to interact well with the many users of the system. Applicants must possess management ability to be able to cost justify the various functions of the system, develop system priorities, and follow through with the necessary coordination to get priorities implemented. Salary range: $[illegible] - $32,342. Send resumes to Three Washington St., Keene, NH 03431, Attn: City Manager.

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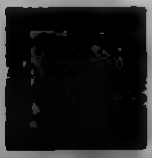

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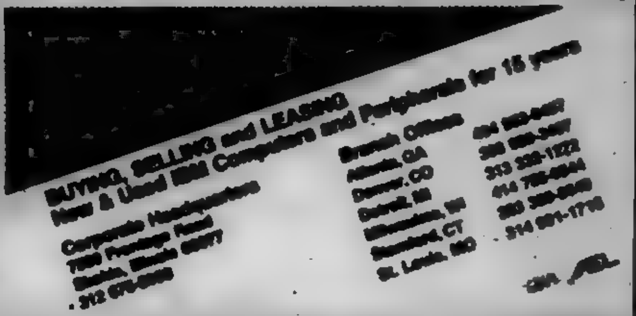

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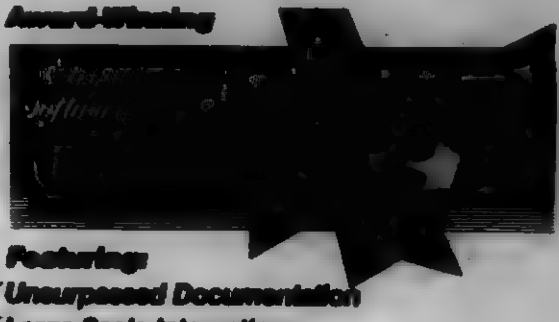

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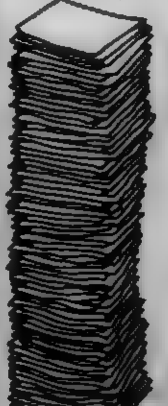

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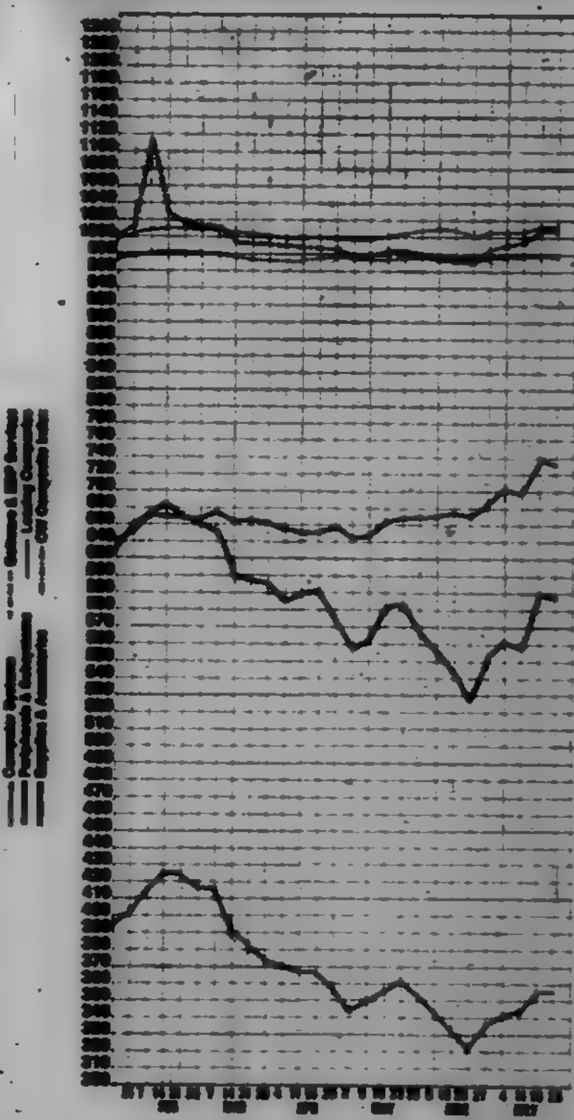

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OF THE BIG THREE IN BUSINESS SOFTWARE, WHO'S THE REAL NUMBER ONE?

If you know corporate software, you know that only three companies are really capable of offering a "total solution" product line. Everything from general ledger to a PC link with your mainframe.

And if your company's sales are $100 million or more, the amount you're likely to invest in corporate software is of such magnitude you undoubtedly should talk to all three.

Not only will you become a more informed buyer, but a more satisfied owner after you buy.

Our recommendation to shop the big three is offered with confidence. And with certainty that once a competitive evaluation ensues, the chance of your choosing McCormack & Dodge easily exceeds one in three. Because, not long after you begin your analysis, the differences will become apparent. Differences in what each company actually means when it claims to have a total software solution, and a totally integrated software line.

We believe your evaluation will show you this:

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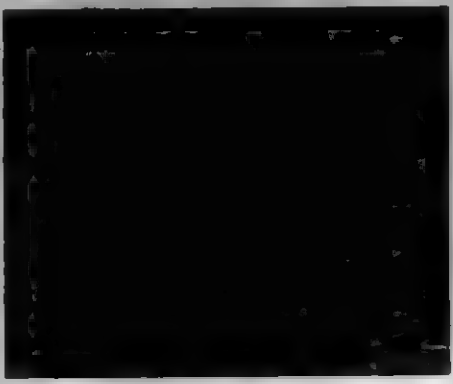
Slumping mini firms act to calm users

By Clinton Wilder
CW Staff

Fourteen months ago, the Henley Paper Co. in Greensboro, N.C., decided that Wang Laboratories, Inc. would be its main computer vendor. The firm committed to purchasing a Wang VS 100, with plans for a future VS 300 upgrade, a VS 65, four VS 15s and 75 workstations. "We are dependent on Wang in the near term and the long term," DP administrator Ray Andersen said. "We're very dependent on [its] future."

But Wang's future has become clouded in recent months. Although companies from IBM on down have announced lower earnings or losses, the losses and layoffs at Wang and Data General Corp., coming after years of virtually uninterrupted and spectacular success, have been particularly shocking. Both companies are currently in transition as they seek to reverse recent setbacks, and users, analysts and company executives are watching anxiously to see if they will succeed.

"I have a concern about it," Anderson said of continued customer service from Wang, "but it's the same with the industry. Wang's not unique. I'd feel more secure in an IBM environment, just because [IBM is] so large, but I still look first at what applications software is out there. If software led me to IBM, great, but if not, I'd still pick the other vendor, like we did with Wang. And I think [Wang is] definitely trying harder now."



Both Wang and DG have redefined their goals this year in the highly competitive office automation market, but the changes at Wang have been more fundamental and structural. The Lowell, Mass.-based Wang has eliminated a layer of middle management and has centralized its marketing approach, attempting to shed its word processing mantle for full-scale DP pitches to MIS managers.

"With our rapid growth, a lot of layers were put on top of things," said Thomas Mercer, Wang's director of product marketing. "Each [regional] branch developed its own marketing program. Now all of that is coordinated at Lowell. Branch managers are asked to come to Lowell on a quarterly basis, at a minimum."

Burned by late deliveries of the six products it announced in October 1983, Wang has vowed to restore its credibility. "Our idea is to do less but to do it better," said John Thibault, vice-president of product planning and management. "We've

See DOWN page 8

Ashton-Tate in micro merger

By Maura McEnaney
CW Staff

CULVER CITY, Calif. — Intense acquisition activity within the young microcomputer software industry continued last week when data base management leader Ashton-Tate announced its intent to acquire word processing champion Multimate International Corp. for $19 million in stock and cash.

The acquisition, Ashton-Tate's second this year, not only will add the leading independent word processing package, the Multimate Professional Word Processor, to its lineup of data base and integrated software products but also will provide Ashton-Tate with broader reach into the large corporation market, where Multimate has a strong presence.

"We're trying to move Ashton-Tate from a microcomputer software company to a computer services company," Ashton-Tate President Edward Esber told *Computerworld* last week. "This clearly establishes us as a dominant supplier in the data base arena and the word processing arena."

Earlier this year, Ashton-Tate had acquired Forefront Software Corp. of Sunnyvale, Calif., author of the popular Framework program, which Ashton-Tate had been distributing. In other merger activity so far in 1985, Lotus Development Corp.

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TOP OF THE NEWS

Datapoint moved fully into the videoconferencing arena with an IBM-compatible, full-motion video workstation. **Page 4.**

■

Drawing a parallel line, PE unveiled a mid-range supermini that can be expanded into a six-processor system. **Page 9.**

■

Winnebago Industries' chairman is pushing his company and Forest City, Iowa, into the information vanguard. **Page 10.**

■

Intel shipped its first five Intel Personal Super Computer hyper-cube systems to researcher customers. **Page 53.**

FYI

Electronic transfer: Computer pro rises at Chase

By Charles Babcock
CW New York Bureau

Arthur F. Ryan said he thinks extending bank services to consumers goes hand in hand with technology, and that is one reason he has been plucked from the ranks of data processing to head consumer banking operations at New York's Chase Manhattan Bank NA.

Named executive vice-president last November, Ryan, 42, brought an expertise in computers to what the bank said it hopes will be an expanding sector of its business.

"Banks are looking for more and more people schooled in the computer industry," said Thaddeus W. Paluszek, a banking industry analyst with Merrill Lynch, Pierce, Fenner and Smith, Inc. in New York.

Computers have become central to the banking business because of their ability to process large volumes of transactions. Instead of treating computers as a utility, however, banks are beginning to see them as crucial to their business planning and strategies. A banking service can be provided quickly if the underlying computer service is already in place, pointed out Big Eight accounting firm spokesman familiar with the banking industry.

In addition, microcomputers are beginning to help banks sell products to customers through the use of financial analysis and asset management tools, said Jan H. Linker, vice-president of the Electronic Banking, Inc. division of Bank Earnings International in Atlanta.

The promotion of DP executives into general management "is an acknowledgment by senior management that these people possess the skills needed to utilize this resource," said a Coopers & Lybrand manager in New York.

The most visible promotion of an executive skilled in computer technology was the appointment in September of John S. Reed as chairman of Citicorp, the nation's biggest bank.

Read, however, graduated from MIT in Cambridge, Mass., with the equivalent of

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NEWSPAPER

Computer Inquiry III opens

WASHINGTON, D.C. — The Federal Communications Commission has proposed relaxing the major regulatory barrier that prevents the regional holding companies and AT&T from mixing computer processing services with their underlying basic telecommunications transmission.

The FCC recently opened its Third Computer Inquiry, five years after establishing its Second Computer Inquiry decision that required the former Bell operating companies and AT&T to set up separate subsidiaries if they wanted to sell enhanced computer communications products such as packet switching, voice store and forward and customer-controlled switching.

The FCC proposal, which will be open for public comment, puts forth the use of a new standard of assessing the state of competition in a given service offering instead of defining a standard of what is computer enhanced and what is not.

"We want to come up with a mechanism that encourages and does not impede growth of new services," said Albert Halprin, FCC Common Carrier Bureau chief.

The FCC said that since the divestiture of AT&T into the seven regional holding companies and AT&T, a rash of waiver requests from the separate subsidiary restrictions outlined in Computer Decision II has pushed the FCC into a role of defining what types of services could be permitted, a role Halprin said the FCC should not take on.

The result was "horribly inefficient" for services being introduced into the basic telecommunications network. The FCC said it will permit new services as long as several necessary conditions are met. The conditions include whether the service is being offered by a carrier or vendor that has control over the bottleneck local-loop facilities or long-distance network in an exchange area; whether there are other providers of similar services; and whether new players can freely enter the market.

The FCC's plan proposes retaining regulation if a carrier does maintain monopoly control over facilities and wants to offer a computer enhancement through the network. However, the policy would drop the requirement that the service be marketed through a separate subsidiary, such as AT&T Information Systems in the case of AT&T.

Instead, FCC regulation would consist of requiring the service to buy the basic transmission portion of the offering at the same rates and terms other vendors would pay for equivalent service. Additionally, the FCC would require separate accounting procedures for the enhanced service.

There are four possible new service categories affected by the proposed regulations, the FCC said. These include protocol conversion; the interconnection or co-location of a vendor's equipment at the local exchange switch owned by the carrier or another vendor to provide integrated digital services; voice message storage services; and network channel terminating equipment.

CORRECTIONS

It was reported that Fortune Systems Corp. was operating under reorganization protection [CW, July 8]. That statement was incorrect. Fortune Systems' most recent financial statement, released July 23, reported second-quarter revenue of $14.6 million and profits of $222,000.

A product announcement for Intrak, Inc.'s compiler for NCR Corp.'s V series mainframes [CW, June 10] incorrectly listed the company address. Intrak is located at 9999 Business Park Ave., San Diego, Calif. 92131.

The price for Marcam Data Systems Corp.'s Pivot RPG-III order processing, invoicing and sales analysis system for the IBM System/38 was incorrectly listed [CW, June 24]. The package is priced at $14,200.

The photographs for the In Depth story "Growing up with MS-DOS" [CW, July 22] were incorrectly credited to the author; they should have been credited to David Current.

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Datapoint rolls out a workstation that combines full-motion video and voice/data communications when attached to an IBM Personal Computer or compatible micro/4

Wang announced the 80286-based Professional Computer to nudge IBM micros further into the VS environment, while DG unwrapped an IBM-compatible micro, word processing software and an MV/4000 upgrade as part of its scheme to promote clustering of Personal Computers around minis/6

PE launched a mid-range superminicomputer that can be extended into a six-processor parallel system/9

A change in leadership has Winnebago Industries traveling down the road to automation/10

Judge Harold Greene has clarified the ability of former Bell operating companies to provide private switched services that can be configured to cross exchange boundaries/12

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WHODUNIT

Sortland Yard warns against "Raffles-type sort programs."

Call (201) 568-9700.

Ask for Inspector SyncSort!

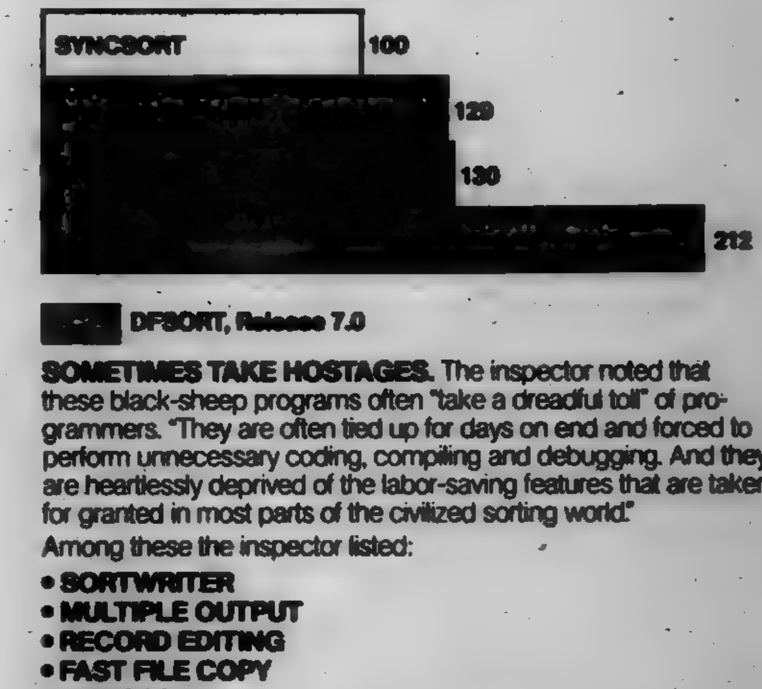
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied, "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

syncsort INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

DEC ports All-In-One software to 32-bit Microvax II

By John Desmond
CW Staff

MERRIMACK, N.H. — Furthering its push into the office automation competition, Digital Equipment Corp. last week announced that its All-In-One Office and Information System software is now available for the 32-bit Microvax II supermicrocomputer.

All-In-One on the Microvax is said to offer the same functions that are available on the VAX. The Microvax All-In-One includes WPS-Plus for word processing, All-In-One Mail, Time Management, Desk Management, Information Management, Help functions and computer-based instruction and costs $12,600. Customers need the All-In-One Generator Package running on the VAX-11/750 or larger systems to customize the Microvax II software, according to the vendor.

DEC also acknowledged the widespread presence of the IBM Personal Computer in the office by announcing various software packages that allow the IBM micro to communicate with the Microvax II and VAX systems.

'A way to fight back'

The All-In-One announcement "is important because IBM is attacking at the low end of the office market with the System/36, and DEC needed a way to fight back at that level of machine," in the view of George Colony, president of Forrester Research, Inc. in Cambridge, Mass.

The move also gives DEC users a low-end entry into All-In-One, previously available only on a more expensive VAX superminicomputer. "Large users can now get a taste of All-In-One as a sort of pilot system," Colony said. "It was such an all-or-nothing type sale in the past."

Gene Hodges, manager of market development in DEC's Office Information Systems Division, pointed to the ability to build distributed systems with the Microvax II All-In-One software, which is compatible up the line of VAX hardware.

Colony said, "In the distributed office systems environment, [the new software] is a perfect link with the larger All-In-One" running on other VAXs.

Decnet-DOS for Microvax II

The DEC announcements also included Decnet-DOS for the Microvax II, a $500 package that allows IBM Personal Computers to participate as end nodes in Decnet networks based on the Microvax II and other VAXs.

Among other introductions, DEC announced software permitting IBM Personal Computers and compatibles to emulate DEC terminals to the Microvax II. Vterm II software allows the IBM Personal Computer to emulate a DEC VT100 terminal, for file transfer from the IBM micro to a Microvax II or VAX system. Vterm II is priced at $160.

Poly-Com 220 and 240 emulation packages, developed by Polygon Associates, Inc., allow IBM Personal Computers to emulate DEC VT200 terminals to VAX systems. The packages cost $200 and $300, respectively.

Colony called the price of linking the IBM Personal Computer to the Microvax II a possible stumbling block, saying it may be less expensive for users to use DEC terminal emulation software from independent vendors.

Runs with 5M bytes of memory

All-In-One software runs under the MicroVMS operating system on the Microvax II with a minimum of 5M bytes of memory. The All-In-One Generator Package costs $6,500. Runtime licenses for customized packages cost $12,600 for each Microvax II system.

The cost for a Microvax II system with 16 active users and 30 subscribers, 9M bytes of memory, Decnet, Xerox Corp. Ethernet and terminal services, 30 VT220 terminals and All-In-One software that offers word processing, electronic mail, time management and administrative support, costs slightly more than $120,000 — approximately $4,000 for each subscriber.

DEC announced that the A-to-Z Integrated Software development package is also available on the Microvax II. A-to-Z integrates graphics, word processing and spreadsheets with customized business applications. Software modules of A-to-Z on the Microvax II cost $1,395 for word processing, data management and business graphics. The A-to-Z Base System costs $1,295. The A-to-Z Integration Kit costs $1,395.

DEC is located in Maynard, Mass. 01754.

Datapoint unveils color, full-motion video unit

By Charles Babcock
CW New York Bureau

NEW YORK — Datapoint Corp. has announced a workstation with full-motion, color video and voice communications for use on a network of IBM Personal Computers or Personal Computer-compatible units.

The Multimedia Information Network Exchange, or Minx, workstation consists of a high-resolution color monitor, a color motion picture camera, a viewfinder and a full-duplex speakerphone and is plugged into the Personal Computer, taking the place of the Personal Computer monitor. It allows videoconferencing among any number of users on the network, company officials said. The video portion of the conference is voice activated, with each user's screen showing whoever is speaking, company officials said.

Although Datapoint officials said the system can be geared for use with any personal computer, it has been implemented only for IBM Personal Computers and compatibles so far. It may be used with Datapoint's Vista-PC, an IBM Personal Computer-compatible, including an Intel Corp. 80186 microprocessor.

George L. Leonard, director of marketing for Datapoint's Advanced Products Division, the new unit that developed the Minx, said 8-bit microprocessors in the Zilog, Inc. Z80 family run the workstation and cluster servers that manage communications between up to eight workstations and the rest of a network.

In a basic eight-workstation cluster, each workstation is priced at $9,990, plus $9,200 for the cluster server. In addition, a $400 keypad is needed for dialing on the system and a $495 interface cable connects the unit to the Personal Computer.

When purchased with a Vista-PC, each workstation in a cluster of eight is priced at $14,385.

Leonard said the Minx is available now, with shipments to customers who have already placed orders starting later this month. The Minx system is intended for use on local-area networks, including Datapoint's Arcnet local-area net, and larger networks, company officials said.

Eight workstations can be connected to a cluster server through a single coaxial cable; the maximum distance between server and workstation is 1,000 feet. Larger networks of more than 200 users and 32 cluster servers can be built with industry standard, broadband networks, company officials said.

Workstations on Datapoint's baseband Arcnet can be connected to a more extensive broadband network through modem gateways that convert baseband signals to broadband, Leonard said.

The Minx workstation may also be used without being connected to a personal computer for voice and video communications, but it then loses the capacity for data communications, company officials said.

In addition to the normal configuration, standard video equipment may be attached to the workstation and used with it — video cameras, video recorders, monochrome document cameras or closed circuit video sources, such as news or business programming, company officials said. For private conversations, a telephone handset may be attached, the officials added.

Datapoint is located at 9725 Datapoint Drive, San Antonio, Texas 78284.

Looking for live stories on terminal technologies

New technologies have dramatically changed traditional data communications terminals. Now display and graphics terminals are available for the corporate and DP environment that feature a wide and impressive range of capabilities.

The *Computerworld* October Special Report on data communications terminals will examine some of these new terminal technologies, specifically high-resolution color graphics terminals and terminals with integrated voice/data telecommunications options.

The Oct. 28 report will also address the pros and cons of terminal communications as opposed to microcomputer communications from a data processing perspective.

Article contributions are now being considered for publication in the report. Submissions should take one of two forms:

- A tutorial article discussing an issue or a trend.
- An application story outlining a particular user's experience with data communications terminals.

The deadline for contributions is Aug. 30.

Articles must be typed, double-spaced and range in length from three to five pages. Artwork such as charts, graphs and photos is encouraged.

If you have a story you would like to tell or an opinion you would like to express, contact Janet Fiderio, Special Reports Editor, *Computerworld*, 375 Cochituate Road, Box 880, Framingham, MA 01701.

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Wang offers 80286-based micro

By Eric Bender
CW Staff

LOWELL, Mass. — Wang Laboratories, Inc. took conflicting steps in its cautious dance toward the IBM Personal Computer standard last week, as it launched a non-IBM-compatible Advanced Professional Computer along with three products linking the IBM micro with Wang VS minis.

The Advanced Professional Computer is completely compatible with the company's Professional Computer, permitting users to upgrade to the new design by swapping system boards, and it runs comparable software up to twice as fast as the IBM Personal Computer AT, Wang officials claimed.

However, industry analysts generally registered surprise that Wang did not make the system compatible with the AT. "I don't understand why they're still resisting the full IBM-compatibility issue," commented Tom Billadeau, president of TRB & Associates, Inc. in Ogunquit, Maine.

Available now at a starting price of $3,465, which does not include a monitor, the machine is built around an 8-MHz Intel Corp. 80286 chip and features 512K bytes of internal memory, which is expandable to 2M bytes on the system board.

The system acts as a single-user workstation under Microsoft Corp.'s MS-DOS 2.11 or supports up to four users under Microsoft's Xenix. More than 600 MS-DOS applications are available, and an emulation option allows about 90% of IBM microcomputer applications to run, the company said.

Last week's introductions also included Wang Word Processing for the IBM Personal Computer, the Wang Local Office Connection and the Wang Remote Office Connection, all said to work with the Personal Computer and Personal Computer XT but not with the AT.

The word processing package includes the company's widely used software, a replacement keyboard that handles both Wang and IBM functions and an interactive tutorial. Priced at $695, the package is scheduled for October shipment.

Wang's Local Office Connection enables the IBM micro to act as a VS workstation, giving access to host resources such as printers, storage devices, communications options and Wang Office and other system applications. All VS terminal functions are supported except graphics display on the IBM monitor, the company said. The product consists of an emulation card, a coaxial link to the host, word processing software and a replacement keyboard. The Local Office Connection costs $1,895, and delivery is expected in December.

The Remote Office Connection combines a word processing package and keyboard with a Wang Systems Network component originally announced in June 1984 and never shipped.

The connection permits Personal Computer users to hook up to a Wang VS minicomputer over point-to-point or multipoint synchronous links at speeds up to 9.6K bit/sec. and to run VS applications, Wang said. The product also allows users to transmit or retrieve for editing word processing documents to and from the VS and to store binary files on the larger system. The Remote Office Connection costs $1,200 and is slated for October availability.

The standard Advanced Professional Computer comes with a five-slot chassis, serial and parallel ports, keyboard and a single 360K-byte floppy disk drive. Another version with an eight-slot chassis and a 1.2M-byte floppy disk drive is priced at $3,900. A system upgrade from the Professional Computer costs $2,000.

Among other options are a Character/Graphics/IBM Emulation (CGI) card that combines IBM monochrome character, Wang monochrome graphics and IBM monochrome emulation and keyboard control for $655; a $1,000 20M-byte, half-height hard disk drive and a $4,400 67M-byte full-height hard disk drive, each requiring a $595 controller; a 43M-byte

See WANG page 8

DG unveils IBM-like desktop

By Edward Warner
CW Staff

WESTBORO, Mass. — In an effort to capitalize on the escalating trend that sees users linking office personal computers with departmental minicomputers, Data General Corp. has introduced its first IBM-compatible desktop personal computer. At the same time, DG doubled the number of users supported by its Eclipse MV/4000 DC minicomputer.

To take the computing-intensive task of word processing off the MV/4000, DG capped the rollout with the introduction of CEOwrite, a Microsoft Corp. MS-DOS-based word processing program. DG said CEOwrite will integrate with DG's CEO office automation software to permit document sharing via the MV/4000 DC. With word processing taking place off-line, the MV/4000 DC will be considerably faster, the company added.

The star of last week's rollout, however, was the Dasher/One, a 256K-byte personal computer offered in two models, each with a 12-in. green-screen monitor and at least one 3½-in., 720K-byte diskette drive. The machines will be directly marketed both to new customers and to DG's installed base of minicomputer users, according to Lou Delzompo, DG senior product manager for workstations and communications.

The Dasher/One is not a complete clone of the IBM Personal Computer, however. For one thing, it uses 3½-in. diskette drives, rather than the Personal Computer's 5¼-in. drives. Delzompo said the Dasher/One has 3½-in. drives because that is the size of the drives in DG's first IBM-compatible personal computer, the laptop portable DG/One, introduced last fall.

He also noted another incompatibility with the Personal Computer: The Dasher/One will not accommodate Personal Computer-compatible option boards. DG will introduce its own line of option boards for the machine, Delzompo said.

Delzompo said DG waited until now to introduce an IBM-compatible desktop because there "wasn't a clear user demand from our customers." It was also not until recently that decreases in hardware costs permitted the creation of an IBM-compatible priced similarly to an intelligent terminal, he added.

Pricing concerns, he said, were also behind the use of the Intel Corp. 8088 microprocessor in the Dasher/One. Nearly all of the latest personal computers for the office, including the Wang Laboratories, Inc. Advanced Professional Computer (see story at left), use the Intel 80286 chip, the high-speed processor used in the IBM Personal Computer AT.

Users access CEO features

Using DG's CEO Connection software — introduced in February for the DG/One — the Dasher/One, the DG/One and the IBM Personal Computer reportedly can operate as MV/4000 DC workstations, accessing CEO software. As a result, DG said, workstation users can access such CEO features as electronic mail and filing, calendaring, word processing and decision support. CEO Connection costs $295 for the Dasher/One and DG/One and $395 for the Personal Computer. A version for machines under DG's AOS/VS operating system costs from $1,600 to $3,250, depending on the CPU.

The $2,100 Dasher/One Model 1, based on the Intel 8088 microprocessor, reportedly runs all IBM Personal Computer software at the IBM machine's standard 4-MHz clock speed. The $2,415 Dasher/One Model 2, based on the Intel 8088-2 chip, offers users a switch-selectable chip speed of either 4 Mhz or 8 MHz, a second 3½-in., 720K-byte diskette drive and screen resolution of either 200 by 800 pixels or 400 by 600 pixels, the latter for use with text.

Users may, at no extra cost, choose either of two keyboards, one similar to that of the IBM Personal Computer AT and the other designed specifically for use with the CEO software, DG said. Options for both models include a 10M-byte internal hard disk, a sec-

See DG page 8

Wang, DG debuts draw little enthusiasm from analysts

By Edward Warner
and Eric Bender
CW Staff

ANALYSIS

Most analysts reacted with relatively little excitement to Wang Laboratories, Inc.'s and Data General Corp.'s announcements of personal computers and software last week.

Indicative of the responses were the comments of Kenneth Bosomworth, president of International Resource Development, Inc., a Norwalk, Conn., market research firm. "There's no suggestion that these companies have any new ideas to bring to the market," Bosomworth said. "It [looks] more like a lack of strategy — like lemmings [jumping] into the ocean, just falling over each other."

Tom Billadeau, president of TRB & Associates, Inc., a research firm in Ogunquit, Maine, expressed disappointment that Wang did not become the first major computer vendor to introduce an AT-compatible machine.

Bosomworth also downplayed the importance of the new Wang system. "I would be really hard pressed," Bosomworth commented, "to see a reason to buy that machine over the AT."

Having unveiled a desktop machine that is not compatible with the latest IBM offering, Wang is still bucking the Big Blue trend, said George Weiss, president of Quantum Science Corp. in New York. "Our research shows that workstation procurement in large organizations is almost exclusively IBM or IBM-compatible products," according to Weiss. "It's a difficult time for Wang, DG and [Digital Equipment Corp.] to make inroads in the workstation marketplace."

DG's introduction — an IBM-compatible personal computer that can operate as a workstation with the DG MV/4000 DC minicomputer — received a favorable reaction from analyst George Colony. According to Colony, president of Forrester Research, Inc. in Cambridge, Mass., DG was "giving users the alternative of attaching to CEO [DG's office automation software] on the MV/4000 via a terminal or attaching a personal computer to that departmental system and getting some resource distribution."

On the software side, analysts reacted more positively. Of the debut of DG's Ceowrite for off-line word processing on either the Dasher/One or IBM Personal Computer, Colony said that taking word processing off the MV/4000 means that users "are going to get better performance out of CEO [software]."

Billadeau, too, liked the idea of Ceowrite, which he said was important for its ability to span a wide range of DG systems. He also said he liked the choice of three user interfaces for the word processor. "You can turn on menus ad nauseum, or go way down to the control level."

Wang's enhanced communications offerings also received good reviews, although analysts noted some limitations of the products.

Wang's workstation strategy "enables us to welcome wholeheartedly the IBM Personal Computer into the Wang fold and opens the VS family to IBM Personal Computer users," said J. Carl Masi, senior vice-president for worldwide sales and marketing, at last week's announcement.

But such fine sentiments have not yet made the IBM Personal Computer a true family member, Billadeau said. "It's clearly a stepchild."

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Cleveland	Aug 6
Dallas	Jul 16, Aug 8, Sept 11
Denver	Jul 18, Aug 13, Sept 19
Detroit	Jul 23, Aug 20, Sept 24
Greensboro	Aug 1
Houston	Jul 30, Aug 28, Sept 24
Huntsville	Jul 31
Indianapolis	Sept 17
Kansas City	Sept 12
Los Angeles	Jul 25, Aug 27, Sept 26
Minneapolis	Aug 1
New Orleans	Aug 13
New York City	Jul 31, Aug 14, 28, Sept 11, 26
Newport Beach	Aug 14, Sept 17
Oklahoma City	Sept 17
Omaha	Aug 7
Orlando	Jul 17
Philadelphia	Jul 18, Sept 18
Phoenix	Aug 6
Portland	Aug 6
Rochester	Jul 23
Sacramento	Aug 8
St. Louis	Aug 8
Salt Lake City	Jul 16, Sept 24
San Diego	Sept 10
San Francisco	Aug 1, Sept 5
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Tulsa	Aug 15
Washington	Jul 25, Aug 8, Sept 12, 26

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asked ourselves, 'Do we really need so many versions, colors and variations?' [The slump] has given us a chance to clean up our product lines and focus on what's really important. It's time to put the [late delivery] ghost to rest."

Most users and third-party representatives interviewed recently praised Wang's new approach. "They're being more realistic about what products they intend to ship and when they intend to ship them, which I think is great," said David Cort of Pacific Edge Systems, a Los Angeles consulting firm specializing in Wang software. "I think it relates directly to their bad press and financial pressures."

The fiscal pressure has been brutal: Wang reported a $109 million loss in the quarter ended June 30, swallowing a $137 million inventory writedown and costs related to 1,600 layoffs. At a company that had come to expect 30% to 40% growth as the norm, the fiscal 1985 balance sheet saw revenue climb a mere 8% to $2.35 billion and profits tumble from $210.2 million in the prior year to $15.5 million.

In nearby Westboro, Mass., DG's most recent quarter was not much brighter. The company posted an $8.3 million loss and a 6% decline in sales. DG's cost-cutting program included the release of 1,400 employees.

'Shakes up users'

"Of course, that shakes up users," said Peter Lowber, a minicomputer industry analyst with the Boston-based Yankee Group. "But these are big organizations; they still have more money for [research and development] than startups. It's a question of not scattering it around. They're not going to suddenly evaporate, but they have to rethink things and choose their targets carefully."

DG, taking a financial beating in its scientific/technical and small business OEM sales, has now invested heavily in targeting Wang's traditional OA market. But where Wang approached the office through the desktop word processor, DG came in from the back room housing the supermini CPU.

"[OA] has really become a system product," said Robert Miller, senior vice-president of DG's Business Group. "With us and [Digital Equipment Corp.], that plays to our strength. But we have an uphill fight to demonstrate that our product is a superior solution. We have to convince the end users of the IBM tradition that we can support them and not just OEMs."

Miller, like Wang officials, insisted that DG's fiscal losses have not cut the meat out of R&D, only the fat. "There are some things on our 'we'd like to do' list that we're not going to get to," he said, "but we've been careful to have no drain on R&D in critical areas like [OA]. Our cost cuts have lightened the boat, but we don't want to do anything to the engine that runs it."

Miller admitted that customers may feel IBM is the safest port in the industry storm but contended that DG's recent news has not shaken its own reputation. Except for consolidating the formerly separate dealer sales unit into its North American sales division, DG has not reacted to the downturn with major organizational changes, Miller said.

"We're basically battening down the hatches and riding it through," he said. "Even though the layoffs look the same [as Wang's situation], the stability of our management speaks for itself."

Richard Swan, DP manager of the DG-based shop at L. S. Starrett Co. in Athol, Mass., said he has not seen any changes. "Our salesman was a victim [of layoffs], but we seem to have a very capable replacement," he said.

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streaming cartridge tape drive for $2,500; a 512K-byte, user-installable memory upgrade for $580; and an Intel Corp. 80287 numeric coprocessor priced at $375.

Xenix System III will be offered next month for $995. Multiuser configurations require use of Internal Workstations, new Wang bit-mapped terminals that have a base price of $1,835 for all but the system monitor.

A four-user Advanced Personal Computer configuration with an eight-slot chassis, 2M bytes of internal memory, a 1.2M-byte disk drive, 67M-byte Winchester drive, monochrome monitor with CGI card, three Internal Workstations, four keyboards and Xenix will cost $17,465, the company said.

Wang also intends to offer Interactive System Corp.'s IN/IX, another AT&T Unix version, on both the Professional Computer and the Advanced Professional Computer in second-quarter 1986.

IN/IX role on larger systems

Hinting at a role for IN/IX on larger Wang systems, Helayne Jones, director of desktop systems, said the operating system "is tied closer to our strategy than Xenix is." However, no IN/IX pricing was announced.

Additionally, Wang said it will open its architecture for the Professional Computer line, offering specifications to third-party software and hardware developers.

More information is available from Wang at One Industrial Ave., Lowell, Mass. 01851.

DG from page 6

ond 3½-in. diskette drive and up to 640K bytes of internal memory. With two diskette drives, the Model 1 is $2,565, and the Model 2 is $2,880. With a 10M-byte internal hard disk and one diskette drive, the Model 1 is $3,460, and the Model 2 is $3,775. With 640K bytes of memory, one diskette drive and a 10M-byte hard disk, the Model 1 is $4,095, and the Model 2 is $4,410.

Delzompo said the MV/4000 DC was enhanced to support up to 32 users, twice the previous number, as a statement of support for the departmental cluster concept, under which personal computers are linked with a mini acting as a file server. When running CEO, however, only 24 users are supported because of the need to free ports for use with printers, he noted.

A typical MV/4000 DC system, including a processor with 4M bytes of memory, 22 workstations, an IEEE 802.3 transceiver and cable, two 120M-byte disk drives, a diskette drive, three letter-quality printers and DG's AOS/VS operating system package, which includes CEO, costs $107,448.

Also introduced for use with the Dasher/One was the $650 Model 4467 printer, a daisywheel printer offering underlining, bold printing and subscripting and superscripting, among other features, according to the vendor.

Additional information is available from DG's Information Systems Division, 4400 Computer Drive, Westboro, Mass. 01581.

ACQUIRE from page 1

of Cambridge, Mass., acquired the assets of Wellesley, Mass.-based Software Arts, Inc., including the now-defunct Visicalc program; and Software Publishing, Inc. acquired Harvard Software, Inc. and its market-leading project management product line.

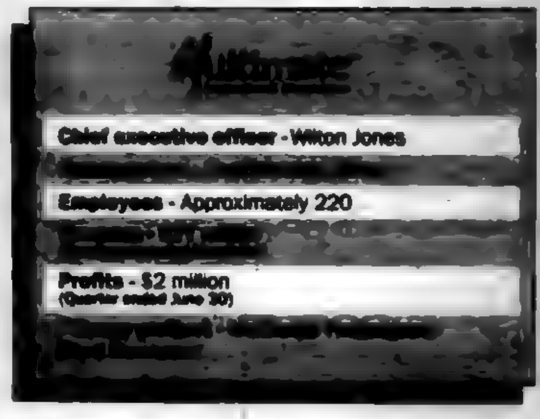
Analysts have been predicting for some time that successful small software vendors will be grabbed by the few larger companies as the still-young industry goes through a maturation process and shakes out the hundreds of one-product companies that lack marketing resources.

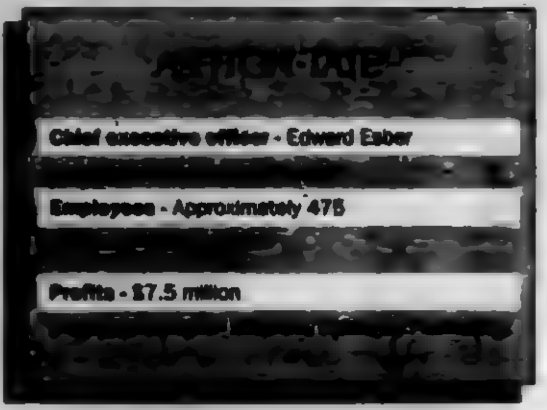
One industry insider recently told *Computerworld* that the four leading microcomputer software companies — Ashton-Tate, Lotus, Software Publishing and Microsoft Corp. — could virtually have their pick of smaller companies seeking acquisition by the giants. "Each of these four has a table virtually full of offers from smaller vendors," according to Benjamin Rosen of the Sevin-Rosen venture capital firm, "and they can now mix and match to fit their own product lines [best]."

Series of consolidations

Concerning the Multimate/Ashton-Tate pairing, Bill Ablondi of Future Computing, Inc. noted that it is the first in what could be a series of consolidations among the leaders of microcomputer software companies. "Ashton-Tate won't be the only one acquiring other firms that lack some distribution skills," he said. It may not be the last of Ashton-Tate's acquisitions as well, according to Ablondi.

The acquisition also gives Ashton-Tate a strong East Coast presence and a pipeline into the substantial East Coast programmer talent pool, a critical consideration in future Ashton-Tate software development plans. The Southern California-based firm has been seeking such a base for some time


Multimate
Chief executive officer - Wilton Jones
Employees - Approximately 220
Profits - $2 million
(Quarter ended June 30)


Ashton-Tate
Chief executive officer - Edward Esber
Employees - Approximately 475
Profits - $7.5 million

and has been in ardent pursuit of Software Arts, before that acquisition candidate chose to be swallowed up by Lotus.

In the fiscal year ended Jan. 31, publicly held Ashton-Tate's sales were $82 million and profits were $7.5 million, ranking it behind micro software vendor Lotus, which had a revenue of $156.9 million.

Founded in 1980 by Hal Lashlee and the late George Tate, Ashton-Tate's product line includes Dbase II, a popular data base package, Dbase III and Framework, an integrated spreadsheet, graphics, data management, forms processing and outline generator package.

Multimate was founded in 1982 under the name Softword Systems, Inc., by programmer Wilton Jones. In 1984, the company changed its name to Multimate.

East Hartford, Conn.-based Multimate claims to have approximately 30% to 35% market penetration of microcomputer word processing software within corporate installations. Multimate's Executive Vice-President Richard Lefebvre said his company plans to take advantage of Ashton-Tate's established marketing and distribution network.

Shareholders of privately held Multimate will receive one million shares of Ashton-Tate stock, valued in excess of $11 million, and cash for a total package value of $19 million. Multimate will be operated as a wholly owned subsidiary of Ashton-Tate.

The merger agreement must be approved by the boards of directors at both companies and is expected to be finalized by November, company officials said.

In June, Multimate announced plans to port its word processing software to the IBM System/36 minicomputer and to IBM mainframes. Esber said Ashton-Tate will reassess the prospects for mainframe versions of Multimate.

At the time of the announcement, Multimate indicated it had enough cash on hand to complete the project. "The [Ashton-Tate] deal was not made for financial reasons," Lefebvre said.

Ashton-Tate was actively seeking a merger partner in the word processing arena, according to Esber. Chief competitor Lotus currently has no strong word processing element in its product line.

PE supermini bolsters parallel processing offerings

By Tom Henkel
CW Senior Editor

OCEANPORT, N.J. — Claiming to have completed the second major step toward making a parallel CPU architecture the mainstay of its product offerings, Perkin-Elmer Corp. last week added a mid-range parallel configuration to its Series 3200 line of superminicomputers.

Called the 3230MPS, the system is based on a newly announced mid-range uniprocessor, the 3230XP, which serves as a host in the 3230MPS configuration. To the 3230XP, users can add up to six processors that function with the 3230XP in a tightly coupled fashion. The add-on processors can consist of auxiliary processing units, I/O processing units or a combined auxiliary processing-I/O processing unit.

The 3230MPS is the second parallel configuration announced by PE in the past six months. In January, the company announced the 3260MPS, a high-end parallel system based on its 3250XP processor [CW, Feb. 4].

The two parallel configurations come in the face of stiffer competition for a share of the scientific-oriented superminicomputer marketplace. PE, a 10-year veteran in the scientific market, is now facing competition from start-up companies offering specialized processors geared to number-crunching tasks.

Recent entrants into this marketplace, such as Intel Corp. with its Intel Personal Super Computer system, Encore Computer Corp.'s Multimax and Floating Point Systems, Inc.'s Flex/32, are hoping that systems based on multiple microprocessors will be attractive enough to end users to steal market share away from established vendors such as PE.

Said to be aimed at both scientific and commercial users in need of high computational and I/O capabilities, the 3230MPS reportedly offers users the option — by adding additional processors — of a fivefold increase in performance over a basic 3230XP processor without having to change the host CPU. The system is available with a minimum of 2M bytes of main memory but can be expanded to 16M bytes. It offers up to two direct memory access channels, each capable of supporting a data transfer rate of 10M byte/sec., the company said.

The 3230XP CPU includes 4K bytes of writable control storage, an automatic restart feature and a multiperipheral controller board. Existing users of PE's 3230 CPU can upgrade to the 3230XP configuration via a $20,000 field conversion option. In addition, each of the parallel processors that can be attached in the 3230MPS configuration offers 4K bytes of direct-mapped cache memory.

Like other members of the PE 3200 family, the 3230XP and 3230MPS can use PE's OS/32 operating system, a version of AT&T's Unix operating system.

A basic 3230XP with 1M byte of main memory costs $85,000. Additional processing units that compose the 3230MPS configuration cost $44,000 each for the auxiliary processing units and I/O processing units and 48,800 for the combined auxiliary processing-I/O processing units. A six-CPU 3230MPS configuration would cost roughly $325,000 to $500,000, the company said. The systems are available immediately.

More information can be obtained from PE, 2 Crescent Place, Oceanport, N.J. 07757.

Unit ties IBM, Net/One tools

SANTA CLARA, Calif. — Attempting to move its local-area network line squarely into large corporations, Ungermann-Bass, Inc. has announced two network interface units that enable its Net/One to communicate with IBM mainframes.

The products, NIU-74 and NIU-78, act as intermediaries between IBM 3274 controllers and Ungermann-Bass' local-area network line. The local-area net line works with four types of media: broadband, baseband, optical fiber and coaxial cable. The broadband network operates at a speed of 5M bit/sec.; the other versions work at speeds up to 10M bit/sec.

The NIU-74 sits between a Net/One network and an IBM 3274 controller. It provides up to 16 coaxial connections each at a maximum distance of 100 ft and routes information from a host to its proper place on a Net/One.

The NIU-78 supplies eight ports that can be used for IBM 3270 Type A devices. These devices can be connected through coaxial cables.

With the interface units, a Net/One network can support IBM 3278, 3279, 3178, 3179 and 3180 terminals as well as IBM 3287 and 3262 printers. The gateway works with IBM Systems Network Architecture and Binary Synchronous Communications protocols.

The NIU-74 costs $5,425, and the NIU-78 sells for $4,900.

Ungermann-Bass is located at 2560 Mission College Blvd., Santa Clara, Calif. 95050.

A practical, easy-to-read text...

MVS TSO

Concepts • Commands • ISPF • CLIST

If you're developing programs under OS/MVS, you're probably using some type of time-sharing system. If that time-sharing system is TSO, a book called *MVS TSO* is for you. It zeroes in on the tasks a programmer has to do most often, so you can master TSO in a hurry.

Here's what you'll learn, whether you're using native TSO or ISPF (a menu-driven extension to TSO)

- how to create or change a data set or a library member
- how to allocate, display, print, rename, delete, move, or copy a data set
- how to compile, link-edit, and execute a program interactively
- how to debug a COBOL program interactively—that is, how to monitor the program's execution, look at the contents of data fields, watch the order in which subprograms execute, and so on
- how to start and control background processing for batch jobs (a background job doesn't run in your time-sharing region, so your terminal's not tied up as the job executes)
- why you have to use native TSO commands for some functions even if ISPF is available on your system

In short, you'll learn everything you need to know to use TSO commands or ISPF for program development.

For experienced TSO users: How to use command procedures

MVS TSO will also teach you how to use command procedures, or CLISTs. A CLIST is a series of TSO commands and statements that are executed in sequence (it's roughly equivalent to a JCL procedure). In this book, then, you'll find out:

- how to create and execute a simple CLIST for a specific job
- how to create and execute a generalized CLIST that can be used in a number of situations
- how to write a complex procedure that uses facilities much like those of a high-level language
- when and why you should write a program in a high-level language instead of using a CLIST

2 reasons why this book works

1. A technical subject like TSO is easier to master if you have plenty of practical examples to study. That's why *MVS TSO* is loaded with illustrations. For example, you'll find:

- before-and-after screen images that show you what values to enter into a screen and what the result will be
- TSO command formats that clearly explain each operand
- sample CLISTs
- schematic drawings that show how TSO works and how it relates to MVS

These illustrations not only help you understand TSO in the first place. They also serve as handy references when you're working at your terminal.

What's more, they teach you the basic patterns of TSO commands and ISPF options. So you won't have any trouble looking up new features in the IBM manuals or other references when...and if...you need them.

2. This book is organized in a way we've found works well. After chapter 1 (an introduction to MVS and TSO), the book is divided into 3 parts: one each on ISPF, TSO commands, and CLIST. So if ISPF isn't available at your installation, you can skip that part and concentrate on native TSO. If you already have TSO experience, you can go directly to the part on CLIST.

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OS JCL teaches you how to code job-control language for everyday applications that involve sequential, direct, ISAM, or VSAM files. If you're a TSO user, this book will help you understand why you have to supply JCL for some TSO jobs and what that JCL should be.

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Winnebago, Forest City travel down automation road

By Paul Korzeniowski
CW Staff

CW PHOTO BY PAUL KORZENIOWSKI

Winnebago Industries, Inc. manufactures recreational vehicles in rural Iowa.

FOREST CITY, Iowa — One probably would not expect to find a half-billion-dollar corporation in a city so rural that it lacks a fast-food franchise.

Neither would one anticipate that in-depth computer training programs would be run at high schools so tiny that each graduating class consists of fewer than 30 students.

But that is what one finds here in this town of 4,000 in northern Iowa, home to acres of cornfields and Winnebago Industries, Inc.

One cannot underestimate how important Winnebago is to this farm area. When times are good for the recreation vehicle manufacturer, which employs 2,500 workers, then good times come to Forest City residents.

Tough times at Winnebago

In the early 1980s, times were tough for Winnebago. New competition, unrealistic sales projections and unstable gasoline supplies and costs had turned a stream of steady profits into an $18 million river of red ink.

To stem the tide, major changes were made. John K. Hanson, the company's 71-year-old founder who had stepped away from an active role in the company in 1975, returned. With Hanson came an emphasis on automation, especially factory automation.

That new emphasis brought a corresponding increase in the use of corporate mainframes. The addition of product design and factory control applications had overloaded the company's IBM 4341 mainframe.

To ease the burden, an IBM 4381 was installed in the fall of 1984, and business applications such as a payroll system were off-loaded to it.

System still taxed

Despite the additional horsepower, the company is still taxing its systems. "Both mainframe systems are operating at full capacity, and we will have to upgrade them shortly," noted John Rieff, advanced technologies manager at Winnebago.

Part of the reason for the squeeze on its systems was that the company's business had once again begun to prosper. Hanson's leadership and a new line of smaller, lighter recreational vehicles helped to turn the business around.

Another reason for the increased automation was that, like other manufacturing companies, Winnebago has been exploring how computers can aid design, manufacturing and production processes. "When [General Motors Corp.] is ready to unveil its factory of the future, we want to be ready with ours," Hanson said.

Rieff is charged with realizing Hanson's vision, which has a target date of 1988. The advanced technologies manager is a member of a computer-integrated manufacturing (CIM) committee, whose job is to determine how Winnebago should automate its production processes.

"CIM is more than just [computer-aided design and manufacturing]" he said. "It incorporates concepts such as distributed processing so that corporate information can be spread throughout a company and used wherever it is needed."

CIM committee

The CIM committee consists of middle and upper level managers from a broad range of departments, including marketing and various Winnebago factories. Rieff will not have to school other members in computer fundamentals because three years ago Winnebago embarked on a comprehensive computer literacy program.

The program included computer literacy training classes for any employee interested in learning how the machines operate. The classes supplied a basic understanding of simple concepts such as input and output.

Also, a microcomputer learning center with a full-time in-house consultant was established. Employees can visit the center at any time. After they tell the consultant how they work, the consultant may recommend a package that the person can try out. If a user determines that a computer could help him do his job better, he or his manager can purchase it.

"There really isn't much of a risk," Hanson claimed. "It is only $5,000 and a company this size can afford to spend that amount of money without a guaranteed return."

The center supports equipment from various vendors including IBM, AT&T, Hewlett-Packard Co. and Apple Computer, Inc. "I think any employee should be able to work with whatever type of equipment he feels comfortable with," Hanson said.

Computer phobia held back execs

The only problem with the program was senior executive computer phobia. "I could not believe the resistance some of the senior managers had to working with the machines," Hanson claimed. "It took a real long time for them to overcome their fears."

Today, the microcomputers are primarily used in stand-alone fashion for typical spreadsheet and word processing applications. In order for CIM to become a reality, this data has to be integrated with other corporate information, according to Rieff. Consequently, the company has begun to look at some network alternatives.

In addition to productivity increases, Hanson saw another benefit to the campaign. Today, more microprocessors are used by the automobile industry to control engine activities than by the computer industry to control data processing. "When our engineers know how a microprocessor works, they may be able to incorporate them into the design of our products and save us money," he said.

Might we see a recreational vehicle equipped with a personal computer for someone who wants to take a spreadsheet on vacation? "Our customers tend to be older and are not very interested in vehicles equipped with microcomputers," Hanson said.

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RYAN

from page 1

an MBA and learned the uses of technology in bank management positions. Ryan, on the other hand, is a mathematics major whose career has followed much more traditional data processing lines.

Ryan graduated from Providence College in Providence, R.I., and joined Datatrol, a software company in Washington, D.C., that was soon acquired by Control Data Corp. Starting out as a systems analyst at Datatrol, Ryan left CDC eight years later as manager of the Washington, D.C., office.

He joined Chase Manhattan in 1972 as a DP project manager. In those days, he said, a project manager "designed systems and wrote code, mostly in assembler language," along with everyone else.

In 1975, Ryan's responsibilities were enhanced to include securities data processing, and he proceeded through a succession of DP management posts during the next few years.

In banking, data processing is inextricably linked to bank operations, such as check processing or wire transfers, and in the process of supervising such operations, Ryan assumed general responsibility for the staff attached to it as well as the computer systems and personnel involved. In 1981, for example, when he became head of electronic data processing, Ryan also assumed responsibility for all Chase Manhattan clerical personnel devoted to check processing, securities and trust services and other operations.

Banking industry insiders note that Ryan's move from technical responsibility to supervision of a growth area of the bank might have been difficult for a more traditional MIS executive to make. Computer management and people management "have been intertwined throughout his career," said a Chase Manhattan observer.

Nevertheless, Ryan is an advocate of technology and thinks it holds the key to bank consumer services. "Technology is becoming dominant in the delivery of services. . . . It is the highway to get our product to the consumer," he said.

Whereas the branch bank was once the preferred delivery vehicle for financial services, the high overhead of bricks and mortar and the potential of electronic technology has now made automated services more attractive, Ryan said. Another factor in their appeal, he said, is that many bank customers actually prefer to deal with machines in some transactions.

As computers take over more of the routine tasks at a bank, the service people will be able to act more like salesmen and less like order takers, Ryan continued. In this context, the automatic teller machine, viewed by some as the epitome of impersonal service, actually frees staff to interact with customers as service and sales personnel.

The major banks have already installed the back-office computer services that clear checks and allow ATMs to process on-line transactions. Modern communications enable these services to extend their reach. When combined with the ability to organize information through data base management, the result "has been nothing short of extraordinary," Ryan said. But technology will play an increasingly direct role in consumer banking, he said.

One of Ryan's visions is of a day when banks place terminals in real estate brokers' offices, through which brokers can access listings of property for sale along with mortgage rates available from local banks. Such terminals, said Ryan, would be able to host programs that could analyze the borrowing limits of a house hunter, speeding his search and initiating the mortgage application process.

Ryan

The Chase executive believes that computerized home-banking services have a promising future independent of the questionable future of the home computer market. Chase declined to reveal the number of home-banking customers it serves, but it has the capacity to execute normal banking transactions as well as discount stock buying through Chase's subsidiary, Rose & Co., in Chicago. On this system, customers may view up-to-the-minute values of their portfolio and order trades to be executed the following day after regular trading hours.

With technical support, Chase can open small business loan offices or personal financial centers and staff them with sales people and minimal support personnel. It operates 13 business offices and two personal financial centers in the New York area. It also operates a mortgage office on Staten Island, N.Y.

Ryan also believes that it is only a matter of time before the courtesy cards that allow customers to access their accounts at ATMs begin to function as debit cards, usable at many retail stores. Instead of writing a check, a transaction would be routed electronically to the customer's bank and the amount deducted from his account. Such a step would be aided by emerging videodisk storage techniques that can store greater quantities of information and still make it available quickly.

"The amount of information that people want appears to be unlimited, but it is limited by cost and convenience," Ryan said. Consequently, Chase is turning to technology to help it provide information and service at a reasonable cost.

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Greene OKs private-line switching by divested Bell firms

Decision permits rerouting onto long-distance circuits

WASHINGTON, D.C. — U.S. District Judge Harold Greene recently declared that the regional holding companies can provide switching services at their exchanges for private-line customers who want to route local calls onto long-distance circuits. The decision gives the divested Bell operating companies clearance to configure private networks that service multiple exchanges while keeping them out of the long-distance business.

Greene said it was permissible for Pacific Northwest Bell Telephone Co. to carry out a reconfiguration of the state of Oregon's private intrastate multiexchange network where three nodes were established that were able not only to switch local calls but to switch local calls onto long-distance circuits.

While Greene's decision is being viewed by the U.S. Department of Justice, which oversees the enforcement of the AT&T divestiture decree, as specifically pertaining to the Pacific Northwest Bell case, other observers say the court order could spark new efforts by the divested Bell operating companies to play a larger role in the configuration of networked communications across exchange boundaries, especially for large-volume corporate users.

Bell Atlantic Corp. said, "The decision . . . enhances our ability to compete for large customers as long as we don't provide interexchange circuits." Bell Atlantic noted that it is currently seeking to provide a similar network configuration service to the state of Virginia.

Richard M. Wolf, executive vice-president of Robert E. LaBlanc Associates, a Ridgewood, N.J., telecommunications consulting firm, said the Greene decision "represents a clear softening of the interexchange prohibition demarcation line" for the divested Bell operating companies contained in the original divestiture decree. However, he cautioned that the effect of the Pacific Northwest Bell decision will be limited and represents Greene's approval of a state government as opposed to a commercial interest obtaining a similar configuration.

"I do think, however, that intrastate interexchange switching is going to be the area most prone to pressure for change. Here, state utility commissions have jurisdiction and a federal-state issue is presented," he added. AT&T petitioned Greene to test the legality of Pacific Northwest Bell's service, alleging that it was offering an interexchange long-distance service in violation of the divestiture decree and also was engaged in discriminatory pricing by giving lower local rates to private-line customers than to long-distance carriers.

In rejecting the AT&T petition, Greene noted that the divestiture decree forbids the former Bell operating companies from performing interexchange or long-distance routing to particular long-distance carriers, but it does not prohibit them from providing switching services to customers as end users when they want to originate or terminate traffic from dedicated private or tie lines that connect to interexchange circuits as part of a Centrex offering or a private branch exchange (PBX) service.

Greene noted, "Indeed if the [former Bell operating companies] were precluded from providing such services, they would be foreclosed from a substantial portion of the end-user switching and private-line network markets which they currently serve."

Greene said that in the case of Pacific Northwest Bell, the company switched the state of Oregon's interexchange private-line calls onto the private interexchange transmission facilities that were being provided by AT&T at its points of interface. The state switched the remaining calls using on-premise PBX equipment.

Greene said that marketing and engineering functions performed by Pacific Northwest Bell consisted of estimating the number of interexchange circuits the state would need to connect two intraexchange nets, which he said was "an inherent and necessary part of its authorized businesses of providing the intraexchange portion of the customer's private network and of marketing Centrex- and PBX-based private- switching systems and services."

Pacific Northwest Bell did not select the long-distance carrier to be used by the state to connect the nets but rather programmed its Centrex switches to establish connections with AT&T Communications circuits that were picked by the state's planning officials.

Greene rejected the AT&T charge of discrimination in local exchange pricing for the same service, even though rates for carrier access were higher than for private network access. He upheld Pacific Northwest Bell's contention that carrier access pricing, unlike local private-line rates, was meant to support local service.

While the Justice Department argued that Pacific Northwest Bell's service was legal, it pointed out that it believed the divested Bell operating companies are prohibited from "designing routing algorithms for tandem routing of interexchange traffic, the selection or recommendation of the long-distance carrier and the procurement for customers of interexchange service from the interexchange carrier."

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Darpa fuels supercomputing

GAITHERSBURG, Md. — A new generation of supercomputers is being born across the U.S., sponsored by money from Uncle Sam.

Already, a new large-scale multiprocessor machine — called the Butterfly Multiprocessor — is up and running and is available for access by researchers who have hookups to the U.S. Department of Defense's Arpanet system. It was designed and manufactured by Bolt Beranek & Newman, Inc. of Cambridge, Mass. The sponsorship of the new generation of supercomputers is being directed by the Defense Advanced Research Projects Agency's (Darpa) Strategic Computing Initiative at a cost, to date, of $150 million. The goal of the project is to develop advanced machine-intelligence technology during the next 10 years.

In addition to a new generation of supercomputers, other research areas being supported by Darpa include software applications generators to promote AI systems for speech recognition, natural language computer interfaces, vision comprehension systems and advanced expert systems.

The Butterfly machine is the first product to emerge from the Strategic Computing Initiative based on a multiprocessor architecture. In this case, a variable number of processors can be incorporated into the machine, accommodating up to 128 commercially available microprocessors (Motorola, Inc.'s 68000 series). Each processor has access to .5M bytes of memory and the top machine speed is quoted at 200 million instructions per second (Mips).

Bolt Beranek & Newman currently has government commitments of up to $20 million to build 10 of the Butterfly machines.

A second supercomputer, being developed at Carnegie-Mellon University in Pittsburgh, is a programmable systolic array. The system consists of a configuration of multiple processing elements that is slated to run at a rate of 10 Mips.

A third supercomputer that will be completed this year with support from Darpa is the Connection Machine, manufactured by Thinking Machines Corp., Cambridge, Mass., which will contain 64,000 processors that are connected to each other.

The initial 64,000-node processor machines will be manufactured using very large-scale integration technology of 10,000 gate array chips, each containing 16 processor elements to connect to other surrounding nodes, as well as a communications router, according to the vendor.

The Connection Machine will be directed by a computer at the front end that will instruct the machine on the task to perform at rates potentially as high as 10 billion instructions per second.

The fourth and final supercomputer project being supported by Darpa's Strategic Computing Initiative is under way at Columbia University in New York, where researchers have designed and built a non-von Neuman machine based on a tree architecture that combines up to 8,000 large and small processors. The machine is functionally similar to the Connection Machine.

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Ramblings from the floor of Cincom Systems, Inc.'s Directions '85 Executive Management Conference:

■ It may be because of the joint marketing agreement Cincom recently penned with Digital Equipment Corp., but for whatever reason the Cincinnati-based software vendor made DEC representatives feel right at home at its Directions '85 Conference last week.

Two Cincom speakers took time from their presentations to point out that most of the initial development work for the company's IBM mainframe and DEC VAX-compatible software was done on VAX processors. Other representatives, including Chairman and Chief Executive Officer Thomas Nies, described benchmark tests conducted by Cincom that they said illustrated the price/performance superiority of the VAX compared with two classes of IBM mainframes.

Nies also gave attendees a brief history lesson on IBM's introduction of its OS and DOS operating systems, both of which he described as primarily batch oriented.

Nies said the fact that OS and DOS were not designed for on-line environments "was a little error in the beginning that became a big problem over time." Nies labeled DEC's VMS, which he said was designed as an interactive operating system, a product of "modern thinking."

CW AT DIRECTIONS '85

Another Cincom speaker claimed that "many of the links between IBM processors are weak." On the other hand, he told visitors, DEC has been successful in ensuring compatibility among its processors, everything from the VAX 8600 to the Microvax.

■ Asked whether IBM would introduce an operating system successor to MVS/XA later in this decade, Ron Weeks, senior product manager of architecture and business planning, said such an announcement would depend on what Big Blue's competition has up its sleeve. "IBM does what its customers want," he said, "but only as fast as the competition pushes it. IBM's solutions are longer term. If you can wait, that's okay."

■ As an aside, Nies said IBM offered to sell the CMS component of its increasingly popular VM/CMS operating system to Cincom some 10 years ago for $2.5 million. Nies said he declined the offer because "I didn't think we could sell an operating system."

■ John Carpenter, corporate technical consultant with Cincom, told visitors that end users will have to become more involved in applications development. "We can't move far enough ahead, fast enough, without greater user involvement," he said. "We don't have enough programmers to automate all the functions that need to be automated."

■ Comments made by a Cincom spokeswoman indicated that the company was less than thrilled with the recent National Computer Conference (NCC) attendance. She said the show garnered Cincom about 300 prospects, a smaller group of potential customers than Cincom won at last year's Las Vegas show. However, the figure was not low enough to cause Cincom to consider withdrawing from NCC participation, the spokeswoman said.

Aging systems nag managers

CW AT DIRECTIONS '85

By John Gallant
CW Staff

NEW SEABURY, Mass. — Picture the DP manager as a long-distance runner. Striding toward the goal of providing information that a company needs to survive, the DP manager must dodge the obstacles tossed up by "technological earthquakes" — the rapid and often incompatible advances in computer and communications technology — according to Ron Weeks, senior product manager of architecture and business planning at Cincom Systems, Inc.

The long-distance DP runner must also carry the millstone of obsolete methods and aging applications.

Weeks was not the only Cincom speaker to draw on the millstone analogy at the company's Directions '85 Executive Management Conference here last week. Thomas Nies, Cincom's chairman and chief executive officer, also claimed that reliance on older technology — especially software — and outmoded approaches to information management are inhibiting advances in MIS.

"The large investment in old software makes it tough to move forward," Nies said. "You cannot drag the old along and hope to make great progress. Advances in software have tended to be evolutionary, while breakthroughs in hardware have been revolutionary. Thus, there is an increasingly large gap between the

See CINCOM page 15

[illegible]

Last May, when Apple Computer, Inc. announced that Steven Jobs would assume "a more global role" in the reorganized company's operations, the firm probably had no idea how apt its choice of words would become.

At the time, Apple was consciously engaging in euphemism. Since then, however, Apple's memorable exercise in double-talk has taken on new meaning.

As the San Jose, Calif., *Mercury* recently reported in a front-page news story, Jobs now wants to become an astronaut. Yes, the wunderkind who pioneered the microcomputer industry and became a prototypical American success story has signed up for a program that gives a select handful of civilians the opportunity to tag along on future space shuttle missions.

In all probability, Jobs' bid to become the first counterculture entrepreneur in outer space will end in disappointment. Only a tiny fraction of the program's horde of eager applicants will ever realize their dreams of roaring off into the yonder.

But if good fortune smiles on Jobs and his application for a space shuttle seat is accepted, his position may someday become infinitely more global than Apple ever imagined.

Jobs' desire to join the space shuttle crew seems an unusual career move. But under the circumstances, his aerospace aspirations are understandable.

Here, after all, is a man who, probably more than anyone else, popularized personal computers, built Apple into a Silicon Valley legend and made himself a millionaire many times over before he turned 30. Then, in one fell swoop, he saw himself unceremoniously stripped of all his day-to-day management duties and reduced to being a figurehead. To add insult to injury, his demotion became fodder for nationwide news coverage and was engineered by an executive he himself had helped recruit.

Compared with the woes that have recently befallen him on terra firma, the perils that await him in the frigid but tranquil void of outer space look positively piddling. Who could blame him for gazing longingly at the spacecraft *Challenger*?

Jobs, of course, is by no means the only one who suffers in the industry these days. Suppose for a moment that the travel agency at Cape Canaveral chartered a special space shuttle excursion just for the benefit of harried members of the computing field. Who or what organizations should be included? A suggested list of passengers follows:

■ IBM President John Akers. Having originally predicted improved earnings for the company in 1985, Akers later found himself in the uncomfortable position of retracting his earlier statement and announcing the industry giant's first quarterly downturn since God knows when. One nagging question about Akers' space shuttle participation still lingers, however. As a concession to IBM, will mission organizers be willing to issue dark, three-piece space suits with pin stripes?

■ Apple President John Sculley. Although he has effectively rid himself of the bothersome Jobs, Sculley still faces the unenviable task of leading his firm into battle against Big Blue on its own home turf. Red ink and postreorganization tumult also qualify Sculley for an outer space getaway. But if Apple's recent past is any guide to its future, Sculley will arrive at the launching pad only to find that all the space shuttle seats are already occupied by IBM staff.

■ The Internal Revenue Service. A collection of new IRS computer systems that were supposed to speed the processing of this year's tax returns had the opposite effect. An unusually large number of refund checks were significantly delayed. But even if the modified systems had worked perfectly, the IRS would probably win a place on the space shuttle by acclaim. Most taxpayers would probably rejoice at the thought of hurling their revenue agents at warp speeds in the direction of Alpha Centauri.

BDPA meet slated

PHILADELPHIA — The Black Data Processing Associates (BDPA) has scheduled its seventh national convention for Sept. 20 and 21 at the Franklin Plaza Hotel here.

The conference will include seminars and exhibits from a number of vendors. Some of the sessions topics include data base strategies, local-area networks, an introduction to AT&T Unix and artificial intelligence. .The keynote speaker will be Carl Singley, dean at Temple University's school of law.

The convention costs $210 for BDPA members and $225 for nonmembers.

More information is available from BDPA National Convention, P.O. Box 7466, Philadelphia, Pa. 19101.

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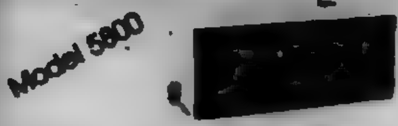

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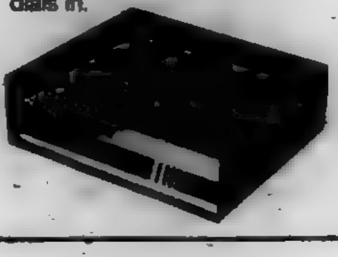

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Four-part approach seen key to integrated applications

CW AT DIRECTIONS '85

By John Gallant
CW Staff

NEW SEABURY, Mass. — MIS managers must ensure that four key software components are in place if they want to provide users with a completely integrated applications portfolio.

At the heart of such a portfolio, according to Thomas Womeldorff, senior product manager for Cincom Systems, Inc., is a data base management system (DBMS) that provides a common data resource for all applications and network management tools that allow data to be shared among processing environments within a company.

Speaking at Cincom's Directions '85 Executive Management Conference here, Womeldorff said a second vital component is a set of applications for what he labeled "predictable" business functions, such as general ledger or order entry. Supplementing those standard applications, he said, is a fourth-generation language that allows an MIS department to build systems for unique needs or to customize vendor-supplied packages.

The final component, Womeldorff said, includes data retrieval and decision support tools for meeting unpredictable information needs.

According to Womeldorff, such a portfolio offers the following three levels of integration:

- Data integration, which ensures that "a single definition of all corporate information is viewed and updated by all business events or activities."
- Transactional integration, which means that a single transaction is used to record an event. The transaction — for example, the entry of a customer's order — updates operational records, such as inventory, feeds financial tracking systems and triggers feedback to planning systems.
- Operational integration, which Womeldorff described as a single menu and security system and a standard screen design that allows users to initiate transactions easily and move between applications.

"The quality of a company is more and more related to the quality of its planning, operational and financial tracking systems, all of which must be linked to ensure that information flows swiftly throughout," Womeldorff said.

Despite the obvious benefits of such integration, he said, very few companies have all the components in place. Why?

"The cost and difficulty of developing an integrated applications portfolio in-house are prohibitive," he said. "You would essentially be building one huge application. That is a job that has outgrown virtually every company.

"Also, many applications vendors have specialized in specific areas and do not support a full spectrum of packages. Even within one vendor's line, packages are not completely integrated.

"It seems so logical to have integrated applications," Womeldorff continued. "Some smaller companies just starting out can build a portfolio more easily. But larger companies with older applications in place find it very hard to do. It is a long-term project that requires you to consider applications on a companywide basis."

CINCOM

from page 13

capabilities of software and the growing potential of hardware.

As an example, Nies said that roughly 85% of users are still using Cobol. "Cobol was born in the late 1950s when they still made DeSotos and vacuum tube computers. Today, the programmers are younger than the languages they use," he said.

But Nies, whose company is one of the leading vendors of systems software and an important player in the applications market, laid the blame for sluggish advances in MIS not on users, but on software vendors.

"Vendors are interested in account control, locking customers into their systems. "It is not the customer's fault," he said. "It is the vendor's fault."

Nies warned that locking in users also locks in vendors — a point that Weeks addressed. "We are witnessing a spreading out of applications to all levels in a company," he said. "The trick is to move data and processing [functions] between a variety of systems. Success will come when users can decide what is the most optimal use of resources.

"The only way hardware and software vendors can sell more products is to help users reach that goal," Weeks concluded.

The key, Nies and Weeks said, is for vendors to provide software that is insulated from its environment and provide the tools users need to exploit and integrate new technologies. The biggest obstacles, Nies said, are "the idea that things should be done the way they always have and . . . the entrenched power groups who block technological advances."

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IBM wins FAA job for CPU replacement

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The Federal Aviation Administration (FAA) recently awarded IBM a contract with a potential value of $432 million to replace the existing IBM 9020 mainframes at 20 air-traffic control centers.

The replacements will be IBM 3083 Model BX1 units, with each installation consisting of a primary processor with a backup unit, FAA officials said.

IBM was awarded the contract following a 21-month design competition with Sperry Corp. According to the FAA, the selection was based on cost and performance factors, including the results of a "compute off" between the two candidate systems at the FAA Technical Center near Atlantic City. A key factor in the evaluation was the ability of the IBM system to host the current 9020 software package with minimal modifications, officials said.

Award made despite criticism

The contract award was made despite criticism from the U.S. General Accounting Office that the FAA tests were insufficient because they did not simulate the heavy work load expected in the late 1980s.

FAA officials said the IBM 9020s, installed in the early 1970s, must be replaced because they lack the storage capacity and processing power to handle the increasing volume of air traffic in the U.S.

Furthermore, according to Secretary of Transportation Elizabeth Dole, "the new computer will have the capacity to assume added functions — such as improved conflict detection and resolution — permitting the FAA to make more efficient use of controllers."

Options could increase value of contract

Dole said the basic value of the contract is $196.9 million, but options for future hardware maintenance, software and technical support could increase the value of the contract by an additional $235.1 million.

The contract calls for IBM to deliver the systems to the air-traffic control centers over a one-year period, beginning next summer. Similar units will be delivered to FAA technical centers to use for training purposes.

The FAA expects to use the IBM mainframes until about 1990, when it plans to install an advanced generation of computers for air-traffic control. IBM and Hughes Aircraft Co. are now engaged in a three-year design competition for the Advanced Automation System [CW, Sept. 3].

The IBM 3083 systems will provide "a stable transition vehicle to our advanced automation program in the future," Dole said.

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WASHINGTON UPDATE
CW Washington Bureau

GAO maintains firm misled SSA

WASHINGTON, D.C. — The U.S. General Accounting Office (GAO) recently reaffirmed its contention that Paradyne Corp. misled the Social Security Administration (SSA) about the status and availability of data communications equipment that it demonstrated in 1980 to win a $118 million contract.

The GAO was asked by U.S. Rep. Jack Brooks (D-Texas), chairman of the House Committee on Government Operations, to review two affidavits that Paradyne submitted to fight a government proposal to bar Paradyne from obtaining future contracts [CW, March 18].

The affidavits, submitted by George Whit Dodson, a retired government procurement official, and Joseph M. Fox, a former IBM official, asserted that Paradyne did not mislead the SSA in its proposals or equipment demonstrations [CW, April 22].

Dodson's affidavit said that it is a common practice in the computer industry to use the present tense to describe products that are not yet available. The GAO disagreed and said the SSA bid request specifically sought hardware that is "available to the general user."

Referring to the fact that Paradyne demonstrated a Digital Equipment Corp. PDP-11 processor instead of the Zilog, Inc. Z8000 processor proposed in its bid documents, Dodson and Fox said the processors had the same functional capabilities. The GAO auditors said that although both are 16-bit processors, in almost every other technical respect, they are dissimilar.

Worldwide DP system hits snags

WASHINGTON, D.C. — The U.S. Department of State is having some problems with the installation of its worldwide distributed data processing system for financial management, according to a review by the U.S. General Accounting Office (GAO).

A recent GAO report cited the following difficulties:

- Air-conditioning and air pollution problems interfered with installation of a minicomputer at the Cairo site for several months. Also, the center at Abidjan, Ivory Coast, has experienced serious electrical failures.
- Systems managers in Bangkok, Thailand; Brasilia; New Delhi; Cairo; and other sites reported difficulties in getting timely maintenance services.
- The State Department has experienced delays in installing high-speed data communications lines for a variety of reasons, including the fact that facilities in some lesser developed countries are not suited for high-speed communications.

The GAO report said the State Department is well aware of the problems and is taking action to overcome them.

Audit finds DP center lacking

WASHINGTON, D.C. — The U.S. Department of Agriculture's National Finance Center in New Orleans, which provides financial DP services for the agency, needs to improve the security and reliability of its DP operations, according to a government audit.

In a recent report, the U.S. General Accounting Office (GAO) said the DP center lacked a formal disaster recovery plan and had outdated and incomplete software documentation that hindered system maintenance.

Furthermore, the GAO's report said, software changes were not independently tested nor reviewed for integrity, and some personnel had access to both the data files and the financial programs, raising privacy and security concerns.

U.S. Department of Agriculture officials reported that steps have been taken or are planned to address the GAO findings, but all of the necessary actions have not yet been completed.

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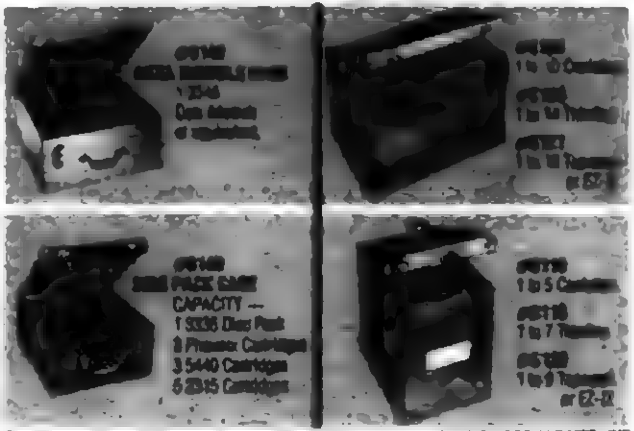

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WORLD DIGEST
CW International News Network

TOKYO — Hitachi Ltd. announced last week a $120 million dollar program to purchase equipment immediately in the U.S. in response to Japan's heralded "Action Program," which is intended to rectify the U.S. trade imbalance. The company said this money would be in addition to the approximately $200 million it already spends annually on American products.

At a press conference held in Washington, D.C., Executive Managing Director Toshi Kitamura also announced an increase of Hitachi investments in the U.S. for the next year, with the opening of additional manufacturing plants. Also announced was the Hitachi Foundation, an endowment of $20 million earmarked for "continuing and expanding the company's support of joint educational research projects, scholarships, cultural and charitable programs in the U.S."

A 10-member import promotion team will arrive in the U.S. in August with orders to promote purchasing arrangements with U.S. companies. Four areas have been targeted for the purchase agreements: production facilities and equipment, research and development equipment, more long-term purchase contracts for U.S.-made semiconductors and long-term purchase contracts for U.S.-made communications equipment. A Washington, D.C.-based corporate affairs office will also be established, a Hitachi spokesman said.

TOKYO — NEC Corp. will act as the Japanese distributor of General Electric Information Services Co.'s (Geisco) worldwide teleprocessing services here, according to an announcement made last week. NEC's clients in Japan will be able to obtain teleprocessing services provided by Geisco's international network as of Oct. 1, according to a spokeswoman. The interconnection of Geisco's service with NEC's own Japanese value-added network will significantly expand business opportunities for both companies, NEC added.

[illegible], *Australia* — A market research firm here has predicted that IBM will manufacture Caironet's AT&T Unix-based multiprocessor microcomputer, Micronode, here for worldwide sales. The move is an effort to counter sales of Digital Equipment Corp.'s Microvax II technical workstation, according to a report by the Yankee Group.

Two weeks ago, Caironet announced a deal with the Sydney software house of Neology Ltd., which was to port Unix onto the Micronode. At the time, Caironet said it was negotiating with a "multinational computer company that had manufacturing facilities in Australia" to produce the Micronode here. Meanwhile, an IBM product, code-named Quicksilver, believed to be the Micronode, is due to be announced soon. The Yankee Group report claims that since DEC's Microvax II was released last May, IBM has faced increased pressure to show its hand in the market for technical workstations.

CANBERRA, *Australia* — Australia's international promise to look at developing long-term copyright protection for computer software might not be kept, a senior public servant has warned.

The pledge was made not only in the Parliament but also before a United Nations body specifically convened to consider software copyright at international levels. Sources in the attorney general's department here believe that the international community is not close to a consensus and called ordinary copyright laws acceptable, if not ideal, for the protection of software. It is thought that Australia will soon merely amend current copyright laws to cover computer programs, just as the U.K., France and West Germany have done this year.

PERTH, *Australia* — Claiming that there are no Australian consultants with expertise in integrated mining systems, Alcoa Ltd. has employed French contractors to set up a mainframe recently ordered from National Advanced Systems, Inc. (NAS). The 16-channel NAS 9060 with 24M bytes of main memory scheduled for delivery in September will replace an IBM 3033N.

Like the IBM 3033N, the NAS mainframe will run in parallel with a second IBM 3033U.

The parallel configuration supports a 400-terminal network encompassing three refineries and four mine sites in Western Australia, as well as three Victorian facilities.

SYDNEY, *Australia* — Criminals thinking that they may have pulled off successful capers in the past have cause to worry. The New South Wales Police Department purchased a $5.7 million system that matches fingerprints at a rate of 2,310 prints per second and successfully matches partial prints with accuracy previously unobtainable, a police spokesman said. The order for the automated fingerprint system went to NEC Information Systems Australia Pty. Ltd., which won the bid over three other vendors on the basis of speed, optical disk capacity and applications software. NEC has supplied similar systems to police departments in California, Alaska and Japan, but this is said to be the company's first Australian mainframe order.

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CALENDAR

WEEK OF SEPTEMBER 1

SEPTEMBER 3, NEW YORK — **Vtam: Its Structure and How to Use It.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 5, 10 and 12 in New York.

SEPTEMBER 3-4, CHICAGO — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 3-6, ATLANTA — **Vtam: From Start to Finish.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 3-6, FORT LEE, N.J. — **IMS/Data Communications Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 3-6, SAN ANTONIO — **CICS/VS Logic and Debugging.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 4, NEW YORK — **CICS/VS Application Programming — Macro Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 6, 9, 11 and 13 in New York and Sept. 9-13 in San Antonio.

SEPTEMBER 4-6, LOS ANGELES — **Information Systems Architecture.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

SEPTEMBER 5-6, CHICAGO — **Recovery/Restart.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 5-7, SAN FRANCISCO — **Third Personal Computer Faire.** Contact: Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

WEEK OF SEPTEMBER 8

SEPTEMBER 8-11, CAMBRIDGE, MASS. — **1985 Society of Manufacturing Engineers (SME) World Congress on the Human Aspects of Automation.** Contact: SME, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

SEPTEMBER 8-12, BOSTON — **Managing the Explosion; End-User Computing and Emerging Technologies.** Contact: Kimberly Gandia, Society for Information Management, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

SEPTEMBER 9-10, ATLANTA **Principles of Prototyping.** Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

SEPTEMBER 9-11, VANCOUVER, B.C. — **International Communications and Computer Exhibition.** Contact: Tracon Exhibitions, 202-535 W. 10th Ave., Vancouver, B.C., Canada V5Z 1K9.

SEPTEMBER 9-11, WASHINGTON, D.C. — **The Data Entry Management Association's (Dema) Ninth Annual Data Entry Management Conference & Exhibition.** Contact: Marilyn S. Bodek, Dema, P.O. Box 16711, Stamford, Conn. 06905.

SEPTEMBER 9-11, WASHINGTON, D.C. — **Federal Computer Conference.** Contact: Federal Computer Conference, P.O. Box N, Wayland, Mass. 01778.

SEPTEMBER 9-12, LOS ANGELES — **CICS/VS MRO/ISC.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 9-12, MONTREAL — **First International Conference on Computer-Aided Technologies.** Contact: Stephen J. Leahey, P.O. Box 577, Desjardins Postal Station, Montreal, Que., Canada H5B 1B7.

SEPTEMBER 9-12, SAN ANTONIO — **CICS/VS Application Design.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 9-13, ATLANTA — **CICS/VS Internals.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 9-13, CHICAGO — **CICS/VS Application Programming — Command Level.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 9-13, CHICAGO — **Structured Analysis and Design Techniques Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

SEPTEMBER 9-13, HOUSTON — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

SEPTEMBER 9-13, TORONTO — **Basic Systems Analysis.** Contact: Thomas J. Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

SEPTEMBER 9-13, WHISTLER MOUNTAIN, B.C. — **The Ninth Data Communications Symposium.** Contact: William Lidinsky, Bell Laboratories, Room 6B309, Naperville-Wheaton Road, Naperville, Ill. 60566.

SEPTEMBER 10-13, MELBOURNE, AUSTRALIA — **The First Pan Pacific Computer Conference.** Contact: The Australian Computer Society, P.O. Box 212, Hampton, Vic. 3188, Australia.

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EDITORIAL

Mini vendors poise for change

Recent financial reports dramatically prove that, with a few exceptions, minicomputer vendors are shouldering the brunt of the sudden decline in computer equipment sales. If the slump extends beyond this year, the minicomputer industry may find itself undergoing a drastic restructuring rivaling the infamous microcomputer shakeout.

The mini vendors, meanwhile, are betting that the situation is a mere cyclical correction that will run its course by the end of the year. But that is just what semiconductor manufacturers were saying at this point last year, and just recently, two of their number — Intel Corp. and Texas Instruments, Inc. — warned that the chip industry is in its worst recession since 1974, with no end in sight.

The problems of mini vendors Data General Corp. and Wang Laboratories, Inc., which seem to be spreading to other vendors, probably do not quite parallel those of either the chip manufacturers or micro vendors.

In the personal computer wars, history proved that it was suicidal for vendors to ignore standards — witness Gavilan Computer Corp. and Otrona Advanced Systems, Inc. But it also proved that mere adoption of a standard was insufficient to guarantee success.

In the chip industry, commodity pricing and excess capacity acted as pincers when helter-skelter demand suddenly dried up, and customers found they had more than enough products to absorb.

Where once DEC had the dominant role in scientific and engineering applications and where Wang was king of the office typing pool, now there is competition from IBM on one side and a host of commodity manufacturers on the other.

The alternative to emulating DEC and IBM seems to promise pitfalls that mirror the woes of the chip industry. There is a host of firms offering similar versions of minicomputers using Motorola 68000 series microprocessors and AT&T's Unix operating system.

As such systems proliferate, users can pretty much base their shopping decisions solely on price, with the result that the vendors sell into a commodity market that cannot support more than a few low-cost producers.

Unlike the Personal Computer look-alike industry, minicomputer vendors have not been sitting still. DG was able to grab market share with its MV/10000. DEC hopes to regain momentum with the VAX 8600 on one end and the Microvax II on the other. Some younger companies are betting that the relatively middle-aged mini vendors are too big and cumbersome to catch the next wave of technology. With the arrival of Alliant and Encore and others comes a variety of multiprocessing and parallel processing alternatives that promise to offer solutions that can't be filled by general-purpose machines.

It seems that the mini industry is poised at the trunk of three branching alternatives. Will users select the commodity option that seems certain to wreak savage disruption; will they stick with the tried-and-true vendors and continue to press for greater communication with IBM mainframes; or will they bet on upstarts promising breakthroughs?

One year ago, we would have thought there would be time and money to provide some coexistence of the alternatives. Today, it seems that economic factors are forcing vendors into a make-or-break situation. If the sales slump continues, a severe shake-up seems inevitable, particularly if worried users decide that IBM provides the most stable choice.

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'Doesn't the First Amendment protect our poetic license rights?'

LETTERS

Certification for professional pride

In response to your article "Hiring execs don't see ICCP certification as critical asset" [CW, June 24], the writer forgot to mention how nonexecutive data processors feel about certification. Certification is a personal achievement for most professionals.

Our field, although no longer in its infancy, is still trying to carve out a place among the professions. Accountants, engineers, doctors, nurses, lawyers, teachers, insurance agents, to name a few, can be certified in some fashion, and most require further education to be certified. In some cases, their certification is a requirement for employment; in other cases, it is a title that goes with professional pride.

By 1990, surveys report that there will be a work force of 500,000 analysts in the DP profession. Currently, there are approximately 300,000 analysts of which 30,000, or 10%, are certified. The Certificate for Systems Professionals (CSP), first to require recertification, has approximately 7,000 holders.

Those in the industry have indicated that recertification through continued education keeps the profession up-to-date.

The CSP is a step in that direction. All CSP holders are required to have 120 hours of continuing education during a three-year period to retain their certificate. Soon, the remaining types of DP certification will follow suit.

Sharon Burns
Information Services

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VIEWPOINT

Where are the emperor's new clothes?

WOHL STREET MINIJOURNAL
Amy Wohl

You remember the parable of the emperor's new clothes: Dishonest tailors clothed the emperor in invisible garments and cunningly convinced him they were of the finest and sheerest cloth. The naked emperor paraded through the streets of his kingdom and none — save a very honest young lad — dared tell the truth.

But what does it mean when the emperor insists he is naked, while his courtiers and scribes insist they see his new clothes? For months now, the press has been full of tales of IBM's imminent announcement of a personal computer. "Any day now," stories say, "here is what it looks like," they proclaim. "Wrong time to buy old stuff."

And there's the problem. Suddenly, personal computer sales, IBM's and others, seemed to slip. Especially skittish were the big users. Who wants to get stuck with a thousand slightly out-of-date new machines?

Enter IBM. "Stop the rumors," they say. "There is no PC2. So don't sit around waiting for an imaginary machine to appear, buy some Personal Computers today." Well . . .

Let's look at the facts. IBM's Personal Computer is not exactly a new product. In fact, it is not a product at all but rather a family of products, more or less compatible, embodying a range of related technologies and capable of significant and continuing enhancement before a noncompatible machine would have to occur.

And there are marketplace facts to consider. No one, no matter how much technology they have stuffed into a microcomputer product, has successfully outrun IBM since its announcement of the original Personal Computer in 1981. They can try to be bigger, smarter, faster or more exciting, but users will still want it to be Personal Computer compatible. The more they buy Personal Computers, the more they need to care about the compatibility of new products with their growing installed base.

So IBM holds most of the cards. As long as it doesn't change the rules of the game by creating a new machine with new kinds of compatibilities, it is unlikely that any noncompatible challenger can pose a serious threat.

IBM customers greeting PC2 with open arms?

IBM has to worry about how a PC2 would be received by customers. Big buyers of the Personal Computer would scarcely greet the announcement of a noncompatible machine, however dazzling, with open arms. So even IBM will be constrained in its eventual announcement of a less compatible, newer technology product. Clearly it will have to offer hooks back into the older environment and the giant installed base that the Personal Computer's success has created.

IBM is, of course, technically correct in its recent PC2 comments to the press and the industry.

- There is no PC2. That is, whatever IBM is going to call the machine, it's not going to be PC2. Nor is PC2 a current internal code name for any IBM product. IBM always calls potential products by much more exotic names — like mountain ranges or wild animals.
- There is no PC2. That is, IBM has not yet selected the product that will replace or extend its current Personal Computer product line from among a number of contenders being developed, tested and politicked within IBM.

IBM normally looks at a number of possible products before making a major decision — four or five products for the original Personal Computer, for instance. The rich set of features you've probably glimpsed in articles about PC2 are a direct result of this IBM strategy. The press has actually fallen over four or five different products but has talked about them as if they were a single "super product," a real competition killer.

If IBM is going to continue to be in the personal computer business, eventually it must choose a product for the next major, but not necessarily the next, Personal Computer announcement. That is, there could be a further extension of the current family before IBM finally moves up to new, more powerful and different technology.

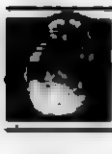
- There is no PC2. That is, IBM can't abandon its current customers who have so enthusiastically bought the current generation of IBM Personal Computers. Anything that IBM announces from now on will require some compatibility with its installed base. This, in itself, will allow IBM to deny forever that anything is a PC2, since if it's compatible at any level with the current product it can, with justification, be called an extension of the current product and not a new product at all.
- There is no PC2. That is, as long as IBM has lots of Personal Computers in inventory, it won't want to announce a new product and substantially reduce the value of existing assets. So if there are lots of Personal Computers still around, you can bet that IBM will try to sell them off first. If that doesn't work, it can always hold the fire sale later.

Of course the other personal computer vendors — everyone in the industry except IBM and possibly Apple, since they aren't trying to be particularly Personal Computer-compatible anyway — aren't very happy about all this. They need time to plan if they're going to be competitive and compatible with whatever IBM decides to do next. Their efforts to discover something substantive about IBM's activities is what fuels the furor.

Too bad. Short of a leak from within IBM (unlikely), based on an already-made decision of what to announce next (less likely), the competitors have to wait. And so will you, gentle user. But take heart. All things happen eventually. And you're probably not ready for all that new technology yet anyway. If you are, you know what to do. Tell the emperor you'd like to be invited to a fashion show.

Wohl is president of Wohl Associates in Bala-Cynwyd, Pa., and editor of the "The Wohl Report on End-User Computing" newsletter.

Three-phase approach to converting business users



HUMAN CONNECTION
Jack Stone

The press recently reported on a survey by Software Access, based in Mountain View, Calif., of U.S. households and their personal computer use. Based on the results, its president, W. L. Coggshall, was quoted as saying that "the preponderance of Americans cannot imagine any way they could use a personal computer, either at home or at work."

This conclusion should hardly come as a surprise to most data center managers who have struggled long and hard to convert even a tiny number of business folks to truly effective DP users and who know the uphill battle they face in extending this meager success to the rest of the population.

One data processing manager who has endured his share of frustration with user training has a novel approach to it:

"We tend to forget that the perspectives — and the expectations — of the vast majority of business users of computing equipment, be it mainframe, mini or micro, derive from appliance-class electronics, [for example], machines designed for acceptance by the broadest range of consumers.

"Until our systems can be packaged in a similar manner, the large percentage of users will continually rebel against them. 'After all,' they proclaim, 'to install our stereo and video equipment, we didn't have to spend a week in a classroom, study audiovisual tapes, read 400-page manuals — and we absolutely didn't need to fool around with an operating system.'

"The point is that the public expects a complex machine to be one that nevertheless plugs in and operates after only a brief bout with an installation manual — a situation that is a far cry from what we offer our users.

"But there is a second point to make that is not fully appreciated: the average citizen, after a successful break-in period with a new machine, routinely examines ways of optimizing performance, be it twiddling knobs on a stereo system or adjusting the height of the rug attachment on a vacuum cleaner.

"Obviously, the industry will not — and probably cannot — change its arcane ways in the short range. So we have to look for other solutions. One notion is a three-phase approach to bringing the users up to the point where they will embrace mainframe operations with open arms.

"The first phase involves the use of a low-cost, appliance-style computer for basic computer training, one that satisfies, or at least comes much closer to satisfying, the needs of typical neophyte users.

Information products without hassle

"Most important, it must provide immediate information products of significance and do so without any substantial hassle, particularly extensive training, or a need to understand an operating system.

"Then, banking on their demonstrated willingness to adapt and grow, in phase two I would expect to wean the users off the appliance onto a personal computer.

"Now this will only work after the staff develops reliable applications, based on proven, well-established software packages and loaded with automatic operating system procedures and keyboard macros so that the users can focus on data to be processed and the output results, instead of systems internals — which is the whole point of information systems in the first place.

"If this second phase of development goes well, then they would be ready for phase three, a transition to mainframe operations with all the technical eccentricities attendant thereto.

"For us, systems for phases two [IBM-compatible personal computer] and three [the mainframe] are in place, and recently I've found a system for phase one that seems promising. I'm looking at the Kyocera-class portable machine, like the [Tandy Corp.] TRS 100/200 and NEC Corp. 8201A.

"Most important, recently released packaged software from independent vendors has provided some simple but valid functionality — perfect for immediate, though elementary, production — and a complementary, easy-to-learn and [easy-to-use] processing capability for an IBM-compatible machine to handle files uploaded from the Kyocera."

Stone is a Washington, D.C.-based independent management consultant, educator and writer, specializing in DP human communications and personnel development.

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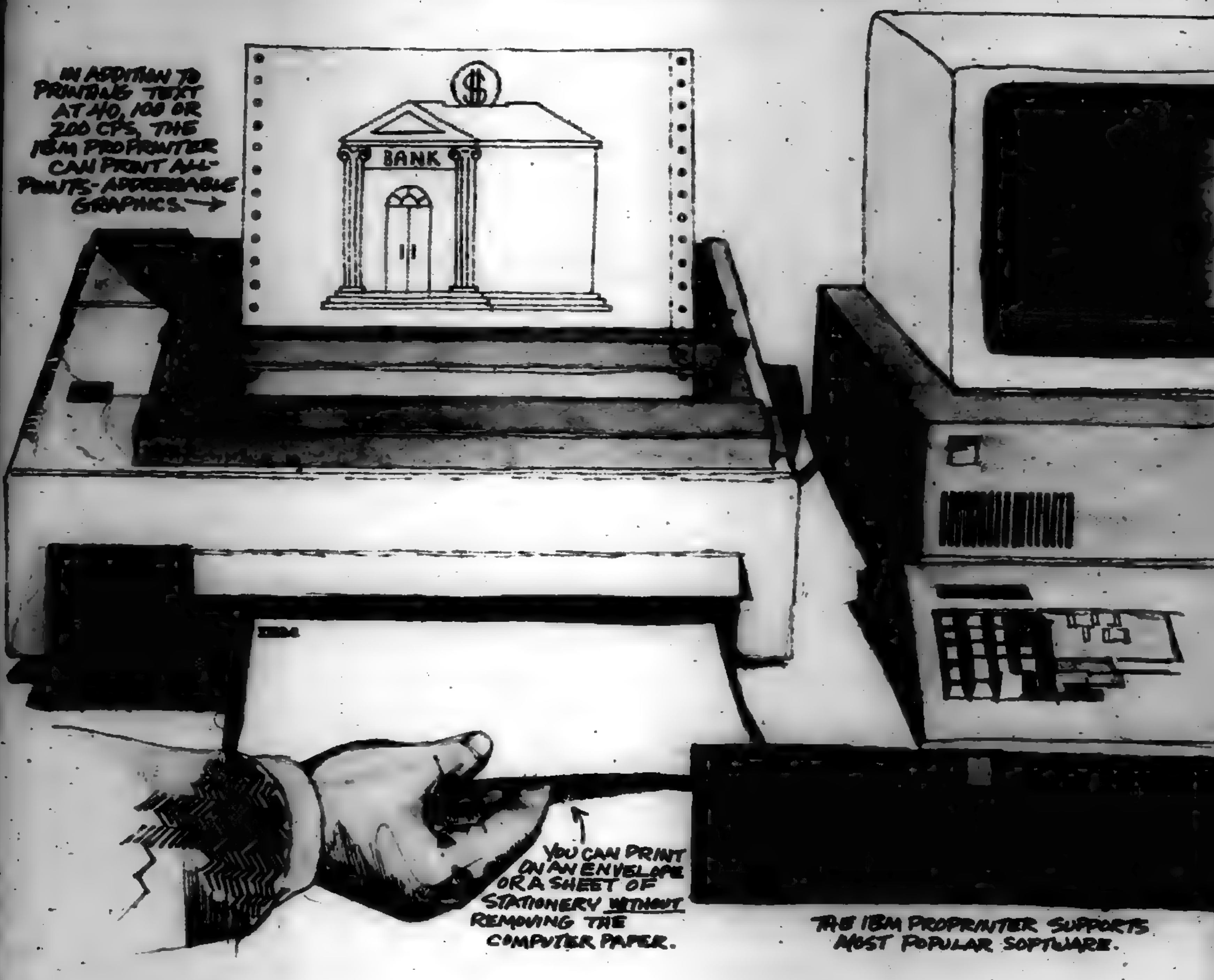
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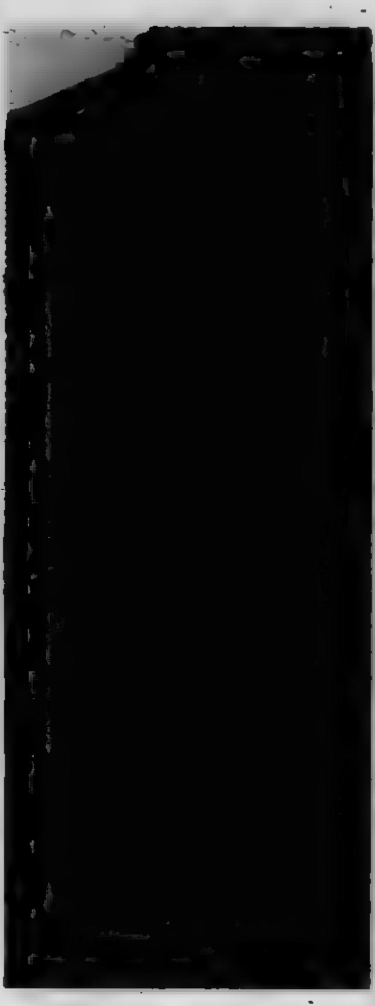
IBM Personal Printers...The Finishing Touch

Update

Getting serious about printers

By Glenn Rifkin
Update Editor



Among the early driving forces of office automation and business computing was the promise of an end to the mountains of paper that rose higher and higher with the birth of the information age. The promise, however, appears empty. "The paperless office will arrive," the saying goes, "the same day as the paperless bathroom."

Indeed, despite the sophistication of electronic transmission and the ubiquity of the desktop terminal, the desire for hard copy is, if anything, on the rise. For the printer industry, that spells good news. Soaring growth rates are predicted for the next five years and beyond. According to International Data Corp. in Framingham, Mass., total industry revenue should jump from $7.3 billion in 1985 to nearly $13 billion in 1989. The number of units shipped is predicted to increase from 6.4 billion this year to more than 15 billion in four years — growth that is driven by the personal computer.

The allure of the market has drawn such heavyweights as IBM, Digital Equipment Corp., Hewlett-Packard Co., Burroughs Corp. and Texas Instruments, Inc. Traditional printer makers such as Xerox Corp., Dataproducts Corp., Centronics Data Computer Corp. and Printronix, Inc. are gearing up to try and hold market share while fighting off both new U.S. entrants and the powerful Japanese manufacturers.

For the consumer — whether a data processing manager, information worker or home personal computer owner — the burgeoning market has been a mixed blessing. Prices have plummeted for many machines because of increased competition and advances in printing technologies. Unfortunately, the market has also become ensnared in a maze of confusion. According to Datek Information Services, Inc., a Waltham, Mass., consulting firm, there are nearly 150 companies marketing more than 500 printer models. "It is an industry that now boasts over one dozen distinct printing technologies with print lines ranging in size from 1 inch to 6 feet across," a Datek report says.

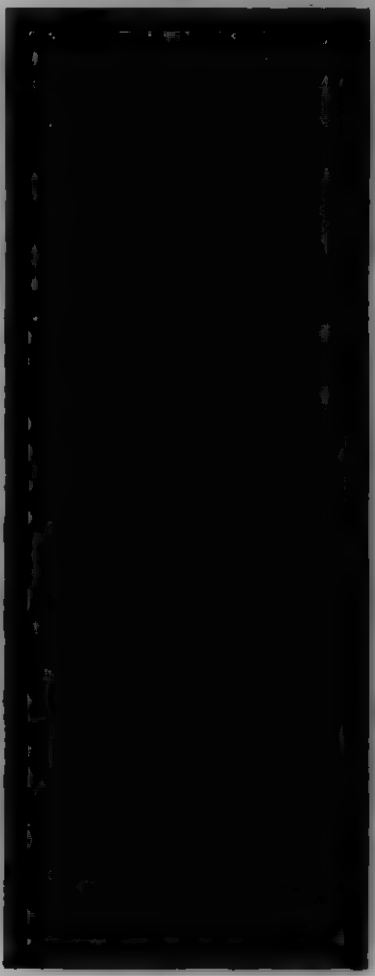
For the seller, the slice of the market pie is becoming tougher to acquire; and for the buyer, the purchasing decision on a printer has become increasingly complex.

The printer market is split into two key factions: impact and nonimpact technologies. Impact, which is an outgrowth of basic typewriter technology, encompasses any printer mechanism in which the blank page is struck by some print-head device. Nonimpact covers a growing parade of technologies in which the printing device does not come in contact with the page.

For the DP staff, the printer has become yet another key item on the high-tech shopping list, and both impact and nonimpact vendors are taking great pains to state their cases.

This section of *Computerworld* Update will explore the various components of the printer industry and assist the DP professional in making the proper purchasing decision.

Among the areas of focus are impact vs. nonimpact printing — the merits and demerits of both; the Japanese impact on the U.S. market; cost justifying the printer; IBM's influence on the market; a look at the software and controllers in sophisticated new machines; and new technologies — what does the future hold?



The impact side

"In the printer business, there are no revolutions, just evolutions," states Peter Steiner, an analyst with Dataquest, Inc. in San Jose, Calif.

This statement explains, more than anything, the staying power of impact printing, a technology that was expected to get swept aside by the onrushing waves of nonimpact machines. Though the new technologies such as lasers, ink jets, thermal transfer, magnetography and ion deposition grab the headlines, impact printers still generate the sales.

"The idea that nonimpact will rule the world and eradicate all impact technologies in the next five years has been suggested. But to our way of thinking, that is not going to happen," declares Jonathan Dower, vice-president of Datek.

"We show that by 1989, nonimpact printing will constitute only 25% of all revenue. It is currently just 9% or 10%," Dower says.

Though the trade press and industry consultants have embraced nonimpact technology with a passion, "in truth, the market has not really received it well," Dower says.

Industry watchers offer many explanations for why the nonimpact fire has not burned brighter, but it generally comes down to a basic tenet: Change does not come easily. It is not uncommon, for example, to find old drum printers, now considered a dinosaur among printers, hard at work in data centers.

In the multibillion dollar printer business, the role of impact printers varies according to market segmentation, but at virtually every level, the impact side continues to dominate.

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Serial Matrix	$2,929,374	$3,686,884	$4,350,991	$5,006,463	$5,569,997
Serial Character	1,386,563	1,388,888	1,377,699	1,246,155	1,124,090
Line Matrix	266,187	320,108	368,543	419,383	472,347
Line Character	1,292,374	1,416,081	1,511,926	1,601,250	1,662,299
Total Impact	5,874,498	6,811,961	7,609,159	8,273,251	8,828,733
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Serial	393,169	660,787	844,691	1,036,477	1,270,089
Page Subtotal	1,180,790	1,497,940	1,719,950	2,116,050	2,649,170
Total Nonimpact	1,573,959	2,158,727	2,564,641	3,152,527	3,919,259
Total Value	7,448,457	8,970,688	10,173,800	11,425,778	12,747,992

Source: International Data Corp.

The high end

In the centralized data center, the steady clattering of the workhorse — the fully formed character line printer — has become an ambient feature as recognizable as the hum of the mainframes. Though belt, chain, train and drum printers are all under the line printer umbrella, the band printer is the most popular of the DP center line printers. It is an entrenched mechanism that has withstood the test of time.

Capable of operating at speeds of between 400 and 3,600 line/min, band printers are known for their seeming invincibility. They chatter on hour after hour, day after day, year after year, turning out page upon page without missing a beat — and virtually never need repair. In a life of unexpected disasters and constant crises, the DP manager will not

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COVER ILLUSTRATION BY KAREN WATSON

PRINT from UPDATE/3

be easily convinced to part with this trusted printing machine.

"Just like with drum printers, there are lots of people out there committed to line printers, and you'll have to plead a tough case to get someone to switch to nonimpact," Dower says.

Another factor contributing to the staying power of line printers is again pragmatic: carbon-based multiple part forms. Regardless of the sophistication of electrophotographic nonimpact printing, those machines, by design, cannot strike the page and are therefore incapable of creating the multiple part forms that the billing, invoicing and accounts receivable departments require for their record keeping. Companies that print W2 forms, stock certificates, mass mailing cards and legal documents will continue to use impact printers. Until that requirement changes, the impact printer will remain a viable business product.

Dower

Though the market for impact line printers is relatively flat, it continues to generate in excess of $1 billion annually in sales. And in the past few years, when consultants were ready to declare the technology moribund, vendors such as IBM, Dataproducts, Centronics and Cynthia Peripheral Corp. responded by turning out new products that brightened the picture considerably.

IBM introduced its 4248 band printer in 1984, and the 3,600 line/min machine quickly became the Cadillac of the market. Earlier this year, IBM reconfirmed its commitment to the technology by unveiling its 4245 band printers (Models 12 and 20), which are capable of 1,200 and 2,000 line/min respectively. At that introduction, IBM also announced 25% price reductions on its high-end line of band printers and 12-month warranties on both the 4248 and 4245.

According to Jack Smulovitz, IBM's planning manager for impact printer product development, the warranty is significant as "a statement of the quality of the box" (see story Update/18).

As Dower points out, IBM's offerings are, from a cost/performance perspective, "extremely competitive with [nonimpact] page printers.

"IBM has an enormous installed base of line printers," he continues. "If they just went out and sold replacement printers, they could keep themselves in business for years."

Big Blue's introductions perceptibly brightened the prospects of the other major players in the impact game. Dataproducts, the Woodland Hills, Calif., printer manufacturer, has long dominated the line printer business as a supplier to OEMs and value-added remarketers. For Irving Weiselman, Dataproduct's vice-president of technology assessment, IBM's imprimatur "is saying this is important, and the market will be around for a while."

For Dataproducts, the timing couldn't be better. In order to remain a leader in the printer business, the company has begun exploring new avenues and markets. It recently introduced its first nonimpact printer, the LVR 2600 26 page/min laser with a Toshiba, Ltd. engine. It has also entered the retail market selling printers under its own label. But the company's bread and butter continues to be its sales of impact printers to OEMs like DEC, Wang Laboratories, Inc. and Prime Computer, Inc.

"The strength of our company is the friction-free flex hammer mechanism that is the heart of all our impact printers," Weiselman says. "They don't need maintenance, and they go on forever."

Weiselman indicated that Dataproducts is soon to announce a new version of the hammer mechanism that will be part of a new band printer designed to replace its now aging B series. Acknowledging that nonimpact will make inroads into the impact world, the company plans to offer more new nonimpact machines. "But we're still very committed to the impact world and plan to be there a long time," Weiselman says. "Impact will still be dominant."

Ironically, it is the very quality and reliability of the high-end band printers that has caused the market to stagnate. Having an installed base of machines that "go on forever" and are by now fully paid for, the DP manager is not in any hurry to make a change. As Dower points out, the buying decision for many is a nondecision.

"People tend to not make any decision," he explains. "They just stick with what they have.

See PRINT UPDATE/6

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Day one is for dealers, distributors, retailer[illegible] other third-party vendors to talk to Apple and the 100 + exhibiting companies about their products.

Days two and three are specifically geared for people interested in the Macintosh as a tool for business and anyone else interested in the Mac.

Update

Japanese companies making waves in U.S. printer mart

By Peter M. Steiner
Special to CW‡

Like the automobile, home appliance, wristwatch and audio/video markets, the U.S. electronic printer market has undergone dramatic changes as a result of products imported from Japan.

Usually the most discussed subject concerning Japanese products is price. In the lower speed segments of today's printer market, price is a key factor, but a broader scope is required to understand Japan's true impact.

Both the dot matrix segment and fully formed (daisywheel) segment of the serial printer market were established and dominated by U.S. manufacturers, including Centronics Data Corp., Diablo Systems, Inc. and Qume Corp. The first real Japanese market impact came in the serial dot matrix arena in the 80 char./sec. to 100 char./sec. speed range.

It is true that pricing did give Epson America, Inc. and Okidata Corp. an advantage, but the real struggle was for volume and market share. Volume is extremely important to Japan's "just-in-time" manufacturing technique as well as to its "full quality control" approach.

A factor that contributed to the Japanese companies' successful sales penetration was the establishment of excellent marketing organizations. The truly successful companies invested heavily in marketing groups that are clearly the pride of the industry.

As more Japanese companies entered the dot matrix market, each was driven by the same basic equation: market share equals volume sales equals lower production costs. Thus, the early market leaders found themselves in a pricing/margin squeeze.

To escape this situation, more features and functions were added to the printers to maintain price levels. This cycle continues today with the net result being more performance for the dollar.

The daisywheel market segment followed the same pattern as the dot matrix segment, although it took much longer for Japanese companies to become a significant factor. Once they did, however, they made their presence felt. Japanese companies fully dominate the low-cost, low-speed — under 20-char./sec. — segment of the daisywheel market. Japanese companies had an 86% share in that market segment during 1984.

The fact that the Japanese hold 74% of the serial printer market has drawn a response from several U.S. companies. Some manufacturers have moved to special niches, and others moved to offshore manufacturing, either for subassemblies or for complete machines.

Steiner

The most notable response came from Hewlett-Packard Co., which introduced its extremely successful ink-jet printer, the Thinkjet. Designed to be a quiet replacement for dot matrix printers, it found immediate market acceptance.

The unique thing about the $495 HP Thinkjet is the low-cost head ink supply cartridge. Both functions are combined in a throwaway unit costing less than $10. The serial printer world is still waiting for a competitive response as well as an HP follow-on product. IBM introduced its 200-char./sec. dot matrix Proprinter for $549. Designed for low-cost manufacturing, this fully featured printer literally snaps together without screws, nuts or washers.

High-resolution impact dot matrix printers were developed more rapidly in Japan to meet the needs of Kanji, the Japanese alphabet. This created the argument over whether 18-pin heads or 24-pin heads were best suited for near-letter-quality printing in the U.S.

The real answer was once again keyed to volume production requirements. Character sets were digitized to take advantage of the 24-pin design so that both the Far Eastern and

See JAPAN UPDATE/22

Steiner is vice-president and director of the electronic printer industry service of Dataquest, Inc., a San Jose, Calif., consulting firm.

✦ ✦

computer show
the Macintosh™

Here are some of the companies who will be showing Macintosh products:

Advanced Logic Systems
Aegis Development
Ann Arbor Softworks
A+/Ziff-Davis Publishing Co.
Apple Computer, Inc.
Applied Logic Systems
Apropos Software, Inc.
Artline Industries
Assimilation, Inc.
Blue Chip Software
Boston Software
Brain Power, Inc.
Cadmus Computer Systems
The Cobb Group
Communications Packaging Corp.
Computer Additions
Computer Identics
Computer Learning Systems
Computer Shopper
Computer Software Designs, Inc.
The Computer Store
Corvus Systems, Inc.
Consulair Corporation/T/Maker
Creighton Development, Inc.
Diablo Valley Design
Diversions, Inc.
EDP Supply North
Enterset
Esoft Enterprises
ExperTelligence
Express Computer Supplies
First Byte, Inc.
Forethought, Inc.
Frontrunner Computer Industries
Future Design Software
General Computer Company
Haba Systems
Hayden Book Company
Hayden Software
Hayes Microcomputer Products
Hippopotamus Software
Icon Publishing
ICON Review/Mindwork
Infosphere, Inc.
InfoWorld
Innovative Technologies/Communications
Intermatrix, Inc.
Intersol
Iomega Corp.
The Kette Group
I/O Video
Kraft Systems
Layered, Inc.
Living Videotext, Inc.
Loki Engineering, Inc.
Lotus Development Corp.
Mac Packs, Inc.
MacTutor
MACWORLD
Micro Design
Micro Marketworld
Miles Computing, Inc.
Microsoft
MPH Computer Products
Mycroft Labs, Inc.
New Line 7
Odesta Corporation
Optimum Computer Luggage
Organizational Software Corp.
Palantir Software
Paradise Systems, Inc.
PBI, Inc.
Peripheral Computers & Supplies
Peripheral Systems
Personal Computer Peripherals
Prometheus Products, Inc.
ProVUE Development Corp.
Queue, Inc.
Scott, Foresman & Co.
Servidyne Micro Systems, Inc.
Sierra Information Systems
Silicon Beach Software
Small Business Computers of New England
SofTech Microsystems
SoftIdea
Software Arts, Inc.
SoftWeave
Softworks Limited
Stoneware
Sunol Systems
Systems Control
Tecmar, Inc.
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Video 7
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MACWORLD EXPOSITION
BOSTON

Update

PRINT from UPDATE/4

That's why drum printers, which everyone knows is an archaic technology, are still around.

"Line printers have a remarkable life history, and 20 years is nothing; they still run fine.

"In the DP site, people tend to buy new systems but don't get new printers, which is why the market moves more slowly than anyone suspects."

The middle ground

While band printers hold up the high end of the impact market, dot matrix line printers have sparked considerable interest in the middle ground, with speeds from 300 to 900 line/min. In fact, though growth in the band printer market remains flat, matrix line printers have experienced strong growth (up to 25% annually, according to Datek) in the past few years. Nonetheless, it remains a relatively small market.

Traditionally targeted to such special applications as bar coding and labeling, matrix line printers have picked up speed in recent years and now offer several advantages over band printers. Like serial dot matrix printers, they can handle graphics and color.

This ability, according to industry analysts, is becoming a major requirement for DP shops. "A DP manager now has a choice when it comes to graphics," Dataquest's Steiner says.

"He can use the line dot matrix, which has fairly good speed and will serve both his line printer requirements as well as some imaging requirements, or he can look to digitized imaging using lasers."

If speed is not as critical as flexibility, line dot matrix printers can be an economical choice for the DP manager.

Such vendors as Printronix, HP, IBM, Mannesmann-Tally, Inc. and Genicom Corp. offer 300 to 600 line/min machines for under $8,000. If speed is an issue, HP offers its 2566 matrix printer, reportedly running at 900 line/min — the fastest matrix on the market. But it costs $21,500.

According to Chuck Ulfers, HP's marketing manager for system printers, the matrix line printers provide a good, heavy-duty solution with the capability to run 16 to 20 hours per day.

"Customers' major concern used to be cost of ownership," Ulfers says. "They didn't think much about print quality. Now we're at a sort of midway point, and interest is growing in print quality and flexibility."

On the down side, matrix line printers may be a niche that has nowhere to go. Despite its growth, the market is small and is being nipped at from several sides. High-speed serial dot matrix printers, capable of speeds of up to 300 char./sec., are grabbing for market share at the low end, but consultants concede that even though technological breakthroughs may allow even greater speeds for matrix line printers, by the time it happens users may have already switched to nonimpact page printers.

Speed information is also misleading. Though a company may tout its printer as running at 600 line/min, it has variable speeds, and for such applications as graphics it may operate at considerably slower speeds.

The low end

For the DP/MIS manager, the issue of decentralized, distributed processing remains a priority today. Though not the most critical concern, peripherals are vital to the organization.

The influx of personal computers and workstations among Fortune 1,000 firms

See PRINT UPDATE/7

> 'Now we're at a midway point, and interest is growing in print quality and flexibility.'
>
> — *Chuck Ulfers*
> *Hewlett-Packard Co.*

SCIENCE/SCOPE

In a historic milestone, a prototype high frequency hopping radio system has been tested successfully over several complex communications paths that were not restricted to line of sight. Frequency hopping techniques have been previously used only in the VHF and UHF portion of the radio spectrum to enhance the antijam capabilities of tactical and strategic military communications systems. The recent tests, conducted by Hughes Aircraft Company engineers under contract to the U.S. Army, covered the high frequency range from 2 to 30 MHz. They showed that antijam communications are now possible over great ranges without line-of-sight paths, which require repeater stations or satellite relays. Hughes is developing the system, called Short Term Anti-Jam (STAJ), as a retrofit enhancement kit to its existing line of U.S. military standard high frequency tactical radios.

High-energy laser pointing and tracking systems are among the advanced electro-optical systems supported by the Albuquerque Engineering Center in New Mexico. The center's scientific disciplines include physics, optics, mathematics, lasers, image processing, electro-optical control systems, and computer science. Programs involve electro-optical sensors for strategic military applications, including work performed at the U.S. Air Force Weapons Laboratory at Kirtland Air Force Base and the White Sands Missile Range. The Hughes center is expected to expand from its current staff of 42 highly trained professionals to greater than 100 over the next three years.

Complex microelectronics will be produced faster and better in a "paperless" factory in which computers instantly collect data and process work instructions. A new 71,000-square-foot facility at Hughes in Tucson, Arizona, will make complex custom hybrids—historically a major manufacturing challenge — for advanced missiles. The heart of the facility is a computer that ties into business and CAD/CAM (computer-aided design/computer-aided manufacturing) computers and scores of terminals at work stations. Labor requirements will be cut by up to 60%.

An upgraded weapon system and other improvements will help the F-14 Tomcat fighter deter and cope with threats for several decades. Designated the F-14D, the U.S. Navy aircraft will be equipped with an advanced digital radar, new engines, advanced avionics, and the capability for launching Hughes AIM-120 Amraam and AIM-54C Phoenix missiles, as well as the latest versions of Sparrow and Sidewinder missiles. The AN/APG-71 radar will include a fully programmable signal processor and companion radar data processor. These units will provide digital capabilities, as well as digital radar displays, advanced electronic counter-countermeasures, and improvements in the aircraft's detection and tracking range and accuracy. Hughes will provide the upgraded APG-71 under contract to Grumman Aerospace Corp., prime contractor on the Navy F-14 improvement program.

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HUGHES

Update

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	1985	1986	1987	1988	1989
Impact					
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Line [illegible]	0.7%	0.6%	0.6%	0.4%	0.3%
[illegible]	[illegible]	1.6%	[illegible]	[illegible]	[illegible]
Total Impact	87.9%	84.7%	82.4%	80.1%	77.2%
Nonimpact					
Serial					
([illegible])	10.6%	13.3%	15.4%	17.6%	20.0%
Page	[illegible]	1.9%	3.2%	[illegible]	[illegible]
Total Nonimpact	12.1%	15.3%	17.6%	20.0%	22.8%

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PRINT from UPDATE/6

has brought with it a concurrent mass of printers. As local-area networks and remote computing become more prevalent, the hard-copy wish list of the information worker will fall on the MIS manager's desk.

Although nonimpact vendors are touting their page printers as the perfect shared resource in the office, the serial dot matrix continues to be "the bread and butter of the industry," according to Maureen McManus, manager of the printer market program for IDC. With the personal computer driving the low end, dot matrix printers are the leading printer product sold. Though the 1984 numbers differed — Datek estimated 3.6 million units shipped, IDC put the figure at 2.5 million — it is clearly a massive market.

Also experiencing continued high interest on the impact side are serial fully formed character (or daisywheel) printers. According to Datek, daisywheel printers accounted for 1.1 million units and $1.6 billion in sales in 1984, making it the second largest market area for printers.

For the DP/MIS manager, as well as the individual buyer, this market is crowded and confusing. IDC estimated that more than 150 vendors are selling either serial dot matrix or daisywheel — or both — printers. Though many companies are simply buying a printer on an OEM basis and slapping their names on the box, some significant vendors are jumping seriously into the market. IBM, which until this year had simply been the OEM for Epson America, Inc. printers, now has entered the market with its own $549 Proprinter, a dot matrix machine, and the Wheelwriter, which uses a daisywheel.

DEC, which offers a range of impact and nonimpact printers (mostly sourced from the likes of Dataproducts, Xerox, Ricoh Electronics, Inc. and Tokyo Electric Co.) has recently announced its LA210 office printer. This model, developed internally and manufactured in Taiwan, is the company's most popular dot matrix printer, according to Suzanne Skinner, base product marketing manager. A redesign of the LA100, the LA210 is compatible with DEC's personal computer line.

Given the volatility of this market, DEC and other computer makers plan to do whatever it takes to grab a

See PRINT UPDATE/10

To get a lot out of your printer, you need a lot of programs, right?

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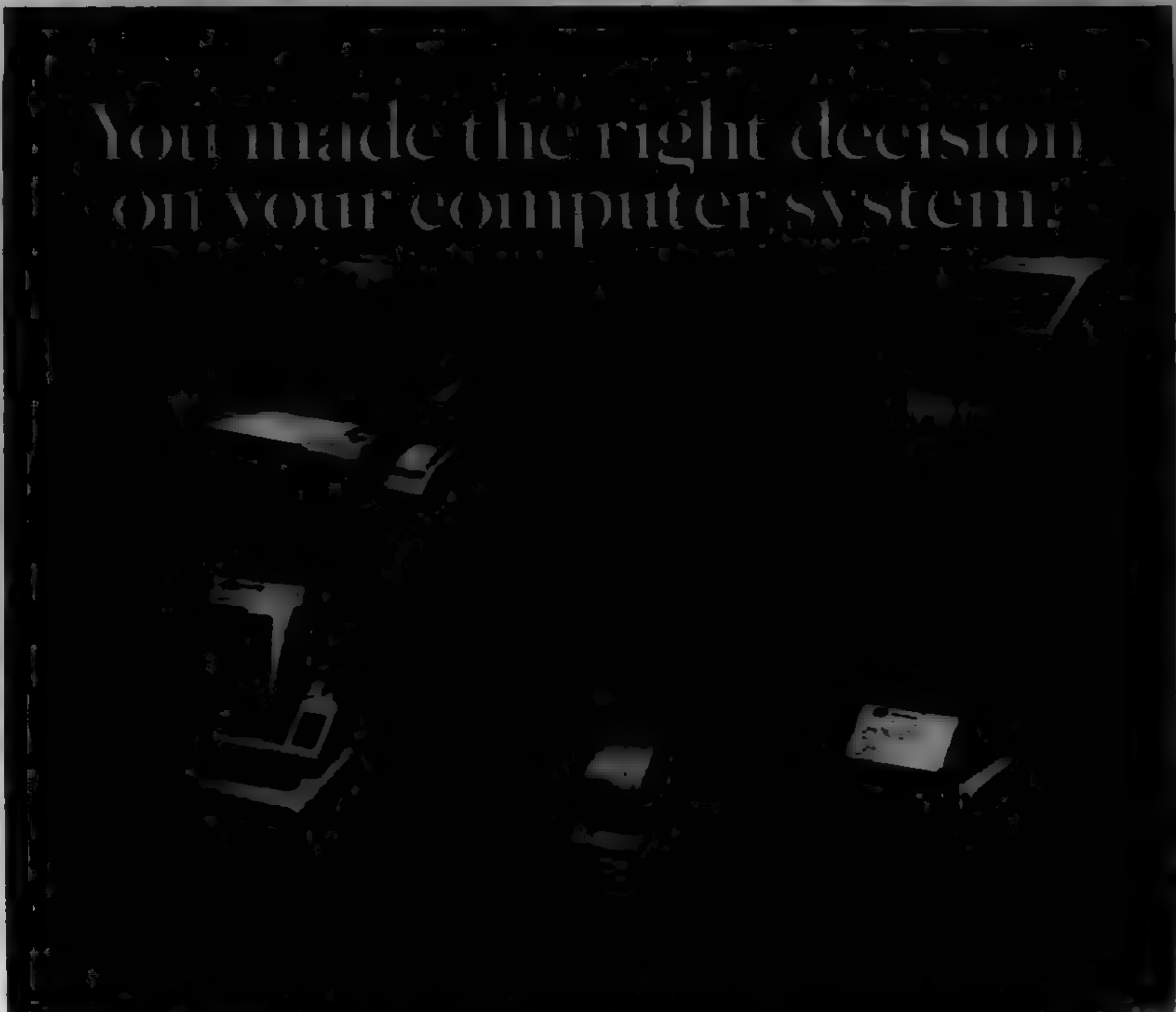

[illegible] these printers, choose Interface Systems.

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Update

Impact vs. nonimpact: The hard-copy battlefield

Technology battle lines are not usually as clearly drawn as they are in the world of printers. Impact printers — the entrenched, traditional workhorses of the data center and beyond — are being challenged openly by the various technologies that make up nonimpact printing.

Though impact machines are currently holding their own, the encroachment of the new breed is being felt as prices for nonimpact machines go down and reliability and versatility go up. Pundits on both

[illegible]

As nonimpact technology gets cheaper and better, how will the impact world fight it off?
Kilcullen: To answer that, you have to go through a few different tiers of price/performance ranges and applications. Starting at the low end, or the personal computer end, of the product line, nonimpact technology is coming forth with serial printers that use thermal transfer technology on one hand or ink-jet technology on the other hand. In the impact arena, we have the low-cost daisywheels and the very low-cost impact dot matrix.

When you look at the four different technologies, the one that I would be most worried about, if I had it in my product line, is the daisywheel, because without graphics it really doesn't provide the utility that people are looking for in the low end of the office environment.

Thermal transfer printers are probably the lowest cost approach, but from a user's standpoint, [they] are relatively limited because of their need to use very smooth, highly finished paper. Certainly in the U.S., where we tend to use a high rag content paper, the print quality is very poor.

The ink-jet is a nice niche product which addresses some color applications, but once again, it won't be super price competitive with impact matrix. Impact matrix has gotten to be very cost competitive and addresses the widest range of potential applications with its graphics capabilities, levels of print quality and levels of throughput. And there is still the need to do multipart documents.

What about the higher end?
Kilcullen: The applications there are going to be filled by the higher performance daisywheel printers, the higher performance serial matrix printers and the lower cost laser printers. They are the three challengers. The big issue there, I believe, is the total cost of ownership of each.

Please explain.
Kilcullen: When you look at the "consumables" aspect of the [Canon USA] CX-based machines with the operator-replaceable module that replaces, in one operation, the photo receptor, the toner and other aspects of the wear items in the printer, that is a pretty high ongoing bill. If you look at duty cycles, it can average you $75 to $100 a month. And with the complexity of that product, you are going to have service calls, certainly more than one a year. Laser printers traditionally have been very service intensive.

On the other hand, we have made significant strides in the impact matrix printers relative to reliability and cost of ownership. The cost of replacing a ribbon every 45 to 90 days at $15 apiece is significantly less than replacing the guts of a nonimpact laser printer.

Robert Kilcullen

'You get a lot more bang for your buck with an impact printer today than you did three years ago.'

The [mean time between failure] of serial impact matrix printers has improved by orders of magnitude over the last five years.

What about the question of versatility and functionality?
Kilcullen: Serial matrix printers have evolved to address some of the specific needs of a user — addressing, for instance, transaction processing where one wants to get a document printed and immediately available to the user. You have demand document tear-off right after the last printed line. You have the ability to insert a document — for instance, a car rental form — that might have information on it already and it's brought back and you can insert it into a printer, print out the remaining information and get it back.

The ability to handle color, although [that] is handled very nicely by ink jet at the low end. But in the middle range, a cost-effective way of doing it with electrophotographic technology has not really been established, and it would be a relatively expensive, complex product.

What about at the data center end?
Kilcullen: Nonimpact printers made their first impact back in the mid-1970s addressing the very, very high-volume print shops with the IBM 3800 and the [Xerox Corp.] 9700. But they went into sites that primarily had very high usage and could almost have justified a field engineer on site because those things go down — they print 18,000 lines a minute — but they are probably down every two hours. You need somebody around to fix them.

But the 2,000 line/min impact printers were certainly affected by the introduction of those types of products. Once again, the trade-off primarily was reliability. People with that demand tended still to want an impact printer. Plus, certain applications need multipart copies; people still don't necessarily trust magnetic storage. So that still is a need that hasn't been and won't be replaced by nonimpact in the foreseeable future. It is interesting to note that IBM announced, in the last year, five new high-speed impact fully formed character line printers.

Consultants seem to think that when the time comes to replace the old band printers, the DP manager will turn to nonimpact technologies.
Kilcullen: Certainly the growth has flattened out [in the impact printer market], but I don't see it as a shrinking market. I can't believe that IBM would make the investment that they did in the 4248 and the 4245 if they didn't see that they were going to have production adaptation. Let's face it, at that end of the business there is no one that should have a better handle on the user base than they do.

What about the unlimited potential of nonimpact vs. the limits of impact?
Kilcullen: It certainly has become a significant factor. The resolution and the flexibility will allow the nonimpact segment, especially in the mid-range [and] up, to grow and to grow significantly. But it doesn't spell death, doom and disaster for the impact world at the same time. The growth rates probably won't be what we experienced in the past, but there are many applications and many reasons why impact printers will continue on and grow, certainly at a more moderated rate.

What about all the publicity surrounding nonimpact? Is the user just ignoring this?
Kilcullen: I've been in this business for about 15 years, and the first time that top management in the company became alarmist about nonimpact taking over the world was about 1970 or '71 when I was on a joint planning committee to look into those technologies. It's always been the dark cloud hanging over our head. Progress has been made in the nonimpact area, but at the same time, the flexibility and the price/performance point with impact printers has been dramatically affected. You get a lot more bang for your buck with an impact printer today than you did three years ago.

So quietly, while all the publicity has been focused on nonimpact, the impact technology has improved as well?
Kilcullen: Yes. You have graphics, color capability, demand documents, a combination of cut sheet and fanfold paper. Acoustics have been improved, head life has been improved and, not the least of which, the cost has improved. Our lowest cost impact serial printer has a retail price of $299. Look back three years ago — who would have ever dreamed that you would be able to buy a printer like that for $299? ■

Update

sides have made their predictions about the future of the printer market. Some openly predict a lopsided victory for nonimpact — a complete takeover of the market within 15 years — while others are adamant about the staying power of the impact world.

Other industry observers tend to agree that although growth in impact sales is slowing and nonimpact numbers are growing rapidly, there is a place for both technologies. Applications, not bells and whistles, will drive the market and users will, as usual, determine their purchases by need, not technology.

Nonetheless, both sides have strong arguments in favor of their respective technologies. *Computerworld* Update Editor Glenn Rifkin interviewed leading proponents for each side of the issue. Representing impact printing is Robert Kilcullen, vice-president of marketing, sales and business management for Centronics Data Computer Corp. of Hudson, N.H. Speaking out for the nonimpact side is James L. Busby, president and chief executive officer of QMS, Inc. in Mobile, Ala.

Centronics, although undergoing internal changes, remains a leading manufacturer of dot matrix and line impact printers for the OEM market. The company was acquired in 1982 by Control Data Corp. Kilcullen joined Centronics in 1977 from CDC where he was responsible for several functions, including product marketing in its printer division. He has 13 years of experience in the area of computer printers.

QMS, formerly Quality Micro Systems, Inc., is a manufacturer of a series of medium to high-end laser printers with a range of graphics options. Founded in 1977 by Busby, QMS has grown to 300 employees and sales of $31 million. A native of Mobile, Busby is an inventor, pilot and blue-water angler with degrees in electrical engineering from the University of Alabama and business administration from the University of South Alabama.

[illegible]

Despite all the publicity surrounding nonimpact printing, the numbers still strongly favor impact. What has to happen to stimulate some growth in this area?

Busby: Initially, laser printers had two basic hang-ups that kept them from successfully competing against impact printers. One was cost; they were much more expensive. The second was reliability because the impact technology was much more reliable.

Over the last year or two, however, you have seen the price of nonimpact printers coming down significantly to the point where Hewlett-Packard introduced the $3,500 [Laserjet] machine. I believe that pricing on nonimpact printers is going to continue to decline over the next couple of years very significantly, to the point where it will represent extremely strong competition against impact printers.

What about reliability?

Busby: Presently, what you get with nonimpact printers is what you pay for. If you get a Canon U.S.A. LBP-CX-based machine, you get a machine which has a 3,000 page-per-month duty cycle and a life expectancy of something like 100,000 pages.

If you want to pay more money and get something, for example, that is based on a Xerox Corp. XP12 print engine, then you can get a machine that's rated at 15,000 pages per month and has almost an unlimited life expectancy. So the reliability is there if you are willing to pay for it. As time goes on, the reliability is going to go up as the price comes down. We hear talk from some Japanese print engine suppliers that they will be producing in the next year or two some very inexpensive print engines with very high duty cycles.

Nonetheless, the numbers are still heavily weighted in favor of impact.

Busby: We see a much higher level of activity in our marketplace than we saw even a year ago or six months ago. We have every reason to believe that the market is not slowing down and, in fact, is accelerating quite rapidly or is going to over the next some months.

Generally, people are reluctant to change, to give up what they are used to for a more complex technology. How will the nonimpact world address that?

Busby: That is one of the problems that we recognized early on as being a barrier to getting into the marketplace and the only answer to that is educating the user.

I think it is just a matter of education and a matter of time. We have seen a very quick acceptance of laser printer products in the field.

What will drive this market at the high end, the data center end?

Busby: Having the right application software so that you can just unplug what you were using before and be able to plug this device in and have it do something useful.

Also, having software packages available which utilize the capability of laser printers. Most of the software that is available today is still based on using impact printers of various kinds. So as time goes on, there will be a lot of companies writing software that supports laser printers . . . and takes advantage of the features and at that point, it will become more cost effective to spend a few extra bucks and get a laser printer.

The band printer market continues to sell well in the data center. What form of nonimpact technology can take on the band printer?

Busby: Certainly not the present state of laser printers because the duty cycles aren't even beginning to approach those of band printers.

Another question that seems to have no answer in the nonimpact world is the multiple-part forms question.

Busby: There are some applications where you are going to need the impact printers no matter what — for example, where you have multiple forms and very high speeds. The main answer with the nonimpact printer is to be able to print multiple copies in a serial fashion and also to be able to print on both sides of a page.

There are print engines that are coming out relatively quickly, I believe before the end of this year, which will be relatively inexpensive and will be able to print on both sides of the page. If you have a laser printer that is five times faster than a similar impact printer, then certainly you can print five copies one after the next as fast as that printer can print five all at the same time. That is the only solution to that problem.

What you are saying is that you don't really believe that nonimpact will totally transplant impact.

Busby: Not totally.

What do you think the market will shape out to be, say in five to 10 years in terms of impact vs. nonimpact?

Busby: My opinion is that within five years, 80% to 90% of all printers sold will be nonimpact printers. I can see it happening right now.

Impact printers seem to have made their presence felt in the high and low ends but not in the middle ground. What can we expect there?

Busby: The problem is that there has not been a print engine, a marking engine that addressed the middle of the marketplace. I firmly believe that by the end of this calendar year, there will be more than one print engine — at least two, maybe more than that — that will address that segment of the marketplace with duty cycles as high as 50,000 pages per month and which are relatively inexpensive.

You think that these are going to come from the Japanese?

Busby: Yes. Although I believe Xerox will announce an engine in that area.

What about IBM?

Busby: I think IBM is likely to impact the U.S. market in much the same way with the laser printer that they did with their [Personal Computer]. When IBM announces a relatively low-cost laser printer, the market will really explode. IBM certainly will be the most dominant competitor from the U.S. They may very well beat out the Japanese.

You feel graphics are a key driver for nonimpact technology?

Busby: Exactly. At this point, with impact printing, you typically get somewhere between 5,000 to 10,000 dots to the square inch. With nonimpact printing, you are now getting 90,000-plus dots. With that kind of resolution, you can do not only better text, but you can also do lines and boxes so that you can create people's forms and fill them in all at the same time. You can do people's signatures and put the signature as part of the document; you can even put somebody's picture as part of the data that you send to the printer. The flexibility becomes enormous.

There are hundreds of printer vendors selling hundreds of products using dozens of technologies. What can the DP manager do to make sense of all this?

Busby: The DP manager just has to continue to keep himself educated because this marketplace is changing so fast. He has to look at what is available and what his needs are. He has to purchase his products based on what he needs to do with those products and not just because it is some sexy new technology.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	712 thousand	[illegible]	2 million	[illegible]	Diablo Systems, Inc. Qume Corp. NEC Information Systems, Inc. Brother International Corp. Silver-Reed America, Inc.
[illegible]	1.86 million	[illegible]	4.6 million	$4.14 billion	Epson America, Inc. C. Itoh Electronics, Inc. Okidata Corp. Star Micronics, Inc. Texas Instruments, Inc.
[illegible]	132 thousand	[illegible]	1.6 million	[illegible]	TI Hewlett-Packard Co. Star Micronics Trendcom Okidata
[illegible]	31 thousand	[illegible]	95 thousand	$510 million	Printronix, Inc. IBM HP Decision Data Computer Corp. Mannesmann Tally Corp.
[illegible]	5.2 thousand	$222 million	72 thousand	[illegible]	Canon U.S.A., Inc. Xerox Corp. IBM Ricoh of America Delphax, Inc.
[illegible]	86 thousand	$1.13 billion	100 thousand	$1.40 billion	Dataproducts Corp. IBM Teletype Corp. Centronics Data Computer Corp. Data Printer Corp.

PRINT

from UPDATE/7

share of the pie. John Bernard, a DEC product manager, states, "We'll build internally or buy what we need to be timely in the market."

For the vendors, the issues are becoming clear. The Japanese have controlled the low end of the market since personal computing became popular. Such companies as Epson, C. Itoh Electronics, Inc., Okidata Corp. and Star Micronics Co. have established a strong presence in the U.S. by selling their own machines, and a spate of other Japanese firms have gained a foothold through OEM agreements. The Japanese, in fact, have been entrenched leaders in several different printer categories (see story Update/5).

For the U.S. manufacturers, the decision to compete in this arena is fraught with peril. Industry analysts agree that a shakeout — some say bloodbath — is coming as price erosion cuts deeply into profit margins.

"We've said all along you're going to see mergers, acquisitions and dropouts," Steiner says. "The total available market is saturated at the low end." For the user, however, the choice is more attractive than ever. As prices fall, the products are becoming better and faster.

Fujitsu Ltd., Toshiba and Epson have begun marketing printers using 24-pin printer heads, which provide denser, higher quality output than the standard 18-pin heads.

"The matrix printer has sharpened the advantage of its versatility — that is, its graphics handling and its font quality have been improved at no threat to its low cost, ease of use or volume handling ability," a report from IDC states.

Daisywheel or character printers, another area where the Japanese hold market leadership, continue to show strong growth as well, but this may be the technology most vulnerable to encroachment from nonimpact printers.

Though it provides the least costly letter-quality output, the daisywheel printer, by virtue of its fixed print-head design, is the least flexible technology.

Despite this drawback and the dire warnings, the daisywheel has done quite well. According to an IDC report, none of the new technologies have been able, thus far, to unseat daisywheel printers.

"Led by price cuts and introductions of models priced under $500, [daisywheel] printer shipments in 1984 were over 70% better than in 1983, growing from 420,000 to over 700,000," the report notes.

This optimism may be temporary, however, and has not stopped the visible palpitations of such U.S. market leaders as Diablo Systems, Inc. and Qume Corp.

Unable to compete with the economies of scale and automated factories of the Japanese, many U.S. firms have taken their manufacturing work offshore or have spent millions of dollars redesigning their own plants.

For Diablo, a subsidiary of Xerox, the handwriting seems to be on the wall. Roger Kiel, vice-president of the Xerox printing systems division, made it clear that the company is committed to nonimpact technology, an area in which it is a leader. Referring to Diablo, Kiel says, "That business end is becoming less important.

"In terms of shipments of a certain class of printer, say 80 char./sec., we think that marketplace will peak within the next one to three years and will be starting on the downhill side by the end of the decade."

Whichever technology is preferred, the DP/MIS manager will certainly have some decisions to make. Personal computer printers tend to average nearly 1:1 ratios with personal computers, and predictions for future growth remain high.

IDC estimates that there were 5.5 million personal computers on corporate desks in 1984 and expects the figure to grow to 35 million by 1989. This influx is going to have a major impact on shipments of printers for use with business micros.

As the questions of local-area networks, shared data bases, micro-to-mainframe links and communications are answered, the micros will not only connect one to another but will create shared access to peripherals.

As the IDC report points out, "When 150 [personal computer] users all have access to a single [or single group of] printers, it is possible to amortize the cost of a smaller number of more expensive printers — printers with the capability to handle more volume, at higher speeds and with higher quality output."

The nonimpact side

Though nonimpact page printers accounted for less than 1% of all printers shipped in the U.S. in 1984, according to Datek, the technology is clearly generating a great deal of excitement. "Once people see the quality in their hands, there's no turning back," states Charles Pesko, president of C. A. Pesko Associates, Inc., a Marshfield, Mass., consulting firm.

For impact boosters, that is a tune that's been heard before. Predictions of multibillion dollar markets for nonimpact printers were trumpeted in the late '70s and early '80s, but those numbers simply failed to materialize. Most consultants remain cautious about the future of the technology, but both impact and nonimpact supporters are now acknowledging that strong inroads are finally being made. A testament to that fact is the sudden interest in nonimpact technology on the part of traditional impact vendors.

"Nonimpact is definitely cutting into the impact market," IDC's McManus says. "The fastest growth rates are on the nonimpact side in several categories." Sales of page printers are growing at an annual rate of 110%, she says, with serial nonimpact sales growing at 60% to 70%.

Numbers, of course, can be misleading. While one consultant predicts that nonimpact will hold just 25% of the printer market by 1989, another consultant expects that 40% will be nonimpact. Those figures, in fact, are more likely to influence vendor decisions than user purchases anyway.

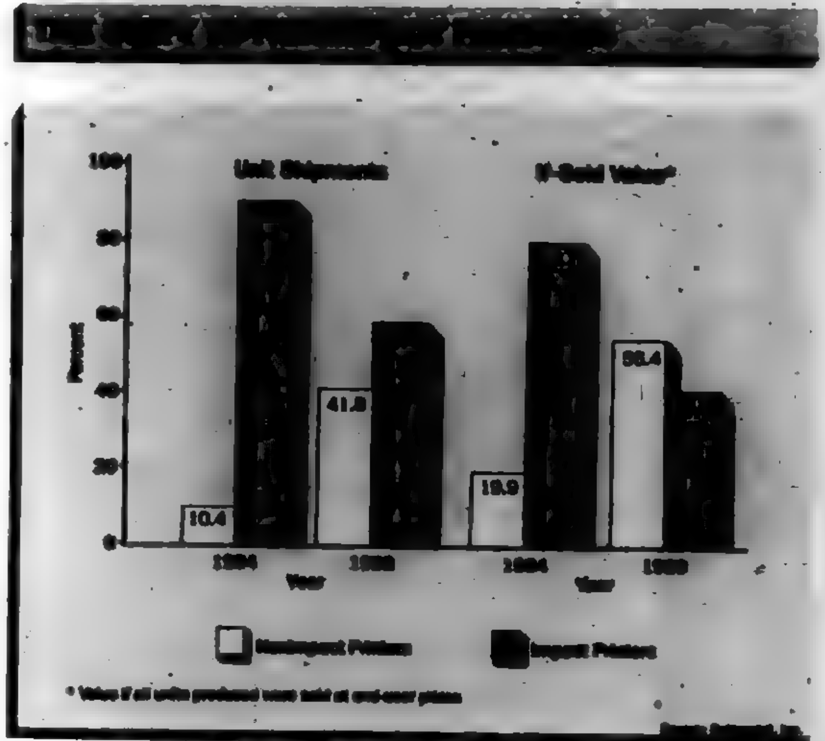
For the DP/MIS manager, there are other considerations, and nonimpact technology has certainly warranted attention. In fact, advances in the technology have started to pay off in ways that can no longer be ignored. Price/performance levels have dropped dramatically for electrophotographic laser printers, and this decline has opened up a new world of in-house printing possibilities that impact machines simply cannot address.

In addition, alternatives to laser printers, which currently hold sway in the market, are cropping up, and a few appear to have long-range possibilities in both general and niche markets.

Using sophisticated software and techniques borrowed from the computer and copier worlds, nonimpact printers are becoming intricate devices capable of speeds and functionality that may well change the nature of hard copy forever.

It is this very complexity that has kept the nonimpact printers from fulfilling their promise.

See PRINT UPDATE/11



Update

PRINT

from UPDATE/10

Nonimpact printers have gained a reputation for being temperamental, unreliable and expensive. "The DP or office manager hears the click, click, click of the counter on a nonimpact printer and still thinks 'that's 4 cents per page,' " McManus says. "The vendors are working hard to make them simpler, less expensive and more user maintainable."

"There will always be resistance to change," Xerox's Kiel adds. "And somebody always has a real need for doing things the way they used to. But by the end of 1983, one third of the pages printed in large data centers were [printed] on nonimpact machines. And I would suspect that by the end of 1985, that number would approach the 50% level."

From the high end to the low end, nonimpacts are clearly adding another choice to the printer buying decision. In fact, according to Steve Josselyn, senior consultant at IDC, the sophistication of these machines has been the catalyst for DP/MIS departments to create printer purchasing policies.

"Some of the issues are changing, and companies are looking to establish policies for centralized vs. decentralized printing," Josselyn explains. "Before, there were not enough products to choose from, and decentralized groups which wanted high-quality printing didn't have many options. Products are coming out now which are changing that."

The products cover a range of technologies such as ink-jet, electrophotographic laser, ion deposition, LEDs, liquid crystal shutters, magnetography and thermal transfer. Though all have virtues, laser printers have clearly captured the early lead in the nonimpact race.

"Lasers are hot," DEC's Bernard says. "Our customers are asking for them."

The high end

It may seem that the excitement surrounding laser printing began just yesterday, but the technology is an old and established one in the data center. IBM introduced its 3800 high-speed laser printer in the early 1970s, and Xerox followed quickly with its 9700 laser printer.

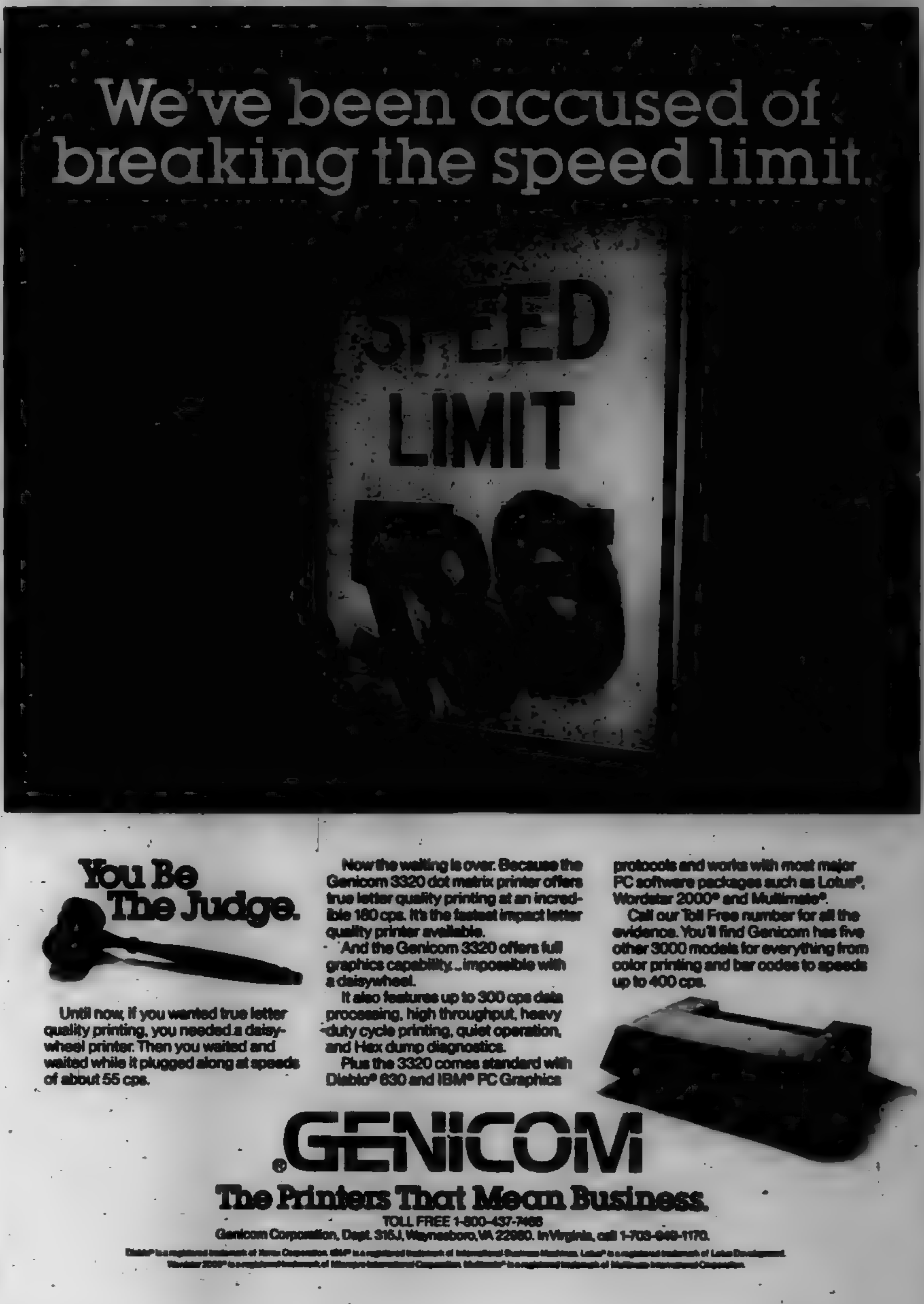
Capable of speeds in excess of 200 page/min and all-points addressable graphics, these behemoths revolutionized the high end of DP printing for very specialized markets. Banks, insurance companies, large retail outlets and other institutions with massive forms and billing needs turned to the high-speed laser printers and were willing to pay $300,000 and more for each machine.

According to Pesko, most Fortune 1,000 companies already have one of these machines in place, and when volume grows, they simply buy another. They often turn out between 1.3 million and two million prints per month. "You need someone full time just pushing paper through them," he says.

Although these machines pumped out paper, they had little flexibility and showed little promise for moving out of the centralized environments. They did, however, give DP managers a taste of what lasers could do.

"Lasers have a strong position in the centralized environment," Pesko says. "They

See PRINT UPDATE/12



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PRINT

from UPDATE/11

are well over the pioneer stage, and their reliability is known. The interest started at the top and is moving down."

These high-end machines have not truly driven the nonimpact printer market, however. Though IBM and Xerox have enhanced their products over the years, the technology has remained of the plain vanilla variety, and the prices have not come down.

The Xerox 9700 actually has more flexibility than the IBM 3800 because it allows dual-sided, cut-sheet printing, but many industry analysts believe that the high-end market is saturated.

"I don't think that IBM and Xerox between them have sold more than 3,500 units in all this time," declares Datek's Dower. "That's because [the units] cost $300,000 and were being sold into very specialized environments. Once IBM and Xerox sold to all those people, there wasn't much of a market left to sell. By and large, at that end, there has been no change."

Joscelyn tends to agree. Users in large sites, he notes, are facing the same issues as they did over the last five to 10 years. The 9700 has added more functions and more clarity, but its cut-sheet paper, while an advantage in some environments, has caused problems for others.

"Users have complained that handling and distributing that paper is more difficult than fanfold [paper]," he explains. "They need some kind of binding mechanism."

Xerox's Kiel nonetheless denies that the market has been saturated and points out that shipments for the 9700 have increased over the IBM 3800 because of its ability to do cut-sheet and duplex printing.

"It's an interesting phenomenon," he says. "I would have thought that by 1982, that market would be saturated. But we are finding that the technology is so well accepted that, as people are starting to replace their older printers, they are going straight to nonimpact technologies. Our activities for the 9700 have not slowed down at all."

Kiel

Pesko adds that he expects IBM to unveil a cut-sheet option for the 3800 sometime this year.

While growth in printed page volume in the data center is expected to be relatively low (perhaps 5% to 10% annually), a trend toward nonimpact technologies in that environment is anticipated.

Consultants agree that ultra-high-speed workhorses like the 3800 and 9700 will continue to reign as the machines of choice. The real dogfight will commence between lower speed laser printers — such as Xerox's 8700 and IBM's 6670 — and the entrenched line printers.

The middle ground

As the market moves down into remote printing departments, distributed DP sites and office clusters, the confusion factor for printer purchases increases. It is in this battleground that DP managers face the hardest choices between impact and nonimpact machines.

A reported 55 vendors now offer nonimpact page printers, and 85% of those products were introduced in the past two years. As vendors such as IBM, Xerox, HP, QMS, Inc. and Southern Systems, Inc. unveil more products, the DP manager is inundated with, and must make sense of, a number of technologies and machines.

This segment of the market is particularly confusing because there is so much price/performance overlap.

See PRINT UPDATE/13

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from UPDATE/12

According to Pesko Associates, printers in this environment operate at speeds between 35 and 80 page/min and currently cost between $40,000 and $100,000. But above the desktop level, there is a large number of machines in the 12 page/min to 24 page/min range being installed.

According to Dataquest's Steiner, "The trend we are seeing is that old line printers are still doing their jobs, but the DP managers are getting more involved with nonimpact printers and have installed one or two. Not the 9700 or 3800 type, but the 12 [page/min] to 20 [page/min] class is being installed in the data center, and people are learning how to use them to serve the client base. They are learning how to put out, not tons of greenbar [paper], but product with graphics."

While IBM's 6670, introduced in 1979, and the yet-to-be-shipped 3820 take on the Xerox 8700, 5700, 2700 and new 3700 and HP's 2680, the entire lot must struggle against the matrix line and band printers for acceptance. And trying to find a share of the crowded market are alternative technologies such as ink-jet printing, thermal transfer and ion deposition. It will not be easy.

"It is very hard for a new technology to establish itself in the market," Dower says, "particularly when there are enormously strong technologies against which it competes. And nonimpact page printers really require a whole new set of application software and application understanding, which didn't exist in the past."

Clearly, the uncovering of new applications that impact printing cannot handle will drive the nonimpact printer market. Corporations are beginning to consider the benefits of bringing into the data center more of the corporate publishing requirements now that they have affordable, flexible machines. The external printing bills for newsletters, forms and reports have traditionally been astronomical. High-speed page printers, which are underused in their new settings, are being put to use for in-house publishing.

"The growth of the electronic printing and publishing segment [of the market] will require a significant market development effort," states a report on nonimpact printing from Pesko Associates. "Electronic printing systems will begin to replace existing printing and duplicating equipment for both in-house and commercial printing. These new systems will offer substantial labor savings by displacing many manual steps in the traditional prepress, press and postpress areas. Consequently, electronic printing systems will represent a revolutionary change in the entire way in which printed matter is produced."

The low end

As laser technology has made its way to the desktop, it has gained more attention than ever. Drops in speed and price and improvements in electrophotographic techniques have suddenly spawned a new and exciting market.

The Japanese have dominated the middle and low ends of the laser marketplace because of their advanced photocopying technology, upon which laser printing is based, and automated manufacturing capabilities. Steiner of Dataquest suggests that a multicolor laser printer will emerge from Japan within the year.

Consultants point out that if a laser printer is not entirely made by a Japanese vendor, its engine almost certainly is.

Not surprisingly, therefore, it was Canon U.S.A., Inc.'s LBP-CX personal nonimpact page printer that turned the industry on its ear when it was introduced in late 1983. Though Canon did not begin to ship its own printers until earlier this year, it sold the product through OEM agreements. The machine cost less than $10,000, a figure seemingly unattainable heretofore. Canon broke new ground in price/performance for laser

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Update

Advanced components drive printer mart

By Maureen E. McManus
Special to CW

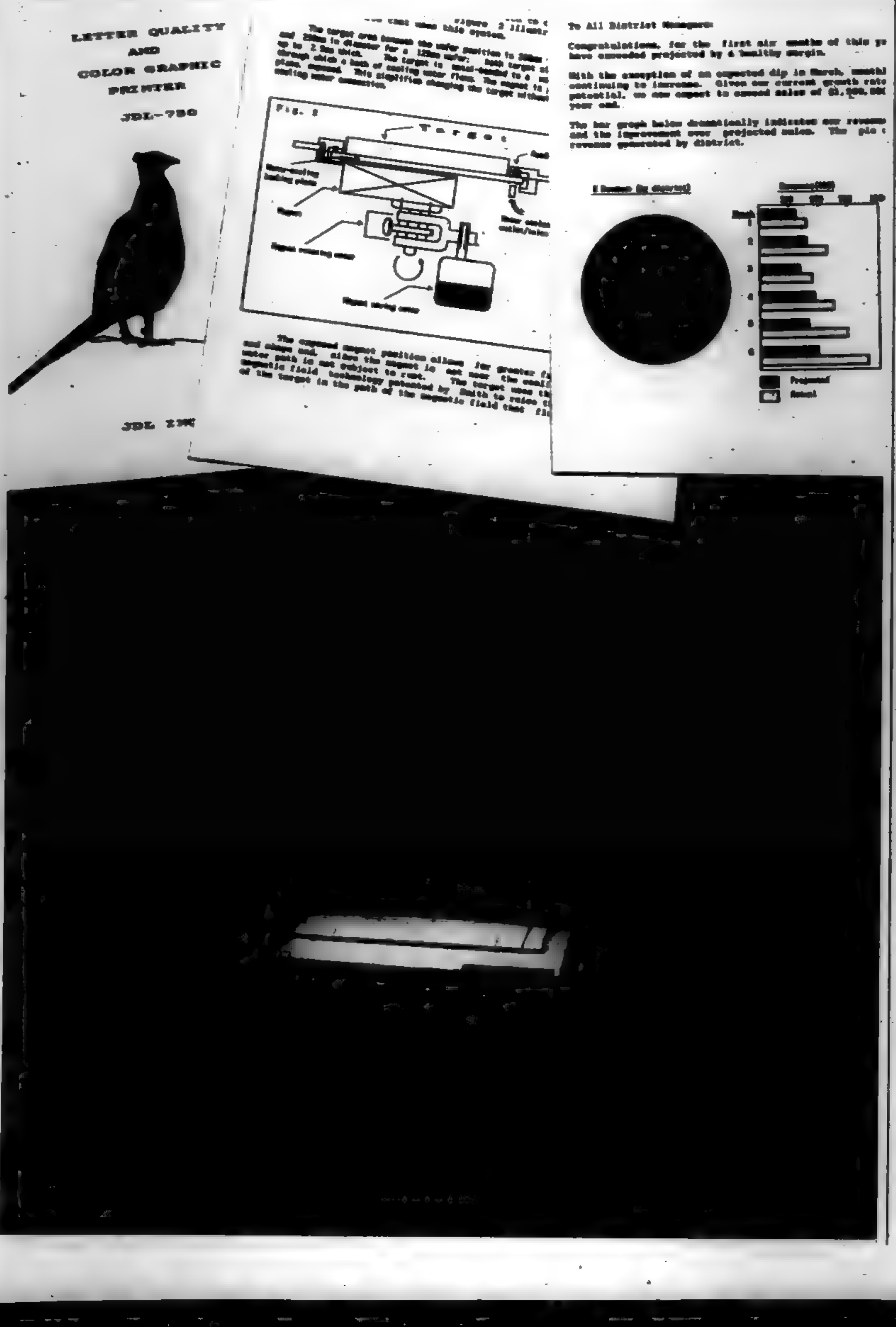
The term "page printer" has been confined to monolithic page printing systems such as the Xerox Corp. 9700 or the IBM 3800. These $325,000-plus monsters printed a page at the blink of an eye and chewed up over one million pages per month operating on the "click, click, click" method. Every time it clicked the image, the end user paid. The footprint was the size of a truck, and undoubtedly the driver was a DP operator. Unquestionably, the technology was laser.

A great deal has changed, giving users a multitude of hard-copy options to fit their specific needs. Much in the same way that their host systems preceded them, page printers began their descent toward distributed printing with the advent of machines like the Xerox 2700, a 12 page/min laser printer costing approximately $20,000. Hewlett-Packard Co.'s Laserjet practically leaped into the laps of the end user in 1984 as the foremost vendor in a line of Canon U.S.A., Inc. LBP-CX OEMs. Price tags on this new generation of lasers run as low as 1% of their forefather's cost, and vendors such as

See MCMANUS UPDATE/23

McManus

McManus is the manager of the printer market program for International Data Corp. in Framingham, Mass.



PRINT from UPDATE/13

printers and began to drive the low-end market it had spawned.

Canon also decided to sell its 8 page/min print engines to U.S. vendors who wanted into the market but did not have the time or money to invest in internal development. Canon engines already can be found in products from nearly 20 U.S. vendors, including Apple Computer, Inc., HP and QMS. It was HP's Laserjet, introduced in 1984 for $3,500, that proved that the technology really could be had for less than $20,000.

The desktop laser printer is unquestionably a product to be reckoned with. Its ability to print text and graphics on the same page, quiet operation and multifont printing on a single page are all attributes. "They appeal to the artist within us," HP's Ulfers adds.

New forms of laser technology are also appearing as companies jockey for position and advantage. Liquid crystal shutters and LEDs are being used as alternative ways to send the light source to the paper.

The desktop laser printer is not a panacea, however, and it has a long way to go before it can compete with the serial dot matrix machines. The Canon LBP-CX engine, for example, has a duty cycle of only 3,000 page/mo, which is considered extremely low by impact machine makers. There is also a need for new software to drive all the LBP-CX's capabilities. In addition, laser printers tend to be less reliable than impact printers.

Although $3,995 is a remarkable price for a laser printer, it is still high for the low end. Xerox's Kiel predicts that the price will drop to the $1,500 to $2,000 range by 1987, but the low-end laser printer will need acceptance as a shared peripheral to get into corporate America.

Apple has taken the desktop laser printer to another plateau. Its Laserwriter, introduced earlier this year as part of the Macintosh Office system, is also based on the Canon engine but goes a few steps beyond the Laserjet. At $6,995, it is significantly more expensive than the Laserjet, but it offers multiple professional typefaces; full-page, high-resolution graphics; and new ways to lay out text and graphics on a page using Postscript, a programming language for page description.

See PRINT UPDATE/16

Dataproducts

370 computer companies have discovered the secret to building some of the world's most advanced printers.

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Update

PRINT

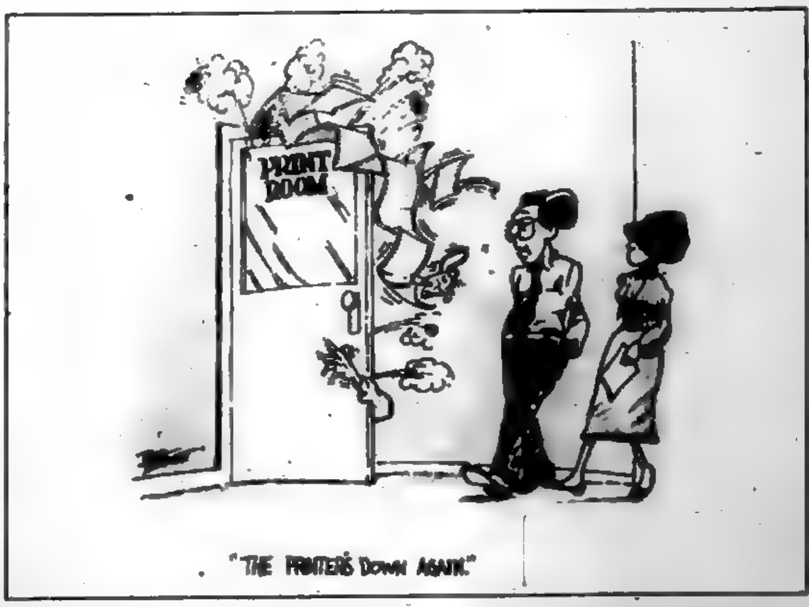
from UPDATE/14

The Laserwriter also incorporates a Motorola, Inc. 68000 microprocessor, as does Apple's Macintosh, and, in fact, features nearly three times the random-access memory of a 512K Macintosh and 20 times the memory of the HP Laserjet.

According to Apple's Bruce Blumberg, product manager for Laserwriter, the product is attempting to change the standard for internal communications. In particular, it is attempting to address the question of where in-house publishing fits in the corporate organization. To date, the data center has shied away from in-house publishing, but increasingly, the margins between the two are blurring, Blumberg points out.

"We're providing the tools to allow people to do in-house publishing significantly cheaper, with a faster turnaround and better results," Blumberg says. "That's the kind of thing DP people are going to be increasingly involved with."

Steiner agrees and says he expects that Laserwriter-type technology will move up to the high end to allow DP shops to handle large in-house publishing requests. "There will be a lot of demand for publishing," he says. "As people get more and more into doing spreadsheets and graphics, they can pull out four or five pie charts and assimilate information more rapidly. If they can have that, why can't the president or vice-president have the same thing? It's not realistic to expect them to look through a stack of greenbar anymore."



"THE PRINTER'S DOWN AGAIN."

The Laserwriter has been extremely well received by consultants, but it too has drawbacks. Although it works well in its native Macintosh environment, it loses much of its capability with other systems, such as IBM's. Apple has turned to third-party software developers to try to solve that problem, and such companies as Microsoft Corp. and Studio Software have already developed driver programs to tie Laserwriter to the IBM Personal Computer.

In terms of in-house publishing capabilities, the Laserwriter is currently alone in the field. "Before this, you needed a $50,000 [Interleaf, Inc.] machine to do this kind of work," says McManus of IDC. "This is really a breakthrough product."

Xerox and DEC both introduced their answers to Apple's printer. DEC's LN03 laser printer uses a Ricoh Electronics engine and retails for $4,195. DEC's Bernard says that it is a more general-purpose machine than the Laserwriter.

As more companies plunge into the still-cold waters of low-end nonimpact printers, the outlook is optimistic but cautious. Says the report from IDC, "Lasers are expected to do well, with 1984 shipments of about 16,000 [increasing] to nearly 200,000 for 1989. Overall though, they are expected not so much to totally supplant other types of printers as to augment a business' varying personal computer printing needs."

Ink-jet technology

The nonimpact technology that is most likely to encroach upon laser territory is ink-jet printing. Ink-jet printers have been on the market for several years, but they have yet to show a commanding presence. Ink-jet technology, however, continues

See PRINT UPDATE/18

PRINTER SUMMARY

Impact

Technology	Type	Speed	Print Quality	[illegible]	[illegible]	[illegible]	[illegible]
Daisywheel	Serial	12 to 90 char./sec.	Excellent letter quality; sharp edges, no scallops	96 to 200 char./wheel; overstrike increases number of characters; graphics resolution to 120 by 96 dot/in.	Interchangeable fonts, low cost, good reliability	Slower speed than impact serial matrix	$600 to $6,000
Serial Impact Matrix	Serial	30 to 600 char./sec.	Draft to near-letter quality: 200 char./sec. draft, individual dots; 110 char./sec., scallops; 35 char./sec., near-letter quality, low uniformity and rough edges	Graphics resolution to 240 by 240 dot/in.	One printer for multifunctions; print quality changes with speed; color graphics possible; good reliability	Low resolution with sparse dot matrix	$250 to $6,400
Line Impact Matrix	Line	80 to 900 line/min.	Draft to near-letter quality; at 80 line/min., near-letter quality, low uniformity and rough edges	Graphics resolution 60 by 60 dot/in. to 160 by 160 dot/in.	One printer for multifunctions; print quality changes with speed; color graphics possible; good reliability	Low resolution with sparse dot matrix	$3,500 to $17,000
Drum	Line	300 to 2,000 line/min.	Utility to correspondence to optical character recognition(OCR)-readable	Fixed character set to 96; graphics only by printing characters	Heavy-duty printing with low maintenance; very good reliability; some print MICR* checks	No interchangeable character sets	$10,000 to $60,000
Chain or Train	Line	600 to 2,000 line/min.	Utility to correspondence to OCR-readable	Interchangeable fonts to 128 char./set; graphics only by printing characters	Interchangeable fonts; long life; good reliability	Chain or train track wear; more expensive and slower than band technology	$12,000 to $88,000
Band or Belt	Line	200 to 3,600 line/min.	Utility to correspondence to OCR-readable	Interchangeable fonts to 128 char./sec.; graphics only by printing characters	Interchangeable fonts; capable of heavy-duty printing; very good reliability	Entire band needs replacement if one character wears	$4,000 to $108,000

Nonimpact

Technology	Type	Speed	Print Quality	[illegible]	[illegible]	[illegible]	[illegible]
Direct Thermal	Serial and Line	18 to 300 char./sec., 200 to 450 line/min.	Draft to near-letter quality	Resolution 64 by 64 dot/in. to 90 by 90 dot/in.	Low cost; low noise	Requires special thermal paper; heads have limited life	$175 to $1,500
Thermal Transfer	Serial and Line	11 to 300 char./sec. 65 to 650 line/min.	Draft to near-letter quality	Resolution 70 by 70 dot/in. to 240 by 360 dot/in.	Uses plain paper; color graphics possible	Ribbon cost is fairly expensive, up to 30 cents/sheet	$199 to $2,000, serial; $2,500 to $12,000, line
Electro-erosion	Serial and Line	160 to 2,200 char./sec., 90 to 200 line/min.	Draft to utility — serial; photomaster book quality — line	Resolution: to 160 by 160 dot/in. — serial, 600 by 600 dot/in. — line	Fast and quiet — serial; high print quality for photomasters — line	Paper appearance is metallic and can wrinkle — serial; metallic appearance no problem for photomaster	$495 to $2,000, serial; $21,000, line
Ink-jet	Serial and Line	20 to 270 char./sec., 300 line/min.	Draft to almost letter quality	Resolution 60 by 90 dot/in. to 300 by 300 dot/in. to 224 by 480 dot/in.	Quiet; color graphics possible; relatively low supplies cost	Optimum printing on some with special papers; reliability on some not too good due to nozzle clogging	$495 to $22,000
Electro-static	Line and Page	300 to 11,000 line/min.	Correspondence to near-letter quality	Resolution 100 by 100 dot/in. to 400 by 400 dot/in.	High speed for printer applications; low speed for plotting to 72 in. wide; color available	Requires special dielectric paper and liquid toner	$5,000 to $165,000
Magneto-graphic	Page	10 page/min. to 30 to 90 page/min.	Near-letter quality	Resolution 240 by 240 dot/in.	Quiet; high speed; good reliability for nonimpact page printers	Lower resolution that electro-photographic	$2,800 to $25,000
Ion Deposition	Page	60 to 120 page/min.	Near-letter quality; uses pressure fusing, hence, a somewhat shiny appearance	Resolution 240 by 240 dot/in.	Quiet; high speed; better reliability than electrophotographic; can print MICR* for checks	Lower resolution than electro-photographic	$60,000 to $80,000
Electro-photographic	Page	8 to 214 page/min.	Almost letter quality	Resolution 180 by 144 dot/in. to 400 by 400 dot/in.	Ranges from quiet, low speed and inexpensive to very high speed, high volume and expensive but competitive cost per copy	Reliability lower than maintenance requirements and higher than some impact printers	$3,500 low-end to $400,000 high-end

* Magnetic ink character recognition

Source: [illegible] Corp.

A guide to cost-justifying smart nonimpact printers

By Charles A. Pesko
Special to CW‡

With a growing market creating more demand for intelligent copier/printers, potential end users need specific, accurate and timely product information. Along with speed, print quality, reliability and flexibility, cost of ownership is an important criterion by which to compare intelligent copier/printers to each other and to traditional impact printers.

An intelligent copier/printer is a nonimpact output device that accepts electronic input and produces hard-copy output of at least correspondence-level print quality. Examples of intelligent copiers/printers are the IBM 3800, Xerox Corp. 9700, Hewlett-Packard Co. Laserjet and Apple Computer, Inc. Laserwriter.

One feature that distinguishes the intelligent copier/printer from other printing systems is its internal capacity to create, format and manipulate many type styles and sizes within a document or within a page.

In some cases, intelligent copier/printers can merge text with graphics and images of great complexity. This process is under the direction of sophisticated, programmable controllers that can create electronic documents efficiently and economically.

There now exist many intelligent copier/printer products using several technologies. Each product offers its own set of features, format flexibility, host interfaces, print quality and speed. However, to make informed decisions, end users also require cost-of-ownership data based on an objective comparison.

Pesko

As part of the Intelligent Copier/Printer Market Requirements Service, C. A. Pesko Associates, Inc. has developed a cost-of-ownership computer model. By keeping major cost elements and assumptions consistent, useful comparisons can be made. The DP manager considering the acquisition of intelligent copier/printers for installation may use such a comparison in an in-house, cost-justification exercise. A cost-of-ownership calculation form is included below for use with these formulas.

There are four key elements and three minor elements in calculating cost of ownership. The major elements include the acquisition cost of the system, service/maintenance costs, usage charges and consumables.

The minor elements are floor space, electrical power and labor. Because of the extreme variability of the minor elements, we have excluded them from the model. However, the potential intelligent copier/printer end user would do well to consider these elements within the context of his company.

Configurations. Although each intelligent copier/printer has its unique constellation of feature/benefits, systems in our model are priced with configurations as nearly consistent as possible, as the following examples show:

- **Interfaces.** Interfaces are always included. Some systems offer no choice of interface. For those offering choices, be sure to price the interface compatible with your computers.
- **Paper trays.** Where the option is available on sheet-fed systems, use two trays or more in the pricing.
- **Fonts.** Fonts may be limited to those included in the basic package. If fonts are not included, add in the price for the minimum number of fonts required.

Amortization. Rental and lease rates vary considerably between vendors and third-party lease companies. When we consider nonpurchased equipment, we use two-year lease rates from the equipment vendor. The comparison of purchased equipment is made at quantity one end-user list price, amortized over 60 months. We disregard the cost of money on purchased equipment. However, we recommend that you consider it in your evaluations as it will, in many cases, diminish the cost advantage of purchased equipment.

Supplies

Supplies prices are taken from the equipment vendors' catalogues. For quantity discount purposes, prices are taken generally at the one-month usage level or at the first price break, whichever quantity is higher. In the centralized environment, volumes are usually high enough to qualify for the greatest discounts.

Production yield of a supply item can vary significantly between end users, and some supply vendors are more sanguine than others in quoting yields. Therefore, this analysis uses the production yield figures quoted by the equipment vendors.

Paper. Paper, like other consumables, varies in price according to volume. In the centralized environment, with more than one million prints per month as an average volume, we use the lowest average paper price as follows:

- **Cut sheet.** Cut sheet measuring 8½- by 11-in. at $.00425 per sheet.
- **Continuous form.** Continuous form measuring 8½- by 12-in. at $.00525 per sheet.

Average monthly print volume (AMPV). The cost of ownership of each system is examined at four evenly distributed AMPVs within the general volume limits of the centralized environment. In most companies, print volumes grow over time. Examine the results of increased volume on your cost per print.

Print speed. Vendors' published print speeds are used throughout the model. The average page may be assumed to be 40 lines of 60 characters each, for the purpose of converting lines per minute to pages per minute. In instances where equipment uses continuous-form paper and print speed was quoted in inches or feet per second, the model assumes the use of 8½- by 12-in. form, running on the 8½-in. axis.

Shift and duty cycles. For the centralized environment, printers are assumed to be available three shifts per day, 25 days per month. These figures were obtained through end-user research.

Based on quoted print speed and the total shift time described above, duty cycles were calculated for each AMPV. As a rule, intelligent copier/printer manufacturers recommend AMPVs work out to low-duty cycles for workstation systems and higher duty cycles in the high-end environments. The duty cycle can be calculated by taking

See COST UPDATE/19

COST-OF-OWNERSHIP CALCULATION FORM

[illegible]
[illegible] ______ (1)

Average Paper Cost per Month
(line 1÷1000) ______ (2)
Your best paper cost per 100 ______ (3)
Average paper cost (line 2 x line 3) ______ (4)

[illegible] ______ (5)
[illegible] ______ (6)
[illegible] ______ (7)
[illegible] ______ (8)

Analysis Period
Number of years ______ x 12 ______ (9)

[illegible] ______ (10)
(line 10 ÷ line 1) ______ (11) ______ (11)
[illegible]

Equipment Cost
Make and Model ______
Basic unit price $______ (12)
Interface, if extra $______ (13)
Fonts each, if extra $______ (14)
Number required ______ (15)
Total for font
(line 14 x line 15) $______ (16)
Software, if extra $______ (17)
Other options ______ $______ (18)
______ $______ (19)
______ $______ (20)
______ $______ (21)

[illegible]

Monthly Maintenance and Service Costs
Contract Plan
Days covered ______ through ______
Hours covered ______ to ______
Guaranteed arrival within ______ hours
Contract cost/mo. $______ (24)
(Note: Be sure to include charges for optional equipment.)
Additional coverage, if required and available
Days covered ______ through ______
Hours covered ______ to ______
Add-on cost/mo. $______ (25)
Total Maintenance and Service Cost
(line 11 x (line 24 + line 25)) $______ (26)

[illegible]
[illegible]
[illegible] ______ (27)
[illegible] $______ [illegible]
Use Charge Structure

[illegible]

Based on AMPV (line 1) and use charge structure, calculate your average monthly use charge total. Do not forget to correct the print volumes per unit by (line 11). $______ (29)

Supplies Cost

	I	II	III	IV	V	VI
Supply Item	Unit Packaging	Yield: Prints per Package	AMPV (line 1)	Packages per Month (III ÷ II)	Best Price per Package at Monthly Quantity	Supply Cost per Month (IV x V)
Toner						
Ink						
Developer						
Fuser						
Drum						
Filter						

Total Supplies Cost (sum of column VI) $______ (30)

[illegible]
[illegible] (line 21 ÷ line 1) $______ [illegible]
[illegible] (line 26 ÷ line 1) $______ [illegible]
[illegible] (line 27 ÷ line 1) $______ [illegible]
[illegible] (line 4 ÷ line 1) $______ [illegible]
[illegible] (line 30 ÷ line 1) $______ [illegible]
[illegible] $______

* Intelligent copier/printer

Source: C. A. Pesko Associates, Inc.

Pesko is president of C. A. Pesko Associates, Inc., a Marshfield, Mass., consulting firm specializing in the intelligent copier/printer field.

Update

IBM marshaling resources for printer mart offensive

By Glenn Rifkin
Update Editor

"IBM is getting very serious about hard copy," states Maureen McManus, manager of the printer market program for Framingham, Mass.-based International Data Corp. Indeed, IBM is no stranger to the printer business. Big Blue's band printers have been staples in DP centers for years, and its ultra-high-speed 3800 laser printer ushered that technology into the DP shop.

But now, IBM is gearing up to enter virtually every area of printer technology — from the high end to the low end, from impact to nonimpact — and that will undoubtedly spell trouble for many in the printer business.

Those with perhaps the most to fear are the Japanese printer makers in the low end of the impact and nonimpact marketplace. IBM has fully automated two of its manufacturing plants, in Charlotte, N.C., and Lexington, Ky., and is ready to turn out commodity products similar to what vendors like C. Itoh Electronics, Inc., Epson America, Inc. and Okidata Corp. have done so successfully for the past five years.

"IBM is going after the Japanese with a vengeance," says Charles Pesko, president of C. A. Pesko Associates, Inc. "And if anyone can compete with the Japanese, it's IBM."

It is at this low end, the personal computer printer market, that IBM will have the most impact. After being an OEM for Epson printers for several years, IBM decided it would be more profitable to go into the market alone. "IBM views the personal computer-related printer business as one of opportunity," says Dan Perez, manager of peripherals marketing in IBM's National Distribution Division. "The fact that in the last six or eight months we have announced four printers, at least three of which are totally developed and manufactured by IBM, is a visual expression of our commitment."

Perez

In May, IBM introduced its $549 Proprinter, a serial dot matrix unit that operates at three speeds and can be used for single-sheet or continuous-feed paper, multipart forms or envelopes. The Proprinter was designed and is manufactured at IBM's Charlotte facility.

The company also introduced the $745 Color Jetprinter, a buyout from Canon U.S.A., Inc. that uses four ink-jet nozzles to create seven colors for charts, graphs, spreadsheets or high-quality text. At the low end, IBM also offers its compact printer for $250; the $1,396 Quietwriter, which uses thermal transfer technology; the $1,795 Wheelwriter, a fully formed daisywheel printer with an integrated sheet feeder device; and a $1,995 color graphics printer, an impact printer that also originates from outside the company.

According to Pesko, IBM will add to its strength with a tabletop laser printer in the near future. That product, when it appears, is expected by some in the industry to do for desktop laser printers what the IBM Personal Computer did for personal computers.

As IBM gears up for the low end of the market, consultants expect a bloodbath for many of the smaller printer vendors who will simply not be able to keep up with the volume pricing of which IBM will be capable.

"A lot of companies will fall by the wayside because of IBM," McManus says. "Price erosion is just beginning."

Price/performance driving the market

Perez points out that he expects price/performance levels to drive the market. "Implicit in price/performance is reliability," he states.

"People want machines that stand up over a long period of time and require minimal repair. . . . the printer is really nothing more than the output extension of a computer and what you don't want is to be impacted on the computer end because of the output device."

IBM also has a strong interest in middle and high ends of the printer business. According to Jack Smulovitz, IBM's impact printer products development planning manager, the company has migrated all of its impact machines into band technology.

Having recently introduced its 4245 band printers [CW, May 13], with Models 12 and 20

See IBM UPDATE/22

PRINT from UPDATE/16

to draw praise.

"Lasers will get a considerable amount of pressure and competition from ink jet as ink jet finally gets the bugs out of it," says Steiner of Dataquest. "It will offer color more easily and cheaply than laser [does]."

"It's a fabulous technology," Dower adds. "But I'm not convinced it is going to sweep the country by storm."

Although it has a high-level print quality and can run at fast speeds, ink-jet printing has had minimal market penetration to date. There is still a question about its sensitivity to the media on which it prints — on rag or ground-wood-type paper, the ink tends to spread a bit before it dries — and reliability continues to be an issue.

Nonetheless, ink-jet printing has mustered enough support from major vendors such as IBM, HP, Epson and Diablo Systems, Inc. that it cannot be ignored. The technology got a big boost in 1984 when HP introduced its Thinkjet printer, which was priced so low ($495) and had such good print quality that the industry sat up and took notice. IBM put its stamp of approval on the market this year with its $745 Color Jetprinter, which it purchased from Canon.

HP's Ulfers points out that his company has made a strong commitment to ink-jet technologies, even more than it has to laser technology.

Although ink-jet printing has been tried at every end of the market, its strength appears to be at the low end. Diconix, Inc., an Eastman Kodak Co. subsidiary, is marketing a 20 page/min machine called the Office Ink Jet, and Dataproducts just announced a joint development agreement with Exxon Enterprises Printing Systems to produce a business computer printer using ink-jet technology. But it is unlikely that the data center market will face a rash of ink-jet products.

"Ink jet could become a major player," Dower says, "but the jury is still out."

Thermal transfer

This technology has gained significant attention at the low end of the market because it is extremely inexpensive. Okidata, for example, offers its Okimate 20 for less than $300.

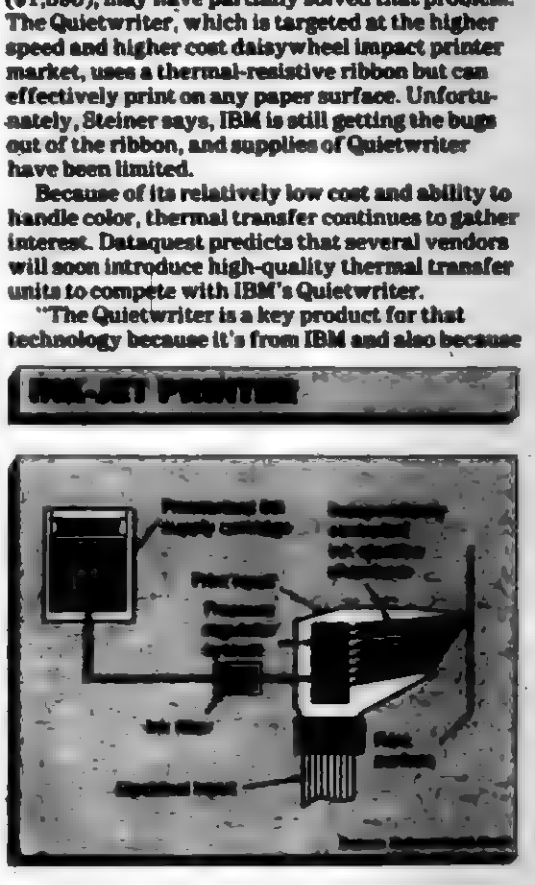
Unfortunately for thermal transfer technology, it generally requires the use of special thermal paper or, in some cases, a special thermal ribbon. That may be its biggest drawback. "One thing history has shown in the market is that users will do anything to avoid using special paper or supplies," Dower says. "They want to get paper out of the drawer and use it."

IBM, with its recently introduced Quietwriter ($1,395), may have partially solved that problem. The Quietwriter, which is targeted at the higher speed and higher cost daisywheel impact printer market, uses a thermal-resistive ribbon but can effectively print on any paper surface. Unfortunately, Steiner says, IBM is still getting the bugs out of the ribbon, and supplies of Quietwriter have been limited.

Because of its relatively low cost and ability to handle color, thermal transfer continues to gather interest. Dataquest predicts that several vendors will soon introduce high-quality thermal transfer units to compete with IBM's Quietwriter.

"The Quietwriter is a key product for that technology because it's from IBM and also because it can print on rougher surface paper," Steiner says. "You'll see more and more thermal transfer products like that in late '85 or early '86."

INK-JET PRINTER



Ion deposition

Ion deposition — another "new" technology that is actually 10 years old — has recently begun to win a small band of converts. Ion printing is a relatively simple procedure that uses an ion projection cartridge that produces an electrostatic image directly on a dielectric drum by projecting an array of charged particles. Characters are formed when the particles are projected in a dot matrix pattern to the rotating drum's surface.

Unlike lasers, there is no rotating mirror to direct the laser beam, and less heat is generated. There is also no toner recovery system (ion printing has a reported 99.7% toner transfer), and the drum is hard and durable (see chart Update/23).

With fewer moving parts and no need for a specialized environment, ion deposition printers have several advantages over lasers. Delphax Systems, Inc. of Westwood, Mass., which holds all proprietary rights to the technology, is trying to cash in on these advantages.

Delphax is an outgrowth of Dennison Manufacturing Co. of Framingham, Mass., and Canada Development Corp. and was set up to market ion printers and sell ion printer engines to OEMs. Several firms have bought into the technology, including Xerox, which recently purchased Canada Development's share of Delphax and plans to introduce an ion deposition printer in August.

Ion deposition currently targets the data center. Delphax markets its S6000 printer, a 60 page/min machine, to centralized environments and is ready to announce a 90 page/min version soon. Southern Systems sells the Mercurion 1, which uses the Delphax engine, to data centers.

"The response has been excellent," says Don Dooley, national sales manager for Southern Systems. "We've shipped 300 machines in two years, and we have the largest base of ion deposition machines out there."

Ion deposition printers — although incapable of duplex printing — are reportedly more

See PRINT UPDATE/19

PRINT from UPDATE/18

reliable than laser printers because they have fewer parts and procedures and cost less. The Delphax S6000 costs $60,000 to $80,000.

"[Ion deposition is] a potential player," Pesko says. "It can cover a broad range of applications in the centralized environment."

For Delphax, Xerox's interest has been a boon.

"Having Xerox as an investor certainly legitimizes the product," says Mark Casey, a product specialist at Delphax. "People realise that it's not some perpetual motion machine we cooked up in the garage."

Magnetographics

Magnetography uses magnets instead of lasers to create the image. These printers use a thin-film magnetic recording head to generate dot images on a magnetically coated drum. The head uses specially designed elements that let the printer place dots close together without magnetic interference.

As the drum rotates, it contacts dry monocomponent toner that adheres to the magnetic images. These images transfer to plain paper, and the printer heat fuses them to ensure that characters are sharp and distinct.

Consultants consider this technology, along with ion deposition, the most promising of the new printing techniques. Magnetographic printers have an advantage over other nonimpact machines in that they can store their own images and duplicate at faster speeds.

The market has been slow to accept this technology. Only Ferix Corp. in Sunnyvale, Calif., and Cynthia Peripherals, Inc., the U.S. subsidiary of Compagnie de Bull in France, sell magnetographic printers. Their products, like those of Delphax, are aimed at the high-speed market. Ferix, however, has encountered difficulties and recently laid off half its work force.

"They are at a stage a lot of start-ups get to. They are two steps from what might be success, but it gets very expensive," Steiner says.

The buying decision

Deciding what printer to buy used to be relatively simple for the DP manager. The technologies were few and clearly differentiated. Price/performance determined the selection, and like all peripherals purchases, the decisions were never considered high priority or critical.

Today, the buying decision is considerably tougher, and the lines between technologies have blurred. The questions that a buyer must

See PRINT UPDATE/23

COST from UPDATE/17

the recommended print volume and dividing it by the total number of prints produced theoretically if the machine ran constantly. The highest duty cycles are in the centralized environment and average about 35%. A few vendors go as high as 45%. Higher duty cycles are a feature of impact printers.

Multiple units. The end user's decision on how many units of a printer are needed is based on volume requirements, acceptable downtime and cost of ownership. In many cases, these price structures offer the intelligent copier/printer user a strong financial incentive to add units rather than to exceed a given AMPV.

Service/maintenance contracts and usage charges. The cost of the individual service contract on each specific system is included in the model. It is recognized, however, that many large end users have blanket contracts, with full-time, on-site personnel servicing a variety of equipment.

The highest level service/maintenance contracts available — guaranteed on-site within four or eight hours — were chosen on the assumption that these systems are used in locations where extended downtime is unacceptable.

Vendors approach usage charges in one of the three following ways:

- Flat rate per "click" regardless of volume.
- Graduated charge, based on volume increments.
- No usage charge. ■

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Hardcard
from **Plus**

Update

JAPAN from UPDATE/5

the Western markets could be served by the same head design.

Thermal transfer printer development was highly emphasized in Japan because of its potential to provide reliable, quiet, low-cost devices with a choice of color or monochrome printing. The U.S. market did not respond quickly to the thermal printer offerings because of the smooth paper required. IBM, however, responded to the challenge by introducing the Quietwriter printer.

The Quietwriter uses a different approach to thermal transfer printing called thermal resistive ribbon printing, in which the ribbon and not the head heats up. Also differing from the Japanese approach, IBM's thermal resistive ribbon, rather than the traditional waxed-base ink, transfers thermoplastic to paper.

IBM was able to use the thermal resistive ribbon approach, coupled with a complex head design, to print high-quality text on a wide variety of common office paper types. Japan is responding with several new products. Okidata has been successful in opening the low-cost personal thermal transfer printer market with the Okimate series offering color at a very reasonable price.

The latest Japanese influence on the U.S. printer market has been in the lower speed segments of laser printers. Canon U.S.A., Inc. certainly broke this market wide open with the introduction of the LBP-CX. The popular Laserjet printer from HP is based on the Canon print engine.

Prior to Japan's entry into the laser printer arena, there were no offerings less than $19,000. Now the price for 8-page/min laser printers averages approximately $2,800 for text-based devices. Dataquest expects these prices to drop to approximately $2,000 by mid- to late 1986.

Most of the Japanese influence on the U.S. printer market has been concentrated on the lower speed, high-sales volume devices. Japan has become a formidable competitor in this market.

Several U.S. vendors have successfully responded to the challenge, but Japanese firms claimed more than 70% of personal computer printer shipments in 1984. They brought cost-effective printing devices to personal computer and distributed processing users.

At the high end, Japan has had little or no influence on the higher speed electronic printer market in the U.S. To date, these market segments have not offered the opportunity for volume or mass-production cost savings.

The level of support required in these high-speed markets is also a barrier to entry, and Japanese vendors would have to have a much stronger U.S. presence to create a solid image in the market. Overall, however, there is no discounting the immense effect Japan has had on the electronic printer industry in the U.S. and in the world. ■

IBM from UPDATE/18

capable of speeds of up to 1,200 line/min and 2,000 line/min, respectively, IBM has a fully granular product line to offer.

At the top is the 4248, which operates at 3,600 line/min, and at the lower end, the 3262 and 5262, each with speeds of 650 line/min.

When announcing the 4245, IBM also announced a 25% price reduction on the 4248 and a one-year warranty on both the 4248 and 4245 models.

"That is a key point because we feel it is a statement of leadership and quality from our standpoint," said Smulovitz about the warranty.

In the middle and high-end areas of the nonimpact printer market, IBM continues to successfully sell its 3800 laser printer, a $315,000 machine with speeds up to 215 page/min, as well as its 6670, which operates in the 36 page/min to 80 page/min spectrum.

The company has announced, but not yet shipped, the $28,000 3820, a high-speed laser printer operating at 20 page/min.

Big Blue also markets its $21,000 4250 electroerosion printer for document processing and publishing applications.

For IBM, this blanket coverage of the printer market is aimed at providing application solutions for all its customers. Smulovitz indicated that IBM has no interest in taking sides in the impact vs. nonimpact debate. "The market is application driven," he explained.

"Different technologies address different applications. If you look at the total cost of ownership, nonimpact will have to exceed the price/performance [levels] of the impact printers in order to displace them, and we've just set some very aggressive numbers to shoot at. But there are applications that drive both sides."

Although no one at IBM will get specific, both Smulovitz and Perez acknowledged that IBM is looking into many of the alternative printer technologies. "IBM evaluates any technology that has potential," said Smulovitz.

For the competition, IBM's aggressive stance on printers is essentially no different from its positioning in virtually every other computer-related market. And as the market knows, I-B-M usually spells trouble. ■

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MCMANUS

from UPDATE/14

Kyocera Corp. offer cabinets smaller than a bread box.

Currently, laser technology dominates page printers, with desktop laser printers representing about 99% of the year-end 1984 U.S. shipments of about 38,000 page printers. But many alternatives — such as ion deposition, magnetographics, liquid crystal shutters, LEDs and CRT printers — are emerging to seek a market share in the next few years. At the heart of these machines, the resident controllers and software are becoming more plentiful and powerful, enabling printers of all technologies to perform advanced functions. Vendors are opting for a modular approach, externally sourcing components if necessary, at least initially, to meet their product's market window.

There are three basic components that make up the majority of page printers: the marking engine, controller and resident software. In the past, the market centered around the print engine. The Japanese dominate the low-end, print-engine market, which has essentially become a commodity.

Today the focus and driving forces behind the exploding page printer marketplace lie in the intelligent controller and the software or page generation languages. The raster image processor (RIP) controller houses the printer's intelligence and storage. This computer within the printer performs all the necessary computing — vector-to-raster conversion — and handles the massive amounts of storage requirements needed in generating graphics.

As evidenced in the QMS, Inc., Imagen Corp. and Apple Computer, Inc. controllers, based on the Motorola, Inc. 68000, these are hardy boards in their own right. These internal controller boards enable the host CPU to save its power and memory so that it does not become a slave to the output device. Controllers encompass a wide range of power and capabilities proportionate to price.

In addition to the printer and system makers involved in controller development, such as Xerox, Apple, HP, Imagen and QMS, there have been a number of independents popping up in the last few years such as EMC Corp., Intran Corp., Office Automation Systems, Inc. and Lasergraphics, a vendor that specializes in these rasterizing computers for color printers.

Another highlighted issue in page printers is the emergence of page generation languages. Currently, no real standard has yet been set in this arena, so this will be an interesting part of the market to watch.

The development and digitizing of the typesetting fonts these languages produce is extremely difficult and only two success stories have been written thus far. A few years ago, several former Xerox employees set off on their own and formed Adobe Systems, Inc. in Palo Alto, Calif. They wanted to pursue a purer vision of an interpretive programming language.

That pursuit has resulted in Adobe's Postscript language, which takes a font solution approach — storing its sets as a formula or outline. In this way, they are not locked into addressing every character or size change on a bit-by-bit level, thus saving time and money. Adobe Postscript is both device and resolution independent. Adobe's market is the same one Xerox has been targeting for its Interpress protocol.

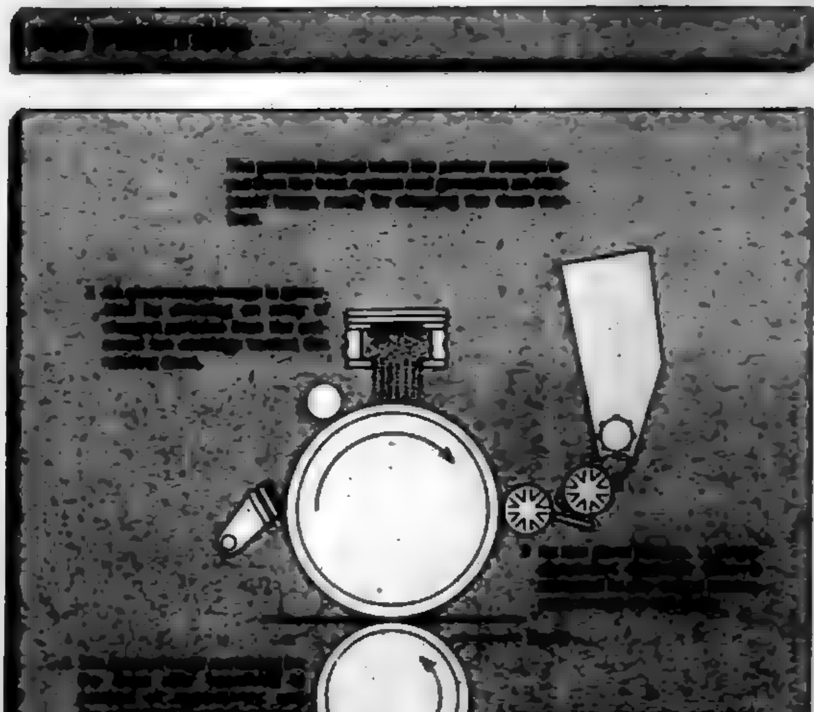
Currently, Apple is the largest Adobe Postscript user. Linotype and QMS have also signed agreements, and other major vendors are reportedly close to reaching accords as well.

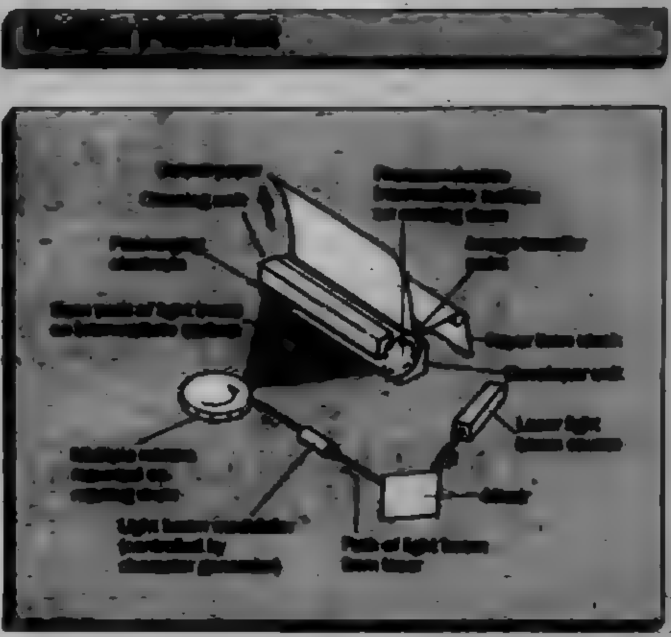
The Xerox Interpress Printing Architecture, introduced in April 1984, incorporates all of the Xerox Network Systems protocols required for printing documents on Xerox printers. The initial layer of these protocols has been publicly available since 1981, and the new Interpress architecture provides a way for different vendors to use common programs to link their products with each other and with a variety of electronic printers. It reportedly allows users to create documents in any layout and combines any number of line graphics, half tones, scanned images and text.

A key element in the Interpress architecture is the Interpress document format language. In the battle between Postscript and Interpress, Xerox has just won a major victory with the announcement of support from 19 companies, including such printer heavyweights as Digital Equipment Corp., Burroughs Corp., Siemens AG, Imagen, Dataproducts Corp. and Interleaf, Inc.

This sophisticated software and components, as stated, are truly the heart of the new wave of nonimpact printers. Depending on the price/performance target market, the wise vendor must carefully match the appropriate pieces at the right time. This requires a lot more understanding, commitment and support in the areas of software, services, distribution, training and marketing of these advanced-function page printers than is required for a volume commercial market of cameras or marking engines. This possibly explains why there has been such a long period of time between the debut of the concept and the shipment of products to the marketplace.

While the Japanese have the technology and marking engines, they do not have, nor do they seem to want, the distribution channels and all the software and support issues that are enveloped with it. Their strength and understanding lie in volume production. They can bring to market a mechanism but not the solution that is needed. Thus the focus on intelligent controllers and page generation languages brings, at least for the time being, the attention and money back to an American market.





It was Apple with its $6,995 Laserwriter that put all the pieces together with their 68000-based RIP controller and the adoption of Postscript. In a way, the Laserwriter may have already performed its most important market function by promoting user awareness and feeding off the business ego.

Once one end user distributes his presentation, generated on a Laserwriter-like device, to the board of directors, you can bet that is how fellow workers will prepare their reports next month. The Laserwriter is only the first step in a new generation of products that will be faster, more functional and capable of much greater volumes, which enables them to operate as shared resource printers. Nonimpact page printers will change the way business views and accepts its hard-copy output. ■

PRINT

from UPDATE/19

ask have not changed; there are just more of them on the list.

The No. 1 question, consultants and vendors agree, is, "What application do I have to fill?" The application, more than anything else, will dictate where the buyer looks. For the high end, price/performance along with speed continues to be the major concern.

Another question is whether to go with cut-sheet paper or continue with old-style fanfold paper. Currently, graphics and color are still considered luxuries, but according to HP's Ulfers, those features will become mandatory within a couple of years.

In decentralized environments and office settings, print quality, noise, ease of use, reliability and volume are paramount. A major concern for DP managers is putting the right machine in the right location. Overuse or abuse is a serious problem for users who are constantly frustrated by continuous downtime. Although vendors are pressing their sales representatives to point out the correct volumes and uses of their machines, abuse continues and often gives products an undeserved bad name. Temperamental machines, on the other hand, will inevitably begin to gather dust as users shy away.

Although impact printers are expected to remain a viable technology, most industry watchers anticipate that the next generation of computing will turn almost exclusively to the sophisticated, nonimpact offerings. If it comes to pass, it will require a lot of sociological changes, according to Ulfers. Until then, the paper chase will continue. ■

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IN DEPTH

Three views of voice/data integration

In the new world of voice/data integration, experience is crucial. These three have it. David Rappaport, a partner in Arthur Andersen & Co., is responsible for the firm's telecommunications consulting practice worldwide. Ralph Krichbaum, manager of technical consulting at Westinghouse/CSI Communications, provides corporate guidelines and consulting on networks and equipment. Roy Weber, director of the Systems Architecture Center at AT&T Bell Laboratories, oversees the user-interface layers of AT&T's evolving Systems Architecture.

The three were brought into dialogue by Intech, the integrated information technology conference to be held Aug. 26-29 in San Francisco. Rappaport, Krichbaum and Weber will be speaking on voice/data integration, one of five subject areas at this conference, sponsored by National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

ILLUSTRATIONS BY ALAN HOPKINS

Rappaport: Integrating voice and data consists of three almost independent submarkets. I'll call them the workstation market, the office equipment market and the network market. What mix of markets a corporation decides to use is really triggered by the impetus it has in integrating voice and data.

The network market is probably the one that receives the most attention because there are tremendous savings available by integrating voice and data, either by putting in tie lines, sharing Wats lines, going to full digital T1 or the like.

The Consultant
David Rappaport
Arthur Andersen & Co.

The office equipment market is the local-area network or private branch exchange. The impetus there is reduction in wiring costs and increased flexibility in the office.

Then, finally, there's the workstation market. Here the benefit is productivity improvements and not so much hard dollar savings. We have coming on the scene integrated voice/data workstations — personal computers with special boards in them.

The User
Ralph Krichbaum
Westinghouse

Krichbaum: I can tell you where Westinghouse has done things. In the network area, we have implemented digital facilities wherever possible. We use T1s, microwave and CATV for up to 15 miles or fiber optics where we can get it from the local telephone company.

We're also doing a lot of work in the local sites. For a number of years, we have advocated the installation of six pairs of wires from the wiring closet to each workstation when we install a new PBX. These terminate in two miniature six-pin telephone jacks, one for voice and one for data.

Rappaport: In installing your systems at Westinghouse, where were the big paybacks?

Krichbaum: The T1 between Orlando, Fla., and Pittsburgh is a case in point. It eliminated 38 analog voice circuits, each using 32K bit/sec., and five 56K bit/sec. [AT&T Dataphone Digital Service (DDS)] circuits. The data lines cost more than $6,000 each, and the voice circuits cost a little more than $1,000 each. The T1 cost $28,000 per month, and termination gear, amortized over four years, came to another $2,000 a month. We ended up cutting costs in half.

The big advantage of the T1s is that if you need an additional 56K bits — in our case we're using 32K bits for voice — you get two analog private lines from the telephone company, and that's essentially your cost for 56K bits.

The Vendor
Roy Weber
AT&T Bell Labs

Rappaport: So you not only save money, but you increase your long-term flexibility?

Krichbaum: Absolutely; flexibility is key. This business is so volatile that we try to maintain as much flexibility as we can.

Rappaport: Roy, from the AT&T/Bell Laboratories perspective, where is integrated voice/data going?

Weber: I come at it from the networking perspective. Integration of voice and data can vary all over the place. The simplest form is a point-to-point, 1.5M-bit facility with a fixed-channel assignment of circuits. Currently, 32K-bit coding of voice is an important option. Such configurations are economically attractive when you have some data circuits to go along with the voice circuits. The concept of inventorying bandwidth for flexibility and disaster recovery is also important.

One can be a lot bolder. You can certainly integrate access to a long-haul carrier service node and fan out that access to various services in a static way, a reconfigurable way and ultimately, with ISDN [Integrated Services Digital Network], in a call-by-call way. Certainly, integration goes to the terminal level as well. It exists in pre-ISDN terminals and now with some advanced personal computer packages.

The key that everyone is searching for is the application-level integration of voice and data. Corporations shouldn't be concerned only with an individual facility or a single application. Many companies are doing the wrong thing when they build application-specific networks that turn out to be inflexible. These networks can't grow, and hence, the companies get themselves into trouble.

Integration networking is critical. The use of a 1.5M-bit backbone network with overflow to public networks, integrated operationally, makes a lot of sense.

Rappaport: Where are we in implementing that spectrum from T1s to full ISDN? What is the time frame? And where does the small user fit in? Doesn't the small user get integrated voice/data just by sharing his Wats line in a pure dial mode?

Weber: Absolutely. Wats and 800 service are used for data as well as voice. That's integration almost at a trivial level, but it's certainly important. T1 facilities are used extensively by major customers for integrating voice and data, certainly on a fixed, point-to-point basis. One can get a 1.5M-bit access facility and then fan out the access channels to a set of special services.

In addition, with customer control and reconfiguration capabilities, one can reconfigure the resulting networks. That's being planned by people who are very interested in things like disaster recovery, where you have a backup host computer to which you want to redirect your entire network in minutes.

This all exists today. What we're going to see is that kind of access technology being applied to the public switched services as well. In fact, it has all been developed and is in the tariff process right now. Within the next year or two, we're going to see the introduction of ISDN capabilities where you can do call-by-call assignment of channels. It's going to take awhile for that to penetrate and for people to start using ISDN protocols and the like. I think we'll see the introduction of ISDN within the next year or two, both in network and terminal-type products.

Rappaport: When we're talking about integrating voice and data, planning becomes critical. One has to take the broad view of the communications needs of the business, how we can fill those needs cost-effectively and even, to some extent, how we can use communications to give us a competitive advantage over others in our industry.

Most companies are just starting to become aware of this need for long-range planning and find they are suffering from the stumbling block of decentralized communications management, where data communications is managed in one group, voice communications is managed somewhere else and text somewhere else.

What do you see as the direction corporations should move in when they find this problem? How do we get around the organizational or political hurdle to use technology effectively?

Krichbaum: About five years ago, data communications was rolled in under corporate communications. When the Westinghouse Productivity and Quality Center was formed, the corporate telecommunications department became a part of the Corporate Systems Integration (CSI) department. As the name implies, CSI is responsible for promoting the integration of all technologies, especially electronic, as they are used in the factory and the office.

The plan that we are currently implementing — the installation of communications hubs at Westinghouse sites around the country, connected by T1 facilities to the Communications Service Center in Pittsburgh — was justified by the combined requirements of voice and data. Most of these hubs house a voice tandem switch, a corporate packet switch and data multiplexing equipment. Shared use of power transmission facilities, equipment rooms, backup power and support personnel permitted the required cost justification.

The corporate packet network permits us to combine the separate transaction networks that connect users to the computer centers supporting the many Westinghouse businesses. With small packet switches overseas and connections with the public networks, we are able to support our international users as well.

What we would like to see for local-area networking is every terminal tied into a packet assembler/disassembler (PAD). We would like to see that at 64K bits, but today those PADs aren't available. We really believe that would be an optimum network because addressing is a big

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problem, in this corporation at least, and with a packet network, you have a built-in addressing scheme.

Weber: Packet switching is a very important technology to solve the application-specific network problem. Such networks usually consist of many multipoint private lines scattered all over the country. When the corporation tries to grow new applications, they find these networks are inflexible. Frequently we recommend packet-type technology. For intercorporate communications, packet is ideal.

Krichbaum: Another big advantage is that when you start an application, you don't have to connect it directly to a private packet network. You can use a public packet network to get to a private network.

Rappaport: Roy, what do you see the companies you deal with in the industry doing to get around the political barriers for planning and integrating voice and data?

Weber: Some are doing it effectively, and some are not. Some still play the territorial game of one person managing the computer center and another managing voice communications. They're losing out to their competitors, who have effectively gotten over that. People who have put telecommunications into the core of the company's business, as opposed to just using it as an auxiliary function, seem to do the best.

Rappaport: The ones who are successful today have attacked a business problem rather than using technology just to clean up here and there. What is the situation at Westinghouse in terms of getting over territorial problems? What plan do you have?

Krichbaum: We have the five-year strategic plan, which is to go as much as possible to digital. Early next year it's our plan to implement an essentially Class 4 office that will be ISDN-compatible. So we're looking at a central-office-type switch that will handle digital facilities in multiples of 56K or 64K bits under ISDN.

The plan is to provide dedicated circuits where we have some very high bandwidth requirements. In CAD/CAM, for example, the voluminous data that goes to the high-resolution screen doesn't lend itself too well to the packet, so we tend to do that by multiplexing.

Rappaport: What is driving this five-year communications plan at Westinghouse? Are there strategic business advantages that you see?

Krichbaum: We have a corporate electronic mail system, a voice mail system, and quite a few vendors and suppliers on that system. It really enhances our ability to communicate with our suppliers and customers. We are providing customers with a way to look at our inventories in our warehouses. We have customers that submit their orders to us by terminal. Good customers can find out for themselves when delivery could be.

Weber: That's exactly what I was talking about. That gives you an advantage over a competitor who is just trying to save costs and is not looking at those opportunities.

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> ***Corporations shouldn't be concerned only with a single facility or application. Many companies are doing the wrong thing when they build application-specific networks that turn out to be inflexible. These networks can't grow, and the companies get into trouble.***

I have an example that might shed light on some of the opportunities strategically and technically. A large customer with many locations scattered through the country had a data network that was the essential to the running of its business. If there were any failures in the data network, the customer was out of business. The customer also had a significant need to manage incoming calls.

We designed for them a backbone Electronic Tandem Network (ETN) built out of 1.5M-bit transmission facilities. The voice load allowed a triangular configuration and left room for data to ride free.

The triangular design meant that every one of the hub locations had two ways to get to every other location. We therefore had a very reliable data network because of the integration with voice. Traffic from smaller locations and overflow from the large locations were served by a software defined network. We then integrated that network and the ETN operationally together.

Rappaport: As I understand it, in putting that network together, you created a PBX-based ETN with backbones using T1s. Do both voice and data flow through the PBX?

Weber: Data doesn't necessarily have to flow through the PBX. You can have a front-end system that separates the voice and data. Facility switching within the network provides an additional opportunity. We use a device called a Digital Access and Cross-Connect System to allow the customer to reconfigure its backbone network.

Rappaport: In this example, you integrate voice and data in a circuit-switched or circuit allocation style. Before, we were talking about packet switching as the optimum. How does one choose which to use?

Weber: It depends on the application. Packet switching is good for certain things, but this particular customer had a very big data need focused on a single host computer. For this customer, there were some auxiliary functions where packet switching made sense, but for the bulk of its needs, statistical multiplexing onto a reconfigurable channel network was ideal.

Rappaport: In looking at circuit switching vs. packet switching, voice drives us to channel allocation or circuit switching because we don't have packet-switched voice. Do you see a packet-switching environment whereby we would truly integrate voice and data in that type of environment?

Weber: Absolutely. We have some very aggressive exploratory work under way at Bell Labs to understand how we can become more flexible in the management of bandwidth. That implies you have to deal with voice, because voice uses a lot of bits.

We have prototypes of packetized voice equipment; we are certainly not using traditional packet switches and X.25 protocols. We integrate data and image with the voice. That kind of thing is working in the laboratories today — in fact, there is a field trial under way where we're tying several AT&T sites together.

We're taking a careful look at how we grow the ISDN capabilities and take advantage of this technology when it's ready. While I'm not promising that the service will be introduced within the next few years, we are looking aggressively at the technology.

Krichbaum: I think you can see the pieces of that in many places. First of all, we're using four times as many bits for voice as we need because we want to handle dial-up data on the voice network. If all you're talking about is faithful reproduction of voice, 16K bits is easily attainable, and Bell Labs has had that capability for a number of years.

You mentioned before having triangular circuits so that you always have redundancy. We do that in our packet network and, to a lesser extent, in our voice network. One of the advantages of packet is that the switches and the design of the system will automatically switch if you lose a circuit. In the voice and more conventional multiplexing world, you have to do that manually. You're talking about minutes to make the backup.

Rappaport: Until now, Ralph — with your example at Westinghouse — and Roy — with the example of your client — we've been talking about the big user. How does the smaller user get started?

Weber: Smaller users who don't need or want a big backbone network still have voice and data coming out of their particular buildings. The ability to integrate access to a long-haul carrier or to a local operating company using a 1.5M-bit facility will be important to them. You can break up the access and have one of those channels access a packet service, another channel be part of the private line, another be a Wats line and another an 800 line.

If you're much smaller, then we're talking about the basic-rate ISDN rather than the primary-rate ISDN. Centrex and key system-like services, with an ISDN interface, will also be an option. There are certainly some pre-ISDN capabilities now in things like local-area data transport that the divested Bell operating companies are deploying.

Rappaport: As a prerequisite for them to take advantage of this environment, are we saying then that they need to position themselves by selecting a voice/data PBX, one of the third- or fourth-generation PBX, as a basis to get started?

Weber: That's desirable. It depends on the size of the customer.

Krichbaum: My feeling is that ISDN is going to be very viable around 1990. We're going to have a corporate ISDN before that. Today you can buy a PBX, and while it might last more than five years, you certainly shouldn't plan for a life of more than five years. Within the next couple of years, anyone who buys a PBX without vendor commitment to support the ISDN capability is backing himself into a corner.

Rappaport: Are you talking about the commitment to support the I-series international standard? Are we going to see those standards implemented in the U.S.?

Krichbaum: We're seeing the international and North American standards coming together. We still have a difference in the standards on the size of the T1. The international uses 32 channels, 30 of which are usable. In North America, you use 24 channels, 23 of which are usable. It's a world market. The need is to communicate worldwide.

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AT&T wants to sell internationally, and the Japanese, as well as Europeans and some others, want to sell here. As a matter of fact, I think it's part of the European plan to try to implement ISDN as quickly as possible so that their local supplier can perhaps get a step up on the North American suppliers. We may see an attempt in some foreign countries to get to all-digital ISDN service as quickly as possible.

It's my opinion that we're going to see a world of communications-rich areas and communications-poor areas. I don't think we can export digital technology to those places where we can't get DDS today.

Weber: You're going to see AT&T supporting those standards both from the customer premises equipment and the network sides and in the product side that we sell to other communications companies. That's a corporate commitment. We're very active in the international bodies that are shaping those standards. We're designing, building and defining services that make use of the ISDN standards.

Rappaport: We've talked about a lot of things in the late '80s or 1990s time frame.

Weber: I disagree. We've also talked about some here-and-now products and services.

Rappaport: Certainly the pace is picking up speed in this area. It's volatile, both from a technology and a regulatory perspective. The things people are doing today are cost driven and are therefore susceptible to the vagaries of the tariff structure. Could we be putting in things now that we're going to be stuck with in two years and that are no longer economical?

Krichbaum: One of our axioms is that we maintain a flexible position. There are alternatives. AT&T provided T1. MCI now provides it. There's a lot of fiber optics being designed to go into the ground. It's like satellites — I don't believe it all will be put in, because there's a lot of redundancy. Satellites are a viable alternative. We would prefer to stay terrestrial because satellites have delay problems that in voice you cannot get around and in data that you can get around only with extra effort.

The digital direction is driven by the fact that the price of memory comes down 30% a year and the price of logic comes down 25% a year. It's so inexpensive to make digital devices. The direct product cost is less than the design cost for some of the smaller vendors. We feel that the digital direction is going to take over. We believe that, standards aside, the basic environment is going to force it.

Rappaport: Are you saying you can move with changes in tariff structures and in the technology?

Krichbaum: Yes. Our basic objective is to maintain flexibility. Our long-range objective is to take advantage of the cost savings and capability offered by the new technology, and our short-range objective is to provide for the corporation's communications needs in a cost-effective manner.

Historically, we have invested in the people and tools needed to manage our networks. We have lived in a mixed-vendor environment for more than a decade.

We believe ISDN will be a fact. The desire of the communications vendors to get their users to spend more money is there. There's also the desire of the users to do things such as full-motion videoconferencing. It's a question of when, not whether.

Rappaport: So the needs are there, but we just haven't made it economical to implement?

Krichbaum: It's a chicken-and-egg situation. Packet-network PADs don't have 56K- or 64K-bit ports today. Most terminals won't communicate at 56K bits because those facilities haven't been available. But now there are PBXs at a site to permit you to communicate at that speed. It won't be too long until we'll see those speeds for IBM Personal Computers and many other devices. Transmitting at 56K bits doesn't take much more capacity than transmitting at 300 bits.

Rappaport: What about the workstation? Today we see terminals with certain telephone facilities or personal computers with telephones attached. These are made either by adding a board to a standard personal computer or by producing a new stand-alone unit. However, few applications exist to take advantage of that integration.

Krichbaum: While we plan rather far ahead, we're up to our ears trying to implement what people want today. We don't get a lot of requests for that. I'm on a number of committees where we look at those areas, but we don't see the payback; we don't see users even thinking in that direction.

Weber: There are some early forms of integrated voice/data applications, but certainly a lot more maturing is needed. Already in existence are applications such as unified messaging, where voice mail, electronic mail, station callback and message center services have integrated alerting and retrieval functions.

I see these things beginning, but clearly we have a long way to go. I believe there will be lots of integrated voice/data applications coming out of the woodwork once we have the technological foundation.

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   Types of equipment with which you are personally involved either as a user, vendor or consultant. (Circle all that apply)
   A. Mainframes/Superminis
   B. Minicomputers/Small Business Computers
   C. Microcomputers/Desktops
   D. Communications Systems
   E. Office Automation Systems

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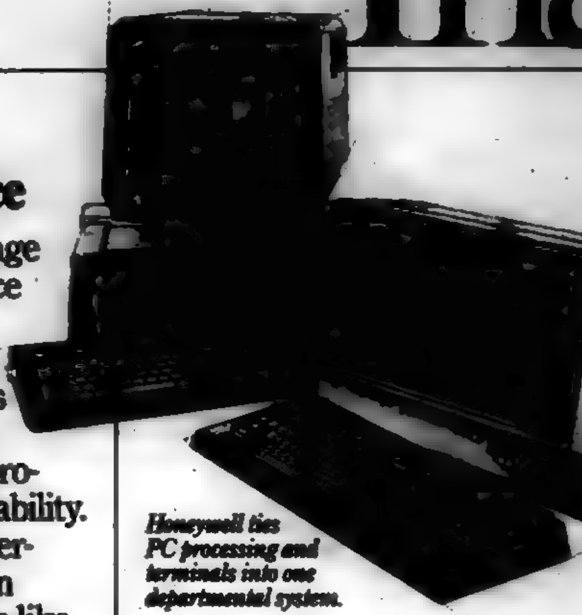
COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

[illegible]

Honeywell has better office integration than Wang or IBM.

That's right.



Honeywell ties PC processing and terminals into one departmental system.

Introducing The Honeywell Office

Honeywell is about to change the way you think about office automation.

Because standalone and non-compatible product lines aren't enough to provide the most dramatic increases in productivity and corporate profitability.

The biggest increases in performance can only come from office automation capabilities like integration and networking that allow all systems to "talk" to each other—which is why we designed The Honeywell Office.

The Honeywell Office integrates office processing, data processing, networking and communications, and distributes these resources across a single, compatible product line of micros, minis, and superminis.

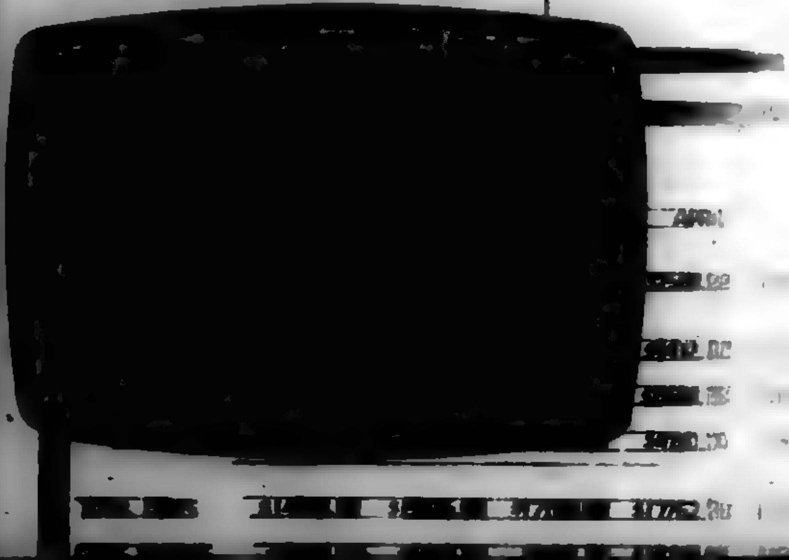
It's the reason why one customer credited our approach to office integration with helping to increase sales by 50%.

Here's how The Honeywell Office can help you manage and direct your information resources more efficiently.

Unsurpassed Office Processing

We started with competitive word processing in virtually every area and developed superiority in the crucial area of file management.

INFOCALC, our three dimensional spreadsheet, lets you merge financial data and text.



But we didn't stop there.

We integrated decision support tools and distributed networking capabilities so that your departments can transfer, share, and combine office and data processing information with simple commands. Without unnecessary steps. Without costly duplication of efforts.

InfoCalc, our integrated spreadsheet, lets managers access information from the department across the country as easily as the sales office from across the corridor.

There is also a database management capability that allows professionals to set up their own departmental databases.

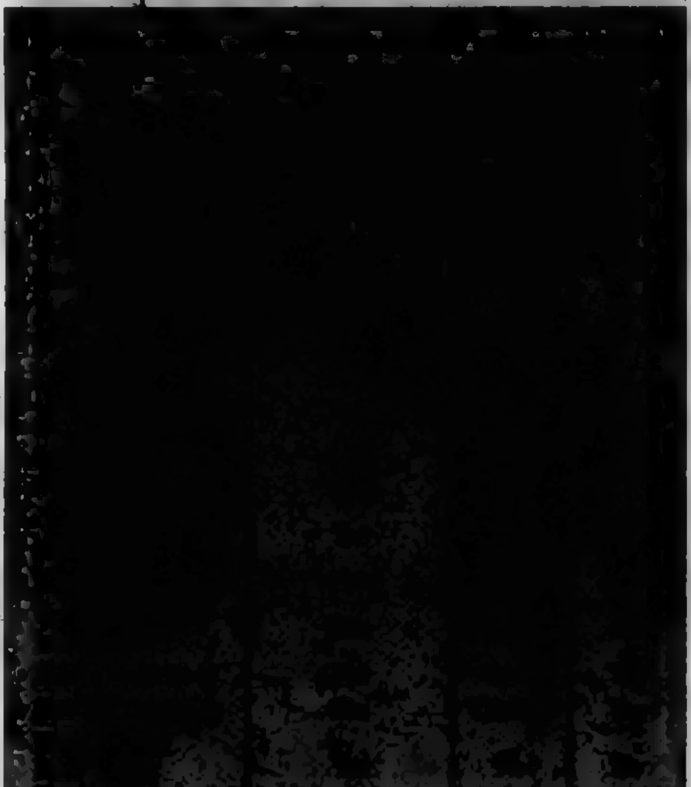
And that's only half of it. The other half is how *well* it integrates the office side of your business with the data processing side.

Flexible Data Processing

No word processing vendor can integrate the extensive array of data processing products you'll find with The Honeywell Office.

The Honeywell Office provides unrivaled flexibility by combining office and data processing into one distributed, departmental system. It supplies integrated transaction processing, database management, program development tools, query and report, data entry and specialized industry applications.

So now your accounting, marketing, and other departments can access and control their information.



*Over 2000 installations.

And when it comes to writing new applications, we offer a full complement of programming languages that include BASIC, COBOL, FORTRAN, ASSEMBLY, ADA, C, RPG, and PASCAL.

Quite simply, The Honeywell Office gives you a better growth path, stronger database management, and greater systems flexibility than our competitors.

Honeywell.

Advanced networking lets you connect all your departments.

Integrated Networking and Communications

Honeywell expertise in networking and communications helped the Metropolitan Life Insurance Company create one of the largest distributed branch office networks of its kind.

Over 1300 Met Life district sales offices in North America are automated using our DPS 6 minicomputers, linked through an SNA network that supplies reliable branch office-to-IBM host communications.

Unlike competitors who require mainframes for network control, we aren't limited to creating star networks. Our ISO based Distributed Systems Architecture (DSA), gives you the flexibility to configure ring, mesh, peer-to-peer, and other styles of networks.

For local and remote user-to-user communications, our integrated electronic mail helps minimize network costs by letting you route your mail and documents in economical quantities, and prioritizes transmission by time of day.

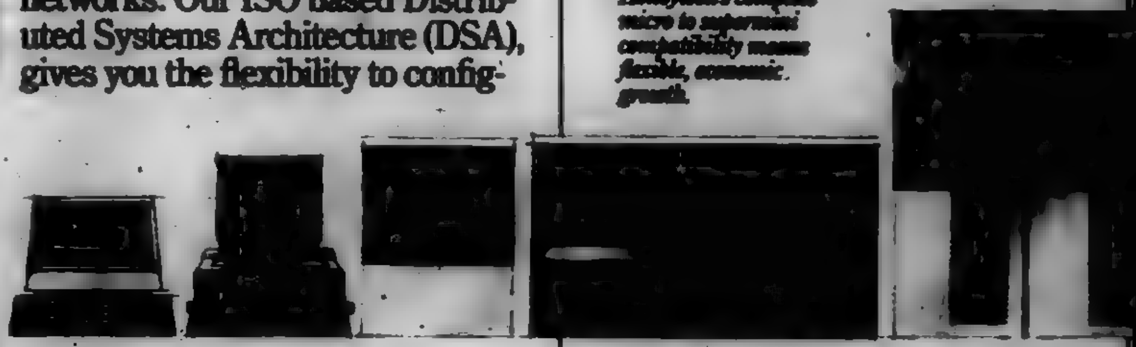
Finally, The Honeywell Office lets you access network services such as CompuServe, Dow Jones, The Source and Weslaw right from your desktop.

Complete Micro to Mini to Supermini Compatibility

From the very beginning, The Honeywell Office was designed for complete compatibility from top to bottom. Compatible hardware. Compatible software. And compatible communications facilities.

One consistent interface is presented to all systems, small and large, permitting the virtually limitless exchange of information. Standard menus and prompts provide major user training benefits. Upgrade options are more flexible and economical because all systems can be linked together.

Honeywell's complete micro to supermini compatibility means flexible, economic growth.



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The Honeywell Office is backed by TotalCare,™ our comprehensive nationwide support program.

Uptime, after all, is everything, and TotalCare™ provides everything you need in programs and services that can be tailored to help meet your requirements.

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The Honeywell Office reflects a strong commitment and adherence to a standard interface, state-of-the-art technology, and a modular, open ended design, so that your office can grow as your needs do.

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(More technology in the tank!)

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You say you've always had very simple tastes? All you ever wanted was the best?

Well, step into our showroom and kick a few tires! We'll show you two programs that are the Ferrari and Lamborghini of VM programs.

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- **Syncsort CMS — the world's fastest and most maneuverable VM/CMS sort program.**

What makes 'em so special? Well . . .

(1) TURBO PERFORMANCE: Have you ever stepped down on the gas in a dangerous driving situation and discovered . . . nothing? Well, that'll never happen to you with these two vehicles.

Both are equipped with our special brand of "software turbocharging." We call it FBT, which stands for Fluid Buffering Technique. Our competitors call it something else.

We discovered FBT one dark and rainy night when we were trying to find a way to speed up the movement of data in sort programs. After crying "Eureka," we applied it to our OS and DOS sort programs. The results were . . . wow!

Now we've carried that bright idea over into VM dump-restores and sort programs. And the results are still wow! Compared to any other backup or sort program clogging the nation's VM thruways today, SYBACK and SyncSort CMS will save you up to:

- **50% in Elapsed Time;**
- **45% in VTime;**
- **55% in TTime;**
- **75% in SIOs.**

So who needs all that speed? You do. If you want to optimize your VM operations, stay out of needless DP traffic jams, and make the boss happy with your throughput.

Here's what happened to one large government agency: Their backup operations used to require a full 24 hours to complete. Then they installed SYBACK. Now their backup takes — are you ready? — one-half hour!

(2) EASY HANDLING: SYBACK and SyncSort CMS are among the most flexible, user-friendly programs ever produced by anybody anywhere. That's one reason programmers love 'em. And where does it say that backup and sort operations have to be hard to be good?

(3) "MISTER SOFTWRENCH" SERVICE: We've got the best pit crew in the business. More than 85% of all customer requests are resolved within 24 hours.

If you'd like to put a little high technology in your VM tank, give us a call. We might even take your used VM dump-restore or sort program as a trade-in!

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SOFTWARE & SERVICES

SOFTALK
John Gallant
CW Senior Editor

Mini software outlook mixed

Events in the microcomputer and mainframe software arenas tend to overshadow trends in minicomputer and supermini software. But, as two recent International Data Corp. (IDC) studies indicate, the minicomputer world is seeing plenty of software action. Even within IDC, however, there are contrasting viewpoints as to the future of mid-range processors — and the software that runs on them.

Recently, IDC's "Software Watch" newsletter pointed out that independent data base management system vendors are coming to see the minicomputer environment as a valuable source of revenue that has been left largely untapped. The IBM mainframe marketplace has been a hotly contested one for the DBMS makers, and observers are suggesting that, while the saturation point is still off in the distance, the IBM mainframe market has been deeply penetrated.

Thus, IDC said, some industry powerhouses have begun to port their DBMS products to the leading minis such as Digital Equipment Corp.'s VAX line or Data General Corp.'s MV 10000, both of which boast a large installed base. According to IDC, 35% of mini sites had installed a DBMS at year-end 1984. But, according to "Software Watch," that figure is deceptively high, because Hewlett-Packard Co. bundles its Image DBMS as part of its operating system. With Image sites filtered out of the sample, only 16% of mini sites had

See [illegible] page 39

Girish Parikh

Published to coincide with the opening of the recent 1985 National Computer Conference (NCC) in Chicago, Girish Parikh's study titled "There is a Fortune to be Made in Software Maintenance," (Shetal Enterprises, Chicago) sheds light on what its author calls the vast opportunities awaiting exploitation in the field of software maintenance.

Parikh, a Chicago-based independent consultant and president of the research and publishing firm of Shetal Enterprises, is an author on the subject of software maintenance. Parikh spent two years researching the study, subtitled "Opportunities in the $30 Billion Software Aftermarket," which he hopes will draw attention to the growing — and increasingly costly — problem of maintenance and the potential career and product openings that exist today.

Parikh discussed the study and maintenance issues in general with Computerworld *Software and Services Editor John Gallant during NCC.*

Do you think conferences like NCC devote enough attention to the subject of software maintenance?
I am disappointed that there were very few sessions at NCC devoted to maintenance. That reflects that the industry is more concerned with front-end, or new development, projects than it is with maintenance. Maintenance is a big subject, but it is not as glamorous as development and advances in areas like artificial intelligence and microcomputers.

It is important for that perception to change. Maintenance should be seen as continuous development. There is no analogy between appliances and software. Software is an intellectual work that should grow and evolve. We need methods and standards for maintenance and a way to transfer maintenance expertise from one professional to others. Maintenance costs industry so much — billions of dollars every year — that we have to come up with these things.

What is the major finding of your study?
I found that maintenance is a wide-open area in terms of research to be undertak-

See PARIKH page 34

SOFTLINE/FRANK SWEET

Understanding flow of records key to DBMS design

Data flows through files like water through an irrigation system. In parts of a data base, records race along in a rush, while in other places they pool into reservoirs with little perceptible movement. Yet everywhere they follow a set rule: Pool time times flow rate equals population.

Records follow a steady-state law. The length of time that records spend in any section times the rate at which records flow into the section is numerically equal to the number of records currently in the section. Data base designers apply this law in all steps of their work, from initial user interviews to physical file design.

Steady-state means that the flow rate of records entering a section eventually equals the rate at which records leave. Say that 1,000 new records are added to a file each month. The file would be in a steady state if, over a year, an average of 1,000 records were removed from the file each month. Some records might be removed soon after being added while others could stay on file forever. If more records were removed each month than were added, the file would soon disappear entirely, thus reaching a steady state with a population of zero. If the reverse were true, the file would quickly reach the capacity limit of the storage medium.

The data base should contain no unidentified data sinks or data sources. Consider a credit-checking procedure where credit applications are funneled into a department for review. If we know that their total backlog is more or less constant from year to year, we infer that just as many emerge each month as are sent in. The only way it could be otherwise would be if somewhere in the department applications were being entered into a data sink, never to be seen again, or if someone were producing new applications internally, which would constitute a data source. Both are unlikely.

Since records out will eventually equal records in, we can use either in computing the formula — whichever is easiest to measure. A typical vendor file may receive new records whenever the firm does business with a new supplier. Inactive vendors are purged once each year. In researching the system, it may be easier to estimate the purge rate than to estimate the number of vendors added each month. And unless the firm is withering away or is in a state of uncontrolled growth, the number of inactive records purged each year will be close to the number of new records added.

The importance of the formula is that given any two of the terms, we can easily compute the third. Given all three, we can cross-check them against each other. The following problem, the case of the pending work orders, illustrates how the formula works.

As part of a materials management project, we were designing a work order reservation system. New manufacturing jobs, represented by work

See SWEET page 40

Sweet is corporate manager of data administration for the Charter Co., a Fortune 100 firm in Jacksonville, Fla. He has worked with major data base management systems since 1970 and is a former president of the national (Cullinet Software, Inc.'s) IDMS User Association.

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PARIKH

from page 33

on and careers to be pursued. No one has really given any attention to the problems involved or to the training that needs to be done.

As a result, we face all kinds of difficulties today. We spend at least 50% of our time on maintenance. Most programmers are not formally trained in maintenance, and our software documentation is poor.

IBM has estimated that maintenance personnel have to spend at least half of their time just trying to understand the programs before working on them.

All of that maintenance effort could be better spent on new development or other, more productive work. By training, providing better tools and streamlining the maintenance effort, we could pursue all kinds of interesting projects.

But we are trying to make advances in so many fields at once that we tend to overlook maintenance. We tend to think that new technology will solve the problem, but each generation of software has its own maintenance problems.

What do you mean by the term "software aftermarket?"
That is a term I have coined to describe any work done on software, whether it is modification, correction or enhancement, after the system has gone into use. By the $30 billion aftermarket, I am referring to James Martin's estimate of its size. I found that figure could be higher, but I went with the conservative estimate.

Are most companies sufficiently aware of the importance of maintenance?
Most managers are aware. But they don't know how to solve their problems. They don't express that because they think it will make them look bad. Thus, maintenance is often given only surface effort. But the problem won't go away until we address it and get to work on it.

Is awareness of the maintenance problem growing?
Yes. There are a lot of references to the problems in the press, and managers are increasingly aware of what needs to be done. But, as I said, the managers often don't know what to do or they don't have the resources to attack the problems.

What are the ramifications of fourth-generation languages on maintenance?
Fourth-generation languages spawn their own maintenance problems, especially if they are used to develop large programs. Even with a fourth-generation language, the programmer needs to think a system through carefully and design and document systematically. Many small programs or prototypes developed with a fourth-generation language grow into big systems. They start out small but become large applications without good design or documentation.

Is Cobol dying? What do the new Cobol 8X standards mean for maintenance?
Cobol is certainly not dying. We have billions of lines of Cobol code, and they won't soon go away. The Cobol 8X standards, because they embody modern programming techniques, will ease some of the maintenance problem . . . Languages are important, but good design and documentation are much more important in easing maintenance.

Are companies turning to modern programming techniques to ease maintenance work loads?
Very slowly. New ideas are not accepted quickly. If you check the personnel ads, you will see that very few companies are looking for people with structured design or modern programming skills. People are talking about the new techniques, but there aren't very many people using them or using them well.

Do you see a class of professional software maintainers arising?
Yes. Maintainers need different skills than developers, so you will see growing specialization in the future.

See PARIKH page 40

Selling systems software? In September Computerworld Focus targets your market.

When it comes to systems software, there are no easy choices. So in the September 18th issue of *Computerworld Focus* on Software: Systems, we take a good hard look at what's available now. And what's coming down the road in the near future.

Topics will include all the building blocks available for a fully integrated system. Like information center packages. Operating systems. Data base management systems. Productivity tools. Data dictionaries. Decision support systems. Even things like artificial intelligence and fourth generation languages.

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For more information, contact Ed Marecki, Vice-President/Sales, *Computerworld Focus*,
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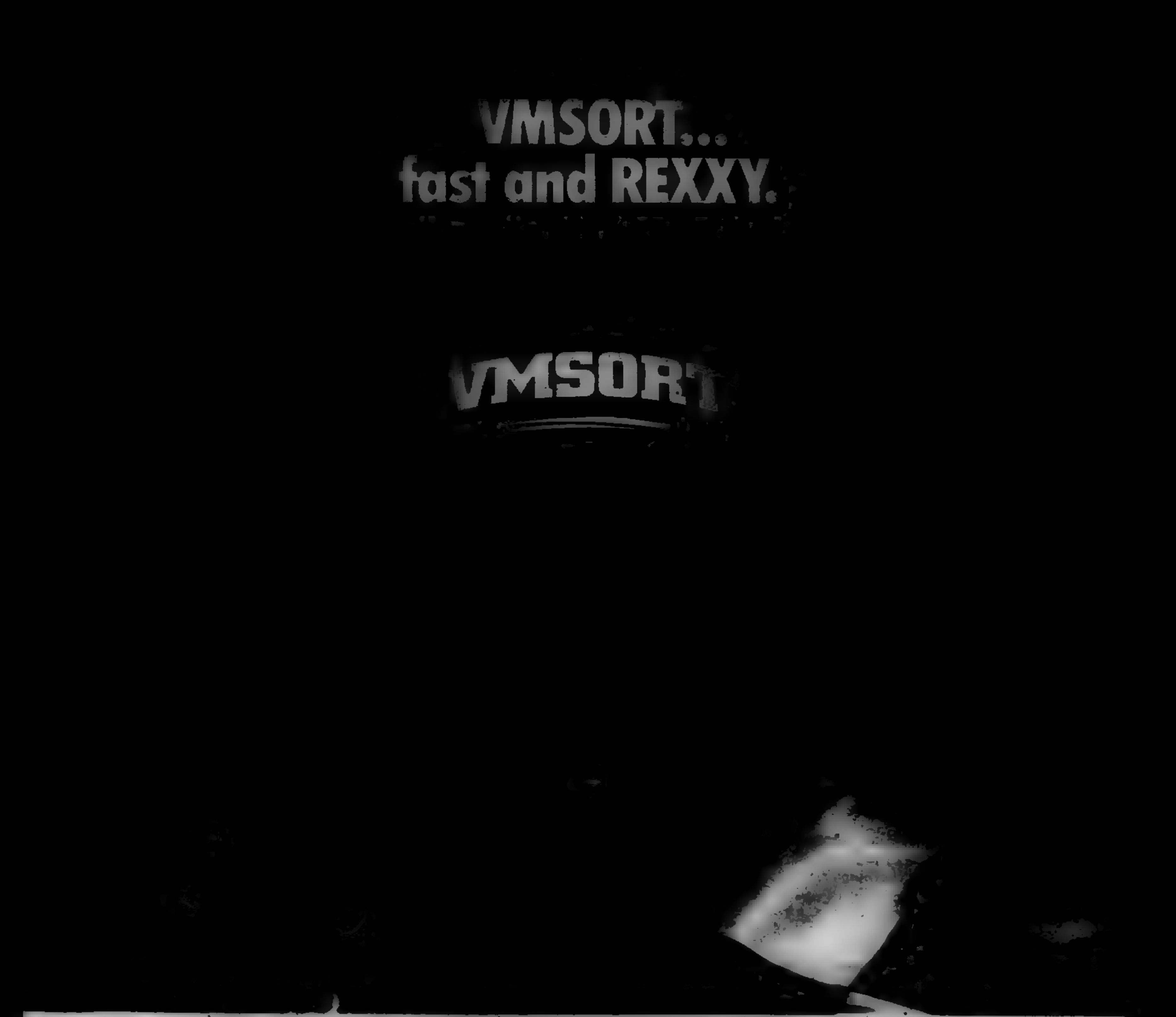

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TELECOMMUNICATIONS AND

ONCE UPON A TIME THERE WAS A BABY WITH TWO MOTHERS.

It's a classic tale of trickery and deceit, of justice and love, of wisdom and as fine a piece of innovative thinking as you're apt to find anywhere.

Two women, as the legend goes, went to a washing place in the great desert west of the Jordan River. Neglecting their children, they began to wash their clothes—when tragedy struck with sharpened teeth. A wolf, seeing the two unattended infants, devoured one with awesome swiftness.

The women immediately fell into a violent quarrel, each claiming the surviving child as her own. After weeks of heated debate, the case was finally brought before King David.

"The baby is mine," wailed the first mother. "She lies," cried the second. Throwing his hands up in dismay, David dismissed the case for lack of evidence.

Enter Solomon, the King's teenage son, who had been listening from the next chamber. "Dear father," said Solomon, "give me leave to pronounce judgment between these two." Now it was known that Solomon, while young in years, was wise in the ways of people. So David consented.

"Let's chop the infant in two," said Solomon, "and give each woman a half." The first woman agreed to the division. The second, lamented. "Give her the child," she moaned, pointing to the other woman.

Solomon continued: "The child belongs to the one who weeps. She who would not see it harmed is the true mother."

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SAS Institute launched an effort to develop a subset of the SAS® Software System for the IBM Personal Computer. After careful study, we agreed that C was the programming language of choice. And that the Lattice® C compiler offered the quality, speed, and efficiency we needed.

One year ago...

Development had progressed so well that we expanded our efforts to include the entire SAS System on a PC, written in C. And to insure that the language, syntax, and commands would be identical across all operating systems, we decided that all future versions of the SAS System—regardless of hardware—would be derived from the same source code written in C. That meant that we needed a C compiler for IBM 370 mainframes. And it had to be good, since all our software products would depend on it.

So we approached Lattice, Inc. and asked if we could implement a version of the Lattice C compiler for IBM mainframes. With Lattice, Inc.'s agreement, development began and progressed rapidly.

Today...

Our efforts are complete—we have a first-rate IBM 370 C compiler. And we are pleased to offer this development tool to you. Now you can write in a single language that is source code compatible with your IBM mainframe and your IBM PC. We have faithfully implemented not only the language, but also the supporting library and environment.

Features of the Lattice C compiler for the 370 include:

- **Generation of reentrant object code.** Reentrancy allows many users to share the same code. Reentrancy is not an easy feature to achieve on the 370, especially if you use non-constant external variables, but we did it.
- **Optimization of the generated code.** We know the 370 instruction set and the various 370 operating environments. We have over 100 years of assembler language systems experience in our development staff.
- **Generated code executable in both 24-bit and 31-bit addressing modes.** You can run compiled programs above 16 megabytes in MVS/XA.
- **Generated code identical for OS and CMS operating systems.** You can move modules between MVS and CMS without even recompiling.
- **Complete libraries.** We have implemented all the library routines described by Kernighan and Ritchie (the informal C standard), and all the library routines supported by Lattice (except operating system dependent routines), plus extensions for dealing with 370 operating environments directly. Especially significant is our byte-addressable Unix®-style I/O access method.
- **Built-in functions.** Many of the traditional string handling functions are available as built-in functions, generating in-line machine code rather than function calls. Your call to move a string can result in just one MVC instruction rather than a function call and a loop.

In addition to mainframe software development, you can also use our new cross-compiler to develop PC software on your IBM mainframe. With our cross-compiler, you can compile Lattice C programs on your mainframe and generate object code ready to download to your PC.

With the cross-compiler, we also offer PLINK86™ and PLIB86™ by Phoenix Software Associates Ltd. The Phoenix link-editor and library management facility can bind several compiled programs on the mainframe and download immediately executable modules to your PC.

Tomorrow...

We believe that the C language offers the SAS System the path to true portability and maintainability. And we believe that other companies will make similar strategic decisions about C. Already, C is taught in most college computer science curriculums, and is replacing older languages in many. And almost every computer introduced to the market now has a C compiler.

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C supports structured programming with superior control features for conditionals, iteration, and case selection. C is good for data structures, with its elegant implementation of structures and pointers. C is conducive to portable coding. It is simple to adjust for the size differences of data elements on different machines.

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The competition...

If you would like to compare, the other vendors of 370 C compilers are: AT&T, Whitesmiths, Ltd., WATCOM Products Inc. (CMS only), Oracle Corp., Amdahl Corp. (UTS only), and IBM Corp. (VM/IX only). We think you will choose the Lattice C compiler from SAS Institute.

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MINIS

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installed a DBMS.

"Because it is a marketplace far from maturity, [we] expect the DBMS marketplace for minis to grow at much healthier rates than its mainframe counterpart. The business this year [1985] will grow some 40%," the newsletter predicted.

Another IDC study on AT&T Unix supermini implementations highlighted similar growth potential. In its report "Unix Migration Strategies of Supermini Users," IDC noted that roughly 10% of the sites surveyed are running Unix on at least one of their superminis. By the end of 1986, IDC estimated, that figure will grow to nearly 25%.

In addition, the study said that while only 25% of packaged software vendors currently offer programs running under Unix, nearly 50% of those vendors will offer Unix versions of their products by the end of this year. Not only will Unix be more widely installed in the mid-range world, IDC predicted, but a larger and more varied set of applications will be run under it.

Market heating up

It would appear from the IDC reports that the market for mini and supermini software is heating up. Vendors like DG, Wang Laboratories, Inc. and DEC are actively pursuing joint marketing and licensing deals with software vendors.

More important, it seems that software companies, many of whom have focused solely on the IBM world, are coming to recognize the extent — and potential value — of the installed base of minis.

But another messenger from IDC cast some gloom on the rosy predictions for the mini world. Commenting on the ongoing computer industry slump — which has been felt most keenly by the mini vendors — IDC Vice-President William Zachmann hypothesized that the "enormous expansion of the use of personal computers" has weakened overall demand for minis and superminis.

And, combined with micros, Zachmann said, multimicroprocessor systems will "ultimately pose a fundamental and eventually fatal challenge . . . to traditional small and mid-size systems."

Zachmann said the belief that microcomputer users' needs for access to corporate data bases or additional capacity would fuel demand for minis and larger systems is merely a myth. "The fact is that personal computers are perfectly capable of meeting many needs that would otherwise have required larger and more expensive systems," Zachmann said.

The incongruities among the IDC viewpoints seem to revolve around the fact that the Unix and DBMS studies investigated growth trends within the current installed base of minis and superminis. But Zachmann's paper pointed out what may be a longer term trend concerning the future growth of that installed base.

Zachmann's view is only one possible interpretation of the forces behind the slowdown stalling the growth of mini and supermini vendors. But, if he is correct and if growth continues to slow, software vendors are likely to look with a jaundiced eye on product development or migration projects aimed at mid-range machines.

And, without a rich and varied supply of software, prospective minicomputer users may turn to other hardware solutions, and current users could be left in the lurch.

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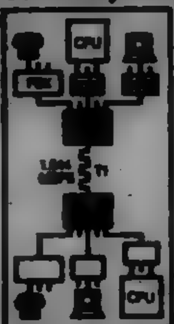

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WESTWOOD COMPUTER CORPORATION

SOFTWARE & SERVICES

PARIKH from page 34

Some of the job titles I have pointed out in my study include software package maintenance specialist, maintenance tools expert and maintenance analyst.

The specialization is coming, but it is important that all software professionals have at least an overview knowledge of maintenance. There are specialists in the health field, for example, but they all have a general knowledge of medicine.

What are some common mistakes companies make regarding maintenance?

When developing systems, designers don't take the time to see potential maintenance problems. Very few managers can see two or three years down the road. Also, management usually emphasizes speed in development and maintenance. The emphasis should be equally on quality and clear documentation.

SWEET from page 33

orders, had their component requirements checked against available inventory before being issued to the shop. The idea was to avoid starting any job for which parts were missing. Instead, the job would be held while needed parts were expedited.

It was obvious that a file of pending work orders would be needed —those held awaiting parts — and that it would be necessary to know just how long to expect pending orders to stay on file. A study of the manual system found 200 work orders scattered around awaiting parts arrivals.

Although individual orders came and went, the total pending backlog had been constant at about 200 for as long as users could recall. Further, about 40 new work orders were issued to the floor each month and, on average, each waited for about 10 days for parts to arrive before being released.

Wait time?

How long will orders wait on file, on average, before the parts for each one are found?

The answer is five months, no less. Our challenge, to estimate the wait time, involved deciding whether to accept the numbers as given or to cross-check them with one another.

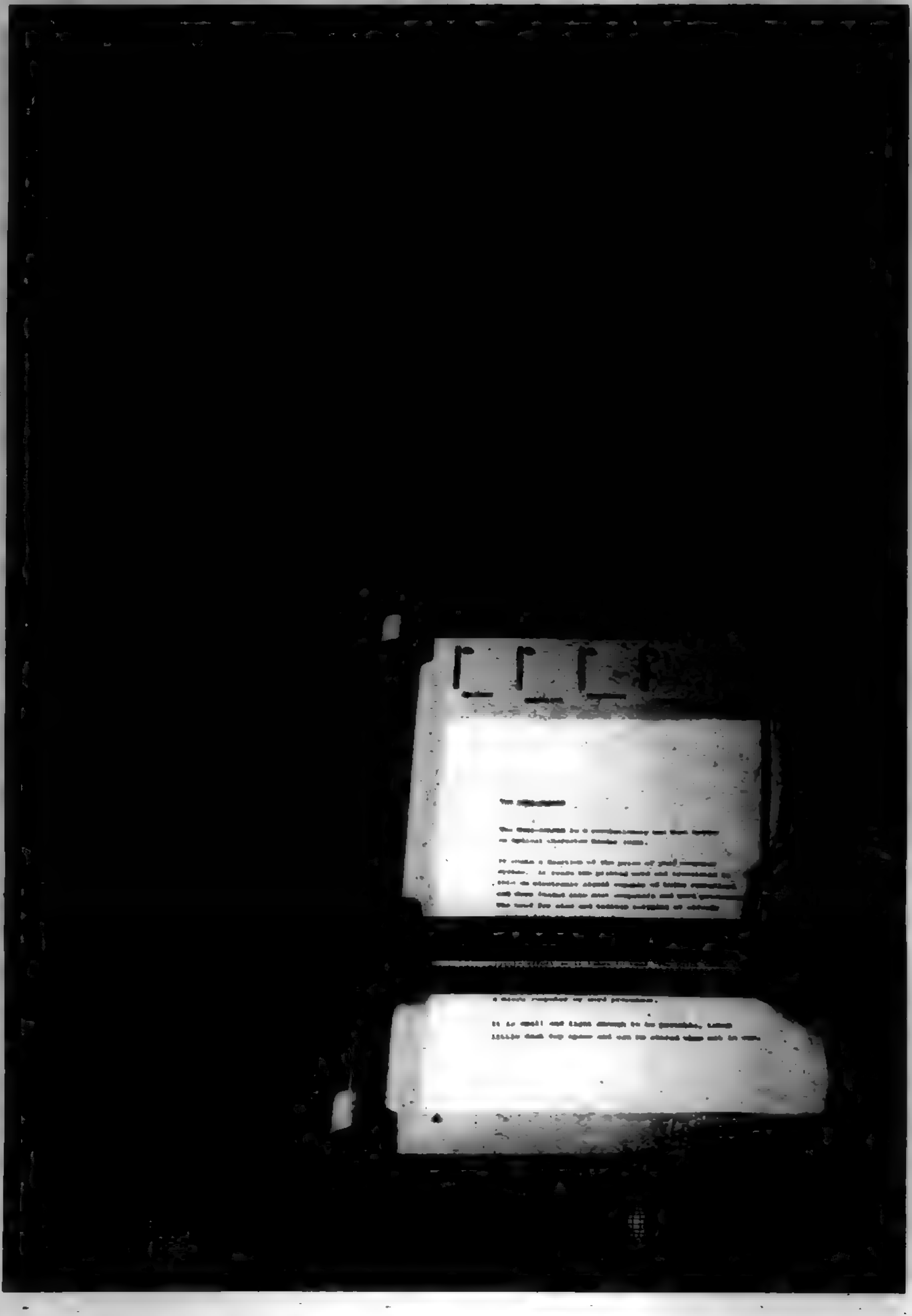
The interview-given pool time, in months (0.3), times the flow rate (40) is by no means equal to the observed population (200). The three figures we collected (flow rate, pool time, population) are contradictory. We must decide which one is wrong.

No challenge

The 200 orders sitting around were our observation, so that figure cannot be challenged. The 40 new orders per month would be easy to verify and thus were unlikely to be misstated. Besides, what motive would there be for understating the figure? It is more likely to be overstated ("See how hard we work?").

By elimination, this leaves the 10-day wait time. The number is suspect for two reasons: First, verifying it would seem impossible, so our informant could say anything at all with impunity. Second, it is the sort of thing higher management puts into goals or management objectives ("Orders must be processed within 10 days.").

When this happens, many will unconsciously adopt a convenient fiction rather than admit an unpleasant truth. Discarding the fishy 10-day figure, we compute average pool time to be population (200) divided by flow rate (40 per month), or 5 months.



Q. IF A MODEM IS A MODEM IS A MODEM, DOES IT REALLY MAKE A DIFFERENCE WHICH ONE I BUY?

A. The fact is, all modems are not created equal. For example, some modems are better signal processors than others. And these superior modems can make an important difference in your total network performance. A difference that can lead to important savings in telecommunications costs.

Q. How can a modem make a difference in my telecommunications costs?

A. The primary purpose of a network is to move information to and from end users and thereby improve their productivity. And a superior modem can improve the performance of your network in at least four areas: It can make your network more reliable. Give your end users faster response times. Minimize the time you and your people spend on network management. And a superior modem can also save you money in line charges.

Q. What makes a superior modem?

A. As you know, a modem converts a data stream into a signal that can be sent (usually over a phone line) from Point A to Point B.

Now that may sound simple enough, but there are a number of variables in that seemingly simple scenario. Such as, what's the distance between Points A and B? What's the line between the points? What's the condition and stability of the line? And many, many more. The point is, each variable carries technical implications that affect the design of the modem. And simply stated, a superior modem enjoys a superior design.

Q. Be specific. How can a superior modem save my company money?

A. Let's face it, modems are not the most expensive part of your telecommunications network. Chances are, line charges are. If you design a modem that can send data more reliably, then that modem can begin to affect your line charges. Every time a modem has a "hit," or an unsuccessful transmission of data, the data must be retransmitted, slowing down response time. The net effect is a reduction in the amount of information carried by the network.

If you use superior modems that give fewer hits, you'll have lower line costs per data unit transmitted and better throughput. Better throughput translates into time and cost savings.

Q. Can a superior modem correct the problem of faulty lines?

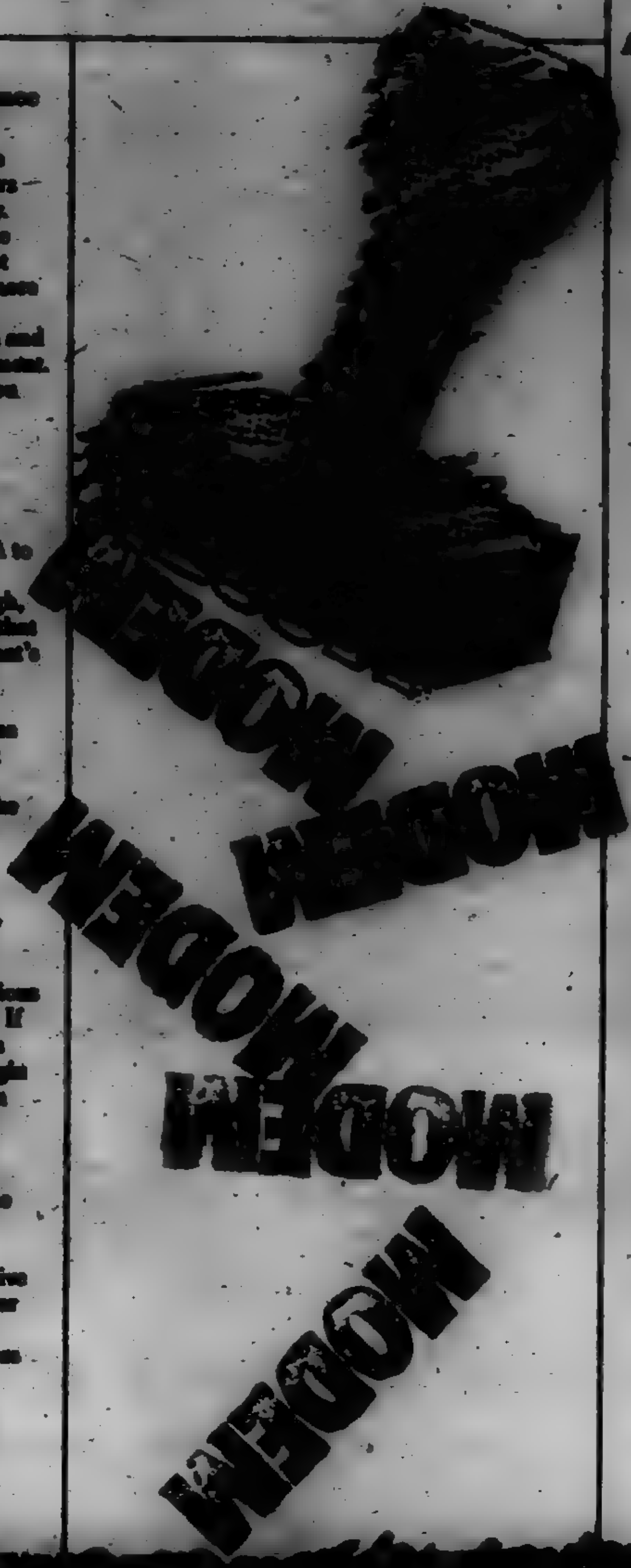
A. A superior modem can go a long way toward compensating for poor line conditions—and thus make marked improvements in the hit rate.

Take the IBM 3865 Modem, for example. It contains a custom microprocessor with an advanced algorithm that in effect enlarges the target area of acceptable transmissions. The result is that this reliable 9,600 bps modem can operate very effectively over unconditioned lines. Now imagine all the line conditioning charges you won't have to pay your common carrier.

Q. How can I go about proving the superiority of IBM modems?

A. Take your most troublesome line and put IBM modems on it. We believe you'll see an impressive improvement. Which leads us to another benefit of superior modems—you'll spend less time troubleshooting your network simply because line conditions that once were considered problems aren't really problems any more.

There are a number of other good reasons why you should consider IBM's line of 2,400, 4,800 and 9,600 bps stand-alone and rack-mounted modems. Not the least of which is that we've recently announced two new modems—the IBM 3833 and 3834—which feature lower prices, smaller packaging and improved serviceability. And like all IBM modems, they can fully utilize IBM's Communication Network Management capability.



The New IBM Modems

	IBM 3833	IBM 3834
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Compatibility	3833, 3863-1,* 3868-1	3834, 3864-1,* 3868-2
LED Diagnostic Indicators	standard	standard
Communication Facilities	4-wire, point-to-point or multipoint	

Both modems operate over unconditioned telephone lines that can be leased (common carrier or PTT) or private.
*Must be in native mode. For full diagnostic capability, must be equipped with the Extended Diagnostic feature.

What's more, we've also recently lowered the prices of the IBM 3863, 3864, 3865 and 3868 Modems by as much as 29 percent. And there are also volume discounts available. If you're looking for modems that offer reliability, can improve end user productivity and are competitively priced, talk to your IBM marketing representative.

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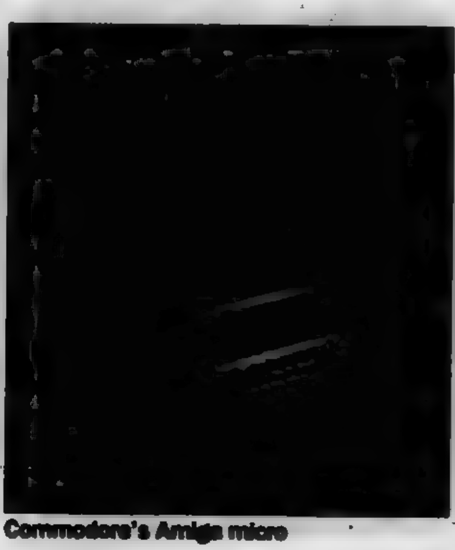
MICROCOMPUTERS

Graphics-oriented Amiga debuts


Commodore's Amiga micro

NEW YORK — Commodore Business Machines, Inc. late last month took the wraps off the much-discussed Amiga, a $1,295 machine that boasts leading-edge color graphics features and is designed for home and graphics-oriented business use.

Built around a Motorola, Inc. 68000 microprocessor and three proprietary chips that handle graphics and I/O functions, the Amiga provides a palette of 4,096 colors, available on-screen simultaneously in a "hold and modify mode," and with a maximum resolution of 640 by 400 pixels.

Scheduled to ship in September, the base system is said to include 256K bytes of internal memory — expandable to 512K bytes — and an internal 3½-in., 880K-byte floppy disk drive.

The micro also features an 89-key keyboard, parallel and serial ports, a system expansion port with full access to the 68000 bus, a mouse, two joystick ports, two stereo audio jacks and built-in text-to-voice and music synthesis capabilities, Commodore said.

The base system weighs 12½ lb and does not include a monitor. A red-green-blue (RGB) monitor is available for $495. Three video ports are provided: analog RGB, National Television Standards Code (NTSC) for a standard TV via a radio frequency modulator and NTSC composite video. An external floppy disk drive port supports up to three additional drives, including a mix of 3½- and 5¼-in. drives, the company said.

The Amiga comes with the Amiga DOS multitasking operating system, Amiga Basic and Amiga Tutor. More than 20 software applications will be available from Commodore when the system ships, and

See AMIGA page 50

- New release of Sorcim/IUS Micro Software's Supercalc3 spreadsheet package supports expanded memory capabilities/44
- Microsoft rolled out Quickbasic Compiler for IBM Personal Computers and compatible machines/48

Nestar to unveil Plan 5000 multifunction micro server

PALO ALTO, Calif. — Nestar Systems, Inc. is scheduled today to introduce the Plan 5000, a multifunction server for the firm's microcomputer local-area networks that can be expanded to provide 1.1G bytes of disk capacity.

The server, available immediately, is aimed primarily at large corporations with existing local-area networks "[that] understand the need for the kind of storage they have on the mainframe," commented Peter Hertan, Nestar vice-president of marketing.

Depending on the application, up to 254 workstations can be supported by the Plan 5000, which typically handles 25 to 50 workstations per server, Nestar said. Multiple servers may be configured on the network.

The starting configuration of the Plan 5000, priced at $25,000, is said to offer 275M bytes (formatted) of end-user storage capability, a 60M-byte streaming tape drive for backup, Nestar Shadow support for a secondary file server providing fault-tolerant capability, an integrated print server coprocessor that can drive three printers simultaneously and the server console.

The base system also features the Planpak starter library of network applications, including Software Connections, Inc.'s LAN:Datastore and LAN:Mail Monitor and Sorcim/IUS Micro Software's Supercalc and Superwriter packages, Hertan said.

A Plan 5000 with 550M bytes of storage costs $35,000, a version with 825M bytes costs $45,000 and the top-end model with 1.1G bytes costs $55,000. A second 60M-byte tape drive costs $2,000.

The server is compatible with Nestar's Plan 3000 and 4000, the company said. The Plan 5000 will support the IBM PC Network in two ways, Hertan said. A version of the Nestar network interface card that emulates the PC Network card is scheduled for commercial release in the fourth quarter. A network software up-

See PLAN page 49

MICRO BITS
Thomas Madron

Memory needs still expanding

How much memory does a micro need? As much as it can get.

From the very beginning of modern computing in the 1940s, industry observers and participants have misjudged end-users' needs and their capacity to make use of computer resources.

From the beginning of the micro revolution in the 1970s, commentators have expressed doubt that users' needs justified

See BYTES page 50

Madron is manager of computer services at North Texas State University, Denton, Texas.

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Supercalc3 version out

SAN JOSE, Calif. — Sorcim/IUS Micro Software has announced Release 2.1 of its Supercalc3 integrated spreadsheet for the IBM Personal Computer line. The enhanced version, priced at $395, allows users to access memory of up to 8M bytes offered by Intel Corp.'s Above Board expanded memory capabilities.

According to the vendor, Supercalc3 2.1 also supports AST Research, Inc.'s Rampage expanded memory board and IBM's Enhanced Graphics Adapter and Enhanced Color Display.

Enhanced capabilities have been added to Sorcim's Fastmath recalculation functions, which now support the Intel 8087 and 80287 math coprocessors, the vendor said.

Supercalc3 incorporates the integrated graphics, data management and macro file capabilities introduced in earlier Supercalc releases, the vendor said.

Supercalc3 requires two floppy disk drives, or a hard disk and one floppy drive, and 96K bytes of random-access memory.

The product comes with Sorcim's Sideways printing utility that can permit horizontal report printing, the vendor said.

Sorcim/IUS Micro Software is located at 2195 Fortune Drive, San Jose, Calif. 95131.

Zenith Data Systems cuts prices on line of micros

GLENVIEW, Ill. — Zenith Data Systems Corp. recently announced price reductions on its Z-158, Z-148 and Z-138 personal computers, which were scheduled to ship last month.

Suggested retail prices for the Z-158 personal computer have been adjusted from $2,499 to $2,199 for the single-drive 128K-byte version.

The dual-drive, 256K-byte version was reduced from $2,899 to $2,499, and the 10M-byte Winchester hard disk drive version has been cut from $4,099 to $3,699.

Pricing for the entry-level IBM-compatible Z-148 personal computer dropped to $1,499 from $1,899 for the single-drive system and to $1,799 from $2,199 for the dual-drive version.

The Z-138 transportable personal computer with a 5¼-in. floppy disk drive was reduced to $1,699 from $1,999, the vendor said.

The Z-138 dual-drive model is now priced at $1,999, down from $2,299, Zenith Data Systems said.

Zenith Data Systems is located at 1000 Milwaukee Ave., Glenview, Ill. 60025.

Bluebird compiler allows mini applications to run on IBM micros

CARLSBAD, Calif. — Bluebird Systems announced a compiler that creates IBM Personal Computer versions of minicomputer applications.

DBComp/286 enables applications written with Bluebird's Databus programming language for Datapoint Corp. minicomputers to run on microcomputers with Bluebird's Superdos operating system, according to the vendor. The compiler converts source code directly into machine code so it can be compiled on a microcomputer.

An IBM Personal Computer AT with Superdos reportedly can support as many as 24 users and supply up to 840M bytes of disk storage.

The compiler costs $795 for an IBM Personal Computer or Personal Computer XT version and $1,495 for a Personal Computer AT version.

Bluebird is located in Suite A, 6352 Corte Del Abeto, Carlsbad, Calif. 92008.

Pop-Up out for IBM line

BELLEVUE, Wash. — Bellsoft, Inc. has added Pop-Up Word to its line of background utility programs for the IBM Personal Computer line. The software functions as a full screen editor and notepad suitable for schedules, "to-do" lists and telephone lists.

Pop-Up Word includes an Ascii file editor that can be used to read and write text portions of other file formats, according to Bellsoft.

The editor works with any Ascii file, including batch and word processing files.

The package's word processing features include block operations, search, replace and delete functions. Text can be cut and pasted from the editor to an on-screen application, Bellsoft said. Lines can be inserted or deleted by a single keystroke.

Pop-Up Word accepts commands from Micropro International Corp.'s Wordstar, in addition to offering its own command set.

The package can store from 4K bytes to 23K bytes of text. Text resides in a virtual area that can be unformatted or formatted in columns, according to Bellsoft.

Pop-Up Word requires 40K bytes of random-access memory and costs $39.95.

Bellsoft is located at 2820 Northup Way, Bellevue, Wash. 98004.

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Computerworld/Danmark serves 20,000 key EDP decision-makers throughout the Danish computer community. Each week *Computerworld/Danmark* covers new products and services, current applications and industry trends.

PC World Danmark is the monthly magazine that targets 12,000 IBM PC and compatible users and supplies them with first-hand information on the Danish PC market.

Run reaches 34,000 Commodore owners and potential owners in Denmark. Commodore is expected to grow at 40% per year through 1989. *Run* addresses the Commodore market with timely updates on hardware, software, and programs.

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The Navigation feature lets you move from screen to screen with direct access from one Masterpiece application to another.

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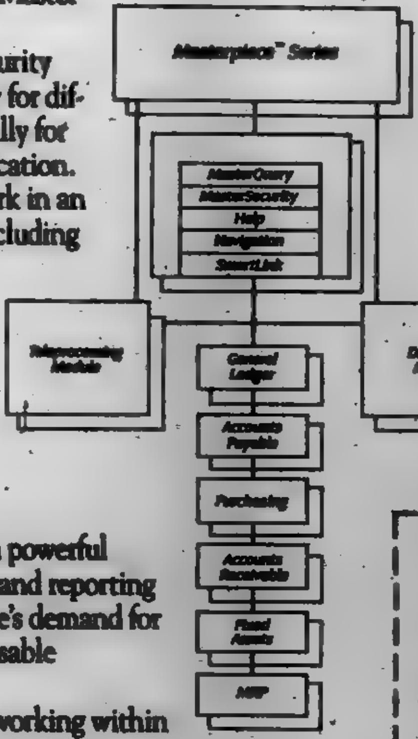

MasterQuery System.

The MasterQuery system is a powerful fourth generation borderless query and reporting tool designed to satisfy an executive's demand for instantly accessible and instantly usable information.

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Microsoft offers compiler for micro Basic interpreters

Boasts faster execution speed

BELLEVUE, Wash. — Microsoft Corp. has introduced Microsoft Quickbasic Compiler, a $99 Basic compiler said to be compatible with the Basic Interpreter sold with IBM Personal Computers, Compaq Computer Corp. systems and other IBM-compatible microcomputers.

Quickbasic reportedly executes at an average of three to 10 times faster than the Basic Interpreter. The software also supports structured programming features, large programs, extended MS-DOS functions, boosted graphics capability and local-area networking, the company said.

More than 3.5 million microcomputers have been shipped with some version of Microsoft Basic, and the company estimated that between 500,000 and 750,000 personal computer users write Basic programs.

"There's an immense amount of code which Quickbasic will compile," said Steven Snyder, director of language systems.

Programming features

Among the new structured programming features, Quickbasic provides alphanumeric labels and does not require line numbers, removing Basic's "single most-talked-about liability" on the IBM Personal Computer, Snyder said.

Lines are executed in the order listed, permitting Quickbasic to work with more powerful editors and making the code more readable, and users can avoid the GOTO and GOSUB commands disparaged by many programmers.

Additionally, users now can break up large programs into subprograms, which can be called by name and passed parameters (by reference or value).

Subprograms can work with either their own local variables or share global variables with the main program, according to Microsoft. Subprograms can be compiled separately and then linked with the main program before it is run, speeding development time, according to Snyder.

Users can create libraries of separately compiled modules, he noted. Multiline functions and standard Basic control structures also are available.

While the Basic Interpreter requires code and data to fit within 64K bytes, Quickbasic permits data to take up to 64K bytes, with code restricted only by the amount of random-access memory (RAM) available, said Rob Dickerson, group marketing manager.

Quickbasic reportedly also supports the IBM Basica Interpreter's graphics and sound statements, along with additional MS-DOS features including SHELL, path names and subdirectories. Additionally, hooks for MS-DOS 3.1 networking are provided, including file and record locking and file access control.

Quickbasic runs on the Personal Computer, Personal Computer XT, Personal Computer AT and compatible machines. The software is scheduled to ship early this month. It requires PC-DOS or MS-DOS 2 or higher and 128K bytes of RAM (with a recommended minimum of 256K bytes).

Microsoft can be reached through Box 97200, 10700 Northup Way, Bellevue, Wash. 98009.

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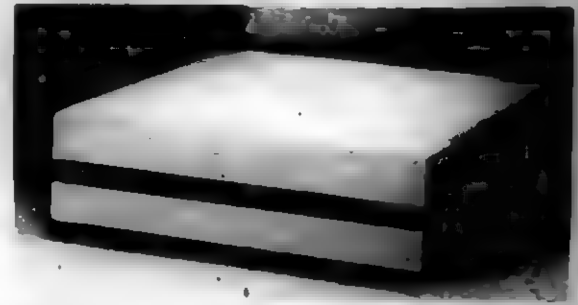

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Use of CAD tools on micros to double by 1990: report

Of CAD users, 32% run tools on micros

By Edward Warner
CW Staff

SUDBURY, Mass. — The installed base of computer-aided design software running on personal computers will double in five years, according to a recently released report from Technology and Business Communications, Inc., a firm here that specializes in the computer graphics market. Presently, the report said, only 32% of firms that use CAD are running it on personal computers.

The report, titled "Doing CAD on a Personal Computer: A Market Study," also predicts that in five years mechanical designers will be the primary users of CAD, taking 38% of the market, though they today claim only 24% of the market.

The use of personal computer-based CAD for electrical design makes up the largest share of the market today at 26%, but will decline to 20% of the market by the decade's end, the report said.

The report, according to Technology and Business Communications President Stanley Klein, summarizes data from about 260 questionnaires returned in a mail survey of personal computer CAD vendors and from individual interviews with personal computer CAD vendors and researchers in the personal computer CAD market.

No potential personal computer CAD users, such as manufacturing or electronics firms, were surveyed, Klein said, because "users don't really assess market growth. [They] are just aware of their own growth."

Klein said his prediction of a surge in the growth of personal computer-based CAD is due to "two things: [the spread of] the distributed processing concept and the stand-alone going into places that heretofore couldn't afford such systems."

Technology and Business Communications also released recently a report that offers background on personal computer-based CAD and advice on whether new users should purchase personal computer CAD as a turnkey system or in piecemeal fashion. That report, "Doing CAD on a Personal Computer," also notes the advantages and disadvantages of using personal computer-based CAD.

Among personal computer-based CAD's advantages, the report said, are ease of use of many of the personal computer CAD programs, desktop access and generally low cost when compared with minicomputer-based CAD.

The disadvantages are said to lie in scaled-down performance. Personal computer-based CAD offers slower speeds and more limited applications than minicomputer-based CAD.

"Doing CAD on a Personal Computer" is priced at $179. The personal computer CAD market study costs $329.

Technology and Business Communications is located at 730 Boston Post Road, Sudbury, Mass. 01776.

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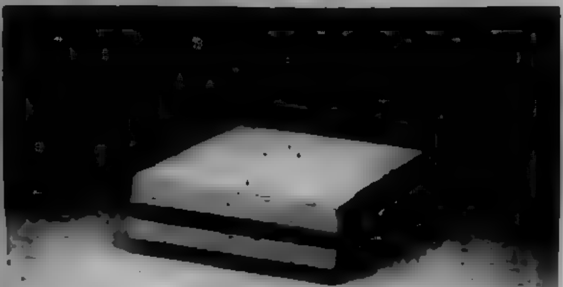

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Net/One from Ungermann-Bass

costs down and
ere you want them.

PLAN

from page 43

grade for Nestar servers, permitting networks to run either Plan or PC Network software, also will be delivered by year's end.

In addition, Hertan said, Nestar expects to provide an upgrade to its networking products allowing them to work with IBM's forthcoming token-ring network within the next 12 months.

More information is available from Nestar at 2585 E. Bayshore Road, Palo Alto, Calif. 94303.

"I knew it wasn't working properly when it wouldn't work."

AMIGA

from page 43

more than 75 developers are writing for the system, according to the vendor.

An optional software emulation package available in October reportedly will allow the machine to run off-the-shelf IBM Personal Computer software, although performance will not be as good as it is on the IBM machine. Additionally, an accelerator plug-in module will increase the speed of the IBM software on the Amiga.

Each option will cost less than $100, the company said.

Future options will reportedly include a variety of printers, a color digitizer and a genlock unit for synchronizing the Amiga with an external video device such as a laser disk or videotape player.

When these become available, developers will be able to "intertwine such standard features as four-channel audio, digitized images, animation, video synchronization and a palette of [more than] 4,000 colors," Commodore said.

Third-party options reportedly will include a 20M-byte hard disk drive, a 20M-byte tape backup, a 1M-byte multifunction card, a 2,400 bit/sec. modem and a graphics tablet.

Additional information is available from Commodore Business Machines, which is located at 1200 Wilson Drive, West Chester, Pa. 19380.

BYTES

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the increases in memory from 64K bytes to 128K bytes and finally 256K bytes, offered by vendors. Next they downplayed the Intel Corp. 80286 microprocessor's ability to address 16M bytes of real storage and up to 1G byte of virtual storage.

Not surprisingly, the critics are now contending that Intel's forthcoming 80386, expected to address 4G bytes of real storage and 64T bytes of virtual storage, represents overkill.

Few applications currently make use of the 80286's capacity to handle 16M bytes of real storage. Of course, there is no widely accepted multitasking operating system yet available for machines such as the IBM Personal Computer AT that use the 80286.

IBM's PC-DOS 3 and 3.1, which some observers once thought would have multitasking capabilities, turned out to be a single-tasking operating system.

AT&T's Unix, which might be a contender, has little end-user appeal, in part because little applications software exists to run on it, and for a business environment, Unix is so actively user-hostile as to be useless without a custom shell. Perhaps PC-DOS 4 will be a multitasking operating system.

Digital Research, Inc. offers Concurrent DOS, but because the vendor does not have the imprimatur of IBM, the product has not met great commercial success.

A multitasking operating environment could bring forth a new generation of applications for personal computers. To do the job well, however, such an operating system must run on a processor with sufficient speed and power to keep everything moving at an acceptable performance level.

As operating systems for micros become more sophisticated and complex, we can expect system overhead to continually take more space. IBM demonstrated this trend with its mainframe systems.

When the 360 series of computers was first introduced, memory of 64K bytes was not uncommon and the operating systems could run in such machines. OS/MFT actually required a bit more to leave enough for applications. The successor to OS/MFT on today's IBM mainframes, OS/MVS, requires 1M byte or more of storage but provides more services than its predecessors.

This trend is visible with microcomputer operating systems; one illustration is the difference between the memory requirements of PC-DOS and Unix.

The development of low-cost laser disk storage will likely provide the external media necessary to make use of the virtual storage capacity inherent in both the 80286 and the 80386. Low-cost read-only laser systems have already been announced for the personal computer market for introduction in mid- to late 1985.

High-cost, high-performance micros are precursors of the larger, faster machines of the near future. Those who question the need for more memory and faster processors simply don't understand modern computing.

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Our comprehensive UNIX System V Software Catalog lists a full range of packages that run under UNIX System V. For end users it's a reference guide to the programs available. And for developers it's a smart way to ensure packages will have even greater exposure to the growing UNIX System V market.

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COMMUNICATIONS

- Datastream Communications reduced prices for its controllers by an average of 25%/52
- Western Union announced a volume discount program/52

Panel lauds fiber-optic net benefits

By John Dix
CW Staff

High data rates, immunity to electrical interference, low bit-error rates and small size are all factors that will fire the acceptance of fiber-optic local networks, according to a panel of experts at the National Computer Conference last month.

Obstacles to that acceptance remain, however, according to James Bryce of Netserve, an Austin, Texas, communications consulting firm. Bryce, who chaired the session called "Fiber Optics in Local-Area Networks," said it is still hard to splice and tap fibers, and further work is needed in the area of transceivers. The most dire need is for standards, Bryce said.

However, the inherent benefits of fibers shine through these present shortcomings. Although initial local network data rates will be around 30M bit/sec., the medium has the potential to exceed 1 billion bit/sec. while sustaining bit-error rates of 10 to the negative ninth or 12th, Bryce claimed. These capabilities, coupled with fibers that are immune to electrical, magnetic and radio frequency interference, make fiber optics attractive for certain applications.

Michael See of IBM's Research Triangle Park in North Carolina, explained how fiber optics can be used in token-ring networks like the type the mainframe maker is reportedly developing. Initially, fibers will be used between distribution points, See said. Eventually, however, fiber can be extended from these hubs to workstations in a star topology. Although the network will physically resemble multiple interconnected wagon wheel hubs with spokes, data will flow in a logical ring, running from one device back to the distribution center and to the next workstation. The wire centers enable workstation spokes or lobes to be bypassed in the event of a loop problem, See explained.

When installing fiber, it is important to ensure that the cable can accommodate future growth, See cautioned. He said the data rates of early fiber nets will be roughly 30M bit/sec., but the medium should be able to handle three generations of information processing equipment, each with a life cycle of five years.

See predicted that LEDs instead of lasers will be the primary light source for use with fibers and that the industry will standardize on the use of photo diode detectors to interpret the light signals and

See FIBER page 52

M/A-Com tool joins Ethernet, broadband nets

GERMANTOWN, Md. — M/A-Com, Inc.'s Telecommunications Division has announced Etherplus, a system that enables an Ethernet-type network to be implemented on a broadband network.

Etherplus is said to be compatible with Ethernet and IEEE 802.3 controllers, protocols and software. Etherplus products include transceivers for single- and dual-cable systems and head end frequency translators.

The Etherplus EP-8100 series of broadband transceivers are used on mid- or high-split single-cable broadband systems, and the EP-8200 transceivers are used with dual-cable implementations. Single-cable systems also require use of the EP-8900 frequency translator, a head end that converts signals from the transmission band to the reception band.

Both types of Etherplus broadband transceivers replace the typical baseband Ethernet transceiver and emulate their function, although there is a delay between transmission and reception because of the inherent characteristics of broadband systems, the company reported. The Etherplus transceivers connect to IEEE 802.3-type controllers with the same multipair cable used to connect baseband transceivers.

The transceivers transmit at 10M bit/sec., with a low bit-error rate and 100% collision detection, a spokesman said. The EP-8100 and 8200 are compatible with the proposed IEEE 802.3 broadband 10M bit/sec. carrier-sense multiple access with collision detection standard.

When used with the EP-8900 frequency translator, the single-cable EP-8100 transceivers will operate over a distance greater than 3,600 meters. The dual-cable EP-8200s boast the same capability. Any node may be up to 1,800 meters from the broadband head end.

The EP-8900 has I/O attenuators that allow adjustment of the translator gain for optimum system operation with different inbound and outbound path losses. The devices include ports for an external monitor and switch-over unit and a test port that allows direct connection of an Etherplus single-cable transceiver for operational checkout.

The EP-8900 mounts in a standard 19-in. rack with 5¼-in. panel height.

The EP-8100 costs $3,975; the EP-8200 costs $3,625; and the EP-8900 costs $4,500, the vendor said. All products are available eight weeks after ordering.

M/A-Com Telecommunications Division is located at 11717 Exploration Lane, Germantown, Md. 20874.

Firm offers NCR-IBM link

System provides path to host CPU via SNA

MIAMI, Fla. — Innovative Electronics, Inc. has announced the Retail Netmaster system for interfacing NCR Corp. point-of-sale (POS) terminals to an IBM host through IBM's Systems Network Architecture (SNA).

The Netmaster system consists of the Netmaster/AP and Netmaster/IS. The Netmaster/AP is a host-resident Cobol applications program that performs configuration, control and monitoring of the network.

The Netmaster/IS is an in-store multifunction computer that supports NCR terminals and provides the interface to IBM or Amdahl Corp. SNA hosts equipped with IBM CICS/IMS software.

Network backbone

The Netmaster/IS processor allows the retailer to establish a network backbone for the authorization of credit cards and functions involving data collection.

The central Netmaster/AP and the remote Netmaster/IS together act as a real-time regulator to maintain the quality and flow of data from the in-store terminals to the host computer, the company reported.

The products are said to free the host and enable it to process individual transmissions more quickly.

Netmaster is said to carry out general merchandising functions, to eliminate the need for IBM 3270 and 721, 724 and 725 processors and to provide SNA/Synchronous Data Link Control to NCR or Burroughs Corp. Poll/Select protocol conversion.

Preprocesses POS terminal data

Netmaster is also said to preprocess POS terminal data, to reduce mainframe processing and to store remotely POS data to maintain mainframe efficiency during peak hours.

The price of the Netmaster system ranges between $8,000 and $10,000 for each store, according to the vendor.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

AT&T satellite-based data transmission service debuts

BASKING RIDGE, N.J. — AT&T recently began offering a private digital satellite service for data communications applications ranging in speed from 56K bit/sec. to multiples of 1.54M bit/sec.

Skynet Digital Service is offered over AT&T satellites with earth stations provided through a comarketing agreement with Vitalink Communications Corp. of Mountain View, Calif.

The service will enable users to establish private digital multipoint networks using the earth stations that are installed on the customer's premises.

On a 5-year lease, these 6-meter earth stations cost $3,810/mo for speeds ranging up to 384K bit/sec. and $5,500/mo for stations capable of supporting speeds from 768K bit/sec. to 1.54M bit/sec.

Cost varies by speed

The space segment of the service varies in cost by speed. The monthly costs of simplex, one-way channels are $900 for 56K bit/sec., $1,000 for 64K bit/sec., $1,800 for 128K bit/sec., $2,500 for 192K bit/sec., $3,200 for 256K bit/sec., $4,800 for 384K bit/sec., $6,000 for 786K bit/sec. and $9,000 for 1.54M bit/sec. channels.

The highest speeds are also available with a usage-sensitive billing alternative — 786K bit/sec. costs $50 per half-hour/simplex channel, and 1.54M bit/sec. costs $70 per half-hour/simplex channel.

Customers using Skynet Digital Service can interconnect these private networks with AT&T's Accunet Reserved 1.5 Service.

AT&T offers this digital 1.54M bit/sec. service between 42 U.S. cities and with links to the UK, France and Canada. This would enable a location that does not have its own earth station to participate in a videoconference, AT&T said.

The service is available now.

AT&T Communications is located in Basking Ridge, N.J. 07920.

Datastream slashes prices on BSC, SNA controllers

SANTA CLARA, Calif. — Datastream Communications, Inc. has reduced prices on its family of IBM-compatible Binary Synchronous Communications (BSC) and Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) 3270 controllers by an average of 25%.

The 774 line, formerly ranging in price from $7,900 to $15,000, will be priced from $6,500 to $12,900, depending on configuration. These controllers come with 128K bytes of memory and support one or two host links and up to 24 Ascii device ports.

The 776 line of BSC 3270-compatible controllers, formerly priced from $4,500 to $7,000, are now available from $1,950 to $2,950, depending on configuration. The 776 line supports one BSC host link, up to nine Ascii device ports and up to 64K bytes.

The 874 line of SNA/SDLC 3270-compatible controllers, formerly ranging from $10,950 to $16,950, are now available from $8,900 to $14,400. The 874 line supports one or two SNA/SDLC host links, up to 16 Ascii ports and 512K bytes.

Datastream is located at 2520 Mission College Blvd., Santa Clara, Calif. 95050.

Western Union discounts

UPPER SADDLE RIVER, N.J. — Western Union Corp. has announced Operation Bigpipe, a volume discount program for business customers with 10 or more analog or 24 Western Union Digital Optimized Wats lines.

A typical 24-line Digital Optimized Wats service is estimated to cost 40% less than AT&T's Wats service, a spokesman said. Optimized Wats is Western Union's wide-area long-distance telephone service for nationwide calling. Rates are based on the distance of a call.

For Operation Bigpipe, customers within a half a mile from a Western Union service center will be supported with local facilities procured from other carriers. On orders of 10 or more analog lines, the use of Western Union's interconnect facilities eliminate local facility charges, the company said. Customers who purchase 24, or multiples of 24, Digital Optimized Wats lines will save $31.64/line per month in port charges.

Where Western Union has existing connections between the customer's building and the local Western Union switch location, interconnect facilities are provided free of charge.

Western Union is located at One Lake St., Upper Saddle River, N.J. 07458.

FIBER

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convert them back into electricity. Although many types of fibers can be used, See recommended using fully graded 100/140 micron fibers, the first number representing the size of the fiber core and the second a measure of the fiber cladding.

Today most fibers of this type use light that has a wavelength of 850 nanometers. However, to support future generations of fiber-optic equipment, it is important to make sure the fiber being installed can support or is optimized for light with a 1,300-nanometer wavelength.

Howard Salwen, chairman of Proteon Corp., a Natick, Mass.-based manufacturer of a token-passing local network, said maintenance of fiber networks is a major concern. "Users are most interested in rapid fault isolation. Network modules should have enough intelligence to bypass faults."

> *'Users are most interested in rapid fault isolation. Network modules should have enough intelligence to bypass faults.'*
>
> **— Howard Salwen Proteon Corp.**

Salwen said the importance of fault isolation encourages use of a ring topology with fiber nets.

Access methods

Another concern dictated by characteristics peculiar to fiber optics is the access method used, Salwen said. Although many types can be used, the high speeds possible with fibers limit the use of methods like Ethernet-type carrier-sense multiple access with collision detection (CSMA/CD).

Token passing and CSMA/CD perform similarly at 1M to 10M bit/sec., Salwen said, but the Ethernet-type protocol collapses at 100M bit/sec., he maintained.

If 100M bit/sec. is not needed, a product from Siecor Corp. that uses CSMA/CD may fit the bill, according to Jay Cunningham, a Siecor product line manager. Siecor markets a passive star coupler that acts like a hub for interconnected workstation links. Within this hub, fibers are, in essence, tied together so that a light signal entering on one fiber will exit on all the other fibers.

Wrapping up the session, Michael Coden, president of Codenoll Technology, Inc., tried to leave the audience with the conviction that fiber-optic local networks are already a reality.

Codenoll, which markets fiber nets, has reportedly sold 20,000 interface transceivers and installed a number of large nets. A former Bell operating company, for example, has reportedly installed a 2,200-node fiber net that will eventually support 5,000 nodes.

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10,000 DP professionals in government, banking and industry read *Computerworld/Mexico*. Modeled after *Computerworld*, its sister publication in the U.S., *Computerworld/Mexico* is considered an excellent way for advertisers to reach a broad range of influential industry leaders. Twice each month, *Computerworld/Mexico* reports developments in hardware, software and terminals as well as industry trends.

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SYSTEMS & PERIPHERALS

Apollo laser printer out for Domain

BOSTON — Apollo Computer, Inc. has released a laser printer for use with its Domain workstations.

The Domain/Laser-26 prints up to 26 page/min of integrated text and graphics at a 300 dot/in. resolution, the vendor said. The printer is said to support the company's Domain local-area networking environment, and it can be configured as a shared resource anywhere on a transparent Domain network.

An integrated graphics processor contains an interpreter for Postscript from Adobe Systems, Inc. of Palo Alto, Calif. Postscript converts commands into images of text and graphics that the laser then transfers to the print engine drum.

The printer can be configured with an RS-232 serial interface or with a Centronics Data Computer Corp. parallel interface.

The Domain/Laser-26 costs $34,900 for the Centronics parallel interface version for Multibus connection and $31,900 for the RS-232 serial interface version. An upgrade kit to change from serial to parallel versions costs $4,000.

Apollo is located at 330 Billerica Road, Chelmsford, Mass. 01824.

Intel ships first five IPSC processor systems

By Donna Raimondi
CW Staff

BEAVERTON, Ore. — Intel Corp. has announced that it has shipped the first five systems of its Intel Personal Super Computer (IPSC) family of concurrent processors, based on multiple Intel 80286 microprocessors.

The initial customers — MIT; Oak Ridge National Laboratories; the Research Institute for Advanced Computer Science in Moffett Field, Calif.; the Supercomputer Research Center in Lanham, Md.; and Yale University — will use the IPSC to explore applications and algorithms in concurrent processing, Intel said.

The architecture of the IPSC family is based on the hyper-cube interconnect structure developed at the California Institute of Technology. The hyper-cube consists of multiple, independent computational nodes, each with memory, linked to other nodes by dedicated communications channels.

The ability of the nodes to do their work concurrently is said to provide the processing power necessary for computationally intensive scientific applications. Very large-scale integration components are said to lower the costs of computing and to provide familiar programming environments for researchers.

MIT plans to conduct research in numerical analysis and numerical methods, Intel said. It will use an entry-level IPSC D/5, which contains 32 computational nodes and 16M bytes of distributed memory. An MIT spokeswoman said the machine has been delivered but will not be officially accepted until a promised C compiler arrives.

Oak Ridge National Labs will use the IPSC D/5 in its mathematical and statistics research section to perform basic research for the U.S. Department of Energy.

According to Bob Ward, head of the mathematical science section at Oak Ridge, researchers there will test parallel algorithms in computational and numerical analysis such as sparse matrices and partial differential equations. Specific applications will include chemistry, solid-state physics, environmental modeling and artificial intelligence and robotics, Ward said.

The Research Institute for Advanced Computer Science will use an IPSC D/5 with 32 nodes to develop parallel programming methodologies for problems in computational fluid dynamics and computa-

See IPSC page 55

■ A disk cache subsystem for VAX users is said to cut paging time/54

■ System Industries unveiled a disk cache processor for use with all DEC VAX series machines/54

HARD TALK

Jumping into the scientific minicomputer act

By Tom Henkel
CW Senior Editor

Aside from the big slump in computer sales, 1985 may well be remembered as the year that scientific-oriented minicomputers made an indelible mark on the computer industry. Everyone seems to be getting into the scientific act, either by bolstering the number-crunching performance of commercial systems or by developing innovative architectures that some believe will eventually replace the file-oriented von Neumann architecture that has been the mainstay of the computer industry for the past 20 years.

A major reason for users' voracious appetites for scientific-oriented systems is the increased corporate reliance on simulations and modeling, particularly at companies that design and manufacture products. The demand for computer-aided design and manufacturing systems will most likely remain brisk. But CAD/CAM is only the beginning. The next strong market for powerful minicomputers will be for artificial intelligence applications, such as expert systems and decision support systems.

For AI applications, an emerging class of systems that use multiple microprocessors seems to show a great deal of promise. These multimicrocomputer systems typically operate either as parallel processors or concurrent parallel proces-

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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis, and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from mainframes to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

● **Why not Cullinet, ADR or Focus?** There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as *the* standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language - each one painting the user into its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few shops nowadays run only IBM mainframes. Why, then, even consider a database solution that runs *only on IBM mainframes?* Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE *are* identical.

FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

● **Why not just go with DB2 or SQL/DS?** A relational DBMS simplifies but does not by itself eliminate application programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are somewhat unlikely ever to run on another vendor's system). ORACLE runs on more IBM hardware and operating systems than do IBM's relational products.

● **What about Goldengate, dBase III, Symphony or Framework?** PCs need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload.

ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350.

SCIENCE

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sors, giving users the ability to work on many different tasks at once. But the problem faced by vendors of such systems is a glaring lack of applications software specifically geared to the parallel, concurrent operating environment.

The right team

It is no secret that hardware and software are inseparable. Teaming up with the right applications software developer could easily push a vendor of a multimicroprocessor-based system into the forefront of the emerging AI business. A mistake could be disasterous.

Intel Corp., for example, has been very careful in selecting the first users of its Intel Personal Super Computer (IPSC) hyper-cube. It has chosen well-respected universities and government institutions that it hopes will do a credible job of investigating the properties of concurrent processing.

It is also clearly Intel's hope that in the process, these institutions will develop some highly desirable software for the IPSC. In the long run, the move will probably prove to be a good one. But it also seems to fly in the face of the traditional marketing techniques used to sell new systems.

> ”
>
> *The next strong market for powerful minicomputers will be for artificial intelligence applications.*

Intel seems to be deliberately holding back the number of IPSC systems it can deliver to users, even though Intel executives claim the demand for the system, especially among AI software developers, has been stronger than expected. The move is risky, because holding back deliveries poses the threat that the IPSC could be surpassed by a more innovative architecture from another company before it ever gets off the ground.

But at the same time, the move smacks of wisdom because a substandard AI system developed around the IPSC could damage the machine's — and Intel's — reputation.

The marketing technique being employed by Intel reflects the growing complexity of software and the profound impact it can have on a new hardware product. The effectiveness of programs used to be fairly easy to verify. If the program fulfilled its intent, and did so efficiently, it was probably acceptable for most applications.

Now, software not only performs a series of commands, it also analyses data and offers users advice.

The question that requires a great deal of scrutiny is whether that analysis and advice is correct. Some software experts are now urging that giving advice be constructed in such a way that the software can also tell the user how conclusions were reached.

But even with such explanations, it is clear that artificial intelligence software will have to be closely scrutinized not only by the user who must live with his chosen package, but also by the hardware developer whose reputation as a systems supplier can be affected by the companies that develop specialized packages to run on that system.

"He's a hacker all right — we brought him in to get our department some time on the mainframe."

System Industries unveils cache processor for VAX

MILPITAS, Calif. — System Industries, Inc. has launched a disk cache processor for use with all Digital Equipment Corp. VAX series superminicomputers.

The processor costs $15,000 and was designed to cache the most frequently and most recently used blocks of data to reduce data access time.

The unit, which is driven by the Motorola Corp. 68000 microprocessor and has its own 2M-byte cache, is said to eliminate head movement for up to 95% of all disk I/O. Average access time is less than 2 msec.

According to the vendor, the VAX's primary bottleneck, especially in I/O-intensive multiuser applications, is the VAX's ability to handle heavy data loads and disk access. The disk cache processor is said to result in up to a tenfold decrease in average access time.

The disk cache processor is said to be compatible with all System Industries Winchester, removable Winchester and removable media disk drives.

More information is available from System Industries, 1855 Barber Lane, Milpitas, Calif. 95035.

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SYSTEMS & PERIPHERALS

IPSC

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tional chemistry, said Mike Raugh, chief scientist at the center.

"We'll experiment with it and use it for learning to write parallel programs," he said. The National Aeronautics and Space Administration's Ames Research Center is sponsoring the research, he said.

The Supercomputing Research Center is said to be doing supercomputer research for national security purposes, a spokesman said. It will develop and evaluate parallel processing on the IPSC D/6.

Yale is planning research on multiprocessors in order to develop algorithms that make maximum use of the architecture. It will develop new programs and languages and determine what kinds of problems can be developed with the new equipment.

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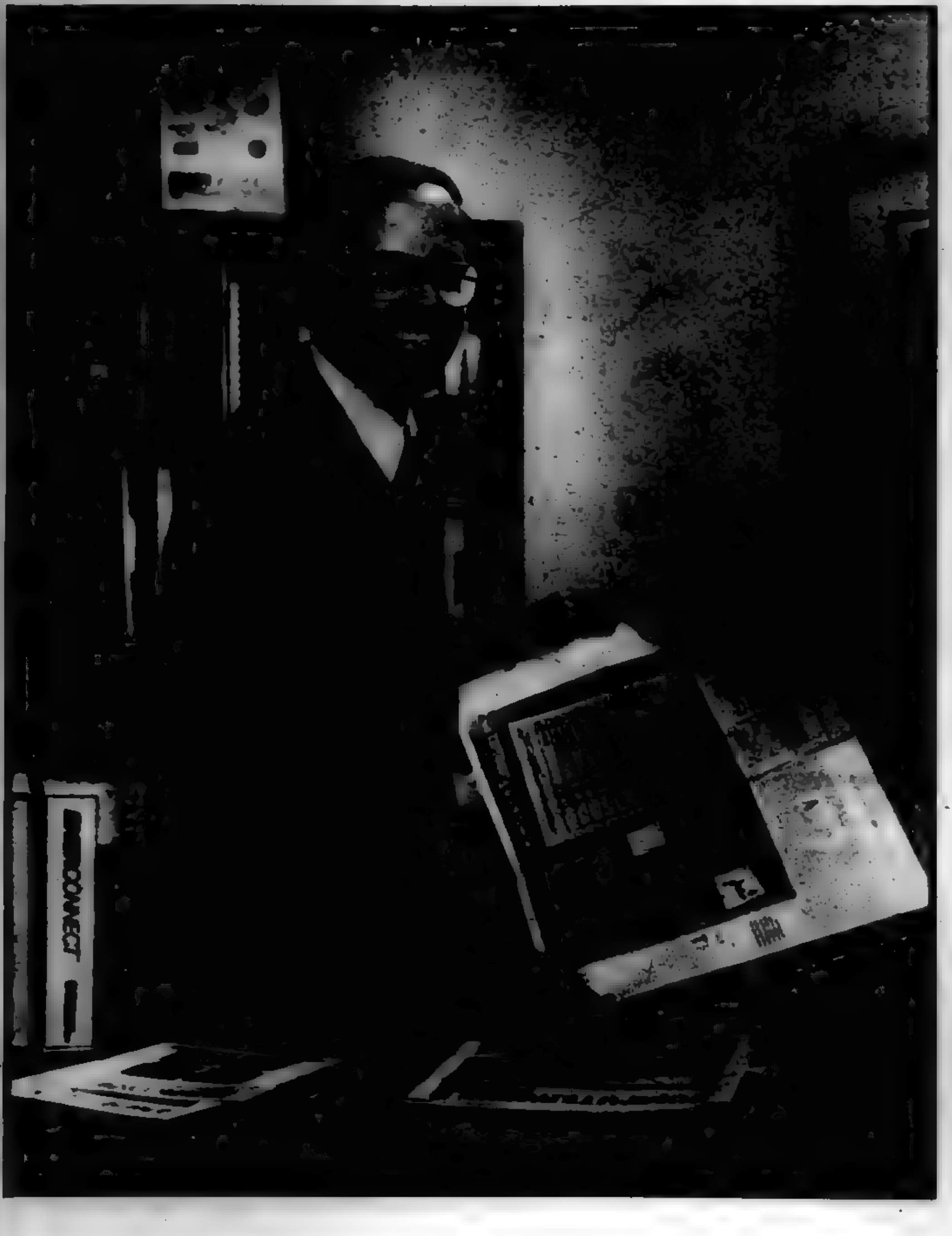

EnerConnect is the second major micro product from Enertronics, developers of the successful EnerGraphics package. As the ad for EnerConnect says, it is “. . . the first software package that puts mainframe graphics capability into the hands of anyone with an IBM PC . . . or 3270 PC.”

When it came time to announce EnerConnect, Randy Andes decided to use *Information Week*, *Business Week*, and *Computerworld Focus*. As Randy puts it, “. . . we knew *Computerworld* reached the people we need to talk to from past ads for EnerGraphics, and we decided to test *Focus* because, as the name says, each issue focuses on a topic. So, we could select an appropriate editorial environment.”

The results? “*Computerworld Focus* has produced the most response of any of the publications used and, by far, the best response. In fact, total response (via the 800 number) has far exceeded expectations. We further intend to continue to tie into *Computerworld's* editorial calendar where appropriate.”

The moral? Well focused advertising in a well focused medium will produce the best results every time.

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Randy T. Andes, Director of Marketing,
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COMPUTER INDUSTRY

Amidst shakeout, firm seeks growth via buyout

MOUNTAIN VIEW, Calif. — The much-heralded shakeout in the microcomputer software industry brings with it aggressive growth opportunities for a few companies, and Software Publishing Corp. intends to be one of the big survivors.

Last month [CW, July 8], the company announced it would acquire Harvard Software, Inc. of Littleton, Mass. The move gives the publisher of the popular PFS product series its first corporate-oriented product, Harvard's best-selling project management software, Harvard Project Manager and Harvard Total Project Manager.

In a recent interview, Fred Gibbons, president of Software Publishing, said the company must address new markets if it is to reach the $100 million revenue mark he has targeted for 1987. Last year, the company's annual revenue was $23 million; in the first nine months of the current fiscal year, revenue was $26.5 million, and profits were $4.3 million.

No further acquisitions are planned, but Gibbons did not rule out future activity. "Mergers are seductive," he said. Gibbons envisions his company in the same revenue category of mainframe software vendor Cullinet Software, Inc. within three years. "And it's all available through acquisitions like this one," he added.

But his immediate priority is "to make this acquisition work first." The merger must still be approved by the boards of directors of both companies, and neither company would comment on whether the Harvard operation would be moved to the West Coast or if its management team will remain intact. The price of the acquisition was not released, but sources said it is approximately $7 million.

Both Gibbons and Harvard Software said they believe the merger provides each with access to the other's high-growth markets.

"We need Software Publishing just like

See BUY page 61

TI reports more losses, staff cuts

DALLAS — Continuing to feel the brunt of the semiconductor industry slump, Texas Instruments, Inc. recently announced a second-quarter loss and its third round of layoffs in eight months.

The company said its chip business operated at a loss during the quarter ended June 30. TI also reported that sales of data systems equipment declined from the year-earlier period. TI reported a net loss of $3.9 million, or 16 cents per share, compared with year-earlier profits of $85.9 million, or $3.57 per share. Revenue declined 16% to $1.23 billion, compared with $1.46 billion a year earlier.

In a prepared statement, Chairman Mark Shepherd Jr. and President and Chief Executive Officer Jerry R. Junkins said the company plans to lay off 1,800 workers and continue reduced work sched-

See TI page 60

- The war of words between DEC and emulator Emulex became more strident, with allegations of espionage being charged and hotly denied/58
- No news is good news these days, with three vendors of communications products recently chiming in with less than glowing financial reports and Perkin-Elmer dismissing workers in a consolidation move/58
- Despite the imminence of commercially viable optical storage products, Eastman Kodak is confident that demand will increase for computer-integrated microfilm applications/59

Software mart: Mixed results

As anticipated [CW, July 15], Applied Data Research, Inc. (ADR) recently reported a second-quarter loss of $3.1 million, or 48 cents per share, its first quarterly loss in two years.

However, two other software vendors, Computer Associates International, Inc. and Computer Sciences Corp. (CSC) continued their growth, posting earnings gains for the quarter ended June 30.

ADR of Princeton, N.J., posted a slight revenue gain to $30.1 million from $28.5 million a year ago. But Chairman and Chief Executive Officer John R. Bennett said the increase did not keep pace with expenses. ADR had earned $1.7 million, or 30 cents per share, in the comparable quarter last year.

See ADR page 61

Move to smaller drive not easy

INDUSTRY INSIGHT

By Edward Warner
CW Senior Writer

In a move that holds the potential to cost users a bundle, IBM late last month announced that it has ended research and development on 5¼-in. diskette drives and plans to cease their production in its sole U.S. diskette drive manufacturing facility.

The move, according to analysts such as James Stone, vice-president for research at Shearson Lehman/American Express, Inc. in New York, is a leading indicator of Big Blue's intent to shift emphasis to the rival 3½-in. diskette format in its future personal computers, beginning with its much-rumored laptop. For the user, this all might appear to be a small matter, something akin to a decision to offer a smaller keyboard. If only that were the case.

In actuality, users of Personal Computer software may find themselves boxed in a few years down the line as they attempt to replace their older Personal Computers with newer IBM desktop machines that use the 3½-in. drives. Confronted with the difference in size between the diskettes of their existing software and the tiny mouths of 3½-in. drives, users will try to copy their programs to blank 3½-in. diskettes.

In the case of non-copy-protected programs, like Multimate International Corp.'s Multimate word processor,

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Seequa Computer ailing; others to handle production

By Clinton Wilder
CW Staff

ODENTON, Md. — One of many victims of the IBM-compatible micro shakeout, Seequa Computer Corp. now hopes to survive by having its computers built by other companies 3,000 miles away.

The 8-year-old vendor has endured reportedly massive debt, the closing of its one production facility and the layoff of almost 90% of its work force.

As recently as one year ago, Seequa employed more than 250 people, many of whom assembled machines like the IBM Portable Computer-compatible Chameleon at the production facility here. Now Seequa employs just 30 marketing, sales and management employees, and its computers are built in California's Silicon Valley and Guadalajara, Mexico.

Late last month, a local auctioneer sold off Seequa's production plant assets in a two-day liquidation. According to Seequa officials, the firm felt it was more cost-effective to farm out all of its production to outside suppliers.

"We're looking for a new location for our offices in the near future," said Seequa sales support representative John Hughes. "There's a lot of unused space here."

In recent months, Seequa has signed agreements with three firms to handle its production. Sunnyvale, Calif.-based Televideo Systems, Inc., manufactures the portable Chameleon XL, Prime Circuit Technology builds the Chameleon in San Jose, Calif., and the Mexican firm of Fabremex will assemble a new Seequa product in Guadalajara.

"We made the decision to shut down here six to nine months ago," said Jim Hoffman, Seequa's marketing director. "We've been gradually phasing out production, and for the last six months we've only done final assembly here. We're keeping a few production people to oversee the subcontractors, but most of [the 30 remaining employees] are in technical, sales and marketing positions."

Televideo's relationship with Seequa is tied to a $100 million U.S. Navy computer systems contract awarded to Federal Data Corp. of Chevy Chase, Md., earlier this year. Seequa was to be a prime subcontractor for up to 1,000 Chameleons, but the firm later sold its manufacturing rights to Televideo through Federal Data and one of Seequa's creditors, the Bank of Maryland.

"Our production costs were too high to support our manufacturing facility," Seequa's Hughes said.

Officials at closely held Seequa declined to reveal financial information, but consultant Terry Miller said the company told its creditors earlier this year that it had $4 million to $4.5 million in assets and $14 million in debts. "They've been in a world of hurt," said Miller, president of Government Sales Consultants, Inc., of Annandale, Va., a firm that advises both the federal government and its computer contractors. "I think the creditors are willing to play along," Miller added.

Second-quarter losses hit leading vendors

The effect of the computer industry slowdown was reflected in the recently announced second-quarter financial results of three leading communications vendors. Intecom, Inc. and TIE/Communications, Inc. posted substantial losses, while Ungermann-Bass, Inc. reported an 11.5% decline in profits from the year-earlier quarter.

Shelton, Conn.-based TIE/Communications posted a loss of $40 million, or $1.12 per share, as second-quarter revenue of $70.2 million was less than half of the company's revenue a year ago. In the second quarter of 1984, TIE/Communications earned $507,000, or 2 cents per share, on sales of $145.1 million.

TIE/Communications blamed the losses on $40 million write-downs of the value of slow-moving inventories, $8 million in restructuring and consolidation costs and the liquidation of some inventories. The firm's President and Chairman Thomas L. Kelly Jr. said an anticipated increase in sales and a lowered bottom line are expected to make the company profitable by the fourth quarter.

Intecom also wrote down backlogged inventories in its older S/40 and TSX product lines, a $7.6 million charge that contributed to a second-quarter loss of $6.8 million, or 21 cents per share. The Allen, Texas, communications switch maker earned $1.8 million, or 6 cents per share, in the comparable quarter a year ago. Revenue declined slightly from $28.2 million to $27.9 million.

Despite a 48% increase in sales, Ungermann-Bass reported an earnings decline from $1.5 million, or 9 cents per share, a year ago to $1.3 million, or 8 cents per share. Second-quarter revenue was $18.6 million, up from $12.6 million in the same quarter in 1984.

The Santa Clara, Calif., local-area network vendor reported that second-quarter operating expenses soared 62%, from $10.9 million in 1984 to $17.7 million in 1985. Outlays for research and development climbed 80% to $3.3 million, or 18% of sales during the quarter.

PE cuts work force by 2%

NORWALK, Conn. — Perkin-Elmer Corp. recently announced it had reduced its work force by 240 people, or 2% of its 15,700 employees, and will shut down in early 1986 its Oak Brook, Ill., Instrument Department.

The company said the work force reduction would primarily affect Connecticut facilities and affected employees will receive full benefits for the 1985 fiscal year.

Horace G. McDonnell, chairman and chief executive officer, said the reduction followed a number of reorganization and restructuring steps made this year to strengthen the company's ability to respond to changing business needs.

McDonnell said the extent of the reduction was lessened somewhat by efforts to transfer employees to other divisions where their skills could be used.

DEC fuels Emulex suit

MAYNARD, Mass. — The ongoing legal battle between Digital Equipment Corp. and Emulex Corp. heated up recently with both firms making additional charges.

DEC amended its pending multimillion-dollar patent infringement lawsuit [CW, July 15] to charge that Emulex induced a former DEC employee to spill trade secrets, while Emulex threatened counteraction to protect itself from harassment.

In its original suit in federal court in Concord, N.H., July 5, DEC charged Emulex with using proprietary DEC technology in its DEC-compatible port protocol, bus and interconnect products. DEC added the trade secret theft charges against the firm July 22 and filed a separate trade secret theft lawsuit against former DEC senior engineer Charles Hess in federal court in Denver on July 19. Separately, DEC sought and was granted an injunction in New Hampshire on July 18 preventing Hess from participating "in any matter relating to the lawsuit."

DEC based its request on a charge that Hess, while employed by DEC in Colorado Springs, Colo., participated in a confidential meeting with attorneys discussing legal action against Emulex. DEC alleged that Hess was secretly discussing employment with Emulex at the time and "related information he learned at this meeting to Emulex." Emulex later hired Hess as director of engineering.

Emulex attorneys have 20 days to file a formal response to the July 18 injunction, but Emulex Chairman Fred B. Cox immediately issued a statement. "We believe that the primary purpose of DEC's inflammatory allegations is to strengthen its position by trying to discredit Emulex in the press," Cox said. "[The charges] that we willfully induced an employee to steal trade secrets and violate terms of an employment contract are absolutely false."

Study belies 'two-tier work force'

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — A study said to dispute the theory that office and factory automation creates a "two-tier work force" of a small number of high-paid executives and a large number of low-paid menial workers was released recently by a computer trade association.

The Computer and Business Equipment Manufacturers Association (Cbema) said the study was commissioned to respond to critics who say that computers and robots have displaced many middle-income jobs, particularly in high-technology industries.

Statements such as these have been made by the AFL-CIO and MIT Professors Harley Shaiken and Lester Thurow.

At a press conference here, Cbema released a report by James L. Medoff, a Harvard University economist, and Paul A. Strassmann, a former MIS executive at Xerox Corp.

Medoff said his study of hourly earnings by U.S. nonagricultural workers showed that "during the past decade inequality in hourly earnings among all wage earners in this country has remained remarkably constant." This finding, Strassmann said, contradicts the two-tier work force theory.

In a previous Cbema-sponsored study done by Strassmann, he said that the computer industry "is the most middle-class industry I have found."

Cbema President Vico E. Henriques said the trade association "is pleased to help demonstrate that the fears some people have about the negative effect of computers are inconsistent with the data."

Zenith names new president

GLENVIEW, Ill. — Zenith Electronics Corp. recently announced the promotion of Robert P. Dilworth to the position of president of Zenith Data Systems Corp.

Dilworth succeeds interim President Carl A. Michelotti, who remains corporate senior vice-president and group executive with the parent company, Zenith Electronics.

Michelotti, who announced Dilworth's appointment, had served as interim president of Zenith Data Systems since May 1984.

Inteq subsidiary

Michelotti recently assumed responsibility for Zenith's recently acquired Inteq subsidiary.

Dilworth is the former president of Morrow Designs, Inc., a privately held microcomputer vendor.

Before coming to Zenith Data Systems, Dilworth was president of Ultra Magnetics and held senior positions with Varian Associates and Sperry Corp.

Exec sees growing demand for microfilm

By Peter Bartolik
CW Staff

Despite the increasing development pace of optical disk storage technology, Eastman Kodak Co. is confident that demand for computer-integrated microfilm applications will continue to grow.

During a recent interview with *Computerworld*, John A. Lacy, general manager for marketing and vice-president of Kodak's Business Imaging Systems Division, said he sees little likelihood that technological developments in magnetic and optical storage will override the cost and duplication advantages of microfilm.

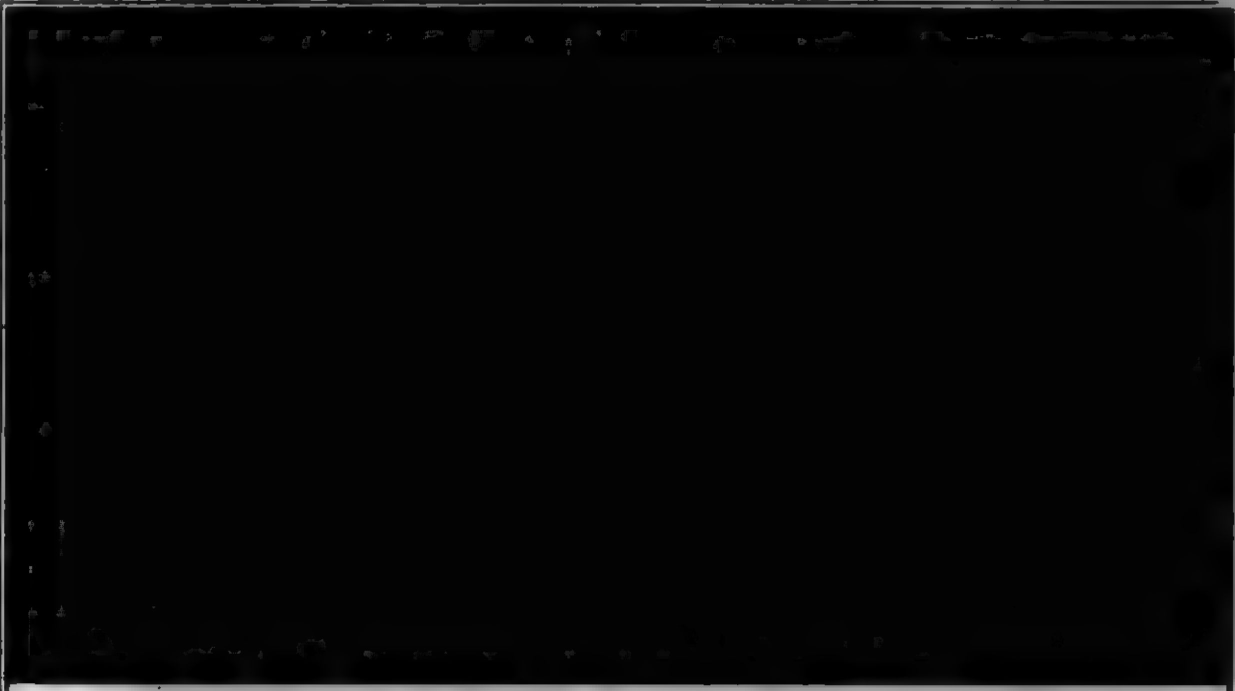
"There is a tendency for people to feel that higher capacity magnetics or optical storage is going to replace film, but we don't believe it for a second," Lacy said. During last month's National Computer Conference, Kodak's recently acquired subsidiary, Verbatim Corp., demonstrated a prototype read-write optical disk drive system using a 3½-in. format.

In recent months, Business Imaging Systems announced a number of computer-assisted microfilm retrieval and computer output microfilm imaging systems. Also, the Kodak Copy Products Division unveiled an electronic publishing system.

Lacy predicted that interest in optical storage developments will spur interest in alternative document storage technologies. He said the situation may be analogous to the introduction of magnetic disk technology, which at one time was incorrectly predicted to signal the demise of magnetic tape demand.

"We are well aware of the disadvantages of microfilm," Lacy said, noting a slower access time for retrieving microfilm. But he noted that technological developments such as the company's autoloading retrieval device has greatly improved access time. "Microfilm still is the least expensive storage medium," he said.

Kodak's strategy is to develop systems capable of using all storage alternatives and allowing customers to make their own selections, according to Lacy.



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that should be no problem. A Multimate spokesman said that the firm does not view such duplication as a license violation.

In the case of such software as Lotus Development Corp.'s 1-2-3 and Symphony, however, the user is in for a surprise. Both programs are copy protected and are already available in versions for the 3½-in. format.

Though there is a trend toward nonprotected software, Lotus has yet to join it, and, if it and other software vendors do not, users will find themselves compelled to buy 3½-in. versions of programs that they already own just so that they can run those programs on new Personal Computers.

Impact on 1-2-3 users

As an illustration, analyst Stone noted the impact this might have on those who want to use 1-2-3 on an IBM laptop, a machine being referred to by some as the Clamshell. As Stone put it, "my price just went up $600 in the Clamshell to buy it in 3½-in. [drives]."

The potential cost to corporate users, who could own hundreds of copies of a copy-protected program like 1-2-3, might be outrageous.

This is not IBM's fault; the Giant of Armonk, though much enamored of standards, has every right to move to adopt a format that uses media that is more ruggedly packaged and has the capacity to hold more data than the floppy diskette. The Personal Computer that IBM sells in Japan, in fact, uses 3½-in. drives — each holding 1M byte of data.

The software vendor, it could also be argued, has every right to make another buck or two by selling the same program twice to users, once for the Personal Computer and again for the Personal Computer's 3½-in. diskette successor.

Additional software costs

That argument is not likely to sit well with those who are facing several thousands of dollars in additional software costs when their corporations want to upgrade their existing stock of Personal Computers.

This may be a nightmare scenario for the corporate personal computer manager, but it is not one they will likely face in the coming year unless they buy a quantity of Clamshell laptop units, should that machine debut soon.

In the view of analyst Jim Porter, president of Disk/Trend, Inc., IBM will use 1M-byte, 3½-in. diskette drives in the Clamshell, if it uses them at all next year — provided, that is, that the Clamshell is introduced.

By 1987, though, users might begin to see 2M-byte 3½-in. diskette drives in use in IBM desktop machines — and at that point, a new standard will be set. When that happens, Personal Computer software in the 5¼-in. format might become as scarce as software in the rival format is today. As Porter rhetorically asked, "You have trouble buying 78 rpm records today, don't you?"

TI from page 57

ules, primarily in semiconductor operations. "It is clear that the world semiconductor industry is in its deepest recession since 1974 and possibly the most severe in the history of the industry," the executives said.

Last December, TI dismissed 2,000 workers, and an additional 1,000 workers were dismissed in April.

The TI executives warned that conditions are not likely to improve soon. "The declining shipment trend is expected to continue, with further adverse effect on the financial performance of this business in the third quarter," the statement said.

Following the operating losses posted by Intel Corp. and Advanced Micro Devices, Inc. [CW, July 29], TI's deteriorating semiconductor operations indicate that the prolonged semiconductor slump is far from over.

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from page 57

they need us," said Shakeel Mozaffar, vice-president of marketing at Harvard Software.

Future Computing, Inc., a market research firm in Richardson, Texas, is predicting that the market for project management software will grow from $50 million in 1985 to $265 million by 1990. However, most of this growth will occur in sales to smaller companies, while the bulk of Harvard Software's present business comes from Fortune 1,000 customers, Mozaffar said.

According to Mozaffar, with its current product line, Harvard Software expects to post sales of $6 million for the year, up from $3.3 million in 1984.

According to Gibbons, "the Harvard product line will serve as a path to more sophisticated business applications for Software Publishing. This is the direction we want to target, because the capabilities of personal computers are increasing, and we need to match this with more software capability and power."

More memory and windowing capabilities are the most important new developments affecting his products, Gibbons said.

Software Publishing's PFS product line has an installed base of 1.6 million units, Gibbons said. During the third quarter just ended, revenue was $7.9 million, up from $5.9 million a year ago. The company posted a third-quarter profit of $892,000, down from $1.06 million a year earlier.

"Both partners will gain from the merger," said Paul Cubbage, an analyst with Dataquest, Inc., a market research firm in San Jose, Calif. The merger will give Software Publishing access to Harvard Software's installed base in the corporate environment, while Harvard Software will gain financial clout and marketing expertise, Cubbage said.

But the marriage may not be completely smooth, according to one analyst. "It will be difficult for Software Publishing to create more complex programs, yet still maintain the ease-of-use reputation which is the company's hallmark," said Richard Matlack, a vice-president at Infocorp, a market research firm in Cupertino, Calif.

Software Publishing will face a horde of competitors when it targets complex applications for the corporate user, according to Matlack, who said there are more than 100 vendors producing project management packages for personal computers.

Gibbons said the company will remain basically unchanged. "We'll keep our products simple. We won't become suddenly feature crazy, adding lots of bells and whistles to our new products," he said. Since both companies sell through retail channels, the merged company will have an advantage over Harvard Software's competitors, most of which market products through OEMs, he said.

ADR

from page 57

"We have always made significant investments in maintaining, enhancing and developing new software products," Bennett said. "While we will moderate our expenses in response to what we think is a cyclical slowdown in the computer industry, we will continue our commitment to building ADR's future. Bennett predicted a $2.1 per-share profit for ADR for the full year.

Jericho, N.Y.-based Computer Associates reported earnings increased 36% to $1.4 million, or 13 cents per share, up from $1 million, or 9 cents per share, in the second quarter of 1984. Sales grew 42%, from $22 million to $31.2 million. The results represented the firm's 15th consecutive quarter of 30% or higher growth in both sales and earnings since going public in December 1981.

"All of our operations performed essentially according to plan," said Computer Associates President Anthony W. Wang. The company also announced that the name of its recently acquired Sorcim/IUS Micro Software division has been changed to Computer Associates Micro Products Division.

CSC of El Segundo, Calif., reported more modest earnings growth of 12%, from $4.6 million, or 34 cents per share a year ago, to $5.2 million, or 38 cents per share, in the quarter ended June 30. Revenue increased 8% to $187.5 million, up from $173.9 million in the comparable 1984 quarter.

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CHASE

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Riyadh 11411, Kingdom of Saudi Arabia

Telephone: (966) 01-401-[illegible]
Telex: 2[illegible] PLAN SJ

Last date for submission of applications is September 4, 1985.

[illegible]

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Reynolds Aluminum has multiple openings for Computer Professionals, at its Richmond, Virginia corporate headquarters. The environment consists of multiple large systems utilizing MVS/XA, JES2, TSO/ISPF, ACF/VTAM, CICS, DB2, CMF and IMS/DB. Also interested in System/38 applicants with experience in CL language, RPG III and screen design aid to support manufacturing and technical applications. Successful applicants will possess a college degree or compensating experience, and enjoy working with a team of highly skilled and motivated professionals in an atmosphere of challenge and growth provided by a Fortune 125 company.

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[illegible] 2 + yrs [illegible]		LA	[illegible]
[illegible]		NE	[illegible]
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[illegible]	TX	OK	[illegible]
[illegible]		FL	[illegible]
[illegible]		TX	[illegible]
[illegible]		TX	[illegible]
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Personnel Department,
Mail Stop 485
Data 3 Systems, Inc.
P.O. Box 441
Santa Rosa, CA 95402-0441
707 528-6560

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Position requires a Bachelor's degree in Computer Science, Quantitative Systems or related field or equivalent experience; 1-3 years experience in programming and systems software programming. MVS and VM and at least 2 years experience in computer operations highly desirable, along with DOS and systems design.

Interested and qualified candidates should submit resume by August 16 to: CITY OF MESA, Personnel Department, P.O. Box 1466, Mesa, Arizona [illegible]. For More Job Information Call(602) 834-2365.

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City of Mesa

DIRECTOR, INFORMATION SYSTEMS

- [illegible] Community College District, Oakland, California. Well-established, [illegible] district with approximately 30,000 students, [illegible] million operating budget, and 1,000 full-time employees. Management level position responsible for centralized comprehensive information systems services including administrative, personnel, and financial applications. Utilizes IBM 4381 - Mod 2 system. 18 full-time staff. Requires college degree or equivalent and significant administrative and supervisory experience in the development and management of modern, government-oriented, automated information systems. Salary open, depending upon qualifications. Submit resume (including current salary and work-related references) by September 17, 1985, to Ralph Andersen & Associates, Management and Executive Recruitment Consultants, 1446 Ethan Way, Suite 101, Sacramento, California [illegible], (916) [illegible].

DIRECTOR OF COMPUTER SERVICES

The Evergreen State College invites applications for the position of Director of Computer Services. The Director is responsible for planning, developing and managing computer activities and resources in an innovative, interdisciplinary, four-year liberal arts college. The Director works with faculty to ensure support for the diverse application of computing resources throughout the curriculum. SALARY: Negotiable. APPLICATION: Submit (1) a resume detailing education and work background; (2) a statement of qualifications for the position; (3) names, addresses, and telephone numbers of three references who can evaluate both experience and management style. MAIL TO: The Evergreen State College, Employee Relations Office, Search Committee, Computer Director, Olympia, WA [illegible]. Review of applications will begin on September 16, 1985. All of the material must have been received before an applicant can be considered for this position. Call [illegible] ext. [illegible] for information. An Equal Opportunity, Affirmative Action Employer

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Candidates for both the Programmer and Analyst/Programmer positions must have a demonstrated proficiency with IBM 4381 or equivalent mainframe running OS; OS JCL; IBM system utilities; programming on-line applications and COBOL.

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Knowledge of applications analysis and programming methods to utilize languages, hardware and tools in developing, coding and implementing applications; ability to work with client personnel to determine solutions and type of data to be processed; to analyze solutions in terms of operating system requirements and modify design to get maximum advantage of existing equipment; to establish efficient and effective procedures in support of automated systems; to work under limited supervision; to write, test and maintain computer programs; to devise data verification methods and standard system operational procedures; to prepare problem definitions and recommendations of equipment needed; to prepare detailed logic flows and machine instructions; and to communicate verbally and in writing.

Send application material to:

Statewide Office of Human Resource Development
University of Alaska
Room 1, Bunnell Building
Fairbanks, Alaska 99701

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[illegible]
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Human Resources
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First National Bank in Albuquerque

EDP Audit Manager

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Information Associates

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The group is responsible for installing and maintaining an expanding base of VM systems, evaluating application packages as needed, configuring hardware and communications gear, developing procedures for operations and, for those systems for which CSO serves as facilities manager, interfacing with the campus units owning and using those systems.

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Applicants for this position should have experience with an IBM operating system, preferably VM/CMS, must be able to communicate effectively, and must have the ability to deal with large systems. Previous experience as a systems programmer is a strong plus.

The starting date is flexible and the salary range is from [illegible] to [illegible]. In order to ensure full consideration, applications must be received by September 3, 1985. Send applications to Robert [illegible], University of Illinois, 173 Digital Computer Lab, 1304 W. Springfield, Urbana, IL 61801. Phone (217) 333-[illegible].

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To develop curriculum materials and provide instruction. We require a minimum of 4 years experience in a similar position. BS in computer science is mandatory, MS is highly desirable. Strong background in BASIC, PASCAL, and FORTRAN required. Previous overseas experience desirable.

COMPUTER ENGINEERING EDUCATION SPECIALIST

To develop curriculum materials and provide instruction. We require a minimum of 4 years experience in a similar position. Expertise in computer electronics, circuit theory, and logical systems. Familiarity with micro-computer operations. Programming ability in BASIC and FORTRAN desirable. BS in Electrical Engineering/Electronics Engineering is mandatory. MS highly desirable. Previous overseas experience desirable.

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[illegible]

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- [illegible]
- [illegible]
- [illegible]
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[illegible]
[illegible]
(313) [illegible]

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The Christian Broadcasting Network, Inc., an evangelical ministry located in Virginia Beach, VA has immediate openings for IBM mainframe Systems Programmers. Knowledge of IDMS is preferred. If you feel led and wish to serve, send letter and resume to:

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Box SJ
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The Underwood Group, Inc.
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(919) [illegible]

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Blue Cross & Blue Shield of Wyoming has an immediate opening for a degreed programmer with a minimum of two years COBOL experience. VSAM and CICS background is a strong plus. [illegible]

[illegible]
Blue Cross & Blue Shield of Wyoming
P.O. Box [illegible]
Cheyenne, Wyoming [illegible]

EOE M/F/H/V

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Apply to:

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P.O. Box [illegible]
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BASF Wyandotte Corporation, a major chemical manufacturer, is currently seeking an MVS Systems Programmer, with a minimum of 5 years' experience in data processing that includes 3 years of systems programming in an IBM OS/MVS environment. Competency in Assembler, OS Utilities and Dump Reading is also required. Our environment includes Amdahl 470 V8 and IBM 4341 Group 2 with MVS, JES2, TSO/ISPF, TOP SECRET, CICS, IMS/DB, VTAM and ROSCOE.

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Human Resources Dept.
CW-SJP-0805
BASF Wyandotte Corporation
100 Cherry Hill Road
Parsippany, NJ 07054

BASF

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- [illegible]
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Engineering

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- **APPLICATIONS ENGINEERS:** customer interface, systems specifications, site planning, overseeing installations, and network troubleshooting; need experience with voice/data networks (both hardware and software), solid understanding of distributed DP, routing, etc., and ability to work with multi-vendor networks. Atlanta, Houston, Denver, San Francisco, Los Angeles (no relocation).
- **SYSTEMS MANAGER:** manage in-house computer systems for engineering design. Handle systems fine-tuning, allocation of CPU, disk space, etc., hardware/software installation, and some utilities and software development tool programming. Need solid VAX/VMS or 68000-based UNIX/C experience; degree preferred.
- **TECHNICAL WRITER:** need 1+ year writing specifications and documentation for hardware and software. Knowledge of data communications highly preferred. 4 year degree preferred.
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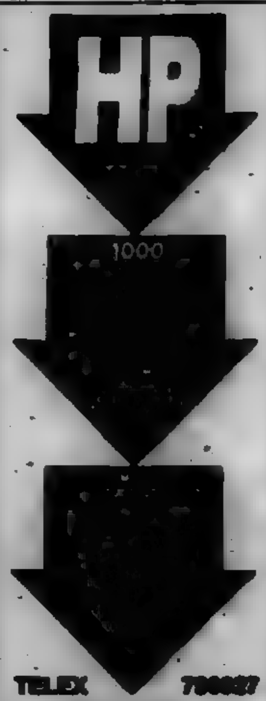

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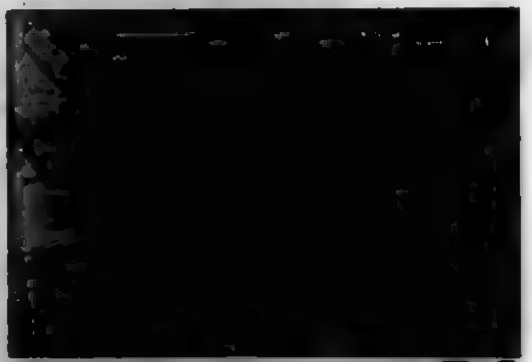

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RANDOLPH MIPS OF THE MONTH

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IBM

SYSTEMS	MIPS (Millions of Instructions Per Second)	MEGABYTES
4321	0.25	1
4331-1	0.25	0.5 to 1
4331-11	0.30	1 to 2
4331-2	0.38	1 to 4
4341-9	0.52	1 to 4
4331-3	0.70	2 to 4
4341-10	0.75	2 to 4
4341-1	0.88	2 to 4
4341-11	1.1	2 to 8
4381-4	1.16	2 to 12
3031	1.2	2 to 6
4381-5	1.45	2 to 12
4341-2	1.5	2 to 16
4341-12	1.65	2 to 16
3031AP	2.0	2 to 6
4381-1	2.1	4 to 16
3032	2.5	2 to 8
4381-2	2.7	4 to 32
3083E	2.9	4 to 16
[illegible]CX	3.3	8 to [illegible]

SYSTEMS	MIPS (Millions of Instructions Per Second)	MEGABYTES
4381-3	[illegible]	[illegible] to 32
3083E	[illegible]	[illegible] to 32
3033N	4.[illegible]	[illegible] to 16
3083EX	4.4	[illegible]
3033UP	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]X	[illegible]	[illegible] to 32
[illegible]	[illegible]	[illegible] to 32
[illegible]	[illegible]	8 to 32
[illegible]	[illegible]	4 to 24
[illegible]	[illegible]	8 to 32
[illegible]	[illegible]	16 to 32
[illegible]	[illegible]	16 to 48
[illegible]	11.[illegible]	16 to 64
[illegible]	14.0	16 to 48
[illegible]	15.5	16 to 64
[illegible]	25.6	32 to 96
[illegible]CX	26.7	32 to 128
[illegible]-[illegible]	29.4	64 to 192
[illegible]-400	52.9	128 to 256

[illegible] installation 1987

AMDAHL

SYSTEMS	MIPS	MEGABYTES
470V[illegible]	[illegible]	[illegible]
470V[illegible]	[illegible]	[illegible] to 32
470V[illegible]	[illegible]	[illegible] to 32
5860	[illegible]	[illegible] to 64
5880	1[illegible]	16 to 64
5868	14.[illegible]	16 to 64
5867	22.0	24 to 64
5888	[illegible]2.0	32 to 128
5870	25.6	16 to 64
5890	38.6	32 to 128

NATIONAL ADVANCED SYSTEMS

SYSTEMS	MIPS	MEGABYTES
AS/5040	5.2	8 to 32
AS/6620	6.5	8 to 32
AS/6650	6.4	16 to 32
AS/6640	7.2	8 to 48
AS/8030	9	8 to 48
AS/8050	11.2	16 to 64
AS/8070	16.2	16 to 64
AS/8080	20	16 to 64
†AS/XL-60	28	32 to 256
†AS/XL-80	50	64 to 256

†First installation 1986

The above information is intended as a guideline for computer users on relative computer system instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However, Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based on hardware/software configurations, and system manufacturers continually modify computer models as design improvements in hardware and software arise.

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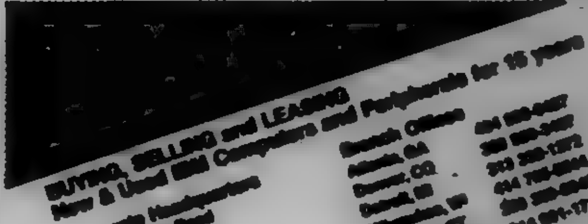

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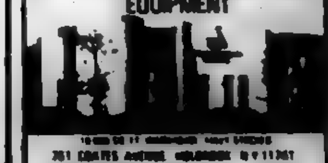

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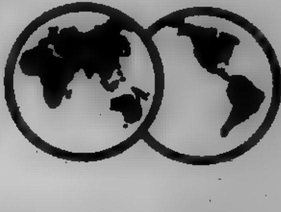

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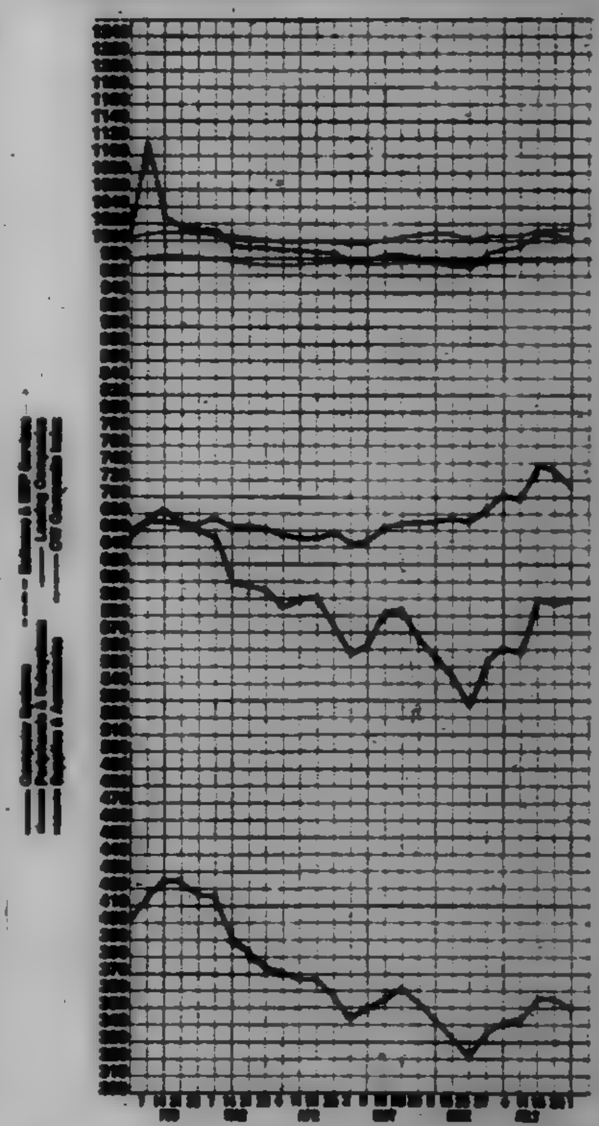
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Revised CICS bows

Version called 'response' to user needs, frees up usable virtual storage space

By John Gallant
CW Staff

"Long overdue but well worth the wait." That was the consensus last week of users reacting to IBM's introduction of an enhancement of its Customer Information Control System.

The product, officially known as CICS Version 1, Release 7, promises to ease the installation and reconfiguration of terminals, offers the potential to free much-needed virtual storage space, boasts improved recovery and restart capabilities and provides additional command-level functions and device support.

IBM's low-key unveiling of the latest version of its CICS transaction manager — the basis for on-line applications in most IBM mainframe environments — was met with praise from both users and analysts (see story page 8). Representatives of both groups contended that the enhancements improve the product's usefulness in supporting large networks. In an apparent effort to show concern for user needs, IBM stated that CICS was revamped in response to more than 55 requirements submitted by the Guide and Share IBM users groups (see story page 8).

"There is a great deal to be excited about in this announcement," said William Ray, manager of data and network services for Corning Glass Works, Inc. in Corning, N.Y. "CICS is now a very healthy product with a great many things that will be of value to us."

According to Frank Gens, industry analyst with International Data Corp., a Framingham, Mass.-based market research firm,

See CICS page 6

DEC profit decline less than expected

By Peter Bartolik
CW Staff

Absorbing some impact from the general decline in minicomputer sales, Digital Equipment Corp. last week reported fourth-quarter profits below its year-earlier level but higher than Wall Street analysts had projected. Of the other major minicomputer manufacturers, both Wang Laboratories, Inc. and Data General Corp. recently reported quarterly losses, while Prime Computer, Inc. reported a slight increase in profits.

In other financial news last week, Control Data Corp. said Securities and Exchange Commission objections to the company's reporting procedures caused CDC to revise its recent second-quarter report to show a loss and to revise 1984 results by cutting reported profits by 84%. Also, Cullinet Software, Inc. said it expects first-quarter profits to dip for the first time in 29 reporting periods.

Maynard, Mass.-based DEC said demand for its VAX 8600 and Microvax II products remained high. A DEC spokesman told *Computerworld* that a new, tough budget will enable the company to weather current economic conditions and to ride out DEC's first-ever fourth-quarter-to-first-quarter revenue decline.

DEC said profits for the fourth quarter were $100.4 million, or $1.66 per share, down 23% from $130.6 million, or $2.28 per share, from the same quarter a year earlier. In recent weeks, securities analysts projected that DEC's profits would range downward from about $1.40 per share.

Revenue for the quarter was $1.85 billion, up 12% compared

See FINANCES page 7

TOP OF THE NEWS

John Hancock's AT&T wiring scheme to support IBM terminals will keep that cable separate from wire used to support telecommunications. Page 2.

■

An education foundation's six-month test of a DBMS indicates the product will handle what had been a huge information overload. Page 4.

■

The Justice Department is looking into accusations that Hitachi illegally dumped semiconductors into the U.S. market to solidify market share. Page 6.

■

High marks for new Symphony

By Eric Bender
CW Staff

Initial reactions to Lotus Development Corp.'s first upgrade of its successful high-end Symphony productivity program were favorable, according to a *Computerworld* survey conducted last week of corporate beta users. "Overall, I felt very positive about the product," said Gary Schnorr, manager of office information systems at General Foods Corp., which has installed approximately 1,200 personal computers.

Schnorr emphasized the importance of the release's expanded memory capability. Working in conjunction with a new generation of memory boards — such as Intel Corp.'s Aboveboard — this capability allows users to address up to 4M bytes of dynamic random-access memory above the usual 640K-byte barrier. "To really unleash the power of Symphony," Schnorr said, "you're going to need the expanded memory." The original version of Symphony, shipped in July 1984, fit within the standard Microsoft Corp. MS-DOS memory limitation.

"Expanded memory is not something

See SYMPHONY page 6

Net gain: Firm finds multimillion dollar solution

By Paul Korzeniowski
CW Staff

ST. LOUIS — Key data processing personnel at McDonnell Douglas Corp. looked into a crystal ball in 1981 to see what the company's future networking needs would be. It was not a pretty sight.

Costs of managing its network were rising by 20% per year. Technical advances were constantly rendering current systems obsolete. Business requirements were shifting and placing additional demands on the network. Divestiture was lurking on the horizon, and the company feared it would lose the support and services that AT&T had been supplying.

In a manner that would have made John Wayne proud, the company decided to take matters into its own hands by designing and implementing what may be the largest private network in the country.

Once the company decided to build its own network, requests for proposals were sent to 30 vendors, according to Ernie H. Ridenhour, staff vice-president for information resource management at McDonnell Douglas and the one responsible for setting its telecommunications policies. The firm established a project team from various departments. The team was headed by D.C. Augustin, director of telecommunications network services at the firm.

Augustin's team considered various proposals before choosing Contel Information Systems, Inc. to handle the implementation of the network. The Contel installation at McDonnell Douglas cost $58 million and now supports 54,000 employees in 222 buildings.

Before the Contel network was installed, McDonnell Douglas' main offices here and in Long Beach, Calif., were connected by a Western Union, Inc. satellite link, 17 voice lines and 13 data lines. Regional offices were supported by these hubs with dial-up and private leased lines. All the offices used Centrex facili-

See NETWORK page 10

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NEWSPAPER

Insurer installs AT&T wiring

By John [illegible]
CW Staff

BOSTON — The nation's sixth largest insurance company here is installing a building wiring system from AT&T to support IBM terminals but will keep that cable separate from wire used to support telecommunications.

After looking at IBM's Cabling System, John Hancock Mutual Life Insurance Co. decided to install AT&T's Premises Distribution System (PDS). Like the IBM product, the AT&T cable scheme details how and with what a building can be wired to provide outlets for terminals that are similar to common electrical sockets. This obviates the need to pull new wire each time a terminal is relocated.

Hancock is installing the AT&T system in its Clarendon building, a 60-year-old, eight-floor structure that is being refurbished into modern office space in a $35 million renovation project. The building had been used for storage since the neighboring 60-story Hancock Tower was added to the company's three-building complex in Boston's Back Bay area.

When renovations are completed later this year or early next year, the Clarendon building will be used by Hancock and some of its subsidiaries, according to Michael Miele, a consultant for facilities planning. The AT&T system will primarily be used to support TSO programmers using IBM 3178, 3179, 3278 or 3279 display stations, Miele said.

The IBM terminals, which have standard plug-and-twist coaxial cable connectors, will be adapted to the four-pair strand wire used in the AT&T PDS system through baluns. Balun is a contraction taken from balanced/unbalanced and refers to the difference in electrical impedance between twisted-pair wire and coaxial cable, according to AT&T.

The flat, four-pair wire will run under the carpet from each office in the Clarendon building through a nearby column and up into the ceiling. Wire groups from the columns will then be gathered at wire closets on each floor. The wire closets house patch panels that enable office outlets to be cross-connected to achieve desired configurations.

The closets on each floor also terminate AT&T fiber-optic cables that run down through the building's vertical risers into Hancock's Berkeley building next door, Miele said. Hancock has moved all of its terminal controllers back into the Berkeley building, which houses the firm's processing facilities. Each of the roughly 25 IBM 3274-type controllers — now locally attached — can support up to 32 remote terminals through a pair of fiber-optic cables. The fiber-optic pairs are outfitted with multiplexers from Fibronics International, Inc.

Miele said that locally attaching the controllers improves terminal response time and facilitates cable coordination. Use of the fiber-optic pairs enables the terminals to be located at such distances from the controllers, but the copper-pair wire running from the fiber termination point in the wiring closet to the workstation cannot exceed 400 feet, Miele said.

> ”
>
> *The AT&T cable scheme details how and with what a building can be wired to provide outlets for terminals. This obviates the need to pull new wire each time a terminal is relocated.*

Hancock chose to wire the PDS system separately from the wire harness used with its AT&T System 85 private branch exchange. "We were worried that we might experience things like cross talk if we put telephone traffic on the same cable with data running at 2.3M bit/sec.," Miele said.

Asked if AT&T had tried to convince Hancock to support the terminals with the System 85, Miele said he believed the heavy TSO traffic would bog down the PBX. "We're still looking for a local-area network, but today local nets are not ready for the Hancock environment; we're strictly [IBM Systems Network Architecture/Synchronous Data Link Control]."

Miele estimated that the AT&T system costs roughly $300 per outlet to install.

Last year Hancock relocated roughly 60% of its employees. Generally, each time a person with a terminal was moved, the workstation had to be rewired. With PDS, Miele expects to save about $200 per move or installation.

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CORRECTIONS

A chart reporting recent layoffs in the computer industry incorrectly listed the number of employees laid off at Honeywell, Inc.'s Small Computer and Office Systems Group [CW, June 24]. There were 120 workers dismissed. Also, the name of Honeywell's Synertek division was misspelled.

An item in the *Softscope* column of June 24 incorrectly depicted the relationship between Digital Equipment Corp. and Cincom Systems, Inc. Although DEC will market and promote Cincom software as a result of a joint agreement, Cincom will continue to supply the products.

In the chart "Users rate their minis" [CW, July 22], the column representing IBM's System/38 was mislabeled System/36.

Contrary to information published in the "Random Access" column [CW, Aug. 5], Digital Equipment Corp.'s External Document Exchange software enables machines ranging from the DEC VAX-11/725 to the VAX 8600 to exchange read-only and revisable form documents with IBM Distributed Office Support Systems hosts.

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DBMS helps foundation handle 'information overload'

By Charles Babcock
CW New York Bureau

NEW YORK — The Exxon Education Foundation has tested Team-Up, a data base management system, on its local-area network for six months, and the results indicate it will be able to handle what had been "a massive information overload."

So reported Richard R. Johnson, the foundation's research director. The foundation has spent two years looking for a data base management system, hampered by a paucity of local-area network products. Major software houses are beginning to bring network systems to market but "at the beginning of 1984, there was virtually nothing," said Joel Levy of Wohl Associates of Bala Cynwyd, Pa.

By mid-1984, foundation staff members had tried two systems, Datastore from Software Connections, Inc. in San Jose, Calif., and Team-Up, previously Informa DBMS, from Unlimited Processing in Jacksonville, Fla.

Random changes not accepted

The early version of Datastore had a glitch in a conversion routine that "caused 1983 to become 1984" when the foundation transferred its records from a minicomputer to its Ungermann-Bass, Inc. local-area network. Datastore was user-friendly and performed well as a DBMS, but "we will not accept random changes in our data," Johnson said.

The version of Informa that preceded Team-Up also had its drawbacks. It was limited to 8M bytes of file memory, and the foundation, with "thousands of documents coming and going day to day," quickly filled it up, Johnson said.

Prior to its attempts to use Datastore and Informa, the foundation had installed a Datapoint Corp. Attached Resource Computer network, but found it could not be linked to its Exxon office equipment. The Datapoint minicomputer had to be custom programmed for each application, and an attempt to implement a business-letter-writing program cost $20,000. "Every time we turned around to do something, the software costs would eat us alive," Johnson noted.

Another major concern was knowing where the foundation stood relative to its budget. "We were months behind with the Datapoint system," the research director said.

So in early 1985, the foundation installed the Team-Up package, the version of Informa that included an application and report generator.

Team-Up "was much more powerful. Suddenly we had a management tool that would keep us up-to-date," Johnson said.

The foundation, with a staff of 11, is Exxon's nonprofit agency for making charitable grants to educational projects. Representatives of educational institutions passing by Exxon's World Headquarters in New York stop in to chat about funds, and 6,000 to 8,000 formal applications are kept on hand, Johnson said. It must maintain files on 2,000 active grants. In 1985, the foundation will give away $32 million, Johnson said.

> ”
>
> *'Every time we turned around to do something, the software costs [of the Datapoint mini] would eat us alive.'*
>
> — Richard R. Johnson
> The Exxon Education Foundation

Because its work lies outside the main business of Exxon, the foundation enjoys more autonomy than many other offices. Although it had to get permission to hire outside consultants for its local-area network, the foundation did not have to go through central purchasing to get its 11 IBM Personal Computers and Personal Computer XTs, Johnson recounted, and this helped it set up its network quickly.

The foundation located the Team-Up package through its consultants, the Institute of Public Services Performance, Inc., a small New York firm that specializes in helping nonprofit agencies with microcomputers.

Suggestions added to beta version

The foundation is beta testing Team-Up, and part of the package's acceptance stems from the fact that the foundation also served as an alpha test site for an earlier version known as Informa. The foundation staff suggested improvements to the product that found their way into the beta version — such as expanding the memory limit for files, according to Johnson.

The system offers the advantages of a true relational data base management system in that updating data for one application updates it for all applications, Johnson said. In addition, multiple indexes may be used, which aid in the search for particular grants.

Additional records may be added to existing files through the Extend utility. Nonrelational systems require precise record definition upon creation of a file and cannot be altered afterward, he said.

In a similar vein, additional records in a Team-Up file may be indexed after the initial index definition through the Reindex utility.

The foundation is developing a program that will, when one set of data is updated, automatically update related data, such as budget or payment totals. It will run as a Personal Computer batch program on the network. Automatic budget updating "solves one of the major problems of managing a foundation," Johnson said.

The foundation staff frequently receives calls for information about the status of grants. Under Team-Up, they can call up a Review program that presents the evaluation of an application, while a control C command fills four additional screens of information. Johnson said the related information, such as how much money has been paid out or when a report is due from the recipient, is available but will not be stored in the Review program when the user is done. "This is critical for managers," who can usually retrieve all the information they need in "the time it takes to transfer a telephone call to them," Johnson said.

File protection feature

On any network, the ability to prevent disruption of files because of multiple contention is important, and Team-Up offers file protection. If Johnson is viewing a file and someone else changes it, he is both notified that a change has occurred and informed what the change is. In other systems, the second user would often be notified that a change had occurred and, at that point, be frozen out, said Stanley Altman, one of the institute's consultants. With Team-Up, the second user can reenter a change to the same record without going out of the program.

Team-Up, with a stated capacity of 32,000 applications with 700,000 files, is large enough for the foundation's purposes, Johnson said. It can access any record in a 35,000-record file in 1.1 seconds, Unlimited Processing spokesmen said.

Several levels of security control the access of each user to applications or files. When a user deletes a file, for example, it is stored in a manager's area for review, because a manager must make the final decision to delete, Johnson said.

Johnson cites one drawback to the system. It relies on a Davong Systems, Inc. hard disk for central storage, and that company is in reorganization proceedings of Chapter 11 under the Federal Bankruptcy Act. Ungermann-Bass has announced it will stop supporting the Davong hard disk at the end of the year, and Johnson said his office will have to buy the recommended replacement.

Buyers have few choices in local-net DBMS market

NEW YORK — Unlimited Processing, Inc., which started shipping its Team-Up data base management system to customers in July, is a 4-year-old, 22-employee company in Jacksonville, Fla., founded to produce multiuser software.

Its first network data base system, Informa, went through three versions before coming out as Team-Up Version 1.1. Team-Up has about 100 users, many of them beta test sites, Unlimited Processing spokesmen said.

Team-Up runs on 13 local-area networks, including 3Com Corp.'s Etherseries; Corvus Systems, Inc.'s Omninet; IBM's PC Network; Novell, Inc.'s Netware; Microsoft Corp.'s Networks; Digital Research, Inc.'s Concurrent DOS; and Ungermann-Bass, Inc.'s Network One.

"There are very few products on the market. No standards have been set, and the whole networking software [technology] is in its infancy," noted Melody M. Johnson, who follows office systems for the Seattle investment bank, Cable, Howse & Ragen.

Competing products at this point include Dataflex from Data Access Systems, Inc. in Miami, Fla.; Knowledgeman from Micro Data Base Systems, Inc. in Lafayette, Ind.; Metafile from Sensor-Based Systems in Glenview, Ill.; and Datastore from Software Connections, Inc. in San Jose, Calif.

The Exxon Foundation tried Software Connections' Datastore but discovered "random changes in our data" while transferring records. Attempts to clear up the problem with the vendor met with disbelief and unreturned phone calls, said Richard R. Johnson, research director.

Software Connections' Product Marketing Manager Gary Kwok acknowledged that a glitch occurred in a conversion routine of the first version of Datastore, a problem that has since been cleared up. He added that the problem occurred before Software Connections established its technical support unit and Exxon's complaint "fell through the cracks. Now it's come back to haunt us," he said.

— Charles Babcock

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Justice probes allegation that Hitachi dumped chips

By [illegible]
CW Staff

SANTA CLARA, Calif. — Cries from the semiconductor industry charging unfair trade practices on the part of Japanese chip manufacturers are beginning to fall upon receptive ears.

The U.S. Department of Justice has launched an investigation into accusations that Hitachi Ltd. is illegally dumping semiconductor chips into the U.S market by cutting prices below production costs.

News of the investigation was made public here by U.S. Sen. Pete Wilson (R-Calif.) at a hearing by a subcommittee of the Congressional Joint Economic Committee held to investigate trade practices of Japanese chip makers.

Wilson had requested such an investigation following disclosure of an alleged Hitachi memo that instructed distributors of its erasable programmable read-only memory (Eprom) chips to undercut by 10% Eprom chip prices quoted by Hitachi's U.S. competitors [CW, June 17].

Hitachi's Hiroshi Miyamoto, based in Washington, D.C., told *Computerworld*, "We are cooperating with the Justice Department in its investigation, and we are confident that when the investigation is completed the allegation of predatory pricing will be shown to be totally unfounded."

Series of positive signals

The Justice Department investigation is one of a series of positive signals recently sent by the Reagan administration to the ailing semiconductor industry, currently in the midst of the most serious economic downturn in its history. In other recent moves, the U.S. International Trade Commission ruled in favor of Micron Technology, Inc.'s dumping claims against seven Japanese chip makers. That case is now before the U.S. Department of Commerce and could result in import duties for Japanese semiconductor firms.

Last week's hearing of the Joint Economic Committee's Subcommittee on Trade, Productivity and Economic Growth was prompted by a petition from the Semiconductor Industry Association (SIA) asking that the U.S. government demand increased Japanese purchase of American semiconductor chips. According to Daryl Hatano, SIA manager of government affairs, Section 301 of the 1974 Trade Act allows the president to take such actions against countries believed to be pursuing discriminatory trade practices.

Hitachi representatives did not attend the opening subcommittee hearing but will testify in later subcommittee hearings, Wilson said. The company recently responded to U.S. manufacturers' charges of unfair trade practices by announcing it will increase its U.S. chip purchases by $120 million by the end of next year.

In his testimony before the congressional panel, Charles Sprock, president of National Semiconductor Corp., called the Hitachi purchasing announcement a grandstand play. "We must insist upon fair trade before permanent damage is done to the industrial base," he said.

'Equal access to every market'

George Scalise, senior vice-president at Advanced Micro Devices, Inc. (AMD), underscored the SIA stance. "We have to have equal access to every market," said Scalise, who indicated that AMD has been seriously affected by the Japanese 10% undercut of the 64K-byte Eprom market.

To correct the imbalance, Scalise proposed that the U.S. should launch an affirmative action program to freeze Japan's U.S. market share until there is parity in penetration.

Past efforts by U.S. manufacturers to increase their share of the Japanese market have failed, Scalise said, and the U.S. semiconductor industry continues to hold a 10% market share in Japan, compared with a 55% market share throughout the world.

SYMPHONY

from page 1

I'm going to promote through the company, but it can really come in handy," according to Robert Martin, manager of decision support systems at Cleveland's Eaton Corp. Martin, whose group supports more than 400 micros, said that expanded memory "bailed us out of several applications in sorting a large data base where the program runs up against a memory barrier." He said he found no bugs in running Symphony 1.1 with Intel's Aboveboard.

Eric Haskell, vice-president for finance at Transamerica Delaval, Inc. in Lawrenceville, N.J., which has approximately 225 personal computers, mentioned the expanded memory capability favorably. However, Haskell said, he doubts his firm will take advantage of the feature for more than 10% to 15% of its machines.

More important, Haskell said, is the Symphony 1.1 spreadsheet's revamped memory allocation scheme, and he found that his beta copy did use RAM more efficiently.

Users commented favorably on other enhancements of the Symphony program. These include coprocessor support, Macro Library Manager, upgraded command language and spreadsheet compatibility with a scheduled upgrade of Lotus' 1-2-3 program.

In regard to coprocessor support, users noted the potential for the Intel 8087 and 80287 numeric coprocessors to boost performance significantly. "I've done a good bit of testing with it, and we're very pleased," Martin said.

The release's speed is close to the original version's, he noted. "We've perceived and measured some time improvements. There are instances where it runs slowly, but those are few and far between. If there's much crunching going on, there's no question it's running faster."

Symphony 1.1's Macro Library Manager, commonly called "Hyperspace," permits users to store macros, numbers, labels and named ranges outside the work sheet. Although it is not for every Symphony user, Hyperspace is a helpful feature, users said.

"Very sophisticated things can be done" with the enhanced Symphony Command Language, Schnorr said. His group intends to use Symphony as a development tool for front-ending host applications, helping to establish consistent user interfaces.

Symphony 1.1 will offer spreadsheet compatibility with the upcoming release of 1-2-3, according to Lotus. With many users sticking with 1-2-3, "that will be a very important feature for us," Martin said.

Relatively few complaints surfaced, but one that was mentioned was the product's inability to fit the new Symphony on a diskette with IBM PC-DOS.

Another was the continued requirement for a key disk on hard disk drive systems, which Martin described as a minor annoyance. Lotus is not the only vendor with that requirement, "and that's the only reason it's a minor annoyance," he said, adding that Lotus soon may be the only one.

Priced at $695, Symphony 1.1 runs on the IBM Personal Computer and compatibles and includes spreadsheet, word processing, data base management, graphics and communications functions. An upgrade from Symphony 1 costs $75.

Symphony made simpler

Reviews of the original Lotus Development Corp. Symphony software described the package as hard to install, learn and use. Although Lotus downplays those criticisms, the firm said that its latest release of the integrated package, Symphony 1.1, addresses them all.

The complicated installation procedure has been cleaned up considerably, early users agreed. "Just about the time I memorized the old one, they improved it," according to Robert Martin, manager of decision support systems at Cleveland-based Eaton Corp. (see story page 1).

Most early users spent little time with the revamped documentation and tutorial, so they gave no solid evidence on how effective those upgrades have been. However, some emphasized that Symphony may have been given a bad rap on ease-of-learning and ease-of-use issues, which are inextricably linked to the package's ambitious scope.

"I was one of those saying, 'There's too much to learn,' " Martin said. "I think I fell into the trap of comparing it to [Lotus'] 1-2-3. We discouraged 1-2-3 classes around here; you could learn it a lot better under pressure.

"Since then I've turned around; I no longer call it a criticism," he said. "When you have a big job to do, you want to make it easy to do, but it's still a big job. I'm willing to accept the fact that the learning curve will be slow."

General Foods Corp.'s manager of office information systems, Gary Schnorr, also said he felt that it is an unfair criticism. "People were trying to learn five applications at the same time," he said. "If you take it in a logical procession, it's as easy as any package."

"A lot of people have gotten over the difficulties," said Dan Spiner, president of Management Information Software, a New York reseller. Symphony is "really serious" software, Spiner emphasized.

Symphony users also stood up for the concept of the all-in-one application package. "In my mind, there's a common misconception that integrated software is failing and that the only answer is integrating, windowing software," said Eric Haskell, vice-president for finance at Lawrenceville, N.J.-based Transamerica Delaval, Inc.

However, he maintained, "a lot of the euphoria of the early [personal computer] influx is over," and users would rather learn one package than play with several. "Integrated software solves that [problem] better than windowing software."

— Eric Bender

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FINANCES

from page 1

with $1.66 billion a year earlier. Equipment sales increased only 7%, however, while revenue from service and other sources generated more than half of the total increase.

Although this was the second consecutive quarter in which DEC profits declined in comparison with the respective year-earlier periods, the fiscal year was closed out with a 20% increase in revenue to $6.68 billion from $5.58 billion the previous year. Profits for the year were $446.7 million, or $7.42 per share, up from $328.8 million, or $5.73 per share.

In a prepared statement, DEC President Kenneth H. Olsen said the company kept inventories below the year-earlier level and ended the year with cash reserves in excess of $1 billion.

Foreign sales remained strong

He also said foreign sales remained strong, but some U.S. customers were postponing purchases. A spokesman later said that domestic sales in the quarter were flat or down slightly from the year-earlier quarter.

Some analysts have expressed concern that the company's unofficial no-layoff policy could squeeze profit margins during the next few months as economic pressures and seasonal adjustments impact the company.

But Mark A. Steinkrauss, director of investor relations with DEC, said the company believes it has implemented a correct business plan. "We understand the concerns, and from many perspectives, it could be a tough quarter, but we feel pretty confident about it," he said.

"We have implemented a tough new budget that is very conservative in terms of growth," Steinkrauss said. The company reduced its manufacturing work force through attrition during the year, but that has been offset by an increase in the number of sales employees.

Steinkrauss said the company has trimmed delivery dates on its VAX 8600 model to three to four months from original estimates of four to five months. He also disputed contentions that demand is less than the company had anticipated. He said fourth-quarter shipments more than doubled from the 140 units shipped in the third quarter.

While the performance level of the Microvax II has led to concern about sales of mid-range products, Steinkrauss said that sales of the VAX-11/750 and VAX-11/850 have held up well in comparison with previous years. "Below the [VAX-11/750] level, sales will probably tend to decline," he said.

Second consecutive losing period

In Minneapolis, CDC spokesmen said objections by the SEC staff compelled the company to reduce fourth-quarter 1984 earnings by $26.5 million, resulting in profits for the year of $5.1 million, or 12 cents per share. The recently reported second-quarter profits of $3.8 million [CW, July 22], or 10 cents per share, was revised to produce a loss of $4.8 million, or 12 cents per share, marking the second consecutive losing period for the company.

CDC said the SEC staff objected to the recording of tax benefits related to discontinuance of its plug-compatible disk drive business and to the method of reporting losses from Earth Energy Systems, Inc., in which CDC owns a majority interest.

Also, CDC said a financial subsidiary posted a second-quarter loss that had not been reflected in the July report.

In Westwood, Mass., Cullinet said it expects to report later this month a $4 million profit for the first quarter, down from $5.5 million a year earlier, and a revenue increase of only 4% to 5% from the year-earlier period. The reversal from several years of 50% sequential quarterly increases in profits and revenue was attributed to delayed orders resulting from current economic conditions.

But John J. Cullinane, chairman and founder of the software firm, said he remains optimistic about future results.

CATV data service OKed

WASHINGTON, D.C. — The Federal Communications Commission opened the door last week to allowing CATV firms to provide interstate data transmission services.

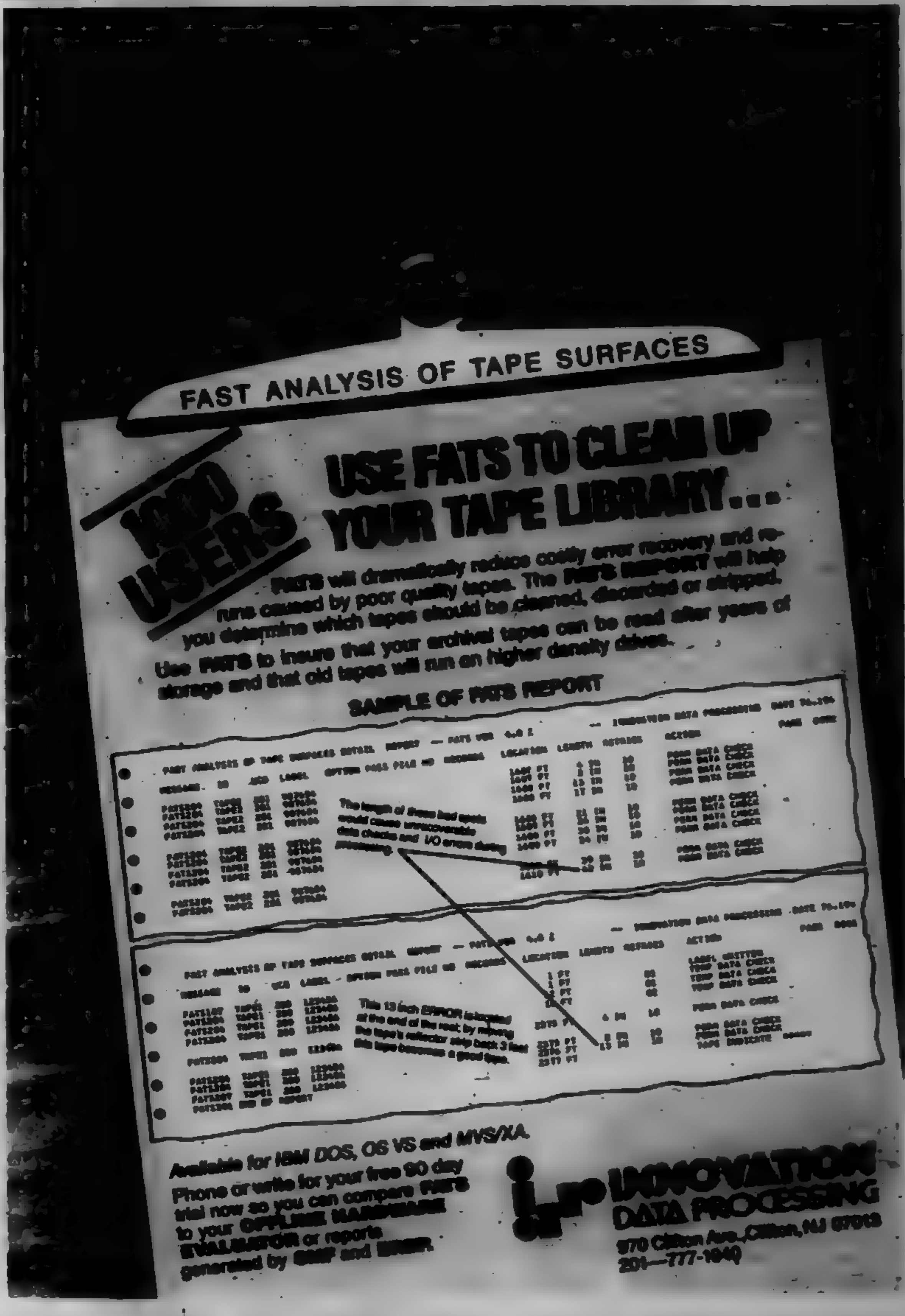
The FCC ruled that states may not impose any regulation that would block CATV companies from offering voice/data transmission services over interstate facilities because doing so would inhibit interstate competition.

The declaratory ruling was prompted by the case of Commline, Inc. of Omaha, a subsidiary of Cox Cable Communications, Inc. that provides dedicated, high-speed digital transmission service — including interconnections with MCI Communications Corp.'s interstate networks — to business and institutional customers in Omaha.

In April 1983, the Nebraska Public Service Commission ordered Cox to drop the service.

The FCC justified its preemption of Nebraska state authority on the grounds that Commline's service includes interstate as well as intrastate traffic, officials said.

FCC officials said the precedent-setting Cox decision will be applied on a case-by-case basis in all states to tear down state regulatory barriers that currently prevent CATV firms from entering interstate transmission markets.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CICS

from page 1

Version 1, Release 7 addresses some major deficiencies that have plagued CICS since its inception in 1973. "What this does is resolve a primary drawback of CICS, the requirement to bring the system down to define or reconfigure resources," Gens said.

Gens was referring to the extension within the release of the Resource Definition On-line (RDO) facility.

Ability to define devices dynamically

This enhancement allows a user to define a new device dynamically, such as an IBM Vtam-attached terminal, while CICS is running. An IBM spokesman said the enhancement eliminates the requirement to reassemble the CICS terminal control table.

The previous release of CICS gave users the ability to define programs, files and transactions dynamically.

Users interviewed by *Computerworld* said most large data centers typically compile a backlog of terminal changes and routinely schedule CICS outages of two hours or more to reassemble and install terminal control tables. The RDO extensions will allow systems programmers to add terminals in a matter of moments whenever necessary, giving users more flexibility in reconfiguring their resources.

In addition, CICS now provides an automatic installation capability that spares users from defining a terminal to CICS if it has been previously defined to Vtam.

The spokesman said the alternative to explicit definition of a terminal reduces the need for definitions, the storage they consume and the effort required to manage them. Terminals can also be defined so that their definitions are shipped automatically to a CICS system, making a single definition of a terminal in a CICS network sufficient.

Users said the amount of virtual storage freed by the automatic installation facility and other CICS enhancements would vary from shop to shop but could range from a 1M-byte savings to as much as 4M bytes.

"The most important change is in the implementation of the terminal control table," said Harvey Kramer, senior information systems consultant with Southern California Edison Co. in Rosemead, Calif.

"By not having to predefine terminals we may get up to a three to four megabyte buy-back in virtual storage," Kramer said.

CICS users also cited potential time savings from enhancements to the recovery and restart facilities of CICS.

Emergency and so-called warm restarts are improved because the opening of Vsam and Bdam data sets is deferred until the data sets are referred to by a specific application.

Also, Vsam and Bdam files can be allocated while CICS is running rather than during job-step initialization.

Reduced need for reinitialization

"If you have a failure in your system, you can restart more quickly because IBM has reduced the number of systems and files that have to be reinitialized," Gens said.

"You can initialize those data sets and applications as they are required rather than right at the beginning," Gens explained.

The enhanced release of CICS also features added command-level programming facilities that provide an interface to the system spool files maintained by IBM's JES2 and JES3.

The facilities allow applications to write and retrieve records directly to the JES spool.

Users said that this improvement will give programmers the capability to address a new class of applications that draw information from batch systems.

CICS upgrade addresses long-overdue requirements

By John Gallant
CW Staff

The fortified release of CICS does not represent a bold technological foray on IBM's part, users and analysts told *Computerworld* last week. But the product's enhancements meet some very real needs — needs some observers said have gone unaddressed for too long.

"This is clearly one of the most important software announcements in recent memory," said William Ray, manager of data and network services with Corning Glass Works, Inc., in Corning, N.Y. The company supports more than 1,500 terminals under CICS on an IBM 3081K processor. "Adding new devices or reconfiguring terminals is a big task for us. We spend a lot of time changing [terminal control] tables. I would like to have seen these changes sooner."

Both Ray and Donald Langston, associate director of Schering-Plough, Inc.'s Memphis data center and corporate computer operations, lauded CICS's new support for on-line definition of terminals. Schering-Plough supports about 1,000 terminals through CICS on a 3084 mainframe under MVS/XA. The company routinely scheduled CICS downtime of two hours or more to reconfigure its network.

"This release has addressed a key issue in continuous operation of data centers," Langston said. "It gives you an opportunity to reduce the number of scheduled CICS outages. We typically wait until we have a number of terminals to add and schedule CICS downtime. That impacts planning and application implementation schedules, which have to be geared to the outage."

But, Langston added, "These requirements have been outstanding for years. The desire by users not to have to take CICS down to make changes has existed since CICS came out."

Growing importance of CICS

John King, executive director of the San Jose, Calif.-based James Martin Associates consulting firm said the announcement marks an acknowledgment by IBM of the growing importance of CICS — one of its most widely installed mainframe software products.

"The most important aspect of this [announcement] is that IBM has recognized the strategic importance of CICS and has brought it into the real world of large networks," King said. "IBM appears to be slowly moving to a point where a systems programmer can have a single view of the entire network, where users can reconfigure and expand a network without huge numbers of people."

King's comments were echoed by Frank Gens, industry analyst with International Data Corp., a Framingham, Mass.-based market research firm. "The release addresses old criticisms of IBM's communications products. It was said that if IBM ran the telephone company it would have to shut the whole system down to add a phone. This is just another situation where IBM is struggling to catch up with a product that has had some major deficiencies. It is not a bold new step or a new direction. But it does make a cornerstone product more usable and functional."

Users agreed that the largest sites — those that face time-consuming network reconfigurations — will benefit most from Version 1, Release 7 of CICS. But, said Christopher Gruchawka, senior technical manager with the Bogota, N.J.-based CICS consulting and education firm Interactive Solutions, Inc., end users will benefit along with DP professionals.

'Attack a new class of applications'

"This is not only significant to systems programmers and network managers," he said. "It is important to users because it will reduce the backlog and waiting involved in restructuring a terminal environment. It will also allow developers to attack a new class of applications that access information in the JES2 and JES3 batch spools."

Observers also emphasized the importance of the enhanced version as a base for future software enhancements. "The release is vital in that it lets users keep their terminal control tables smaller and save on virtual storage," Gens said.

"That is a big issue for CICS users who are in a bit of a squeeze waiting for IBM to announce an [Extended Architecture] version of CICS. This gives them a little bit of relief until then."

IBM 'sensitive' to user needs

"CICS Version 1, Release 7 addresses numerous user requests and satisfies the following requirements submitted by the Guide and Share user groups."

With that brief commentary in its announcement of the new release of CICS, IBM proceeded to outline more than 55 requests and requirements that it had satisfied in the enhanced offering. Whether it was a marketing or public relations maneuver or a sincere attempt by IBM to recognize the work of the two largest IBM users groups, the acknowledgment surprised and impressed users.

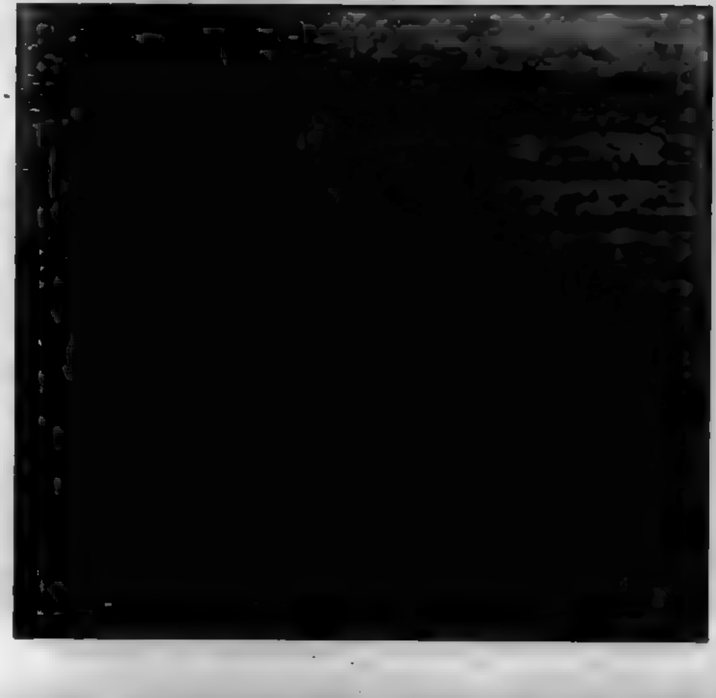
"Of course, part of it is marketing," said Donald Langston, associate director of Schering-Plough, Inc.'s Memphis, data center and corporate computer operations. "But I think IBM was really trying to demonstrate that it is sensitive to users' requirements," he added.

Harvey Kramer, senior information systems consultant with Southern California Edison Co. in Rosemead, Calif., said the recognition was IBM's way of underscoring the importance of users groups.

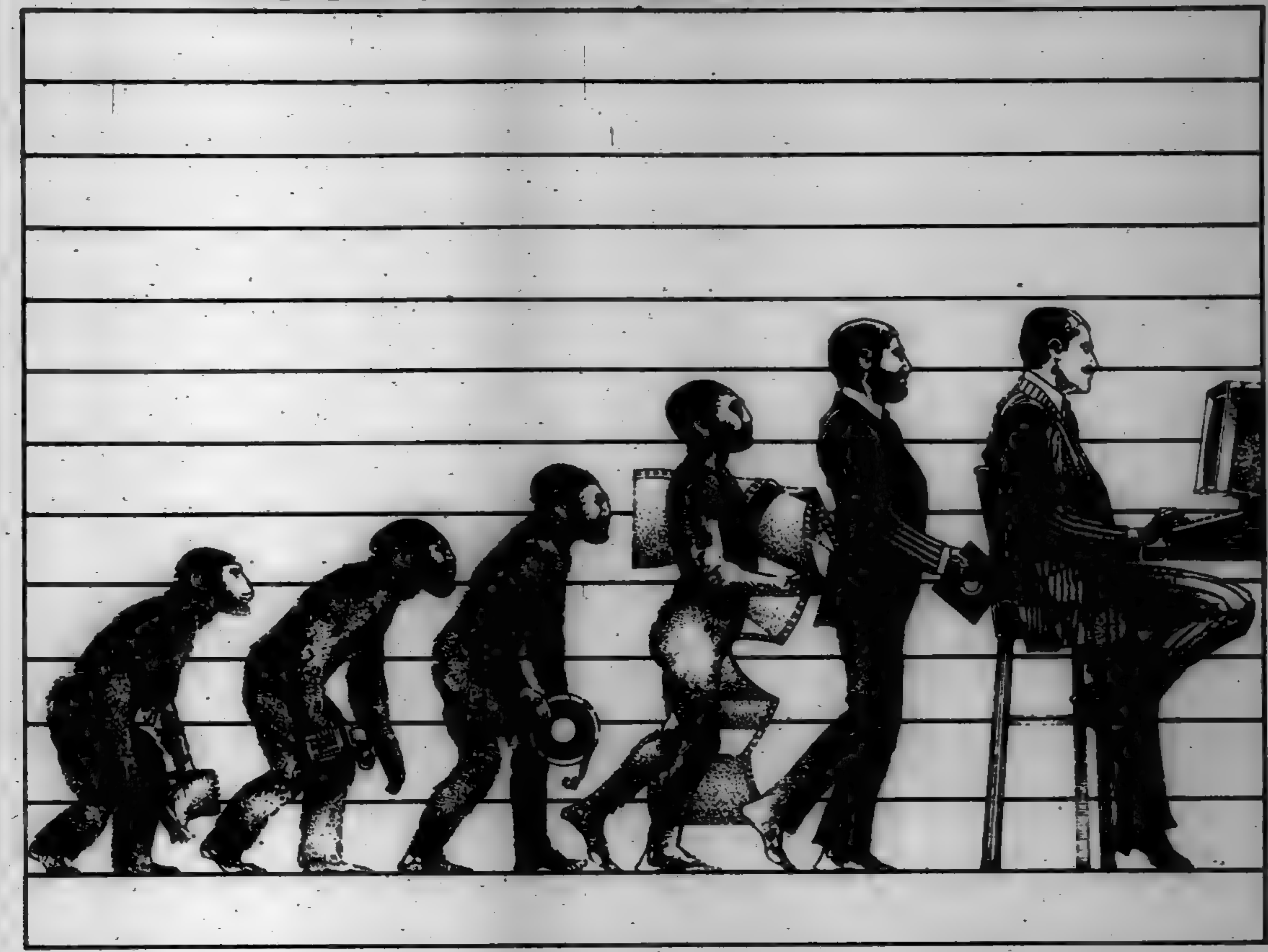
"User groups represent multiple customer interests," Kramer said. "IBM is saying that this is the way to get your voice heard. IBM cannot take care of everyone, but it can address the things that are of high priority to a variety of companies."

While Langston is manager of Guide's Data Base & Data Communication Division, and Kramer is deputy manager of Share's CICS Project, both men said that they spoke for their firms and not as representatives of their users groups.

— John Gallant



A HISTORY OF DECISION SUPPORT SOFTWARE



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NETWORK

from page 1

ties. A backbone network of two AT&T T1 lines now connects the main facilities. Two channel banks are required to digitize voice so it can be transmitted at speeds of 32K bit/sec. over the lines, and front-end processors feed channel banks so that data can be sent over the T1 lines. Microwave facilities connect the nine regional offices to the two central facilities.

Private branch exchanges route traffic between principal McDonnell Douglas offices. The two main facilities and a third facility in Huntington Beach, Calif., are equipped with Northern Telecom, Inc. SL-100 PBXs. The other offices house Northern Telecom SL-1 switches. The PBXs are used for voice, dial-up, data and video transmissions.

McDonnell Douglas chose a combination of twisted-pair and fiber-optic media to link the PBXs and users at the various facilities. Twisted-pair wire connects employees to the network, and fiber-optic backbones are used in various buildings. Augustin noted that there is extra fiber bandwidth that can be used if the network has to be expanded.

> ”
>
> *'It takes two pages to list all the lines we had to cut over to.'*
>
> — D. C. Augustin
> McDonnell Douglas Corp.

The migration from Centrex to PBXs was divided into phases, with the first phase being the installation of smaller switches and microwave facilities at the remote offices.

Like most first-time installations, problems were expected, and they were encountered. "We had trouble getting easements for the microwave facilities," said James C. McAllister, director of telecommunications at McDonnell Douglas. "I don't know how some companies that plan on installing hundreds of earth stations will be able to manage installation." Microwave antennae have to be approved by local building commissions.

At the end of 1984, with the smaller switches up and running, the company began to install the SL-100 PBX, a relatively new switch from Northern Telecom. "The software was not very mature at the time we were installing the switches," Ridenhour noted. "That situation created some problems for us." Since the company was an early user of the switch, no one had tested the product enough to understand fully its functions and its limitations.

Ridenhour maintained that Northern Telecom has solved the problems. With initial bugs fixed, the first big switch was installed at the Huntington Beach facility in February 1985.

In June, the last switch was up and running at the facility here, which has 37,000 employees. "It takes two pages to list all the lines we had to cut over to," Augustin noted. "There are 27,000 trunks at our facility [here]. Switching them all at one time was nerve-racking." If the switch didn't work, no phones would ring at the aerospace and time-sharing company.

Adding to the problem was the software's wide degree of flexibility. "We should have decided which options we wanted when we first looked at the switch," Ridenhour added. "We were changing our requirements at each site."

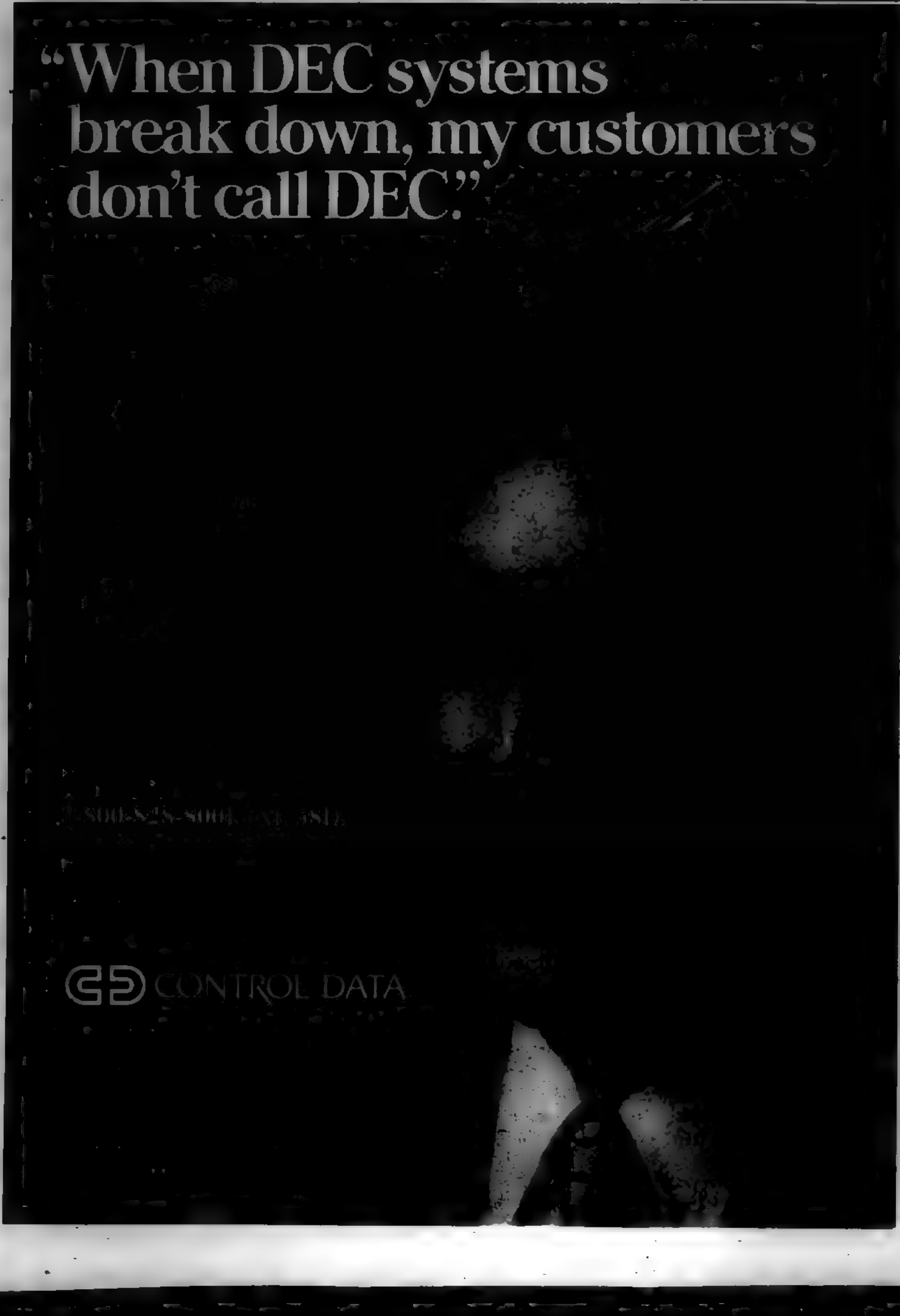
The problems were minor for such a large network, according to Ridenhour. He estimated that the network handles 400,000 transmissions each day. If McDonnell Douglas were a private telephone company, it would be considered the 22nd largest, according to the vice-president.

Thus far, Ridenhour has deemed the implementation successful.

Ridenhour considers training a key reason for the success. All employees were given classes on the system, and the company supplemented vendor training materials with its own offerings.

For two weeks, employees had two telephones on their desks: one for the old system and one for the new. "We wanted to make the transition as simple as possible," Ridenhour said.

Ridenhour estimated that the system would save the company $15 million a year.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CONTROL DATA

User claims NCR sold faulty mini, seeks $1.1 million

By Clinton Wilder
CW Staff

PONTIAC, Ill. — A family-owned accounting firm here is seeking $1.1 million in damages from NCR Corp. for delivering and failing to service an allegedly bug-ridden minicomputer system nine years ago.

The owners of Pontiac Services, Inc., have failed in their two-year battle to have the case heard in court but will argue the case before a federal arbitrator in Chicago on Sept. 11. The Monical family claims its NCR 8200 Century minicomputer, purchased in 1976, failed to run properly, dumped stored data without warning and inaccurately printed textual material.

The Monical case is one of several multimillion-dollar legal actions against NCR stemming from allegedly defective mini systems that the Dayton, Ohio-based vendor sold in the late 1970s.

Successful lawsuits

Earlier this year, San Luis Obispo, Calif., businessman Alex Madonna won $5.8 million in damages in a lawsuit stemming from a defective Model 499, the largest amount ever awarded in a computer misrepresentation case [CW, June 3]. In 1982, NCR paid $2.6 million to an Oakland, Calif., dry cleaning firm that had bought what it claimed to be a bug-ridden 8200 Spirit in 1977 [CW, Nov. 1, 1982].

Pontiac Services originally sought $5.6 million in damages when it sued NCR for fraud in Livingston County, Ill., Circuit Court in 1983. But the court upheld NCR's claim that the case did not involve fraud, and therefore, must be resolved through arbitration, the procedure specified in NCR's general customer contract for settling misrepresentation disputes. The Monicals appealed that decision to the Illinois Supreme Court, but the higher court declined to hear the case, sending it back to arbitration.

Steven Monical, one of the plaintiffs, said an arbitrator can award only actual rather than punitive damages, so the amount sought was reduced to $1.1 million. He said an out-of-court financial settlement is still possible, but he said the amount currently being offered by NCR is "ridiculously low."

Alleged that machine became unusable

The Monicals claim that their $47,000 NCR 8200 minicomputer had problems from the beginning but that the system became virtually unusable in the second half of 1979.

"The machine would just halt, stop processing, and we would have to rerun the whole job," according to Monical. "The printer would insert extra spaces between characters and lines or skip lines altogether. The CRT unit would just go crazy, with characters dancing across the screen."

The plaintiffs also allege that NCR service personnel from the company's Peoria, Ill., office repeatedly failed to correct the minicomputer's problems, despite the $10,500 the Monicals paid in maintenance charges.

"They mostly pointed elsewhere, saying it wasn't a hardware problem but a problem with the power supply, or software or with different operators of the system," according to Monical. "They finally gave up sometime in 1980."

In their 1983 court complaint, the Monicals alleged that an NCR repairman admitted in 1980 that the company "did not have engineers capable of correcting the malfunction." They further charged that NCR did not test the minicomputer before its sale.

The corporate attorney representing NCR in the case could not be reached for comment before press time.

Wang buys switch maker

LOWELL, Mass. — Wang Laboratories, Inc. expanded its move into data communications last week by announcing an agreement to invest in a vendor of department-size digital voice/data switching systems.

Wang said it will acquire an initial minority stake in Los Gatos, Calif.-based Telenova, Inc. Wang added that it will increase the investment to 40% — which a spokesman said represents a value of $15 million — by March 1986 and has the option to increase it further to 51% by December 1986.

The transaction was similar to an agreement reached in April 1984 with Intecom, Inc., a vendor of large private branch exchange systems. Wang owns approximately 22% of Intecom.

In a prepared statement, An Wang, chairman and president of Wang, said the Telenova equipment can quickly be integrated with Wang systems. With agreements for both Intecom and Telenova switching equipment, Wang is "in a very strong position to most effectively integrate both computers and communications to provide total office automation solutions for all sizes of offices," he said.

Telenova is headed by Edmund J. Keane, its founder, chairman and chief executive officer, and has received prior financing through venture capital sources.

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Net control tools help managers keep users happy

By Paul Korzeniowski
CW Staff

Charlie sits at his terminal and presses the Enter key on his IBM 3278 terminal.

From the terminal, the data journeys to an IBM 3274 controller that is connected to an AT&T Information Systems modem that passes it to an Ares Corp. bridge for a Nynex Corp. telephone line that hands it to an AT&T Communications long-haul facility that works with Rockwell International Corp. digital microwave equipment and transports the data to a Bell Atlantic Corp. telephone line that uses another bridge to send the data to the central site's T-Bar, Inc. matrix switch that feeds an IBM front-end processor that works with an IBM mainframe where information is processed and sent on a return trip, if all connections are working properly.

Often, a connection may not be functioning, creating problems for Charlie and for the manager who is responsible for making sure that Charlie remains a productive, happy user.

A number of companies are installing network management systems to keep users like Charlie happy. Network management systems vary, depending on what equipment they monitor for each connection and what information they provide. Some

See MANAGE page 13

Network management and control packages

Vendor	Model	Hardware on which it is Based	Maximum Number of Monitors	Color Monitors	Storage Capacity (bytes)	Number of Circuits	Line Transmission Speed (bit/sec.)	Type of Signaling	Requires Intelligent Modems	Wrap-around Box	Trouble Tickets	Summary Log	History Summary	Inventory Reports	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AT&T	Dataphone II Level 3 Network Control	Proprietary	1	No	256K	400[1]	9.6K	Outband	Yes	No	Yes	No	Yes	No	$11,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Avante-Garde Computing, Inc.	Net/Alert	Perkin-Elmer Corp. 32000	12	Yes	Unlimited	4,096	56K	None	Yes	No	Yes	Yes	Yes	Yes	$200,000- $400,000-
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Codex Corp.	Distributed Network Control System (DNCS) 200	Proprietary	1	No	1.5M	16	16.8K	Outband	Yes	Yes	No	No	No	Yes	$9,200- $13,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Codex	4850	Data General Corp. MV/4000	6	No	50M-1G	496	16.8K	Outband	Yes	Yes	Yes	Yes	Yes	Yes	$84,400
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Digilog, Inc.	Network Analysis and Management System	Digital Equipment Corp. Microvax	3	Yes	30M	2,000	56K	Inband and outband	No	Yes	Yes	Yes	Yes	Yes	$50,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Digilog	Modem Diagnostic and Test System	IBM Personal Computer	1	Yes	360K	576	14.4K	Outband	No	Yes	No	No	No	No	$850/modem
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
General Datacomm Industries	NMC 45	Proprietary	4	Yes	10M	64	64K	Outband	Yes	Yes	Yes	No	Yes	Yes	$16,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Paradyne Corp.	Analysis 5500	Zilog, Inc. 8000	3	Yes[3]	52M	150	Any	Outband	Yes	No	No	Yes	Yes	No	$19,500
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Racal-Milgo, Inc.	Communications Management Series (CMS) 2001	DEC PDP-11	1	Yes	10M	32	19.2K	Outband	Yes	Yes	Yes	Yes	Yes	Yes[4]	$14,795
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Racal-Milgo	CMS 2010	DEC PDP-11	4	Yes	21M	128	19.2K	Outband	Yes	Yes	Yes	Yes	Yes	Yes[4]	$25,950
[illegible]	[illegible]	DEC PDP-11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

MANAGE

from page 12

center on host-based software, and others work with intelligent modems. This report examines modem-based packages.

These systems consist of hardware; software, which usually includes a data base; and diagnostic devices residing at various points on a network. The packages' control capabilities can help prevent a line problem, correct one if it occurs and monitor a variety of equipment. A number of packages also supply reports that aid in examining how often a line may malfunction and that track the number of telephones, telephone lines and modems that a company may require.

Although network control packages have been available for more than 10 years, a random poll by *Computerworld* of communications managers at half a dozen large companies found that managers listed selection and installation of a network control package as their departments' most important objective.

"Now, our network control tools provide bits and pieces of the information we need," noted Sammy D. Taylor, director of telecommunications at National Gypsum Co. in Dallas. "We need a complete system that supplies information to end users, technicians and upper level managers so everyone understands how the network is functioning."

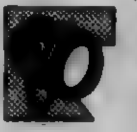
> *'We need a complete system that supplies information . . . so everyone understands how the network is functioning.'*
>
> **— Sammy D. Taylor**
> **National Gypsum Co.**

Two factors are fueling the interest in network management: the divestiture of AT&T and the increasing complexity and importance of corporate networks.

Before divestiture, AT&T provided one-stop shopping for telecommunications, shouldering end-to-end responsibility for voice/data services. Today, a number of vendors are responsible for pieces of connections used by employees like Charlie. If a manager calls one vendor to examine a problem, it will probably blame another vendor's equipment. "Since divestiture, there has been a lot of finger pointing and trouble coordinating problems with the [former Bell operating companies]", according to Al Watrid, manager of technical services at Cuna Mutual Insurance Co. in Madison, Wis. "It took operating companies almost 10 months to install one circuit for us in Southern California."

A number of vendors have attempted to provide the service that AT&T previously supplied. "Whenever a vendor manages a network, it will cost a company 30% to 40% more to run than if a company managed the network [itself]," noted Gerald P. Ryan, president of Connections Telecommunications, Inc., a Bridgewater, Mass., consulting firm.

Earlier this year, Cuna Mutual hired a vendor to manage its network but was not satisfied with the service it received. "We are now looking at buying our own network management package," Watrid said.



One consultant urged other companies to follow Cuna's lead. "I would recommend that companies divorce themselves from all telephone companies and vendors and take network control into their own hands if they have the staff and tools," suggested Gabriel Kasperek, president of Kazcom, Inc., a consulting firm in Park Ridge, Ill. A primary benefit of managing a network is that an in-house staff will fine-tune a network so it will run most effectively.

A second factor fueling the interest is that networks are becoming more complex and more important to many businesses. Often, businesses could function when a network was down because networks merely supplemented business operations. Today, a number of financial, airline and information businesses rely on networks so greatly that when a network goes down, a company cannot function until it is restored. For example, if a central switch at a stock brokerage house went down for 5 minutes, the loss could be catastrophic.

However, even in companies where a network does not pump a company's lifeblood, interest in network control is increasing. "Our networks are not as vital to our business as networks are to banks or insurance companies," National Gypsum's Taylor said. "I would rate their importance as a six on a scale of one to 10."

National Gypsum has seven networks used by separate divisions and their remote sites. Taylor has just begun the evaluation process for a network control package that could be used with the various networks and plans to have it installed by the end of the year.

When managers like Taylor examine these packages, they discover a range of prices of the number of lines they can monitor and of the type of tests they can perform. Some packages are based on hardware as simple as an intelligent terminal; others are as sophisticated as a Digital Equipment Corp. VAX supermini.

In most companies, a network control operator who is a member of the computer operations staff is responsible for the equipment. Sitting at a central terminal, the operator can monitor all network connections,

See MANAGE page 14

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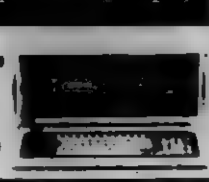

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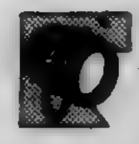
MANAGE

from page 13

even those in remote locations.

This is possible because various points on a net are equipped with intelligent devices that monitor transmission paths. Paths vary in quality for two reasons: Noise or static can cause data to be lost or incorrectly transmitted; also, data terminal equipment can malfunction and block a path.



The intelligent devices monitor telephone line and equipment performance and then transmit this information through an unused portion of a line to the central network control station where the operator sits.

Vendor offerings use various portions of a line to transmit diagnostic data. Some send it over a frequency band that is outside the main data stream, hence the term "outband signaling;" other manufacturers intersperse control data within the data stream in a technique known as "inband signaling." Either technique enables network and diagnostic data to be sent simultaneously.

Because of signaling differences, network management systems require certain equipment. Typically, modem manufacturers have optimized their packages to work with their modems. "Most of the major products do not offer a great deal of flexibility to incorporate other vendor's equipment," Kazcom's Kasperek said.

> ”
>
> *'Whenever a vendor manages a network, it will cost a company 30% to 40% more to run than if a company managed the network [itself].'*
>
> — Gerald P. Ryan
> Connections Telecommunications, Inc.

Many vendors sell wraparound boxes to solve this problem. A wraparound box straddles a modem, monitoring both digital and analog sides. Whether generated by the modem itself or captured by wraparound devices, the diagnostic information gathered is then sent to a central monitoring point. There, some packages automatically evaluate the data; other packages work interactively with an operator.

Alarm notifications are an example of automatic processing. When a system is first installed, a communications manager can set desired quality parameters. If a line's noise level exceeds the parameters, the system will flag the problem, and bells will ring, alerting an operator. Other packages require that operators constantly monitor the data and determine when a problem is occurring.

Some packages sound an alarm before a line reaches the point where data has been damaged. In those cases, a terminal operator is then left with a series of options. He can perform loopback, bit error or other tests that help to pinpoint line problems. When it is located, he can either call a vendor that will fix the problem or, in certain situations, fix the line himself. With some systems, an operator can disconnect a modem, switch to a spare modem and reestablish the connection.

Not all packages sound an alarm before a line is down; some ring only when the line goes down. "Being able to switch a line before it goes down was a key reason for our selection of a package," noted Bill Wolf, assistant vice-president of telecommunications at Pittsburgh National Bank, which has been using a net control package from Racal-Milgo, Inc. since 1981.

Wolf claimed that the network management system, which cost the bank more than a $1 million, has helped the bank expand its branch services, add automated teller machines and monitor how its network is used.

"The system has more than paid for itself," he noted.

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"Quite simply, this package has so many outstanding attributes that even the worst skeptics of integrated software have to be impressed. The spreadsheet is very close to 1-2-3; the word processor combines the best thinking of WordStar, MultiMate, Volkswriter, and EasyWriter; the data base offers the functionality of dBASE II, but with many of the ease-of-use features of PowerBase; and the program offers business graphics and telecommunication. Taken as a whole, Enable surpasses the functionality of Symphony, Framework, Aura and Open Access."
IBM PC Update
December, 1984

"... as powerful as a collection of stand-alone programs, and it offers the benefits of integration to boot. What's more, it runs in only 192K bytes of memory."
ComputerWorld
March 20, 1985

"Offering true integration among all of its applications modules... [Enable is] a powerful production tool that can serve everyone in the office, from data entry personnel to the vice-president of marketing. Each module could stand as a full-powered application in its own right."
PC Magazine
February 19, 1985

"Enable is one of those programs that can be up and running with most of the features you need in a few hours. As you need more, you can get deeper into the program and learn at your own pace."
InfoWorld
January 21, 1985

Enable first in "Performance" rating—including speed and capacity of all modules tested. Enable first in "Versatility" rating—including power and functionality of all modules tested. Enable rated first in overall evaluation of the word processor module.
Software Digest Ratings Newsletter
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December, 1984

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Popular Computing
March, 1985, Paul Goldner, Raymond Hood, Yoram Lirtzman, Michael Wilding

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Computer Buyer's Guide and Handbook
November, 1984

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Lack of features weaken net management packages

By Paul Korzeniowski
CW Staff

Keeping a line up and running is one problem; determining how the line is being used is a second concern. To manage a network properly, companies need to know what information is being transmitted, how long system response time is and where line problems are occurring. Most network management systems adequately keep lines up and running, but few supply the tools to manage a net.

One management tool is trouble ticketing. Whenever alarms are sounded, a system can produce tickets that state the time a problem occurred, the time it was fixed and the line or equipment that was experiencing the problem. This and other information is then stored in a data base from which reports concerning items such as the network's average response time and line quality can be ascertained. With the reports, managers can pinpoint recurring problems, determine how a network is being used and plot the future growth of the net.

Also, a company can track its telephone lines, modems and other communications equipment with inventory reporting capabilities incorporated in most packages.

Despite the benefits, few companies have purchased these packages because they are rather limited. "The vendors have been slow to offer the features that users desire," noted Mark Larow, a consultant with Network Strategies, Inc., a Burke, Va., consulting firm.

A chief complaint concerns the systems' management reporting capabilities. "In most cases, the management reports only monitor connections on a network, they do not include information about how the network is being used," noted Gerald P. Ryan, president of Connections Telecommunications, Inc., a Bridgewater, Mass., consulting firm. "These packages could easily be designed to include information concerning what data is going where over a line, but companies seem unwilling to take this step."

Lack of ease of use is another shortcoming. Many packages require that an operator fully understand how a network operates. "The packages are only as good as the person analyzing the data," noted Steven H. Booth, president of Communication Consulting Associates, Inc. in Framingham, Mass. "In some cases, the person may not have a great deal of technical experience and may supply an inaccurate view of how the network is functioning."

Some vendors are attempting to overcome these limitations. A number of packages are incorporating simpler operator interfaces and color monitors that graphically depict network operations. Other packages are making analysis more menu or command driven.

But even for a large corporation, these packages are expensive and difficult to cost justify.

Ryan stated that current offerings represent a first step toward the products that companies require. "Better tools will become available as users put more pressure on vendors," he concluded.

Staff key to net gain

Once a company has found the right network management package, it has to locate the proper people to run it — a process that can be more time consuming and frustrating than picking a vendor.

"Finding knowledgeable people to run a network can be a problem," noted Sammy D. Taylor, director of telecommunications at National Gypsum Co. in Dallas.

The company currently has two people working in network management, and Taylor predicted that the staff will at least triple in size when a new package is selected and installed by the end of the year.

Taylor's estimated growth may be conservative if one examines changes made at Pittsburgh National Bank since it installed a system in 1981. Its staff has grown from three to 20 network management operators, according to Bill Wolf, assistant vice-president for telecommunications.

Where can a company find skilled network operators? Another company's personnel represents a principal source. However, robbing other companies of their net management employees can inflate salaries and create ill feelings.

Companies like National Gypsum plan to take their own employees and train them to become network managers. "I don't think we really have any other choice," Taylor stated.

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Tektronix unwraps AI workstations, Lisp version

Lowers price tag on 4404 AI system

By Donna Raimondi
CW Staff

BEAVERTON, Ore. — A pair of artificial intelligence workstations, powered by the Motorola, Inc. 68020 processor, were released by Tektronix, Inc.'s Information Display Group. At the same time, the company introduced a version of the Lisp programming language and dropped the price of its year-old 4404 AI system.

The workstations are targeted at AI development, applied AI and advanced software engineering, the company said.

All members of the 4400 family reportedly feature Xerox Corp.'s Smalltalk-80 operating system and a C compiler.

Outgrowth of AI research

The 4405 and 4406 AI workstations join Tektronix's 4404 AI system, the vendor said. The products are said to be an outgrowth of Tektronix Laboratories' AI research efforts begun in 1982 to study knowledge engineering, expert systems, design support environments, AI languages and environments, algorithmic techniques and symbolic computation.

The top-of-the-line 4406 includes a 19-in. display with a resolution of 1,280 by 1,024 pixels; 2M bytes of dynamic random-access memory (RAM), expandable to 4M bytes; a 32M-byte virtual memory address space; and a 90M-byte hard disk with a 5¼-in. floppy drive, according to Tektronix.

The use of the 68020 chip, combined with a Motorola 68881 floating-point coprocessor and extended memory capacity, is said to give the 4405 100% higher performance than last year's model.

The 4405 reportedly offers 32M bytes of virtual memory address space and 1M byte of dynamic RAM, expandable to 5M bytes. This compares with the 4404's 8M bytes of virtual memory and RAM expansion of 4M bytes.

The 4405 includes a 13-in. screen with a 640- by 480-pixel viewable display.

The system comes with a 45M-byte hard disk drive and a 5¼-in. floppy drive and has either a three-button mouse or a joystick, according to the vendor.

Implementation of standard Lisp

The Tek Common Lisp language, developed in conjunction with Alameda, Calif.-based Franz Lisp, Inc., is said to be a full implementation of the standard Lisp as documented in Guy Steele's *Common Lisp, The Language*.

The language has been optimized for performance on the 4400 family, Tektronix said.

A license for the Tek Common Lisp costs $6,000 and includes a year of upgrades and maintenance, the vendor said.

Tektronix slashed the price of the 4404 from $14,950 to $11,950. The 4405 model costs $14,950, and the 4406 costs $25,950.

Users of the 4404 may upgrade to the 4405 via the 4404F05 Field Kit, which costs $3,500 and retrofits the 4404 with the 68020 CPU and the 68881 floating-point coprocessor, Tektronix said.

The newly announced products are scheduled for delivery in January 1986.

More information can be obtained from Tektronix through P.O. Box 500, Beaverton, Ore. 97077.

Chemical firm finds solution in micro-mainframe bond

By Maura McEnaney
CW Staff

WOODCLIFF LAKE, N.J. — William Heany may protest that he is only an end user of computer systems, but this obscures the fact that it was his suggestion that paved the way for use of micro-mainframe links at Witco Chemical Corp., a $1 billion chemical and petroleum products company. Heany's proposal of a terminal emulation product resulted in dramatic corporate savings and improved operational efficiencies for his company.

> 'We felt we didn't have any computing power on a dumb terminal.'
>
> — William Heany
> Witco Chemical Corp.

Heany is manager of Witco's distribution and traffic systems division, which, among other things, keeps track of the 1,200-car rail fleet that transports the company's oil and chemical products across the U.S. Daily reports on car location and cargo status are batched processed by the company's IBM 3083 mainframe, running IBM's OS/MVS operating system, and distributed to 10 Witco locations throughout the country.

In early 1984, Witco converted from leased terminal controllers and printers to personal computers and PCpath, Pathway Design, Inc.'s micro-mainframe product. The results were first-year savings of more than $30,000, according to Anthony Falato, Witco's manager of systems development.

Now, once traffic reports are batched processed on the mainframe, Witco's remote users can log on to the corporate mainframe via micros running PCpath, which is an IBM 3270 terminal emulation package. This package then allows them to extract reports from the mainframe's data.

Prior to obtaining IBM Personal Computer XTs and PCpath, Witco's 10 field locations leased IBM's 3276 terminal controllers and IBM 3276 printers at the cost of about $6,000 per month.

"They were nothing more than dumb terminals, and there were other computing functions that we wanted in our remote locations," Heany said. "In addition to maintaining a connection to the host at Woodcliff Lake via [Systems Network Architecture] protocols, we recognized the need to channel communications to other areas. We felt we didn't have any computing power on a dumb terminal," he said.

Witco rejected an IBM representative's recommendation of downloading information onto the IBM Personal Computer XT hard disk and spooling that data onto its Epson America, Inc. FX-100 printers. Instead, the company opted to be an early user of PCpath, used in conjunction with XTs.

Heany said that the company selected PCpath because of its ability to hook up with Witco's existing printers. Heany and others talked with early users of PCpath, and although they were using different applications, there were enough similarities to give the product a green light.

At Witco, PCpath is used to maintain a communications link with the corporate mainframe and allows the FX-100 printer to appear as an IBM 3287 printer. The IBM Personal Computers can be used with asynchronous communications boards and modems to communicate externally with time-sharing information systems, Heany said.

To expedite training on the Personal Computers, Witco sent the remote users PCpath cardboard templates that indicated key definitions for the 3270 terminal and allowed users to teach themselves how to use the emulation packages, Heany explained. Consequently, Heany said, remote users were able to use the Personal Computers to extract needed reports within three months of installation.

Early-user status did not cause Witco to shy away from selecting the product, Heany said, because PCpath provided capabilities that the company needed. And now, after a year's experience with the product, Witco is planning to upgrade to Version 2 of PCpath. The new product, when available, will permit users to conduct up to five concurrent sessions on the mainframe.

The company also uses PCpath for local terminal emulation at its research and development group in Houston. According to Heany, implementation of a micro-mainframe link meant teaching users about mainframe access and personal computer operation at the same time. "The [personal computer] ball game here at Witco is so new that we're going through some growing pains," he said.

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WASHINGTON UPDATE
CW Washington Bureau

IRS plans pilot program for electronic tax filing

WASHINGTON, D.C. — The Internal Revenue Service recently announced plans to conduct a pilot program in 1986 permitting commercial tax-return preparers to send returns electronically to the IRS, a move that may cut processing time at the IRS by two to three weeks.

The IRS said it wants to take advantage of the fact that a growing number of tax preparation firms use computers to prepare individual income tax returns.

The IRS said the pilot will be limited to refund returns prepared for taxpayers in Phoenix, Cincinnati and the metropolitan area around Raleigh, Durham and Fayetteville, N.C.

Firms interested in participating should contact the Electronic Filing Project Office, IRS, 1111 Constitution Ave. N.W., Washington, D.C. 20224.

Bill curbing computer sales to South Africa advances

WASHINGTON, D.C. — A compromise version of the Anti-Apartheid Act of 1985, which would curb sales of computers to the Republic of South Africa, was recently approved by the U.S. House of Representatives and awaits a U.S. Senate vote in September.

Before leaving for the August recess, House and Senate negotiators approved a compromise bill that prohibits future sales of computers to apartheid-enforcing agencies in South Africa's government.

The compromise bill closely follows the Senate version of the legislation, which was supported by the U.S. computer industry [CW, June 17].

The Computer and Business Equipment Manufacturers Association opposed the House version, which banned computer sales to all South African government organizations.

The Senate, which was unable to vote on the bill due to objections raised by Sen. Jesse Helms (R-N.C.), will resume debate on Sept. 9.

FEC to sell computer access to campaign finance records

WASHINGTON, D.C. — The Federal Election Commission (FEC) recently announced plans to start a subscription service in September that will provide direct on-line computer access to FEC campaign finance records for the news media and other members of the public.

The agency said it plans to provide information for the 1984 and 1986 presidential and congressional election campaigns in two formats. The first format would enable microcomputer users to obtain raw data for storage on floppy or hard disks.

The second format would provide summary tables on candidate finances to remote terminals, like the pilot program now under way with several state election offices [CW, Sept. 16].

GSA offers U.S. agencies programmer's workbench

WASHINGTON, D.C. — The General Services Administration (GSA) recently opened a center for demonstrating to government DP managers how commercially available software tools and processes can improve information management at U.S. agencies.

The center, recently unveiled at GSA's Office of Software Development and Information Technology in Falls Church, Va., features a programmer's workbench that has a family of automated workstation systems for software development, maintenance, conversion and project management tasks.

The center also provides demonstrations of microcomputer-based text search-and-retrieval systems and data base management systems, GSA said.

More information can be obtained from the GSA Office of Software Development and Information Technology, Suite 1100, Two Skyline Place, 5203 Leesburg Pike, Falls Church, Va. 22041.

Computer art contest slated

MELBOURNE, Australia — A worldwide computer art competition is being held in association with the First Pan Pacific Computer Conference (PPCC-1) here Sept. 10-13. CW Communications, Inc. — publisher of *Computerworld* and 53 other computer publications in 24 countries — is sponsoring the contest.

Entries must be produced by computer and should be suitable for display, a conference spokesman said. There are no limitations on the size of the artwork.

Each entry should be accompanied by a description of how it was produced.

Entries must be submitted in time to reach the PPCC-1 organizing committee by Aug. 23.

Entries will be judged in one of two categories: individual or organization. The prize for the individual contest is $1,000, and the prize for the winning company entry is a trophy.

Each individual or company is limited to a maximum of three entries, the spokesman said.

Entries will be displayed and the winners announced during the conference.

Entries and information requests should be sent to First Pan Pacific Computer Art Competition, P.O. Box 212, 11 The Avenue, Hampton, Vic., Australia 3188.

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Army system combats backlog

By Donna Raimondi
CW Staff

WASHINGTON, D.C. — An automated system for processing congressional inquiries to the U.S. Army has slashed response time from an average of 77 days to 22 days. The system allows the Army's Congressional Inquiry Division to handle 40,000 written and 20,000 telephone inquiries per year with the same size staff that processed a total of 6,000 inquiries a year five years ago, according to Col. Michael J. Connor, chief of the inquiry division.

Connor's division receives mail from congressional offices, routes the requests for information to the proper Army field agency anywhere in the world, gathers the needed information and responds to the congressional office where the inquiry originated, Connor said. Until late in 1984, the job was done manually.

The inquiries are given a high priority by the Army, whose goal is to have them answered within 30 days, Connor said. The number of inquiries multiplied rapidly in the last five years to the point where the target turnaround time could rarely be achieved, Connor said.

Under the manual system, mail was opened, sorted, date stamped, given a control number, microfilmed to ensure against loss and then routed to an action officer, Connor said. The action officer wrote an acknowledgment letter to the inquiring congressional office, decided where to get information and sent the inquiry along. After receiving a response, the officer put the information in the proper format and sent the handwritten result to a central word processing office for typing. After proofing, the final result was sent to the appropriate congressional office.

Handling 6,000 inquiries a year, the manual system was slow, with a 40-day turnaround time, but worked fairly effectively, Connor said. By August 1984, with a more than eightfold increase in inquiries, the system had slowed to the point where the average response time was 77 days, Connor said.

Connor looked closely at the steps involved in manually processing inquiries and discovered that 17 of the 57 separate procedures could be eliminated before automating, he said.

Also, the manual system used three work centers — the inquiry control center, where correspondence was logged in and tracked; the action officer center that worked the case; and the word processing center where final drafts were typed. With the new system, the action officer has the power to do all the functions previously performed in the three work centers, Connor said.

The Army's system comprises 65 Recognition Equipment, Inc. Inforex 9000 terminals in a local-area network, connected by 9.6K bit/sec. Gandalf Co. modems to 21 Inforex 9500 processors and three Inforex 9800 main file processors. A 400M-byte hard disk and two 200M-byte hard disks plus a tape backup system complete the setup.

Now, an incoming inquiry is date stamped and handed over to the officer, he said. The officer enters data in 21 fields, including the requesting constituent's name, the congressional inquirer's name, the field agency code, special remarks that will help the researching agency and the receipt date.

When the action officer writes the record, the system automatically generates an acknowledgment letter to the congressional inquirer, giving the constituent's name and the case's code number, Connor said. It also generates a "tasker" — the cover sheet that goes to the investigating agency. The tasker includes all the information the agency needs to work on the case, including general data such as the division's facsimile machine number and tips on how to respond to an inquiry.

The data base is searched for all prior cases in the constituent's name in recent years to earmark duplicate requests, Connor said. This cross-checking system eliminates duplicate searches by allowing the action officer to check the microfilm to see if the request has already been answered.

A word processing document shell is also generated automatically when the record is written, Connor said. It includes a return address, the salutation and the first paragraph. When the answer comes back, the action officer has only to add the remaining paragraphs, he said.

The division has added facsimile capabilities so that large volumes of correspondence can be transmitted without going through the mails, Connor said. Whether sent by facsimile, mailed or phoned in, all inquiries are read, acknowledged and sent to the proper agency for reply within eight hours of receipt, he said.

An Open Case Report gives the status of every unfinished case. Versions of the report are generated for each action officer, each congressional inquirer and each field agency so that everyone involved in the system knows where they stand and can spot any problems left unresolved.

Officer advises, get input on OA systems

WASHINGTON, D.C. — Management must be heavily involved in the development of office automation systems, said Col. Michael J. Connor, chief of the U.S. Army's Congressional Inquiry Division.

When Connor decided to automate a manual system used to answer congressional inquiries to the Army, he questioned each of the division's staff members about what they liked and did not like in their jobs.

"Based on those [staff] responses, it became very apparent to me that we had reached the point where we were literally going under. . . . The [staff] knew that the [manual] system was not responsive in the way that we wanted it to be.

"Managers have got to know what their organization has to do and where the payoff is," he said. After identifying the critical success factors for his organization, he was able to communicate what he needed to the contractor, Recognition Equipment, Inc.'s subsidiary, Inforex, Inc.

The first step in the project was to manually simplify the manual system, Connor said. "Unless a manager does that up front . . . automation is probably not going to solve any of his problems," he said.

After finding out what did and did not work well, Connor and his staff designed screens and user interfaces that would be easy for the staff to use.

Lawmakers seek to widen scope of wiretap statute

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — It is not illegal to wiretap or intercept interstate data communications or electronic mail messages, because the 1968 federal wiretap statute protects only aural, not digital, communications.

To fill this gap in federal law — which makes modern business communications vulnerable to government and industrial spying as well as to mischievous hackers — members of Congress are drafting legislation to protect the privacy of data communications and electronic mail, according to congressional and industry sources.

U.S. Sen. Patrick J. Leahy (D-Vt.) and Rep. Robert W. Kastenmeier (D-Wis.) will cosponsor the bill and introduce it in September, sources said.

Even before drafting of the bill has finished, the legislative initiative has garnered broad support from a wide range of groups, from the American Civil Liberties Union to the Computer and Business Equipment Manufacturers Association (Cbema).

"A broad consensus has developed that the word 'aural' should be stricken from the statute so that all forms of communication are treated the same," observed Oliver Smoot, executive vice-president of Cbema.

This year, Leahy and Kastenmeier are expected to produce legislation that not only strikes the word "aural" from the wiretap law, but also provides privacy protection for electronic mail and cellular phones, a congressional source said.

Michael F. Cavanagh , executive director of the Electronic Mail Association here and a key supporter of the Leahy-Kastenmeier initiative, said the legislation will address several significant concerns:

- It will discourage hackers, industrial spies and embezzlers from gaining unauthorized access to digital networks.
- It will prevent government, law enforcement and security agencies from intercepting or obtaining electronic messages unless they get a court order.
- It will prohibit systems operators from disclosing messages transmitted on their networks, much like telephone company operators are prohibited from disclosing conversations.

Even more important than this legislation, Cavanagh said, is the need for a federal statute that outlaws unauthorized access to private sector computers, since the network's host computer may be more vulnerable than the communications net.

Cavanagh said the Leahy-Kastenmeier bill would complement the computer crime legislation pending in the House Subcommittee on Crime, chaired by Rep. William J. Hughes (D-N.J.). The subcommittee is working on a bill that would expand the scope of the Computer Fraud and Abuse Act of 1984 to cover private computers used in interstate commerce [CW, June 3].

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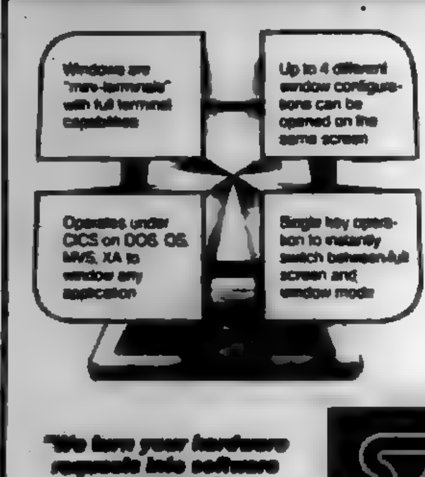
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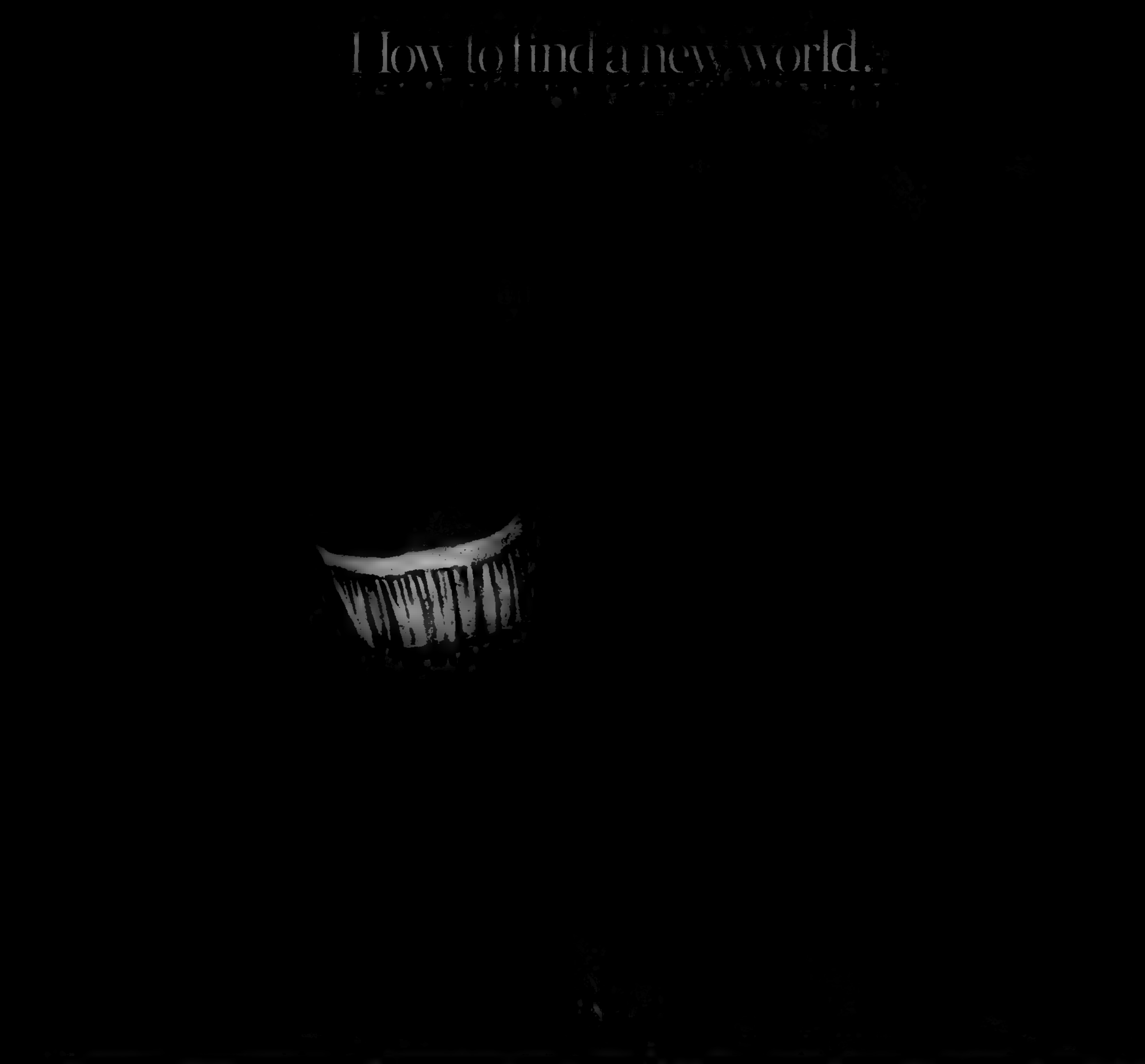

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DBMS opens door to new revenue focus of realty group

System handles member services

CHICAGO — When a national real estate trade association here moved to derive less of its revenue from dues and more from services, it focused on data base management as a critical part in providing efficient service.

During a market slump between 1980 and 1981, the National Association of Realtors (NAR) began to realize it could no longer raise dues to maintain member services. Instead, it would charge for special services — on-line real estate listings and video-based training courses, for example — that it provided to specific groups of realtors.

"We realized that information was the most important resource we have and began our commitment to switching from a dues-oriented to a marketing-oriented organization," said Vincent Amato, NAR's vice-president of computer services. At that time, 90% of the association's revenue came from dues, and 10% came from services. This year, NAR said it expects the split to be 55% from dues and 45% from services, a division Amato said should stay relatively stable in the future.

More efficient processing

The change in focus carried with it a need for more efficient information processing. Using an 8M-byte IBM 4341, the association had kept Vsam files of administrative data — name, address and such information — about its 680,000 members. It maintained separate files for different groups to which those members belonged.

If a realtor was both a member of NAR and an officer on one of the association's committees, his name and other data resided in two different files. If the realtor subscribed to a service, the association set up yet another file that contained the same basic information.

As NAR searched for new DP systems, solving this problem ranked as a top priority. "One of our greatest concerns was that the systems maintain accurate, nonredundant information," Amato said. The association also wanted to find a system that would keep financial information in order.

After a six-month software evaluation, NAR purchased the IDMS/R DBMS, Integrated Data Dictionary, Application Development System/On-Line (ADS/On-Line) and related financial modules from Cullinet Software, Inc.

The association's DP department first used the development tool and data dictionary to set up a data base prototype, then began bringing up applications. Charles Koepke, NAR's MIS manager, explained: "We knew that when we designed the systems we would have to do a lot of up-front thinking and a lot of analysis, and the data dictionary would be the driving force behind that. We were convinced that the initial planning and analysis would help us get the job done faster and get it done right."

Within five months, two staff members implemented a general ledger model, and the association has used this implementation as an example to guide other development projects. Working with ADS/On-Line, programmers have since brought up a number of stand-alone applications, including programs to track political action committee money, realty convention registration and NAR committee membership.

Since it began using the development tool, the association has cut its DP expenditures by about 25%. In addition, Amato said, NAR has cut its DP staff from 55 workers to 42 through attrition, and the smaller staff maintains almost three times the applications load of the larger one. He said some of the productivity gains have come from using Cullinet's packaged financial applications rather than having the staff develop its own.

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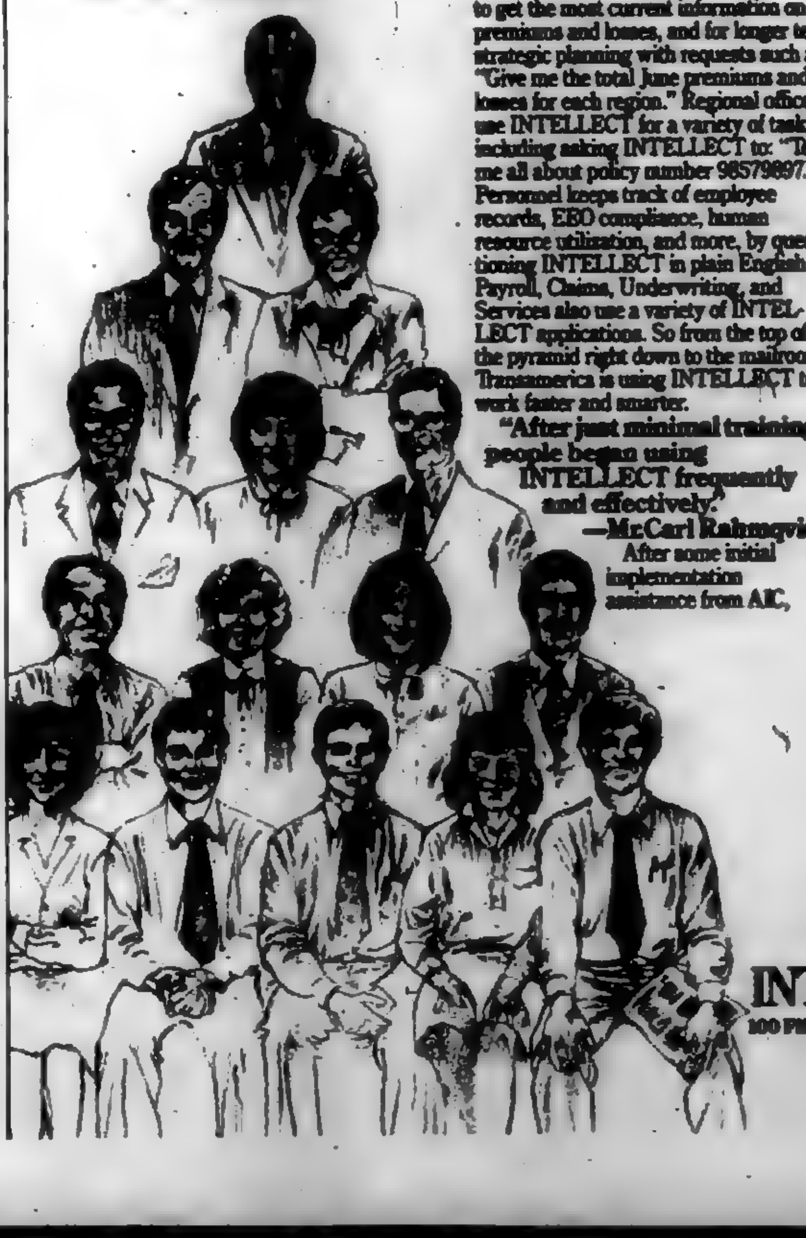

WORLD DIGEST

TOKYO — IBM Japan has reportedly halted production of its JX, the Japanese version of the IBM PCjr, because of a slump in orders here. IBM began shipments of the JX in November, targeting business and home users. The machine is produced locally by Matsushita Electric Industrial Co. NEC Corp.'s PC-9801 is way out in front in the low-end microcomputer market here, which partially accounts for the JX's limited success, analysts reported. Furthermore, the demand for microcomputers for home use is almost satisfied in Japan, analysts said.

BRISBANE, Australia — Queensland residents have shown little interest in electronic funds transfer cards. A survey conducted by the Queensland Institute of Technology indicated that a massive education campaign will be needed before large-scale introduction of the technology is feasible. Two-thirds of the people polled said they would not use EFT facilities, and more than half were negative toward the whole concept of EFT at point-of-sale terminals. Among those who expressed some interest, 61% said they would not be willing to pay a transaction fee for the facility. In general, the public showed a low awareness of technology; just 30% of those surveyed had heard of EFT.

AMSTERDAM — The Dutch Advertising Ruling Committee found the Victor Vickey to be noncompatible with IBM. The Victor portable personal computer was being offered by Dutch importer LCI Computer, which advertised the system as compatible with the IBM Personal Computer. The Committee ruled otherwise after it was requested to authenticate the company's claim of compatibility.

BEIJING — More than $1.5 million worth of Perkin-Elmer Corp. equipment was installed here recently. In May, China National Oil and Gas Engineering Development Corp. installed two PE 3230 minicomputers and a 3205 system on its Shanghai oil rigs.

A month earlier, the Central Iron and Steel Research Center here installed a PE 3252 XP, a 3205 and two 7350A minicomputers.

MELBOURNE, Australia — The National Australia Bank has ordered $62 million worth of new IBM equipment, including three mainframes and an automatic teller machine (ATM) network for self-service banking. The order calls for three 3090 Model 200 series mainframes and upgrades for its IBM 400 series units, disk systems and peripherals, as well as about 1,400 finance and general-purpose terminals and 200 ATMs. Other equipment on order includes a 3890 series reader/sorter, about 500 IBM 3270-type terminals, approximately 300 IBM 5922 series document readers, a number of 3725 communications controllers and upgrades to existing 4700 series controllers. The order does not include software, on which the bank spends about $8 million annually, a spokesman said.

MUNICH — In a major coup for Siemens AG here, Messerschmitt-Boelkow-Blohm (MBB) GmbH, a military equipment manufacturer, has decided on two jumbos from Siemens' 7890 S line. Pricing on the Siemens equipment, manufactured by Fujitsu Ltd., was the deciding factor, according to a spokesman.

The contract with MBB mirrors recent events at other major German firms: Bayerischen Motoren Werke AG and the German car association Adac GmbH both chose Siemens over IBM equipment.

TOKYO — AT&T International and Ricoh Co. will form a joint venture company called AT&T Ricoh Co. to market selected AT&T office automation and telephone products in Japan.

Under the terms of the agreement, AT&T will own 51% of the new company, and Ricoh will own 49%. The company will reportedly start doing business on Sept. 1. Ricoh currently supplies facsimile equipment to AT&T Information Systems in the U.S.

BRISBANE, Australia — Queensland secondary schools will move computer studies away from the hardware/software emphasis of the 1970s with a brave new syllabus designed for the 1990s.

A curriculum to be introduced in January will introduce fourth- and fifth-generation languages, knowledge engineering and the practical application of fourth-generation languages. A microcomputer-based implementation of IBM's relational data base language SQL will be used for the program by Queensland Information Technology, sources said.

An intensive training program has overcome the problem of finding teachers able to handle the course material.

MELBOURNE, Australia — Software developer BBJ had a successful trip to the National Computer Conference held last month in Chicago.

It clinched a $150,000 sale of its application software to a Canadian mining company, and signed up a Scandinavian distributor for its Today software, an AT&T Unix-based program generator.

BBJ's booth was set up by the company's U.S. subsidiary because managing director Ken Begbie opted not to participate in the national stand organised by the Australian Federal Department of Trade.

Products on display included Today and a range of packages for Hewlett-Packard Co.'s HP 3000 line of computers.

MELBOURNE, Australia — A cost-benefit analysis has convinced a Victoria, Australia, insurance company that it should drop a 10-year-old outside service bureau contract and start processing in-house. The move will call for about $1.3 million worth of computer equipment, a computer room and 12 new staff members at Vacc Insurance Ltd. The firm has an 8M-byte Facom M360R with 5G bytes of disk storage, three tape drives and a laser printer from Fujitsu Ltd.

SYDNEY, Australia — With sales of $29.5 million during the first half of 1985, Prime Computer of Australia Ltd. has recorded its strongest first-half growth to date. Product revenue for the second quarter was $12.6 million, up 60% from the same period last year. In 1984, Prime's Australian revenues totaled $40.6 million. The firm expects 1985 revenues to reach $60 million.

NEC wraps Geisco services into its Japanese NEC-Net

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco) said last week it signed an agreement with NEC Corp. of Japan that will make NEC Geisco's primary distributor of its worldwide teleprocessing services in Japan by interconnecting with NEC's new value-added Japanese network — called NEC-Net.

Geisco said NEC will offer its clients access to international teleprocessing applications — such as international order entry, cash management and electronic mail.

Geisco and NEC have also agreed to set up a joint venture company called C & C International Ltd., which will provide marketing and technical support for Geisco's services in Japan.

Geisco is a wholly owned subsidiary of General Electric Co.

Sicob scheduled for September in Paris

PARIS — The 36th Salon International D'Informatique, Telematique, Communication, Organisation du Bureau et Bureautique (Sicob) conference and exhibition will be held from Sept. 18-27 in the Cnit exhibition center, Paris la Defense. The show is geared to data processing professionals, including manufacturers, computer engineering firms, DP managers, systems engineers and analysts.

The general theme of the event is "Data Processing: Opportunities and Drawbacks." Seminars scheduled within the framework of Sicob include "Convention Informatique" (Sept. 16-20, Palais des Congres), "Infodial-Videotex" (Sept. 16-20, Palais des Congres) and "Sicob Study and Application Days" (Sept. 18-27, Cnit).

The registration fee is approximately $4 or by invitation.

More information is available from Sicob, 4 Place de Valois, 75001 Paris, France.

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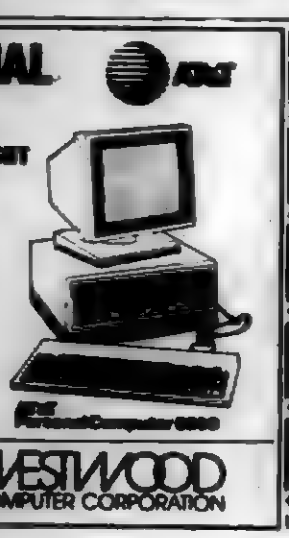

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Net meet set for Sept. 16

SAN FRANCISCO — "Fiber Optic Communications and Local-Area Network Exposition," sponsored by Information Gatekeepers, Inc. is scheduled for Sept. 16-20 at Brooks Hall here.

The exposition is geared to communications managers who purchase, design, evaluate or recommend any type of fiber-optic or local-area network, according to the sponsor.

The conference will begin with in-depth one-day or half-day seminars scheduled on Monday and Tuesday. Topics include case studies from a number of industries. Other topics consist of the fiber-optic market, system design and sensors.

On Wednesday, exhibits will be shown, and there will be a number of shorter sessions addressing topics such as single-mode technology, fiber-optic passive components and fiber-optic sensors, Information Gatekeepers said.

Fees for the three days of exhibits and sessions range from $100 to $250.

The half-day tutorials cost $200.

Full-day course fees range from $395 to $495.

Information Gatekeepers is located at 214 Harvard Ave., Boston, Mass. 02134.

Datastorage '85 targeted at executives

SAN JOSE, Calif. — Datastorage '85 — the fourth annual international Datastorage forum — will convene Sept. 16-18 at the Red Lion Inn here to address critical industry issues and areas of change in data storage equipment and applications.

The forum is designed for executives who set the strategic directions of their companies. This year's conference will explore the role of the subsystem, rigid disk media trends, ⅛-in. tape cartridges in the OEM market, new directions for ¼-in. tape drives, readiness of optical storage products and personal computer data storage requirements.

The registration fee is $925. Information is available from Forum Management, Cartlidge & Associates, Inc., Suite M259, 1101 S. Winchester Blvd., San Jose, Calif. 95128.

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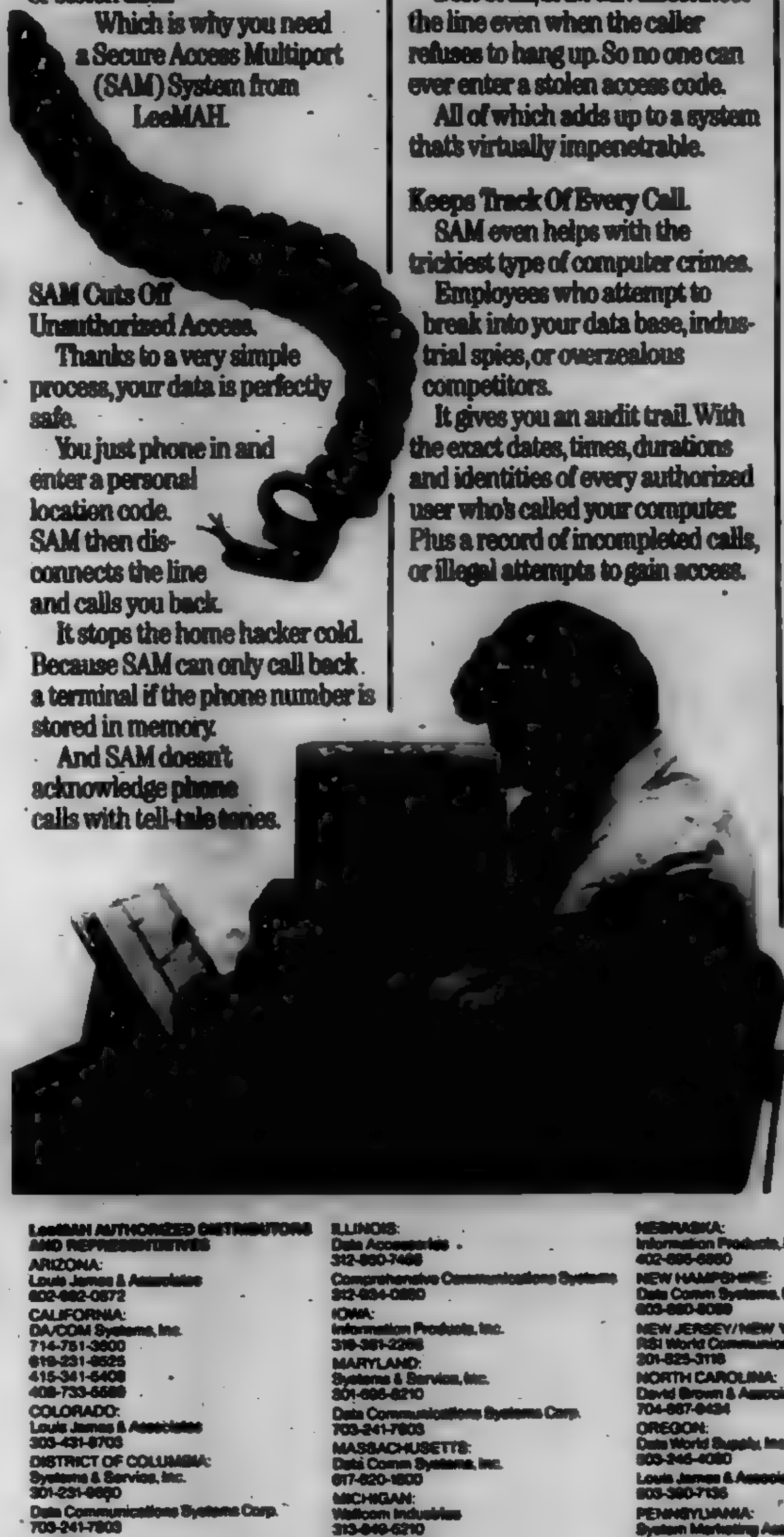

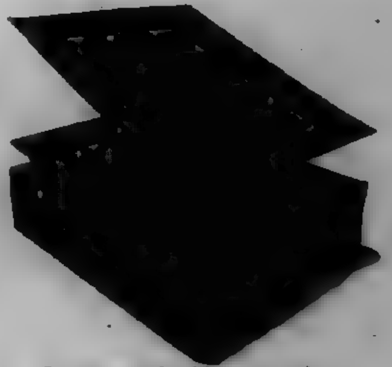

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System beefs up surgical instrument maker's operations

ST. LOUIS — A surgical instrument manufacturer here that cut over from batch processing to an on-line, closed-loop system has reduced its inventory and delivery times and added to its understanding of customers' needs.

Storz Instrument Co., which makes microinstruments, used for eye and ear surgery, along with other medical devices, logs sales of more than $50 million a year. Each day, it ships more than 600 customer orders that represent approximately 1,500 items.

The firm's management depends heavily on its manufacturing software system, NCR Corp.'s Manufacturing Information Support System Integrated On-Line (Mission) to keep track of orders, inventories and shipments in order to gauge customers' needs. The software draws on marketing forecasts to schedule production; it then reports sales bookings, which the firm uses to update its forecasts.

"The closed loop . . . begins with customer demand and closes with revision of our perception of customer demand," said James E. Brands, Storz's senior vice-president of finance and administration.

Storz runs 10 modules of the Mission software — master production scheduling, order processing, inventory management, bill of materials, materials management, routing, costing, material requirements planning, purchasing and receiving — on a 4M-byte NCR 8575M mainframe. The software interfaces with homegrown sales, marketing and forecasting programs.

Other business software — financial systems and the like — run on the mainframe, but Brands said the manufacturing system is more central to the firm's operations.

'No. 1 objective'

"It's obvious that a company of this size and complexity must have computerized systems for sales, bookkeeping and so forth. We couldn't operate even poorly without them today," he said. "But the most significant thing we get from data processing is not record keeping or accounting. It is the ability to maximize the extent to which we satisfy customer demands. And this is our No. 1 objective."

Storz brought up most of its software modules in July 1983 to replace a largely batch processing system. The system had provided some on-line inquiry, but employees could only access day-old data that had been processed overnight.

Employees have on-line access to the system; through any one of about 80 VDT terminals, a worker can enter data and inquire about the status of customer orders anytime between 7:15 a.m. and 5:30 p.m. "We're working with much more detailed, timely and accurate information than we ever had before," Brands said.

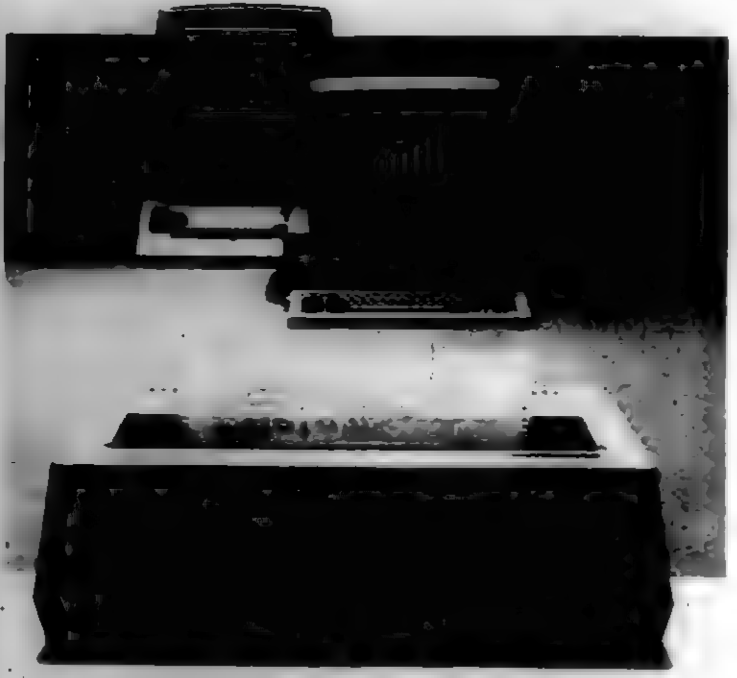
Two Storz divisions use the manufacturing system: the instrument division, which makes hand-held surgical instruments; and the equipment division, which makes larger products such as ultrasound devices. The equipment division has had its operations on the system longer and has logged some substantial results. In one year, the division has done the following:

- Cut its inventory by 23% and its inventory carrying costs by 20%.
- Brought back-orders to their lowest level in the firm's history.
- Decreased its number of production line shutdowns caused by inventory shortages.
- Cut its customer order turnaround time in half.

According to Storz' MIS director, Carl W. Riebeling Jr., both the equipment and instrument divisions have gotten less-specific benefits as well.

"Although people are still getting educated in the new ways, they can already see many intangible benefits from the availability of better information across the company and from a common data base," he said. "For instance, manufacturing and marketing now work with the same facts, and information is readily available for customers via 10 customer service representatives at video terminals."

Riebeling said Storz is still developing and refining its manufacturing system and will continue to change the software as business dictates.



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Wang users schedule meet

BOSTON — The Wang Users Society of America is sponsoring Index '85, the first independent exposition for users of Wang Laboratories, Inc. equipment. The show will be held Sept. 30 to Oct. 2 at the Park Plaza Castle here.

The show will feature vendors of Wang-compatible hardware, software and services and will be held concurrently with the International Society of Wang Users meeting sponsored by Wang at Boston's Marriott at Copley Place.

Admission to Index '85 is $25.

More information is available from Independent Expositions, Inc., 786 Rockrimmon Road, Stamford, Conn. 06903.

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Cannes, France, March 5-7

Papers are now being sought for this fourth worldwide congress. Topics include but are not limited to the following: electronic banking security including electronic funds transfer, authentification, identification, cryptography, point of sale and key management; network security including transborder data flow; security implications of new media including videotex, facsimile and Integrated Services Digital Network; security within microcomputers and distributed systems; juridical aspects of computer security; computer security as a management function; and DP incidents.

Send five copies of the paper to Securicom-Sedep, 8 rue de la Michodiere, 75002 Paris, France.

THE ELEVENTH ANNUAL SAS USERS GROUP INTERNATIONAL CONFERENCE

Atlanta, Feb. 9-12

A call for papers has been issued for this annual international conference. Authors are invited to submit papers on the following topics: capacity planning and evaluation, systems software, econometrics, time series and operations research, education and consulting, graphics, information centers, macro facility, microcomputers, posters and statistics.

Papers/posters must be postmarked no later than Sept. 1. Two copies each of a 200-word abstract and a working draft are also required by Sept. 1. Forms for submitting abstracts may be obtained by contacting SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

THE SIXTH INTERNATIONAL CONFERENCE ON DECISION SUPPORT SYSTEMS

Washington, D.C., April

Papers for presentation at this Sixth International Conference on decision support systems (DSS) are being sought. Topics include builders of DSS and expert systems used for decision support; managers, executives and others who use DSS; researchers in the technical, behavioral and managerial aspects of DSS; vendors of DSS products and services; information systems managers/information center managers who are responsible for or are affected by DSS in their organizations.

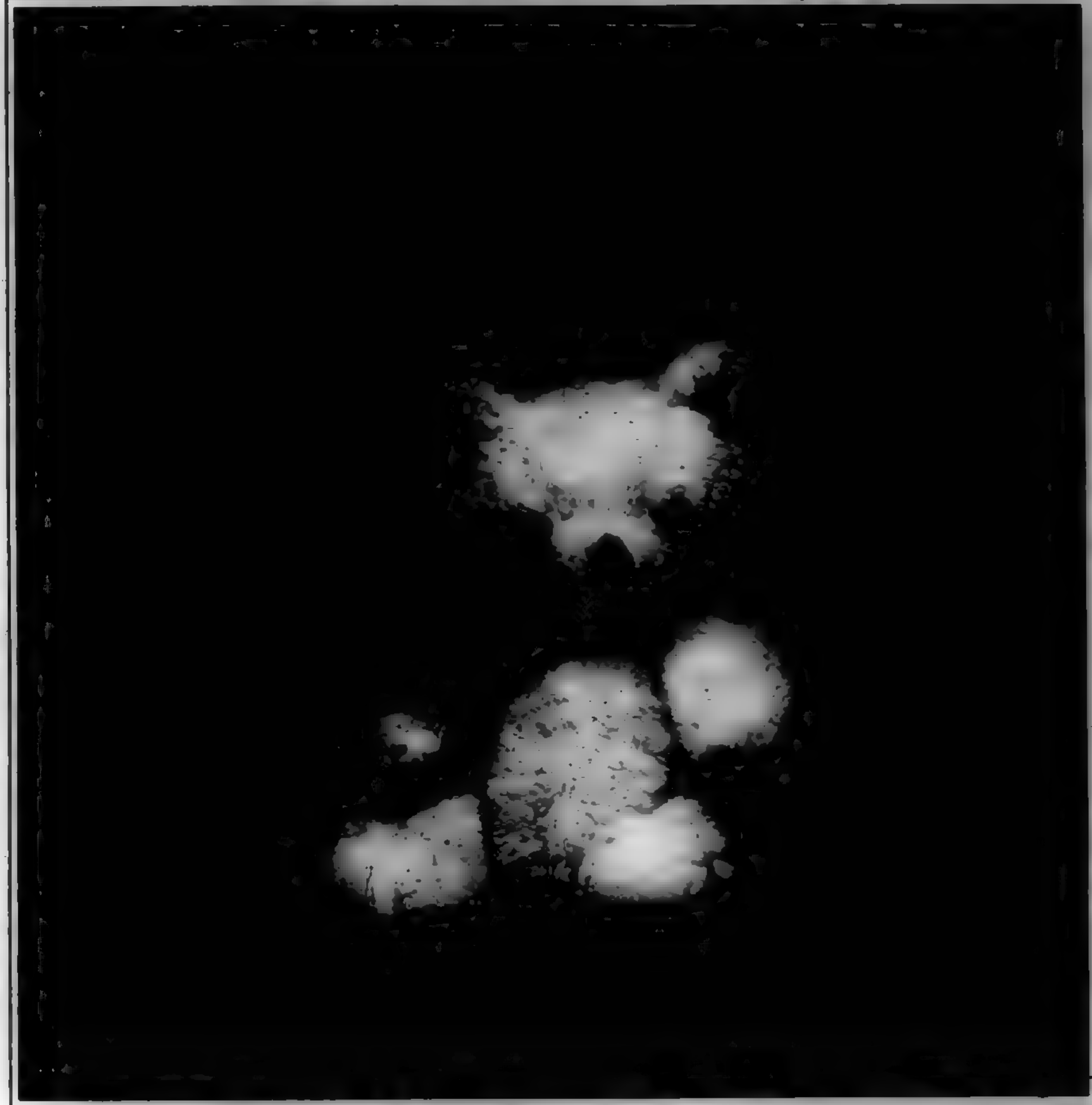
Three copies of the formal paper or paper summary should be submitted no later than Sept. 16 to Prof. Jane Fedorowicz, School of Management, Boston University, 704 Commonwealth Ave., Boston, Mass. 02215. Questions relating to papers, presentations and panels may be addressed to Jane Fedorowicz or to Vincent Barraba, Eastman Kodak Co., 343 State St., Rochester, N.Y. 14650.

THE EIGHTH INTERNATIONAL CONFERENCE ON PATTERN RECOGNITION

Paris, Oct. 28-31

A call for papers has been issued for this international conference being held in Paris. The official language of the conference is English. Papers are being sought on the following topics: data classification; clustering algorithms; signal and image processing; pattern analysis; feature recognition; pattern directed interface; inductive learning; modeling of human perception; image understanding and recognition; speech understanding and recognition; computer vision; expert systems in pattern recognition; specialized architectures; very large-scale integration for pattern recognition; industrial applications; robotics; biomedical pattern recognition; remote sensing; office automation pattern recognition; and text understanding and verification.

Prospective authors should submit four copies of a draft of a full-length paper or a 250-word abstract for poster sessions to: Afcet ICPR Secretariat, 156 Boulevard Pereire, 75017 Paris, France. The deadline for submission of abstracts or poster sessions is Dec. 2.



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DBMS pumps up pacemaker company's tracking system

MINNEAPOLIS — The department that tracks clinical studies of pacemakers and other medical devices for a manufacturer here cut its staff size and more than doubled its work load after it replaced a homegrown, hierarchical data base management system with a packaged, relational one.

Medtronic, Inc.'s 14-member clinical evaluation staff currently monitors about 34 studies a year; in 1982, the staff — with 16 employees — handled 15 studies annually. The studies track human implants of pacemakers and other devices so Medtronic can meet Food and Drug Administration (FDA) requirements and determine whether it should market given products.

Improvements in the staff's productivity came largely from a relational system, Sir, Inc.'s SIR/DBMS, that Medtronic brought up during the spring of 1982, according to Tim Church, manager of biometry for the firm. With the DBMS, for example, staff members can pull together in as little as three weeks' time FDA reports that once took up to two months.

Two major drawbacks

The system runs on an 8M-byte Prime Computer, Inc. Prime 750, and staff members access data through nine Vector Graphic, Inc. personal computers, one Compaq Computer Corp. portable micro and two Televideo Systems, Inc. terminals. SIR/DBMS replaced a hierarchical system called Medque that had been developed in-house during the late 1970s. According to Church, the old DBMS had two major drawbacks: inflexibility and a limited reporting capability.

Inflexibility. Medque supported only two levels of data structure, and its inflexibility imposed strong restraints on the clinical evaluation staff. For each device implant, the system supported one record of the initial implant and a set number of follow-up files that staff members established at the beginning of the study.

"If the scope of a study changed in the middle and we needed more space than we allocated," Church said, "it meant stopping the project to redefine all of the files, unloading the data already entered and reloading it into the new files." The process delayed studies and taxed Medtronic's one full-time programmer and his part-time assistant.

Besides impeding the collection of data from the studies, Medque's structure hampered efforts to manage the studies themselves. Administrative details, such the names of participants and indicators of progress, had to be entered on the implant record with clinical data.

This approach cluttered the implant record; it also blocked staff members' efforts to get at data they needed. "We had no way of isolating the administrative data so we could really use it to keep track of our studies," Church said.

Limited reporting capability. Medque's structure led directly to this second drawback. Church said nontechnical users could easily generate reports that the system's two-level hierarchy supported, for example, a tally that counted instances of a given occurrence. Only experienced programmers, however, had the wherewithal to work around the structural constraints and develop more complex reports.

"Our limited programming staff could not keep up with the demand for data," Church said. "Far too much of [its] time was being spent accessing data and performing analytical tasks for other, less technical users."

The relational DBMS that Medtronic now uses has helped the firm overcome both problems.

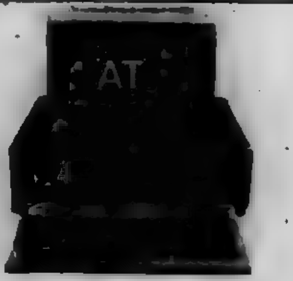
According to Church, SIR/DBMS gives the clinical evaluation staff the flexibility it needs to do its work. The staff sets up separate data bases for administrative and clinical information. Because of this, he said, "we have much better administrative control of our studies, and our study data bases are now completely dedicated to the collection and analysis of study data."

Medtronic's evaluation staff can also organize data bases differently according to the nature of the information they contain. "[The DBMS] allows us to use the natural structure of our data — whatever that structure may be — to its best advantage," Church said. Medtronic uses a network data model for its administrative data base, for example, and a hierarchical model for most of its study data bases.

The DBMS also offers a range of features that help researchers put together reports on administrative and clinical data.

- A query and retrieval language, based on IBM's SQL, allows nontechnical users to put together simple ad hoc reports — lists and summaries, for example. Church said most of the evaluation staff members use this feature, and all of them will eventually learn it.
- A report definition language lets technical users set up complex reports. The language sorts and groups data; produces titles, column headings, totals and subtotals; and formats final reports. Programmers use it to set up menus that will call information from the data base.

COMPAQ could have stopped here



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Medtronic's programmers use this feature to set up standard reports that evaluation staff members can call for again and again. Staff members work through menus to select standard formats and generate printed reports. Once a user selects a format, Church said, he can generate a report within a half hour.

■ A simplified report generator, which relies on defaults for some of its logic, offers many of the same abilities as the report definition language. At Medtronic, programmers use it to format relatively complex ad hoc reports.

■ SIR/DBMS' organization supports Medtronic's various data structures and provides for easier logical reporting than Medque did.

According to Church, the ability of staff members to produce accurate reports is a critical factor in Medtronic's business.

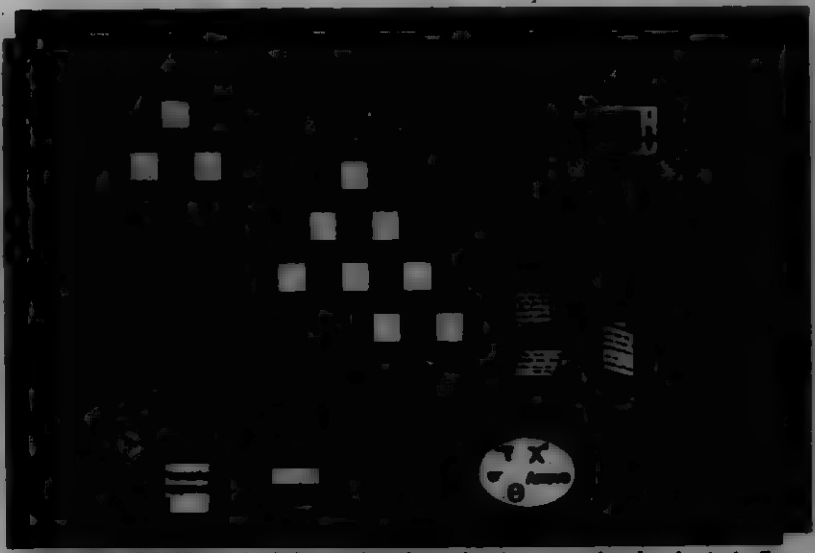
"The more efficiently we can produce the various regulatory reports and approval applications required by the FDA," he explained, "the more quickly we can bring our products to market."

Resource shortage limits productivity

Staff members' productivity, however, has been somewhat limited because of a shortage of system resources.

The clinical evaluation staff shares the Prime 750 with Medtronic's accounting staff, and the machine is frequently overloaded, according to Church.

In the future, the firm plans to buy a dedicated minicomputer to run both the DBMS and a statistical software package that the evaluation staff uses.



Medtronic's DBMS tracks information throughout pacemaker implant studies.

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DBMS manages implant studies

Medtronic, Inc.'s clinical evaluation staff uses Sir, Inc.'s SIR/DBMS most extensively to manage the human implant studies it conducts. Studies begin after the Food and Drug Administration (FDA) approves them and continue until Medtronic feels the product being tested is ready for marketing.

By the time the company gets permission to begin an implant study, the clinical evaluation staff has entered preliminary information about it into an administrative data base on Medtronic's Prime Computer, Inc. Prime 750.

The next step in the process is to develop a data entry form that doctors in the field will fill in with relevant information about an implant and set up the study data base.

Evaluation staff members design a data entry form for the study with RJBForms, a homegrown microcomputer software package. RJBForms uses the format of the data entry forms to generate both a data entry program and a data dictionary.

Once the data entry forms are designed, they and the devices involved in the test are shipped out to participating doctors. As the doctors collect information, they record it on the forms and send the forms back to Medtronic. At the firm, clinical aides review the forms for completeness and accuracy and enter information from them into a microcomputer.

An automatic upload program takes the flat Ascii files from the microcomputer, uploads them to the Prime machine and loads the data into the study data base that RJBForms set up earlier. At this point, SIR/DBMS generates and prints an error report.

Throughout the study, the data base management system prints out a variety of reports, including biweekly update reports that show upper management what studies are in progress and annual regulatory reports that the FDA requires.

From the study data base, clinical evaluation staff members also create analysis data bases in which they run statistical analyses on study data using BMDP Statistical Software, Inc.'s BMDP, statistical software developed by the University of California.

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TURNAROUND TIME

Larry Long

Q Six months ago, I hired a new director of information systems. He took over a difficult situation and has been doing very well. The steering committee has approved all of his recommendations to date, but all of us were taken by surprise when he proposed doubling his budget during the next three years, from $3 million to $6 million. He stated that this increase is needed to bring us up to parity with our peer companies.

We are seriously considering approving most, if not all, of the proposed increase.

But before doing so, we would like to know if other companies are making similar commitments in an attempt to catch up.

In truth, relatively few companies have adopted the giant-leap strategy in an attempt to become state-of-the-art users of computer technology — but more should. If you are way behind now, you can't catch up gradually.

Half of all MIS departments are grossly underfunded. That is, if MIS funding were doubled in these departments, the net result would be a positive contribution to the organization's bottom line. These companies, of which yours may be one, are not taking full advantage of the potential of computers.

Of course, good MIS management is a necessary prerequisite. If your new manager has a well-conceived long-range plan, and you remain confident in his abilities, go for it.

Q I would like your evaluation of my present situation. My data processing career began seven years ago.

I worked for a local government for 4½ years as a programmer/analyst and in industry for two years as a software engineer. The company I was working for had financial difficulties and laid off 25% (50 people) of its staff, including me.

I then accepted what at the time seemed to be a reasonable position, only to find that the DP shop consisted of entry-level programmers. Also, management was deeply involved in a religious sect — my religious preference was asked of me during my interview.

My job involved upgrading the current software to a new system that was purchased from my previous employer.

I had considerable experience with this system. I received a good six-month review, completed the project at 6½ months, and was informed at seven months that my services were no longer needed.

I described this sequence of events during several local interviews and was informed that, "What you're telling us isn't new — they use people like that all the time."

I am currently considering leaving the computer field altogether and would appreciate your views on the following questions: Is this what the data processing industry has to offer — a use-the-people-and-throw-them-away concern for the bottom line? How can a prospective employee obtain an objective evaluation of a company's relationship with its employees?

There is no question in my mind that your previous employer took advantage of you.

However, this unfortunate event is in no way indicative of the DP industry. Harsh, uncaring and even religiously motivated personnel decisions are made in every discipline.

Typical interviewees make two basic mistakes, thereby reducing their chances of an objective evaluation of the company.

First, interviewees don't do their homework; that is, they don't learn about the company's product line, its profit posture over the last five years, its management style and so on.

This type of information can be obtained from annual reports and other publically available information.

Next, the interviewee is too often content to engage in small talk, never asking the hard questions that will render insight into the employer/employee relationship.

When you interview, ask about turnover, potential for promotion, educational support, morale and so on.

When an interviewer sidesteps such questions, this should speak volumes to you.

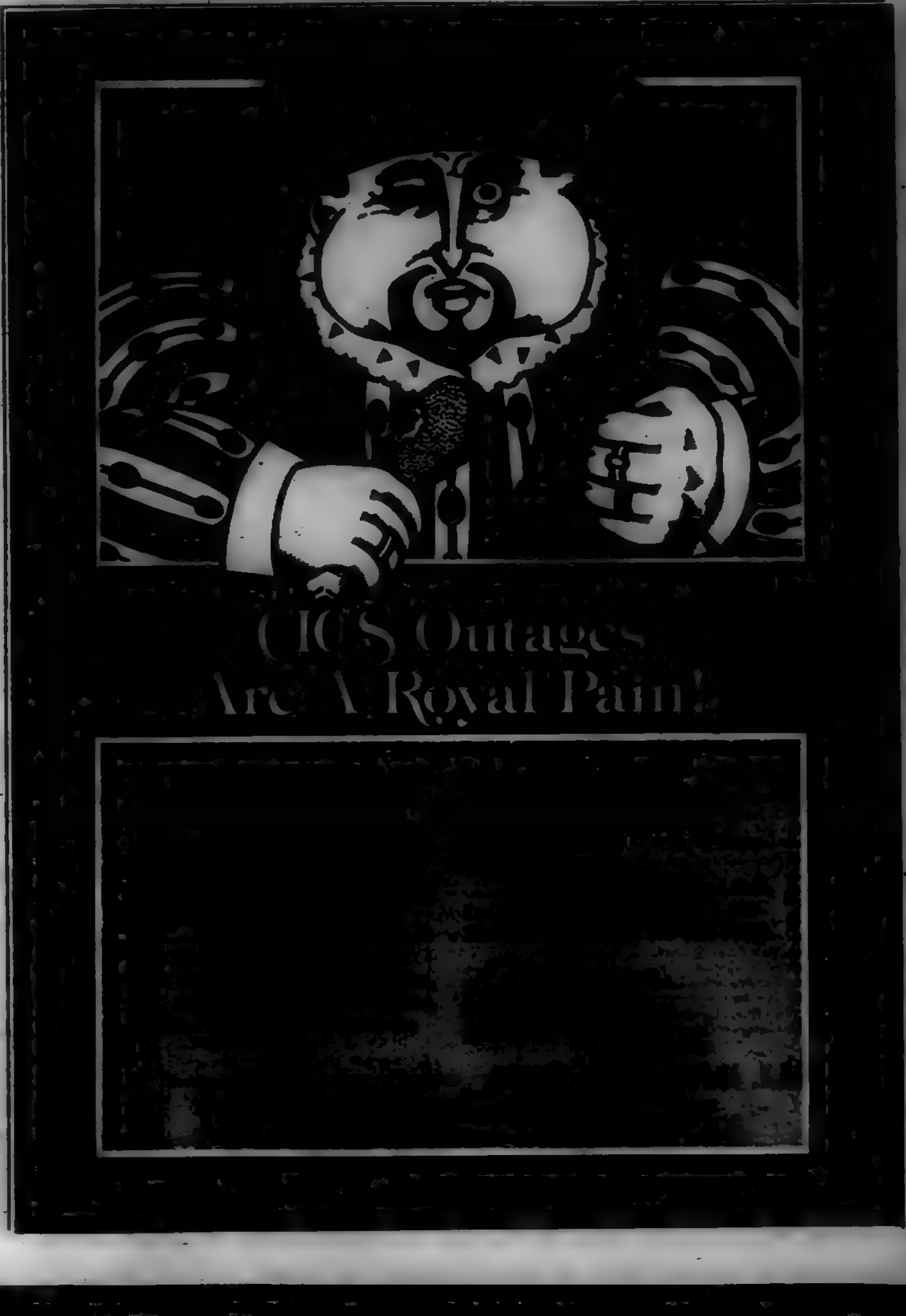
Q I've been an applications programmer since graduation from college 2½ years ago. I have no complaints about my employer or supervisor, but I am having second thoughts about a career in programming.

I'm reasonably good at it and don't have anything else in mind, but I sometimes wonder if I have the temperament for it. What makes a good programmer?

A good programmer is perceptive, patient, persistent, picky and productive.

These are my five "P's" of programming. If you are substantially lacking in any one of these areas, perhaps you should consider a career change.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.



MANAGERS ON THE MOVE

MICHAEL F. MYERS has been promoted to director of systems development in the data processing department of Lincoln National Corp.

Prior to joining the company, Myers spent 12 years with the U.S. Marine Corps serving as a programmer and systems analyst.

Myers, who joined the company in 1980 as a project manager in data processing development, provides project and resource planning, direction and control to the DP development team responsible for the support of Lincoln National's individual products division.

A graduate of the University of Maryland at College Park, Myers holds a bachelor's degree in psychology.

Lincoln National provides life and health insurance and annuities, property and casualty insurance and related financial services.

■

JOHN J. CAHILL has been appointed vice-president of management information systems for Intercontinental Hotels Corp.

In this position he will be responsible for the MIS function at Intercontinental Hotels, coordinating and implementing short- and long-term planning for systems development, computer processing and telecommunications at the hotel, division and corporate levels.

Cahill has had a long career with ITT and Sheraton Corp., where he was most recently director of hotel computer systems.

He is a graduate of Manhattan College in New York.

■

JOSEPH LACKO has been appointed corporate vice-president of information services for Supermarkets General Corp. in Woodbridge, N.J.

Lacko has been with the company since 1970, beginning his career as a senior systems analyst and was subsequently elevated to a project manager in 1972. In 1975, he was promoted to manager of the information systems development department.

Most recently, he held the position of director for the information service department.

He holds a bachelor of science degree in Business Administration from Seton Hall University, South Orange, N.J., and a certificate of data processing from Rutgers University in New Brunswick, N.J.

■

GARY A. REDDIG has been appointed director of forces management for Eaton Corp.'s Information Management Systems Division.

Reddig joins the division after 20 years of military service in which he was involved in areas related to the Information Management Systems Division activities, including readiness and contingency operations functions; executive management of communications and electronics; airborne command and control systems; and management of automated telephone and telecommunications software development and analysis.

Reddig has a B.S. in mathematics and a B.A. in psychology from North Dakota State University in Fargo. He also has an M.A. in human relations from the University of Oklahoma in Norman.

Eaton is worldwide manufacturer of advanced technology products serving the electronic and electrical and vehicle components markets.

AT&T, IBM eyed

NEW YORK — The Eastern Management Group is conducting a conference titled "AT&T & IBM: New Directions in Technology," at the Plaza Hotel here Sept. 11-12.

Speakers will include Archie McGill, president of Rothschild Ventures, Inc.; Dixon Doll, president of DMW Group, Inc.; John Malone, president of the Eastern Management Group; Ulrich Weil of Morgan Stanley & Co.; and John S. Bain of Shearson Lehman Brothers, Inc.

Among issues to be addressed are IBM's need to capitalize on its Rolm Corp. acquisition to establish network and systems management control, the impact on IBM of AT&T's private branch exchange base in Fortune 500 organizations, how AT&T's marketing naivete is limiting its growth in local-area network and computer equipment sales and to what extent a surge in merger activity will begin a pricing revolution.

The conference will also address whether IBM will continue to make acquisitions in the communications area and whether IBM's activity in the area will spur changes in switching architecture.

The conference registration fee is $795.

More information about the conference can be obtained from the Eastern Management Group, which is located at Four Century Drive, Parsippany, N.J. 07054.

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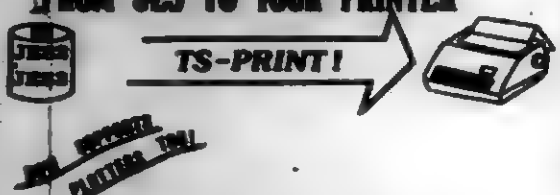

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CALENDAR

WEEK OF SEPT. 8

SEPTEMBER 8-11, CAMBRIDGE, MASS. — 1985 Society of Manufacturing Engineers (SME) World Congress on the Human Aspects of Automation. Contact: SME, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

SEPTEMBER 8-12, BOSTON — Managing the Explosion: End-User Computing and Emerging Technologies. Contact: Kimberly Gandia, Society for Information Management, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

SEPTEMBER 9, NEW YORK — CICS/VS Application Programming — Macro Level. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 9-13 in San Antonio and Sept. 11 and 13 in New York.

SEPTEMBER 9-10, ATLANTA — Principles of Prototyping. Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Sept. 12-13 in Fort Worth, Texas.

SEPTEMBER 9-11, VANCOUVER, B.C. — International Communications and Computer Exhibition. Contact: Tracon Exhibitions, 202-535 W. 10th Ave., Vancouver, B.C., Canada V5Z 1K9.

SEPTEMBER 9-11, WASHINGTON, D.C. — The Data Entry Management Association's (Dema) Ninth Annual Data Entry Management Conference & Exhibition. Contact: Marilyn S. Bodek, Dema, P.O. Box 16711, Stamford, Conn. 06905.

SEPTEMBER 9-11, WASHINGTON, D.C. — Federal Computer Conference. Contact: Federal Computer Conference, P.O. Box N, Wayland, Mass. 01778.

SEPTEMBER 9-12, FORT LEE, N.J. — Vsam From Start to Finish. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 16-19 in San Antonio and San Francisco, Sept. 23-26 in Chicago and Sept. 30 to Oct. 3 in Los Angeles.

SEPTEMBER 9-12, LOS ANGELES — CICS/VS MRO/ISC. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 9-12 in Washington, D.C., Sept. 23-26 in Boston and Sept. 30 to Oct. 3 in Fort Lee.

SEPTEMBER 9-12, MONTREAL — First International Conference on Computer-Aided Technologies. Contact: Stephen J. Leahey, P.O. Box 577, Desjardins Postal Station, Montreal, Que., Canada H5B 1B7.

SEPTEMBER 9-12, SAN ANTONIO — CICS/VS Application Design. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 16-19 in Fort Lee and Los Angeles and Sept. 23-26 in Washington, D.C.

SEPTEMBER 9-13, ATLANTA — CICS/VS Internals. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 9-13 in Boston and San Francisco, Sept. 23-27 in Fort Lee and San Antonio and Sept. 30 to Oct. 4 in Los Angeles and Washington, D.C.

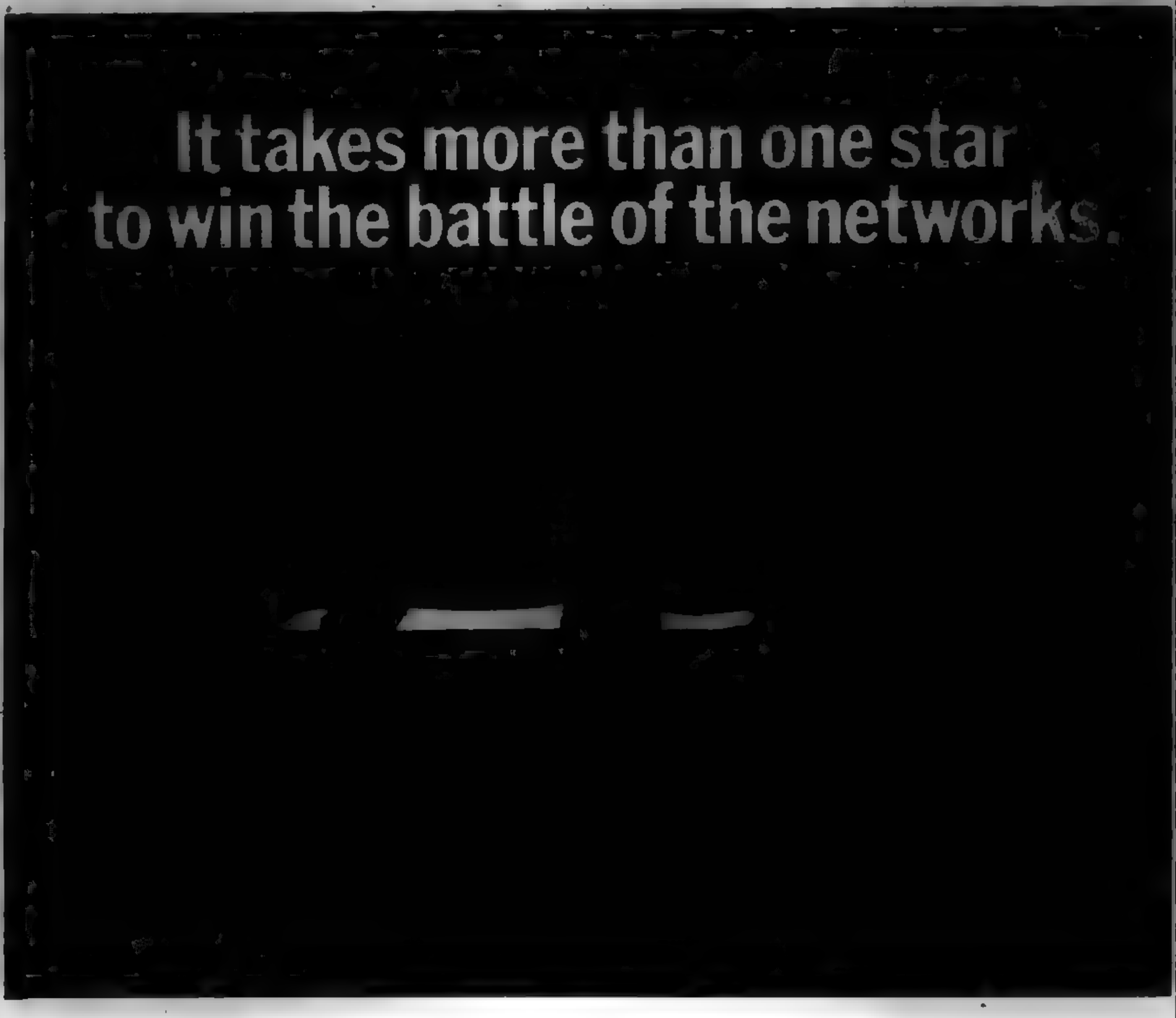
SEPTEMBER 9-13, CHICAGO — CICS/VS Application Programming — Command Level. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 9-13 in Fort Lee and Los Angeles, Sept. 16-20 in San Antonio and Washington, D.C., and Sept. 30 to Oct. 4 in Boston and Denver.

SEPTEMBER 9-13, CHICAGO — Structured Analysis and Design Techniques Workshop. Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

SEPTEMBER 9-13, HOUSTON — Data Base Development Workshop. Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

SEPTEMBER 9-13, TORONTO — Basic Systems

See SEPT. page 41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Analysis. Contact: Thomas J. Biscoquine, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Sept. 23-27 in Kansas City, Mo.

SEPTEMBER 9-13, WHISTLER MOUNTAIN, B.C. — The Ninth Data Communications Symposium. Contact: William Lidinsky, Bell Laboratories, Room 6B309, Naperville-Wheaton Road, Naperville, Ill. 60566.

SEPTEMBER 10, NEW YORK — Vsam: Its Structure and How to Use It. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 12 in New York, Sept. 16-19 in Boston and Chicago, and Sept. 23-26 in Atlanta.

SEPTEMBER 10-13, MELBOURNE, AUSTRALIA — The First Pan Pacific Computer Conference. Contact: The Australian Computer Society, P.O. Box 212, Hampton, Vic. 3188, Australia.

SEPTEMBER 11-13, DALLAS — Data Base Administration and Data Resource Development. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

SEPTEMBER 11-13, SAN FRANCISCO — ISDN User Needs vs. Vendor Capabilities ... Is There a Match? Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

SEPTEMBER 11-13, SAN FRANCISCO — Testing Computer Software. Contact: U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

SEPTEMBER 12-13, MCLEAN, VA. — Federal ADP and Telecommunications Procurement. Contact: International Data Corp., Washington Division, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102. Also being held Sept. 19-20 in Norfolk, Va.

SEPTEMBER 12-13, SAN FRANCISCO — IBM vs. AT&T — Local Network Strategic Issues. Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

SEPTEMBER 12-13, NEW YORK — Crisis '85: Bypass. Contact: The Eastern Management Group, Four Century Drive, Parsippany, N.J. 07054.

SEPTEMBER 12-13, NEW YORK — Micro-Mainframe Links. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

SEPTEMBER 12-13, SAN FRANCISCO — Data Processing Alternatives for Independent Banks: Service Bureau vs. In-House Systems. Contact: Alice Gibons, Inter Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925. Also being held Sept. 19-20 in Los Angeles.

WEEK OF SEPT. 15

SEPTEMBER 16-17, ATLANTA — CICS/VS Performance and Tuning. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 16-18, SAN FRANCISCO — Computers in Finance. Contact: California Datamart, Showplace Sq., San Francisco, Calif. 94103.

SEPTEMBER 16-18, SAN JOSE, CALIF. — Datastorage '85: An International Forum. Contact: Cartledge & Associates, Inc., Suite M-350, 1101 S. Winchester Blvd., San Jose, Calif. 95128.

SEPTEMBER 16-19, LOS ANGELES — CICS/VS Logic and Debugging. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Sept. 16-19 in New York.

SEPTEMBER 16-20, CHARLOTTE, N.C. — Vsam for Practitioners. Contact: American Data Group, Inc., 3686 Woodbury Drive, Duluth, Ga. 30136.

SEPTEMBER 16-20, MCLEAN, VA. — Knowledge Engineering 1: Acquiring the Expert's Knowledge. Contact: Expert Knowledge Systems, Inc., 6313 Old Chesterbrook Road, McLean, Va. 22101.

SEPTEMBER 16-20, SAN FRANCISCO — Analysts' Skills Workshop. Contact: Elise Rabelais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

SEPTEMBER 16-20, SAN FRANCISCO — Fiber-Optic Communications and Local-Area Networks Exposition. Contact: Information Gatekeepers, Inc., 214 Harvard Ave., Boston, Mass. 02134.

SEPTEMBER 17-18, SAN FRANCISCO — Computers in Finance — Datamart. Contact: Alice Gibons, Inter Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

SEPTEMBER 17-19, DALLAS — 1985 Software/Expo. Contact: Software/Expo, Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

SEPTEMBER 18-19, ATLANTA — Recovery/Restart. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SEPTEMBER 18-20, LAS VEGAS — American Production and Inventory Control Society's Fall Seminar. Contact: American Production and Inventory Control Society, Inc., 500 W. Annandale Road, Falls Church, Va. 22046.

SEPTEMBER 18-20, LOS ANGELES — Financial Information Systems: The New Generation. Contact: National Institute for Management Research Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

SEPTEMBER 18-27, PARIS — Sicob. Contact: Sicob Press Service, 4 Place de Valois, 75001 Paris, France.

SEPTEMBER 21-22, PALO ALTO, CALIF. — Seventh Annual Forth Convention & Banquet. Contact: Forth Interest Group, P.O. Box 8231, San Jose, Calif. 95155.

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EDITORIAL

A pioneer remembered

In the annals of computer history, IBM's Philip Donald Estridge will be counted in that topmost tier of individuals who, through a combination of personal brilliance and fate, strongly influenced not only their businesses but also the times in which they lived.

For it can be said that Estridge, killed 10 days ago in a plane crash, did more to institutionalize the microcomputer as a standard business tool than any other person to date. Not only did he, thereby, help to give birth overnight to a multibillion dollar industry, but he also substantially helped change the way corporate America conducts its business.

On the surface, Estridge was an unlikely individual to launch a division at IBM. His freewheeling management style and relative availability to the business and trade press rankled some of his more dyed-in-the-blue-wool counterparts, a style clash that was widely reported to have been a factor in Estridge's transfer earlier this year from the Entry Systems Division to a position with broader corporate responsibilities.

Given enough rope, with which lesser executives might have hanged themselves, Estridge began writing his own rules that would take ESD from a thought in mid-1980 to a $5 billion operation five years later. Although ESD did not design the most functional, powerful or least expensive machine on the market, it did produce a Personal Computer built with off-the-shelf parts — which was largely unheard of in Armonk, N.Y. — and thus gave IBM's Personal Computer assemblers adequate supplies of key components, often from multiple vendors.

As one IBM sales executive said recently, "The Personal Computer has changed the way IBM does business, and we're still learning our lessons from it."

The success of the machine, and of Estridge's strategy, was unlike anything the industry had ever seen.

The same can be said for the still-evolving changes the microcomputer revolution spurred in the data processing shop, where legions of end users are forever changing the nature of the MIS function.

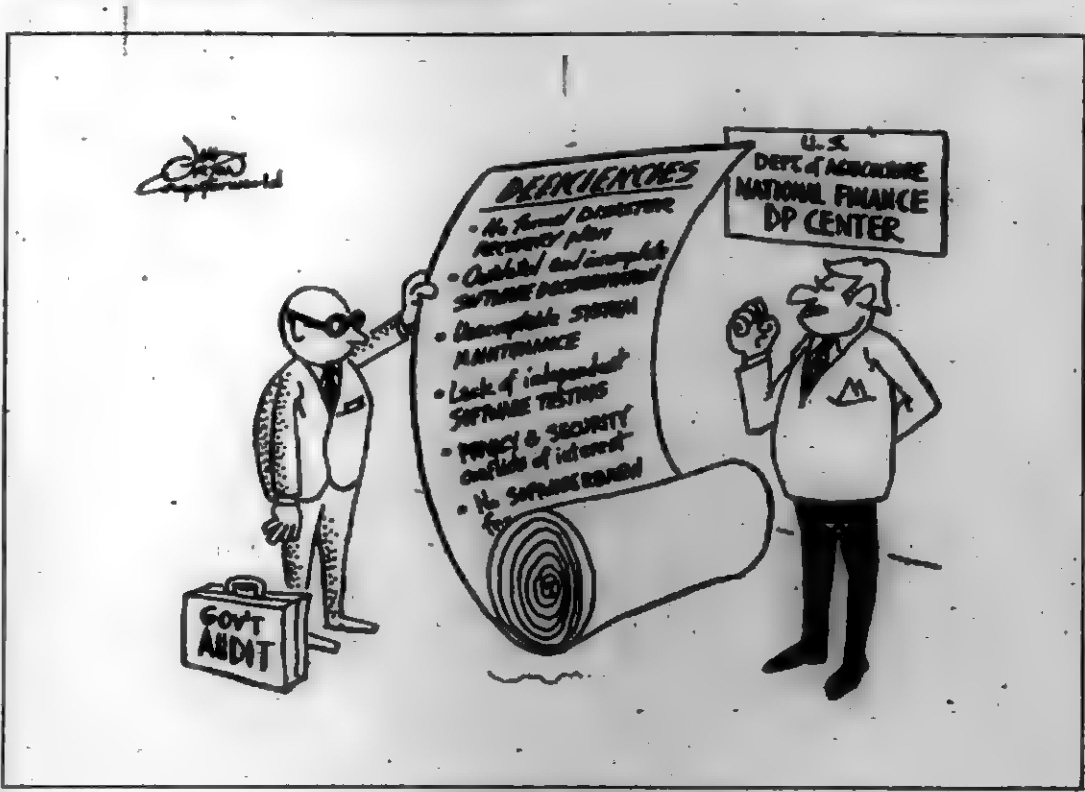
Applause for Amiga

Before the debut of Commodore Business Machines, Inc.'s Amiga personal computer recedes too far in the distance, we want to commend the company for its determination to innovate with personal computer technology — especially in the area of ease of use. Although the Amiga microcomputer currently has serious, perhaps lethal, operating system limitations, it is nonetheless a true engineering breakthrough.

Given a more perfect marketing environment and the resources to work out its technical problems, the Amiga could be a wildly popular business machine. As it is, Amiga will probably survive, if at all, as an entertainment machine.

Whatever the machine's fate, the Amiga's advances in graphics capabilities, system speed, sound reproduction and multitasking functions deserve the attention of conscientious corporate computer management professionals.

Such advances are rare in these times of clones upon clones and should be investigated, applauded and encouraged.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LETTERS

Tenants overlooked in shared services

The articles "Demand Low For Smart Buildings" and "Smart Buildings Hold Little Or No Interest For Tenants" [CW, June 17] accurately reflect the puzzling state of the shared tenant services industry.

In the rush to embrace new telecommunications and information technology and in the euphoria over deals between developers and providers, a key party has been ignored — the tenant. No one, it seems, is looking after the tenant's needs. It's no wonder interest in shared services is so low.

The solution to this puzzle rests in the hands of the developer and the shared service provider. To date, these parties have approached each other as if their interests were dissimilar.

Developers want to limit their involvement. Shared service providers support this position on the mistaken premise that limited developer involvement best serves their long-term profit interests.

Tenant demand and interest for shared services will increase only when developers and service providers can build a relationship on common interest. Meeting tenant needs is the bridge.

Charles B. Coe
Atlanta

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or fewer. Letters may be edited for the purposes of clarity and brevity. Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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VIEWPOINT

The semantics of small computer systems

LECHT ON SCIENCE
Charles P. Lecht

Just in case you think this is an easy subject to tackle, try doing it yourself. I've tried to write this piece at least 15 times over the past three years, but I never got very far. I was unable to define what I, or anyone else for that matter, meant by a "small" system.

My hang-up was that I was trying to find some connection between the word "small" and the system's physical size, its power and its cost. I even considered its usage location as being possibly meaningful — for example, the human lap or the nonhuman desk top. But, I found that all these criteria, whether alone or combined, were wildly unsatisfying.

For example, it is possible to build a system with staggering computational capability that fits in a briefcase and, in quantity lots, costs less than an Epson America, Inc. PX-8. The system is built around a gallium arsenide logic chip — a favorite in our supercomputer community — that produces more than 1 million floating-point instructions per second and is connected to a megabyte of charge coupled device random-access memory (CCD RAM), with both encased in a microrefrigerator. It provides its user with immensely powerful vector processing power. Because the CCD RAM loses its data when the system is shut off, data could be saved in a laser disk memory unit that also fits in the briefcase.

No one would think of classifying that system as small; on the contrary, it qualifies for the title of supercomputer. If you have any doubts about this, try carrying it through U.S. customs inspection and announcing your intention to take it on holiday in Leningrad.

Not to despair, though, for at long last I think I've deduced what people must mean by a small system, and if I am correct, I judge the future of this systems technology to be as bright, if not brighter, than any technology under development today. In these days of computer industry slowdown, a little brightness may go a long way.

Without further delay, I offer my definition of a small system so that I can go on to relate why I think its future is so bright.

Definition of a small system

A small system is one that can't do too much, or if it can, it can't do it too fast. No one cares if you take it out of the country, even to the USSR. And that's that. This having been said, I would like to make a comment on programming that I will relate to small systems technology.

Let's face it, except for a very few, no users really want to program computers if they have anything better to do. It's a thankless, tedious task. In part, it derives from those natural and expected economic trade-offs that serve to establish the boundary where manufacturers' responsibilities end and users' responsibilities begin. In part, it derives from the blazing ineptitude of those scientists that make computer hardware/software.

It's clear to me that until recently, most of our high-technology computer systems design heroes hadn't a clue how the things they were making might be used. They went about making computing systems and labeled them "general-purpose," hoping that people who purchased them might know. The label suggested that their systems could do practically anything, but it masked the fact that they could do little of practical value — like process a payroll — without a laborious disabling of all those generalities that didn't apply and enabling the few that did for a specific application. This process is what is called "programming."

Thank goodness, in recent times, some firms that make computer systems show signs that their designers have finally figured out the purpose of their products. They switched to making special-purpose devices that are easily programmed to do the jobs we need done as we go about our daily chores, without causing us to worry about or research the mysteries of computer science.

Users are tired of buying general-purpose computer systems to do a few highly specific tasks. Soon to vanish are manufacturers of small systems that can do just about anything anyone wants but require that they learn things as basic as Basic to do them. In their places will emerge those manufacturers that produce systems that do very little but do it well and do it for anyone wanting it done. Possessing this capability, these devices should sell like hotcakes — now and in the near future. These are the small systems of the future.

In the business area, this might be a simple word processor that requires a lot less of the user who just wants to draft and edit letters or reports and doesn't care if the system can't do anything else. A large screen so users can see what they are typing, a reasonably quiet keyboard and those very few functions that allow nonprofessional typists to go at it would suffice.

Hardware and software that will one day allow systems to grow into full-fledged office machines — but at the cost of carrying around now superfluous, hernia-inducing devices and coping with small screens — won't sell any longer. Nor will a spreadsheet device that requires so much setup time that users are compelled to recharge their batteries before refilling their martini glasses on a flight between New York and Los Angeles.

The small systems manufacturing community cannot have missed the success of today's photography industry. Since it has begun packaging film (software) in user-friendly ways, putting the intelligence needed to take a picture into the camera and the film itself and creating cameras (hardware) that anyone can operate, sales have soared. I predict that sales of computer hardware and software will also soar if the newly emerging small systems manufacturing community follows suit.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Minimizing the flow of managerial memos

MANAGEMENT MATRIX
Walter F. Cuirle

When was the last time you heard the following statements: "Great idea. Send me a memo me on that." "Summarize that status report in a memo." "Let's see that in a memo, and we'll get moving on it." Just yesterday? This morning? It seems that wherever two or more managers gather together, there will surely be a request for a memo.

Why? The reasons vary. Perhaps the best is illustrated in the first example, a memo that establishes who originated a new concept. That's useful. Memos summarizing reports make life a little easier for everyone except the author, who usually winds up writing the memo.

The last example, "Let's see it in a memo, and we'll get moving," is unfortunately common. Generally, you will hear this kind of a request for two reasons. The first is that the requesters are trying to cover their . . . ah, let's say themselves. That's the memo as an undergarment.

The other, better reason is simple communication. If, for example, there is a change in a chain of responsibility or a revision in critical dates, and more people need to know than can be present at a meeting, then there is a need to put it in writing. Just for the purpose of simple, undistorted communication.

For the moment, let's just agree that every piece of paper generated for internal use is overhead, pure and simple, and as such is something that ought to be watched carefully and minimized.

Managing without memos

Is it possible to manage without memos? Yes, depending on the size of the project and the size of the work group.

Look at the simplest case: if one manager directs one person to do one job that takes one day, is a memo necessary to get started? It doesn't seem so. How about one person, one week? Still not big enough. One person, one month? Probably not.

Let's increase the number of people. If you are supervising five people on a one-month project, do you have to direct the project and communicate its status to them in writing? It's doubtful. You certainly talk to each other — you work together, remember? Brief, periodic meetings will handle the status and direction of the project more effectively and in less time than it would take to do it in writing. In short, it's cheaper.

Those are really the deciding factors — time and effect. There's a certain minimum amount of time required to turn out paper; let's say two hours. If the group is small enough and the project is short enough that you can communicate status and direction face-to-face in less than two hours, then memos are less effective than meetings.

On the other hand, just because it takes a minimum of two hours to turn out a one-page memo doesn't mean it takes six hours to turn out three pages. If the project is so complex that it would take a three-hour meeting to cover all the points, or so many people are involved that it would require two meetings to talk to them all, then it is probably more economical to put it in writing.

This implies that the economy of managerial memos is an economy of scale. In situations like this, the obvious question is, where's the break-even point? When are memos and meetings equally economical?

Effective group communication is a book-length topic in itself. But communications start to break down when a group is larger than 10. A group of 15 people, for example, can be either a cocktail party or a classroom lecture but not a particularly effective discussion group.

Measuring project complexity

Complexity measured in terms of the length of a project is a little more difficult to calculate, but go back to the one-person, one-job, one-month example for a handle on it. That one-month project is going to be divided into discrete steps.

Can you handle 10 to 15 related topics every week, in less than your minimum memo time of two hours? You probably can. So that's the break-even point.

You can repeat the analysis using numbers that fit your operation, but you get the idea. For the figures we have here, the break-even point is 10 people working together on a one-month project. You can handle that or anything smaller in weekly meetings. Don't bother writing until it gets bigger.

Cuirle is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

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SOFTWARE & SERVICES

AN INTERVIEW

Dr. Sundstrom

As the backbone of its communications strategy, IBM's Systems Network Architecture (SNA) has long been the focus of public attention. But a 1982 addition to SNA has in recent days caught the eye of users and software vendors and, by Big Blue's own admission, become a subject of intense interest in the corporate offices of IBM.

Logical Unit Type 6.2 (LU6.2), dubbed Advanced Program-to-Program Communications, is an SNA protocol that allows software programs to communicate — regardless of their hosts — on a peer-to-peer basis. LU6.2 has been touted as the key to advances in micro-mainframe linkage and distributed processing. The protocol has been implemented in a limited but growing number of IBM products and has been embraced by third-party software vendors. Computerworld Senior Editor Software, John Gallant, talked about the future of LU6.2 with Robert Sundstrom, manager of communications systems architecture with IBM's Communications Products Division in Raleigh, N.C.

Why has it taken so long for manufacturers and users to recognize the significance of LU6.2?

Things like this take time. SNA is celebrating its 11th anniversary. But back in 1974, it wasn't as big a deal as it is today. Before LU6.2 becomes really exciting, it needs to be implemented on a wider variety of products. It won't have a really major impact on our customers until they start installing those products.

It has been said that LU6.2 allows a user to retrieve data without knowledge of where that data resides and execute

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- Soft-Switch, Inc. enhanced its Profs Bridge II office systems software/59
- Apollo Computer introduced three-dimensional graphics software for its Domain workstations/59
- An applications development system for Prime 50 series processors was unveiled by Advanced Relational Technology, Inc./59

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CICS test program praised, but users balk at price hike

By Charles Babcock
CW New York Bureau

NEW YORK — Early users of an IBM CICS applications testing program said its automated procedures save manpower, but some of them are disputing its $25,000 to $35,000 price.

The program, Verify, now a product of On-Line Software International, Inc. of Fort Lee, N.J., is being used by Manufacturers Hanover Trust Co., Equitable Life Assurance and Shearson Lehman Brothers, Inc., all in New York, and Allis-Chalmers Corp. in Batavia, Ill., to test CICS application programs after they have been modified, spokesmen for the companies said. The users praised the product, but at least two of them questioned On-Line Software International's decision to increase Verify's price tag by more than 300%.

"We have had it for roughly a year now, and we are using the 'be-jeepers' out of it," said John Haab, manager of systems service at Allis-Chalmers. He said Allis-Chalmers has not yet quantified the manpower Verify has saved it in automatically running test data, but he said the gain is significant.

Verify is "a viable, regression testing tool," said Richard Wysocki, assistant manager of technical services at Equitable Life.

All four users agreed the program addressed a need that in the past could only be met through the tedious manual reentry of test data or through more cumbersome competing packages that added steps to the testing process.

Verify uses hooks into the IBM Terminal Control Program to capture test data as it is entered into an application and stores

See PROGRAM page 59

Execs examine twin problems

SOFTALK
By John Gallant
CW Senior Editor

Insights.

At Cincom Systems, Inc.'s recent Directions '85 Executive Management Conference, Tom Nies provided insights into what it's like to compete against IBM in the large systems software arena. Actually, as Nies told it, "compete" may be a misleading term.

Nies, chairman and chief executive officer of Cincom, said his firm and other independent software companies only compete against IBM in MIS shops

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Wang net package controls VS software inventory

LOWELL, Mass. — Wang Laboratories, Inc. has announced a network administration package for multisystem VS environments.

According to a spokesman, the Software Manager is integrated into Wang's Distributed Management Facility and allows for the control of software inventories from a central site. With the package, users can electronically distribute software to remote sites through the File Transfer Service and Forward Service in a Wang Systems Networking (WSN) environment. Software Manager can also be used to install software automatically on remote systems and to manage applications at the remote site.

The Software Manager requires Release 6.2 or higher of the VS operating system, VS WSN transport releases and WSN File Transfer Service for network distribution.

The software is priced at $1,250 for a perpetual license on the VS 15, VS 25, VS 45, VS 50, VS 65 or VS 80 and $5,000 for a perpetual license on the VS 85, VS 90, VS 100 and VS 300.

Wang Laboratories is located at One Industrial Ave., Lowell, Mass. 01851.

SOFTSCOPE

Notes from the software industry front

Alpharetta, Ga.-based Digital Communications Associates, Inc. said that its Irma's Fastlink high-speed modem is supported by Atlanta-based Management Science America, Inc.'s Expert Link microcomputer-to-mainframe link. Irma's Fastlink transfers data at speeds of up to 10K bit/sec. A spokesman said the coupling of the products allows micro users to send downloaded host data to other micros in remote locations at high transmission speeds.

■

Digital Equipment Corp. of Maynard, Mass., has contracted with New York-based Coefficient Systems Corp. to distribute Coefficient's Vterm II communications software through the Digital Distributed Software program. Vterm II is said to allow IBM Personal Computers, Personal Computer XTs and ATs to communicate with DEC VAX and PDP minicomputers. It offers terminal emulation, five file transfer protocols and other general communications capabilities.

■

Digital Equipment Corp. also entered into an agreement with Philon, Inc. of New York that will make Philon's compilers available for DEC's Microvax I and Microvax II under DEC's Ultrix version of AT&T Unix. Philon will supply its Fast/Compilers to DEC under the Digital Classified Software (DCS) program. The DCS program tests third-party software to ensure that it meets DEC specifications.

■

American Channels, Inc. of Lexington, Mass., announced that it will republish internationally developed computer-aided design and manufacturing software packages for the U.S. The company's first products, originally published in Europe by Cadcentre Ltd. of Cambridge, England, include AC/GNC, a graphics-based numerical control tape preparation system; AC/Diad, a mechanical drafting and design system; and AC/Plan, a computer-aided planning package. The products form the core of American Channels' Shop Floor CAD/CAM product line.

■

Westford, Mass.-based American Business Systems, Inc. will supply its Business Accounting Control Systems (Bacs) Software for Pennsauken, N.J.-based Datamedia Corp.'s recently announced AT&T Unix-based 932 Supermicros. The joint marketing agreement covers the entire Bacs line of general ledger, payroll, accounts payable and receivable and order and inventory packages.

■

Management and Computer Services, Inc. (Macs) of Valley Forge, Pa., and Applied Information Development, Inc. (AID) of Oak Brook, Ill., formed what the two companies called a joint business alliance aimed at assisting clients in software testing and quality assurance. Under the pact, the Macs automatic test data generator, Datamacs, and the Tracmacs audit path analyzer will be brought into client sites by AID to carry out specific testing and quality assurance arrangements.

■

Carleton Corp. of Cambridge, Mass., signed a distribution agreement with Honeywell Information Systems of Phoenix. Honeywell Information will market Carleton's Auditec information retrieval, reporting and auditing software for its DPS 8, DPS 88 and DPS 90 processors under the Gcos 8 operating system.

■

AT&T Information Systems has contracted with Syntactics Corp. to distribute, co-label and publish the Crystalwriter package for its 3B2, 3B5 and Unix PC 7300 computers. Crystalwriter is Syntactics' AT&T Unix-based word processing package for multiuser environments.

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The new IBM 3161 ASCII Display Station is really seven different ASCII displays in one.

In addition to its own function-rich native mode, the new IBM 3161 can emulate:

- IBM 3101 Model 881
- ADDS Viewpoint*
- Hazeltine 1500*
- Lear Siegler ADM-3A*
- Lear Siegler ADM-5*
- TeleVideo 910*

Besides fitting nicely into existing systems, the IBM 3161 also offers impressive improvements in ergonomics.

Improved Ergonomics For Improved Productivity

Take the 102-key ASCII-style keyboard, for example. Its low profile, gentle contour and typewriter touch make for faster keying with fewer errors. The keyboard has programmable function and editing keys so it can be custom-tailored to meet your application needs.

Then, for comfortable viewing, there's the tilt and swivel of the 12" display. And the sharp, clear 8 x 16 character matrix for easy reading. Plus cursor, character and field attributes (blink, reverse video, underscore, dual intensity, etc.). And scrolling. And partitioning. And lots more.

The IBM 3163 with Plug-in Cartridge

And, as if that weren't enough, we're also announcing a second new ASCII display station with even higher function—the IBM 3163.

The sharp 8 x 16 character matrix helps make for easier reading and fewer operator errors.

Outwardly, these two new displays look alike. But the 3163, in addition to its built-in emulation of the IBM 3101 Model 881, also offers the ability to emulate the DEC VT 52 and VT 100* by means of a unique plug-in cartridge.

And while you'll like the power and flexibility of the 3161, for your high-function applications the 3163 goes even further. For example, a 7,680-character buffer and up to three windows enable you to view and modify portions of different host data bases. The 3163 lets you redefine and even recap the keys.

On both displays the setup is menu-guided and written in plain English, so it can be done easily and quickly. The point is, both are designed to improve your user productivity.

Very Attractive Prices

The price per terminal is $695 for the 3161 and $1,095 for the 3163. Quantity discounts are available. What's more, IBM maintenance offerings start as low as $35 per year per terminal for customer carry-in repair.

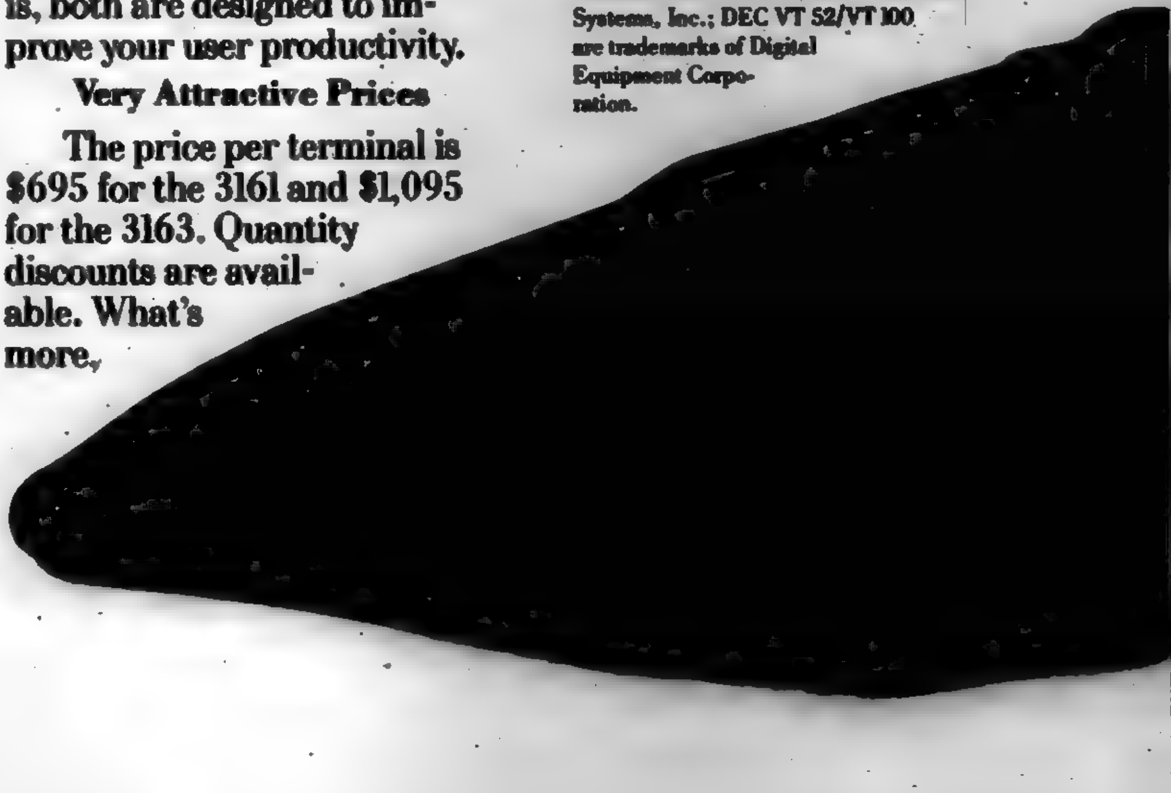
Now there's a new family of ASCII displays with the quality, service and support IBM is famous for. Both displays are available through IBM Authorized Distributors and IBM marketing representatives.

FEATURES	3161	3163
Lines x Characters	25 x 80	25 x 80
Double-sized chars	No	Yes
Line drawing chars	24	24
Vertical scroll	Jump	Jump/ Smooth
Definable function keys	24	24
Windowing	No	Yes
Partitioning	Horiz	Vert/Horiz

Call 1 800 IBM-2468, Ext. LE/90 for the name of an Authorized Distributor near you.

IBM

*ADDS Viewpoint is a trademark of Applied Digital Data Systems, Inc.; Hazeltine 1500 is a trademark of Hazeltine Corp.; Lear Siegler ADM-3A/ADM-5 are trademarks of Lear Siegler, Inc.; TeleVideo 910 is a trademark of TeleVideo Systems, Inc.; DEC VT 52/VT 100 are trademarks of Digital Equipment Corporation.



in one.

The IBM 3161 ASCII Display Station

Soft-Switch upgrades Profs interface

Dissimilar systems now able to exchange data

KING OF PRUSSIA, Pa. — The capability to exchange notes and final-form documents between the IBM Professional Office System (Profs) office automation system and dissimilar office systems has been added to Soft-Switch, Inc.'s Profs Bridge II interface.

Previously, the Soft-Switch Profs interface allowed users of non-IBM office systems to exchange only revisable-form documents with Profs users in IBM VM environments. IBM's Profs includes electronic mail, calendaring and document preparation capabilities.

The Soft-Switch interface now allows users of systems from Wang Laboratories, Inc. and Xerox Corp. to send and receive notes to and from Profs users.

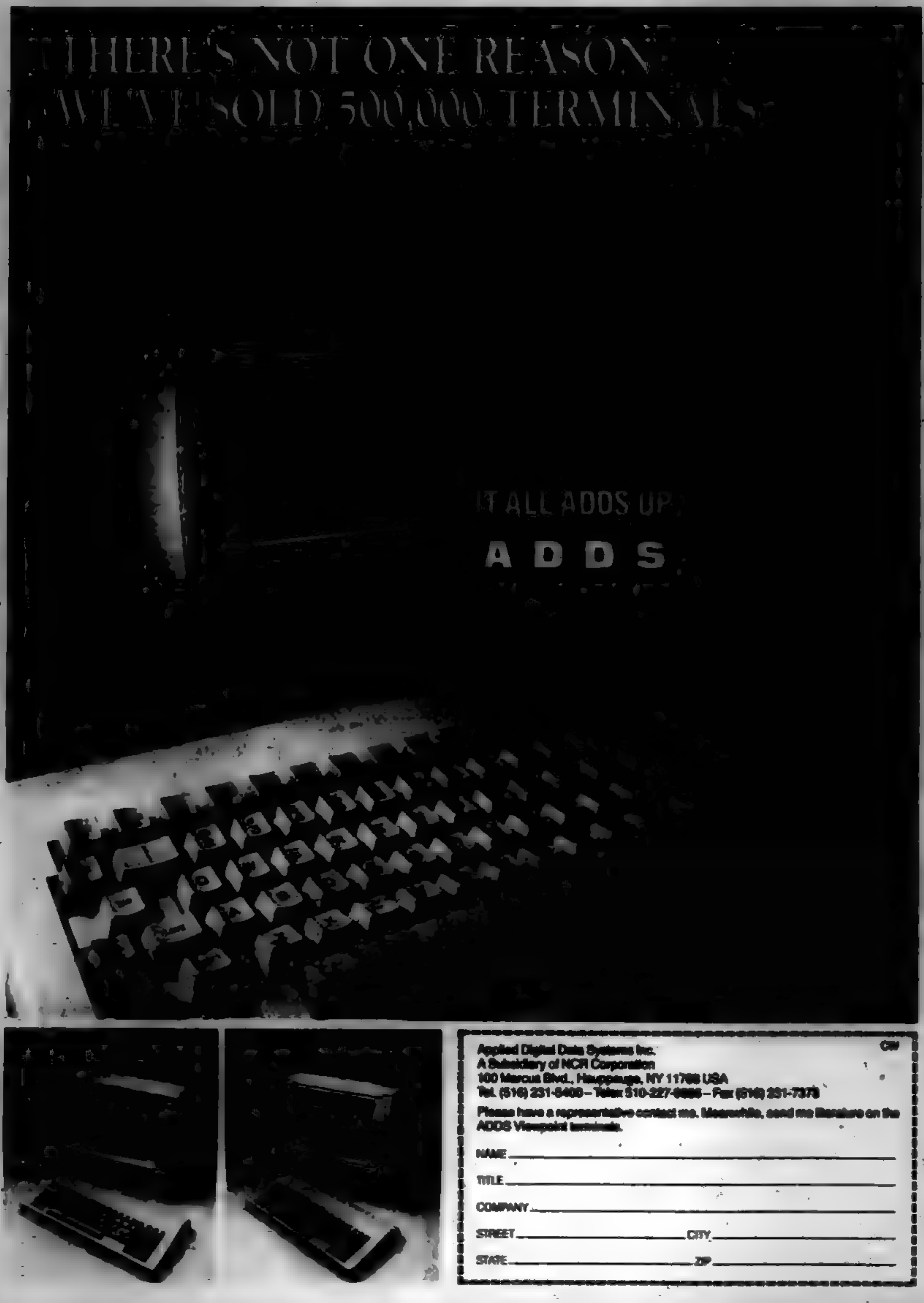
Documents from a Wang system that are intended for Profs users are automatically formatted into Profs notes and final-form documents and appear as a normal Profs incoming mail item to Profs users, the vendor said.

Profs Bridge II also supports Generalized Mark-Up Language in final-form documents, and includes a revised addressing scheme.

The Soft-Switch interface supports the IBM Personal Computer, Final Form Print Image, IBM's Document Control Facility, Displaywriter, Displaywrite 2, Displaywrite 3, IBM's 5520 terminal and the 6640 and 6670 Laser Printers. It also supports NBI Corp.'s Oasys 8, Oasys 64, 3000 and 4000 systems, the Wang Office Information System and VS systems, Xerox's 850/860, and Multimate International Corp.'s Multimate word processing package on the IBM Personal Computer.

The Profs Bridge II is priced at $20,000.

Additional information is available from Soft-Switch, which is located at 200 N. Warner Road, King of Prussia, Pa. 19406.



Applied Digital Data Systems Inc.
A Subsidiary of NCR Corporation
100 Marcus Blvd., Hauppauge, NY 11788 USA
Tel. (516) 231-5400 – Telex 510-227-[illegible] – Fax (516) 231-7373

CW

Please have a representative contact me. Meanwhile, send me literature on the ADDS Viewpoint terminals.

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COMPANY ____________________
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STATE ____________ ZIP ____________

Centre info manager out

REDWOOD CITY, Calif. — Advanced Relational Technology, Inc. has announced the Centre Information Management System, a fourth-generation applications development system for Prime Computer, Inc. 50 series minicomputers.

Centre is upwardly compatible with Advanced Relational Technology's Relgraf Information Management System, the Prime version of which is being discontinued.

The Centre system is based on Advanced Relational Technology's proprietary relational data base management system (DBMS) technology, which includes a compiled query language and special-purpose file system. The Centre system was built around a relational file management system with its own buffer management, recovery and transaction support. This feature is said to speed data retrieval and improve host performance by reducing disk I/O.

The applications development system includes a report writer, full screen forms management and Advanced Relational Technology's nonprocedural language based on SQL.

Release 3 of Centre, including full screen forms management, report writer and fourth-generation applications development languages, together with the Centre relational DBMS, is priced at $37,500 for a license on the Prime 9650, 9750 and 9955 processors. On the Prime 2250 and 2550 processors, the price is $22,000.

Advanced Relational Technology is located at Suite 306, 702 Marshall St., Redwood City, Calif. 94063.

Apollo graphics software debuts

CHELMSFORD, Mass. — Apollo Computer, Inc. has announced that three-dimensional graphics software modeled after the emerging Programmer's Hierarchical Interactive Graphics Systems standard, is now available for its Domain workstations with the SR9 release of Apollo's Aegis operating system.

The Graphics Metafile Resource (GMR) facility is said to offer full 3-D functionality, including interactive scaling and rotation, complex viewing, interactive editing, drawing and displaying of objects.

The graphics metafile feature of GMR is an editable, tree-structured data base that can be shared among applications and viewed on any Apollo workstation on the distributed Domain network. The metafile can be stored and redisplayed, revised and reused at any time, a spokesman said.

The GMR will become standard on all Domain workstations, including the recently announced DN330 and DN560 models, with the updated Aegis operating system. The GMR is also compatible with Domain/IX, the company's implementation of AT&T's Unix System V and University of California at Berkeley 4.2 Unix.

Apollo is located at 15 Elizabeth Drive, Chelmsford, Mass. 01824.

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Announcing Masterpiece™: A Powerful Mainframe Application Software Product Built Upon A Simple Idea Called Intelligent Architecture™.

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What do you call software architecture so artfully conceived it will someday enable a person using an application to move from one database management system to another, or from one teleprocessing monitor to another, without a single change in his work style?

What do you call query and reporting tools so simply and powerfully rendered that even a novice will find them no more difficult to work with than a personal computer spreadsheet?

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The Masterpiece series is a family of mainframe business software products—a classification and a category which may lead you to conclude that it is like other mainframe software products.

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The Masterpiece design is so clean and uncluttered that it makes current and future applications efficient to develop and easy to use. Masterpiece comes with none of the excess baggage, inherent short-comings or system limitations that have traditionally plagued the people who need business information and the people who manage it.

Masterpiece is, in every aspect, a new family of software products.

And, in every aspect, an *improvement* over the software packages you may be used to.

Or are, in fact, now using.

Intelligent Architecture Design: The Fundamental Difference.

Previous software designs have been developed to better utilize the power of the computer.

Masterpiece was designed to mirror the methods and styles of the work place and to anticipate the *inadequacies* of the computer.

Masterpiece design is called Intelligent Architecture. It's a new term. And a new way to build software. Now, Intelligent Architecture brings new meaning to concepts like "modularity," "borderless integration" and "event-oriented processing."

Only application-specific code is contained in the application…other coding (system code, interfaces, code common to multiple applications) is separated out and coordinated by the Intelligent Architecture itself.

This means that ultimately a user can adopt a new database management system without the slightest change in either his way of working or in the application code itself.

Only software built in this manner, is software that will endure.

The Intelligent Architecture design means that all menus and screen prompts become common to all Masterpiece applications. It means that the way users interact with an application will be the same from application to application—a significant factor contributing to greater ease-of-learning and ease-of-use.

It is this capacity, present now in the Masterpiece Intelligent Architecture design, that lifts Masterpiece beyond the promise of other software products in its class.

And *that* is the fundamental difference.

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Masterpiece: Common Functions.

The reason Masterpiece works so well is because each of its pieces work so well together.

And apart.

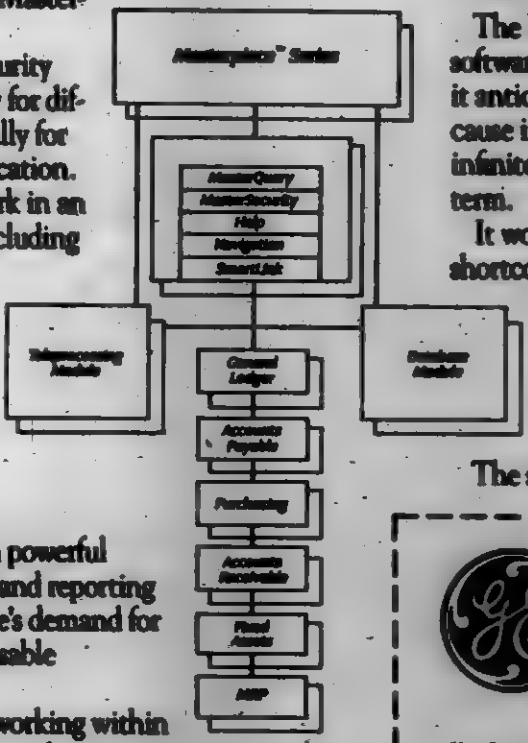
The MasterSecurity™ system, Online Help and Navigation features work across (and are common to) all Masterpiece applications.

But because they are separate from all applications, Online Help, for example, can be custom modified or even translated into different languages.

The Navigation feature lets you move from screen to screen with direct access from one Masterpiece application to another.

Levels within the MasterSecurity system can be determined not only for different applications but set specifically for transactions within the same application.

Everything is designed to work in an intelligent and modular fashion including what may now be the industry's most advanced query tool . . . MasterQuery.™



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The MasterQuery system is a powerful fourth generation borderless query and reporting tool designed to satisfy an executive's demand for instantly accessible and instantly usable information.

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SYSTEMS SOFTWARE

■ Business Controls Corp. has announced a split-screen editor for multifile editing on Digital Equipment Corp. VAX-11 minicomputers.

The Splits package reportedly allows character editing on one file while viewing a second file. The software allows the top half of a terminal screen to display the viewed file with full search and scan capability, while the bottom half contains the file being edited, with full character editing capability.

Splits is said to conform to all DEC EDT conventions, using keypad and function keys similar to EDT.

The cost of Splits is $500.

Business Controls, 3-7 W. First St., Clifton, N.J. 07011.

■ Mid-States Computer Corp. has announced Remote Program Support (RPS) communications software for IBM System/34 and System/36 minicomputers.

RPS is said to allow users to transfer library members, OCL job streams, spool entries and data files between System/34 and 36 processors via dial-up telephone lines. With RPS, users can execute a job stream at the receiving location that was created at the sending location.

RPS costs $900 with a $100 charge per additional CPU. A site license costs $1,800.

Mid-States Computer, P.O. Box 1564, Grand Island, Neb. 68802.

■ New Generation Software, Inc. (NGS) has announced Disksaver/38, a disk space maximization tool for the IBM System/38.

NGS reportedly allows users to reduce the sizes of object libraries by up to 60%. It allows users to limit their on-line storage to the part of the object code needed in normal program operation. It also can reorganize data base files, the vendor said.

The file reorganization system reportedly enables users to reorganize files in all libraries, all files in a single library or selected files in a library.

Disksaver/38 is priced at $985.

NGS, 3840 Rosin Court, Sacramento, Calif. 95834.

■ Specialized Systems Consultants, Inc. has introduced a C Cross Compiler package for Digital Equipment Corp.'s VAX family, Sun Microsystems, Inc. workstations, AT&T's Personal Computer 6300 and Plexus Computers, Inc. micros running the AT&T Unix operating system.

The product allows programmers to write and debug programs in the C language on a Unix-based host and then cross-compile the program to the target microprocessor.

The C Cross Compiler package includes separate compilation and linking capabilities and an embedded assembly language.

It is priced at $3,500.

Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

PRODUCTIVITY AIDS

■ Intelligent Information Systems, Inc. (IIS) has announced IIS/Destiny, an applications development system for users of Digital Equipment Corp. VAX computers.

IIS/Destiny includes a development language, a query facility with report-generation capabilities, a data dictionary and a data base management system that supports relational, network and hierarchical data base models, the vendor said. IIS/Destiny reportedly speeds the development of applications and can reduce applications maintenance.

IIS/Destiny is priced from $29,500 for the VAX-11/730 to $69,500 for the VAX 8600.

Intelligent Information Systems, 90 West St., New York, N.Y. 10006.

■ Help/38 Systems has introduced a productivity package for the IBM System/38.

Easy View reportedly allows users to display and correct System/38 files without programming and allows them to locate and fix programming bugs. Users can check update programs in test mode and create test data base files without programming, according to the vendor.

Easy View is said to be able to convert record contents into four formats: the Hex Display format displays field names beneath corresponding strings of hex code; EZ-Field formats records, placing field headings on the left and values unpacked and edited on the right; Composite Display displays fields selected; and EZ-Field Composite allows field values to be displayed, unpacked and edited next to their headings.

Easy View costs $850 per CPU.

Help/38 Systems, 15102 Minnetonka Industrial Road, Minnetonka, Minn. 55345.

■ Oceanic Information Systems, Inc. has released fourth-generation systems development productivity tools for IBM mainframes in OS, DOS and CMS operating environments. The products were designed for use with the company's Extracto nonprocedural data management and report writer tool.

Compiler/XL is said to allow Extracto users to select between an interpretative mode or a compiled mode. The product can scan control blocks and generate and execute machine code. It costs $20,000.

Screen Power/XL allows users to develop interactive programs under CICS, TSO or with Cullinet Software, Inc.'s IDMS-DC data base manage-

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SOFTWARE & SERVICES

ment system. Users can request a variety of different screen formats. Each of these screens permits users to enter new data for automatic validation. Data entered by the user can be used to direct processing, read records, modify or rewrite a record or create a file. Screen Power/XL will be available in September for a price of $6,200.

Link/XL is Oceanic's licensed version of Micro-Tempus, Inc.'s Tempus Link micro-mainframe communications product. When used under Extractor and in conjunction with the IBM Personal Computer line, Link/XL uses Micro-Tempus' virtual diskette technology to allow users to read and write files residing on the mainframe. The base price for the Link/XL is $6,200.

Oceanic Information Systems, Middlesex Technology Center, 900 Middlesex Tpk., Billerica, Mass. 01821.

APPLICATION PACKAGES

■ **Skantek Corp. has introduced optical character recognition (OCR) software for its engineering drawing scanner.**

A spokesman said the SK 401 software reads and digitizes hand-lettering and printed text. The software is said to reduce the storage needed for computer-aided design and engineering systems.

With OCR capabilities, a drawing's text and graphics can reportedly be read simultaneously. The scanned data is then converted into Ascii-format International Graphics Exchange Standard files.

The SK-401 OCR software is priced at $25,000.

Skantek, 150 Mt. Bethel Road, Warren, N.J. 07060.

■ **Honeywell, Inc. has introduced Release 1.2 of its Magnetic Ink Character Recognition (MICR) Plus II used with Honeywell document handlers for banks and financial institutions.**

According to a spokesman, MICR Plus II Release 1.2 eliminates the need for magnetic tape on Honeywell document handlers and includes capabilities for producing co-mingled cash letters, accepting non-MICR input and making automatic adjustments to cash letters. A Cash Letter Adjustment feature permits automatic generation of reports that list changes to cash letter content because of corrections made in on-line balancing procedures, a spokesman said.

The annual primary license fee is $3,306 with an initial license fee of $12,500.

Honeywell, 200 Smith St., Waltham, Mass. 02154.

■ **Software Express has released a directory of vertical market AT&T Unix applications that have been developed with the company's Appgen application generator.**

Each of the vertical market packages runs on a range of computers including the IBM Personal Computer AT and Amdahl Corp. mainframes.

The directory is available for $10.

Software Express, 2925 Briarpark Drive, Houston, Texas 77042.

■ **Silver-Lisco, Inc. has announced Version 5 of its Schematic Design System (SDS) software for computer-aided engineering. The company also announced that its Design Capture System, including SDS Version 5, is now available for Digital Equipment Corp.'s Vaxstation I and Vaxstation 100 workstations.**

According to a spokesman, the Computer-Aided Schematic System (Cass) within SDS Version 5 now supports up to 10 schematic windows, permitting multiple windows to be opened onto a single schematic. Different portions of the windows can be displayed and users can move between windows.

The Design Capture system, including SDS Version 5, costs $10,000.

Silver-Lisco, 1080 Marsh Road, Menlo Park, Calif. 94025.

■ **Mentor Graphics Corp. has announced the Msimon software simulation package for use in simulating Cmos and MOS very large-scale integration devices. The software runs on Mentor Graphics workstations.**

Continued on page 89

folks. So you can forget about publishing reams of short memos. Its voice prompts guide you step by step. So there's no chance for miscommunication. Problems are solved. Decisions are moved along.

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NIES

from page 45

that evaluate systems supplied by vendors other than IBM. Nies said Cincom surveyed 60 users of its data base management system and an equal number of IBM IMS DBMS users.

The study indicated that Cincom's users had all reviewed a variety of products before selecting their DBMS. The 60 IMS users, on the other hand, had not considered anything but the IBM product.

IMS fares poorly against independents

As Nies put it, Cincom's sales don't come out of IBM's hide unless there is a product evaluation. Nies said that, where there is a product review, IBM's products consistently fare poorly against the independent offerings.

> *'The computer industry is slowing down because of the problems involved with software development.'*
>
> — David Banks
> Cadre Technologies, Inc.

"IBM is generally unchallenged, except when there is an evaluation," Nies said. "When Cincom wins, it is against the independents.

"Unless our products are better, unless our service and support is better than IBM's, we have no chance to win. All things being equal, we would lose. We have to be substantially better to win, provided there is an evaluation at all."

Nies' comments are enlightening in view of the strides the independent software vendors have made in recent years, especially in DBMS — a market that is of only slightly less importance to IBM than operating systems, wherein Big Blue holds most, if not all, of the cards. Though IBM still controls roughly two-thirds of the DBMS market, the independents continue to tear away chunks of its market lead.

Most analysts readily state that the independent vendors' DBMS products are more advanced than IBM's offerings, especially the sophisticated fourth-generation languages and other productivity tools the independents offer in conjunction with their DBMS. But you cannot play to win if you don't know where the game is being held.

■

"The computer industry is slowing down because of the problems involved with software development," according to David Banks, president and chief executive officer of Cadre Technologies, Inc.

Banks has a good point, and it is one that an increasing number of companies are taking to heart. Cadre is part of the growing corps of firms offering workstation-type systems that address either the design or analysis phases of the software development life cycle.

Specifically, Cadre's Teamwork/Systems Analysis (SA) is a turnkey system aimed at the requirements analysis phase — a phase that Banks said comprises roughly 35% of the software development life cycle. Currently hosted on multiuser Apollo Computer, Inc. systems, Teamwork/SA embodies what Banks called a structured analysis methodology designed to speed the drafting of accurate and complete analysis models that can later be used in the design phase.

A single-user version costs about $35,000, and a multiuser version costs roughly $42,000 per node.

According to Banks, the structured analysis procedure, while recognized as vital to the development of quality systems, is so tedious when done manually that many organizations bypass it entirely. As a result, Banks is quick to point out, completed systems don't meet end-user needs, if the system is completed at all, and the ensuing maintenance workload is increased exponentially.

He said research has shown that approximately two-thirds of system bugs can be traced to errors and misconceptions in the design and analysis phases rather than coding mistakes.

Yet most of the automation efforts in software design have been aimed at the coding phase — perhaps the smallest portion of the development life cycle.

Cobbler's children last to get shoes

Banks said one of the biggest problems fledgling Cadre faces in promoting Teamwork/SA is trying to convince MIS managers in the corporate world of the value of investing in such workstation products for programmers. Banks called it a case of the cobbler's children being the last to get new shoes.

He said management in industries such as aerospace, engineering and defense is more easily sold on the concept, having had good experiences with workstation products for computer-aided design, manufacture and engineering.

The increasing attention to tools that aid in software development is encouraging. But Banks' comments also indicated that it may be some time before mainstream DP shops begin to implement the technology on anything but an exploratory basis. It is ironic that software developers may be one of the last groups to benefit from the fruits of their own labor.

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PROGRAM

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it in an IBM Vsam file, Haab said. After a program is modified, it captures the results of an application run and compares the two, noting discrepancies. The programmer can then inspect the differences to see whether they reflect anticipated changes or unexpected results, Haab said.

Before it installed Verify, Manufacturers Hanover had to schedule clerks for overtime work to enter and reenter test data. Complete testing took 12 to 13 weeks, a period that has been cut in half with Verify, said Kenneth A. Hamilton, senior vice-president for global systems.

Florence Bell, manager of testing services at Shearson Lehman Brothers, the brokerage house subsidiary of American Express Co., said Verify's test results could be viewed online as screens on a CICS terminal or printed out.

It is this access to test results, along with a more automated testing procedure, that distinguishes Verify from its competitor, a combination of CICS/Common and CICS/Replay from Highlander Systems, Inc., of Orem, Utah, Bell said. She evaluated both, along with an IBM product, Vtam Performance Analysis Reporting System 2 (Pars) with the Teleprocessing Network System (TPNS).

The Replay combination and Vtam Pars-TPNS both required batch processing and reformatting steps before test results could be viewed, Bell said. The IBM product had a manual editing step before reformatting, and data captured by Vtam Pars had to be fed into TPNS for a simulated run as opposed to Verify's use of the actual application to run the test data, according to Bell.

As with Verify, Replay results could be viewed on a CICS terminal after a batch processing run that separated test scripts. Vtam Pars-TPNS results were available at a TSO terminal after a batch process run, she said.

Prices in line with other packages

After evaluating the three, Shearson Lehman bought Verify. Bell said the $25,000 per CPU for a DOS version and $35,000 per CPU for an OS version was in the range of other software development packages.

Equitable Life's Wysocki, however, said his company initially was offered Verify for $6,000 from its developer, Brask Systems, Inc., a four-year old company in Downers-grove, Ill. While Equitable was negotiating with Brask, the company sold Verify, formerly known as TCA, to On-Line Software, and On-Line increased the price to $25,000 before Equitable concluded the deal.

Wysocki and another Verify user, who asked to remain anonymous, said they disputed the price increase. Equitable ended up purchasing the program at close to its listed price.

Joseph Olynick, On-Line's Verify product manager, said his firm was investing in enhancements to the product and was providing technical support for users.

The $6,000 figure represented "a price somebody was charging from his basement," Olynick said.

David Brask, president of Brask Systems, said the program took two man-years to develop. He said he lost sales when he tried to market it at the $6,000 price because potential customers "thought it must be junk."

Continued from page 55

Maimon is compatible with the Mentor Graphics Idea series of computer-aided engineering workstations. Based on an iterative software algorithm, Maimon is said to achieve 100% convergence on the first run of simulation.

It costs from $13,900 to $22,800, the vendor said.

Mentor Graphics, 8500 S.W. Creekside Place, Beaverton, Ore. 97005.

■ BTI Computer Systems, Inc. has announced that its MCBA business software, the MCBA Generalized Accounting system and the Distribution system, are now available for the BTI 8000 32-bit multiprocessor system.

Modules of the accounting and distribution systems range in price from $6,500 to $7,000 for general ledger, accounts payable, accounts receivable, payroll, inventory management, customer order processing, purchase order and receiving and bill of materials.

BTI, 870 W. Maude Ave., Sunnyvale, Calif. 94086.

■ Pathway Design, Inc. has announced Pcpath/Encryption, a hardware-software product for encrypting data used in the company's Pcpath micro-mainframe link.

The Pcpath/Encryption technology was developed by Jones Futurex, Inc. The product uses Futurex's Encryptor 304 board and Futurex's code on the micro linked to an IBM host, a spokesman said. Pcpath provides links to IBM 370, 4300 and 8100 series and Series 1 processors. The product complies with the national Data Encryption Standard specified by the National Bureau of Standards.

Users encrypt micro files with one keystroke and command. Most of the encryption algorithm is contained in a custom-designed processor.

The price for Pcpath/Encryption, scheduled for September availability, is approximately $900.

Pathway Design, 177 Worcester St., Wellesley, Mass. 02181.

■ DIS/ADLpipe, Inc. has announced that its line of piping design and engineering applications now runs on Sperry Corp. 1100 series mainframe computers.

Software products available for

Continued on page 60

Advertisement

informatics general corporation.

application development report: MARK V

MARK V® HELPS MINIMIZE NEED FOR IMS-TRAINED PROGRAMMERS

"MARK V is helping us to be responsive to user requirements in a timely fashion, while minimizing the need for a heavy IMS resource," says Mike Berkley, Systems Consultant and MARK IV®/MARK V coordinator at Arizona Public Service Company, a Phoenix-based utility.

A software product of Informatics General Corporation, MARK V is an online application generator that can increase programmer productivity by 30 to 80 percent. The development tool allows the programmer to specify what functions the program is to perform, with minimal knowledge of IMS data base processing or online interfacing requirements.

Arizona Public Service has been using MARK IV, a batch oriented application generator for some time, so the company had built up a considerable MARK IV programming expertise by the time MARK V was brought in. This MARK IV talent has been a great asset in training MARK V programmers for the new online applications the company is developing, Berkley notes.

"In the MARK V applications we've developed so far, we've found that the bulk of the system can be done by someone with little or no experience with IMS, a data-base management system from IBM — especially if the programmer is familiar with MARK IV and its hierarchical structure, for example," he explains. "I believe the programmer needs to have some feel for the IMS environment, but at a much more simplified level than what you need to write IMS COBOL."

However, Berkley cautions, it is still necessary to have an IMS-trained coordinator or data base administrator involved in the application development to assure that IMS efficiencies are maintained.

The first test for MARK V was a tie-in with the existing customer information system to allow charitable contributions with utility payments. It had to be done in one week and was! Next, an accounts receivable package was enhanced. Applications were developed in Data Administration to improve access to the table control system and the IBM Data Dictionary. The payroll/personnel function was the scene for several timely, yet very user friendly systems, including medical monitoring and hazard control. One user was so pleased that they changed direction away from a mini and are now committed to the mainframe, an IBM 3081. Payroll/Personnel Systems Supervisor, Bernie Baker, claims "I now have a tool which allows in-house development to compete with software packages." Baker goes on to add, "I'm extremely pleased and encouraged by the success in using MARK V and plan its use in many future applications."

This set the stage for the most important use of MARK V so far — an enhancement to an existing COBOL Gas Services Request System to provide dispatchers and management with more extensive and time information in "trouble" orders. The system was needed as soon as possible, but heavy IMS experience was not available, while MARK IV experience was. Hank Oen, Supervisor, Gas Systems says, "I was convinced that we could not meet the schedule deadlines with a procedural language."

The first step was a one week MARK V class that Berkley taught to Oen's group. Rather than doing the standard class problem, the students programmed two screens from the actual gas

"I believe the programmer needs to have some feel for the IMS environment, but a much more simplified level than what you need to write IMS COBOL."

system. One team had a working subsystem by the end of the second day. Because of the specific need, the class featured an extremely high intensity level and many questions. Once the class ended, the heavy development began and the system was installed on time. However, it became clear that the response time was unacceptable, primarily due to browsing through the secondary index and excessive processing. A redesign effort was undertaken, using MARK IV for a data base conversion and making more efficient use of MARK V. In the meantime, the vital part of the system was left in production by removing certain MARK V requests. It was in this two week redesign effort that MARK V excelled, says Oen, "Module interchangeability allowed reconfiguration of functions for performance improvement in weeks vs months." The final result left smiles on the faces of Corporate and Computer services management, the user and technical staff.

"So far, we've had success using MARK V for smaller applications, especially those with severe time constraints, but I think many of the enhancements have made it a viable product for large-scale systems," Berkley adds. "I particularly like features such as the dynamic action codes, multiple data base updates, data base browsing, subroutine capabilities and, of course, the Program Function keys."

I would like to see how the MARK Series can help me with my CICS, IMS/DC and batch programming.

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Y56a

SNA

from page 45

programs anywhere within a network. Is that accurate?

No. You can execute programs anywhere in the network because you can request a conversation with the program. You have location insensitivity in the sense that when you ask for a conversation with a certain program you simply specify the name of the program and the logical unit that it is on. You don't have to know where in the network it is. But you don't have a directory of where files are, for example. You can build that on top of LU6.2, and that is something we are looking at. But that is not something provided by LU6.2 today.

Two software packages supporting LU6.2 are said to be able to communicate as peers regardless of their host processors. How would you classify that communication?

There are two types of LU6.2 implementations. There is what we call the open Application Program Interface [API] and the closed API. The closed API is where you get LU6.2 along with some application. Take our Scanmaster, which is a [facsimile] machine. The customer cannot get in there and write his own programs. So what you are getting in that case is the Document Interchange Architecture application. On the other hand, if you buy [an IBM] CICS system, you get LU6.2 on top of it. You can add any type of application you want to write. What you get is what you buy. If you buy a closed API system, you get the prepackaged application. If you buy an open API product, you can add whatever applications you buy or develop.

Does LU6.2 spell the end for micro-mainframe link products that are based on simple terminal emulation?

I don't see that there is ever an end for anything in this world. People have bought these products, and they're going to continue to use them. To put LU6.2 in a positive way, technology has just introduced another option to the customer. Revolutions are more effective when they are evolutionary.

Considering the importance of LU6.2, why has it taken IBM so long to provide support for it in Personal Computer products?

I don't have a good answer. That question comes up all the time. The only possible answer is that IBM has a limited amount of resources, and there has to be some prioritization.

Is IBM encouraging third-party software vendors to implement LU6.2 in their products?

We have published all the protocols. There is a great big fat book out there with every detail you need to know to implement it.

I think that is a tremendous amount of encouragement. There is no specific support in terms of educational classes or hand-holding or anything.

Is there a master plan as to which IBM products will support it?

It is more of an individual product-by-product decision that is subject, of course, to corporate review.

Is it a subject of great interest to IBM now?

Yes. It has been for some period. I think the terminology would be recognized by all of our executives, and its status in different product plans is a very hot topic.

Is LU6.2 a major step toward distributed processing?

Sure. It allows distributed programs to talk to each other without having to know where the other program is, without having to know the details of the underlying protocols. It is very natural and easy to develop distributed applications using LU6.2. That is its whole goal in life, to make the development of distributed applications as easy as possible.

What would you tell people to look for in the future with LU6.2? What are the things that are going to happen now that this is becoming implemented and supported?

We are past the architecture phase, though we are still working on some enhancements. I think we are also past the initial implementation phase. We have implemented it in a lot of products, and there will be more to come.

I think we are at the stage where LU6.2 is poised to be widely introduced into the world, widely purchased and installed. I think the next phase is going to be the writing of a lot of interesting applications that use LU6.2.

Continued from page 59

the Sperry mainframes include the Design Information System for maintaining a design data base, ADLpipe for modeling structural analysis of piping systems, Flownet for hydraulic analysis and Adinap for nonlinear analysis of piping materials. The products are priced from $25,000 to $42,000.

DIS/ADLpipe, 55 Wheeler St., Cambridge, Mass. 02138.

■ Uccel Corp has announced Release 3.2 of its Tax Planning and Compliance Manager, a mainframe software package that automates federal, state and local tax planning and compliance.

Release 3.2 of Tax Planning and Compliance Manager runs in IBM's IMS DB/DC environments. The product is supported on IBM's 370, 3030, 3080 and 4300 series machines.

The Tax Planning and Compliance Manager is priced from $49,500.

Uccel, Uccel Tower, Exchange Park, Dallas, Texas 75235.

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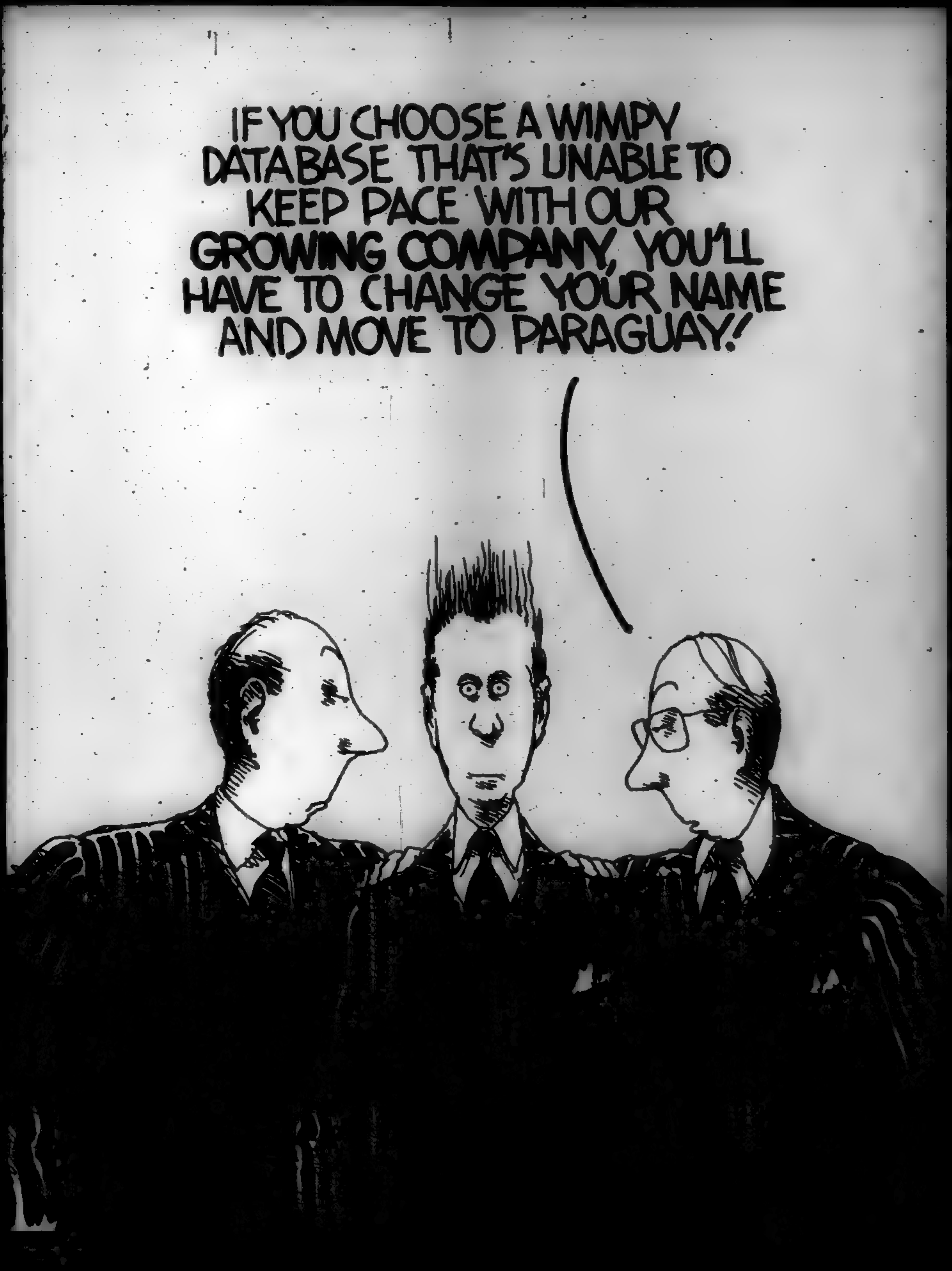
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PC Magazine
September 4, 1984

If you think that dBase III™ or R:base 5000™ is the solution to your information processing needs, consider for a moment the high expectations you and your company should have for your next database management system.

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Your PC's may not be talking to one another today. But they will soon. With Network Revelation you decide when and how. That's because our network software is available now, not "someday soon." And it works with a variety of microcomputer networks.

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With most others, record management is a free-for-all. One person opens a file and locks everyone else out. Or multiple users can simultaneously change data. Hardly the makings of a DBMS for critical record keeping.

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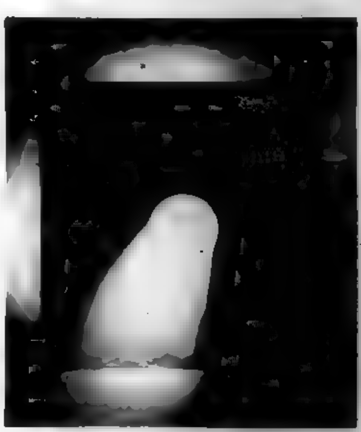
Revelation isn't about to be confined by the limits of MS-DOS.™ For advanced programmers, we include tools to access the world of mainframes and minis.

Imagine, the knowledge of a mainframe in everyone's PC. With Revelation you have an interactive distributed information system that shares both data and processing power. With complete password security, of course.

Be sure that the application generator has an excellent command of the language.

R/Design, Revelation's application development system, does more than paint screens and define relations. It's so powerful your programmers can bid farewell to COBOL forever. And save weeks of coding time on new projects.



That's because R/Design writes programs in R/Basic source code for you. And R/Basic is the most powerful relational database language running on PC's.

Find out how easy it is to retrieve information. Ask the DBMS a few pointed questions.

If you're thinking that Revelation's capabilities make it too sophisticated for the computer neophytes in your company, fortunately, you're wrong.

R/List, Revelation's query language, uses common English words. And unlike other so-called "natural language" programs, you can do far more than define synonyms for system commands and file names.

Words you create can actually call R/Basic programs. A simple inquiry will perform complex calculations, build symbolic fields and write detailed reports.

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That means superior technology with its roots in mainframes and minis. A system so powerful it delivers on every challenge you throw at it.

Network Revelation has it all: variable length fields to conserve precious disk space; unlimited files, fields and records; data dictionaries; dBase II® and Lotus 1-2-3™ conversion utilities; a high-speed compiler; an interactive program debugger; and prices that begin at just $1495 for a complete four user system (suggested U.S. list price).

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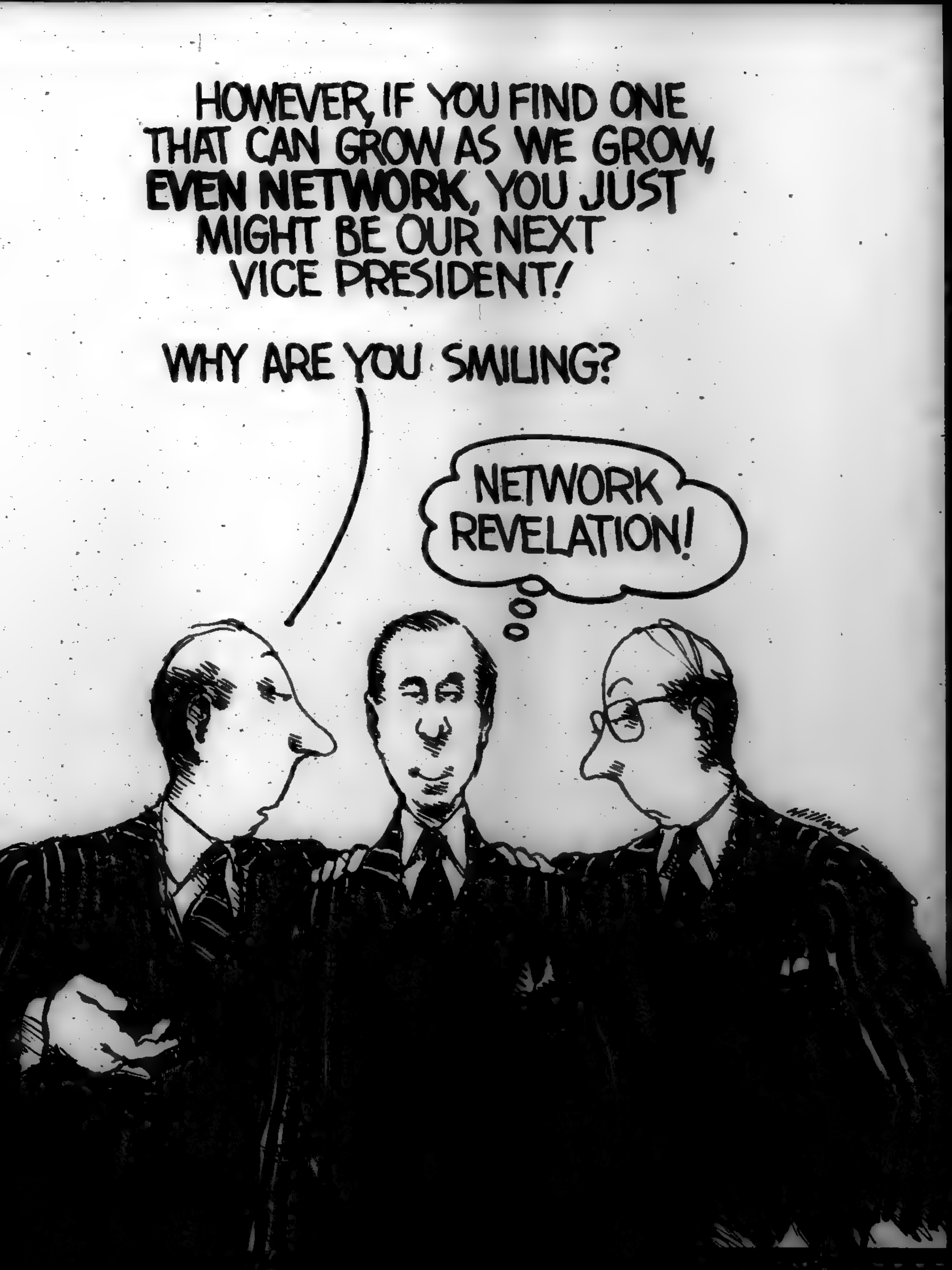
Alert companies like Ford Aerospace, First Interstate Mortgage, Rolls Royce, Price-Waterhouse and Rockwell have already discovered why *PC Magazine* called Revelation "the most comprehensive and powerful database management system available today."

You'll see the difference too when you turn the page...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A revealing point by point comparison between Revelation, R: base 5000 and dBase III

	Network Revelation	R:base 5000	dBase III
Maximum Characters per Record	65000	1530	4000
Maximum Fields per Record	65000	400	128
Maximum Files per Database	Unlimited	40	Unlimited
Maximum Files in Use Concurrently	6000	3	15
Number of Relational Operators	9	6	6
Data Dictionary	Yes	Yes	No
Procedural Language	Yes	Yes	Yes
Variable-Length Fields	Yes	No	No
Multi-Value Fields	Yes	No	No
Symbolic Fields	Yes	No	No
Dynamic Joins (in RAM)	Yes	No	No
8087/80287 Support	Yes	No	No
Automatic Key Index Maintenance	Yes	Yes	Yes
Multiple Field Indexing	Yes	No	Yes
Report Writing Features:			
A) Access to System Date and Time	Yes	Yes	No
B) Choice of Column or Row Format	Yes	Yes	No
C) Accessible Tables	6000	40	10
Password Security	Yes	Yes	No
User-Definable Data Entry Rules	Yes	Yes	No
Context Sensitive Help	Yes	No	No
Pre-Defined Macros	Yes	Yes	Yes
Utilities to Access Program Files From:(1)	dBase II Lotus 1-2-3	dBase II, Lotus 1-2-3 pfs:file, R:base 4000	dBase II
Access to All DOS Commands	Yes	No	No
Application Generator	Yes	Yes	No
Application Compiler(1)	Yes	Yes	No
Run-Time Module(1)	Yes	Yes(3)	Yes(3)
Natural Language	Yes	Yes(2)	No
Network Version	Yes	No(4)	No
Mainframe to Micro-Communications(1)	Yes	No	No

1) From Original Manufacturer; 2) Available Soon; 3) Extra Cost Option; 4) Announced for Fall 1985

dBase II is a registered trademark and dBase III is a trademark of Ashton-Tate. R:base 5000 is a trademark of MicroRIM, Inc. MS is a trademark of Microsoft. IBM is a registered trademark of International Business Machines Corporation. NetWare is a trademark of Novell, Inc.

I think Network Revelation is going to get me promoted and keep me from being transferred to Paraguay.

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☐ I hear Paraguay isn't a bad place to visit this time of year. But just in case, send me a brochure and technical specifications on Revelation.

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Motivating Maintenance Personnel

By J. Daniel Couger

■ ■ ■

"Maintenance . . . tends to act as a millstone around the neck of the development organization."
— Philip Howard

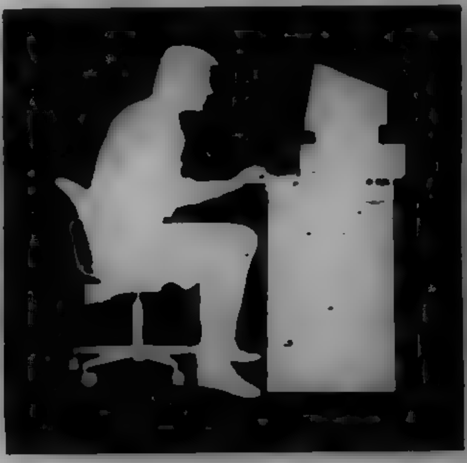
"Traditionally, program maintenance has been viewed as a second-class activity, with an admixture of on-the-job training for beginners and of low-status assignments for outcasts and the fallen."
— Richard E. Gunderman

The above quotations are typical of the attitudes concerning maintenance. They take on added importance when one recognizes that maintenance constitutes more than half of the work of the typical information systems department. Worse yet, that percentage is growing and is forecast to be more than 60% by 1990.

Our research over the past seven years has shown that maintenance work has only one-half to two-thirds the motivating potential of other programming/analysis work (Figure 1). That fact was revealed through analysis of our national data base of more than 8,000 computer personnel.

The job's motivating potential falls precipitously as the amount of maintenance increases. As shown by the curve on the left in Figure 1, fix-it activities are especially demotivating. However, the curve on the right shows every category of maintenance as demotivating. This chart illustrates the huge potential for improvement.

Despite the prevailing view of maintenance, some progressive organizations have proved that such work can be enhanced. Maintenance productivity is as high as that in newly developed organizations. The approach taken in these organizations is analyzed in



PHOTO/ILLUSTRATIONS BY O'CONNELL/ASCOLESE

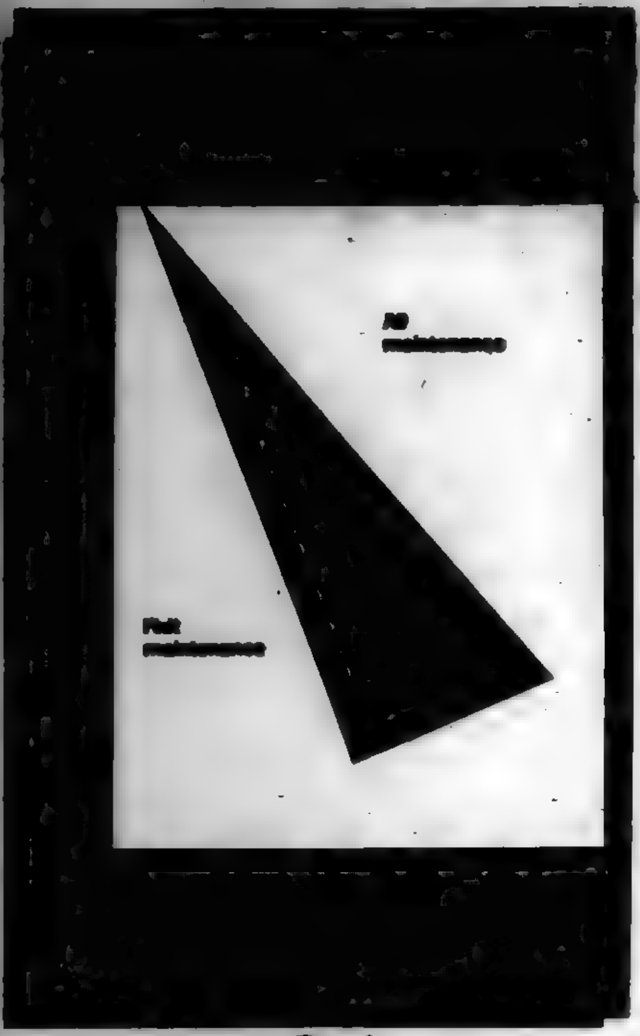


Figure 1

depth in the new Couger-Colter book, *Maintenance Programming: Improved Productivity Through Motivation*, released recently by Prentice-Hall, Inc.

It took a year to identify 10 organizations with good maintenance productivity. In phase one of the research, more than 500 persons in the 10 organizations completed the Couger-Zawacki diagnostic survey questionnaire for computer personnel. In phase two, on-site interviews were conducted with 104 persons — 61 analysts and programmers and 43 supervisors/managers of systems departments. The results demonstrate that productivity can improve by using motivation enhancement procedures — with at least 10% and as much as 40% improvement in productivity.

We synthesized the approaches used in the 10 organizations into a set of generic procedures and selected 13 applications cases to demonstrate improved motivation for maintenance personnel. One or more of these cases will apply to every organization, be it governmental or industrial.

Cost of maintenance

In a study by Barry W. Boehm comparing data on maintenance cost with other hardware/software costs, the proportion of the hardware/software costs allocated to system maintenance in the typical U.S. computer installation is not only more than half of the total software cost but is also approximately 50% of the total computing cost (Figure 2).

A recent study by the General Accounting Office (GAO) estimates that the federal government spends at least $1.3 billion annually on software maintenance, excluding weapons systems software. A recent U.S. Department of Defense study shows that the cost of development for U.S. Air Force avionics software averages $75 per instruction, while the cost of maintenance corrections of deployed software ranges up to $4,000 per instruction.

For some organizations, the cost of maintenance is even higher (Figure 3). J. L. Elshoff indicates that the figure for GM, which is fairly typical of large business software activities, is about 75%. E. B. Daly notes that about 60% of GTE's 10-year life-cycle costs for real-time software are devoted to maintenance. On the two Air Force command and control software systems shown, the maintenance cost was 67% and 72%, respectively.

The Boehm study reports the annual cost of software in the U.S. in 1980 was approximately $40 billion, or about 2% of the gross national product. The number of applications installed has increased substantially, increasing the maintenance load.

In addition, the average system life increased from three years in 1960 to five in 1970 and eight in 1980. The GAO study estimates the current cumulative federal investment in software at $25 billion.

Maintenance is labor-intensive. John Diebold projects that in 1985, the cost of hardware will be one-tenth of the 1979 cost and that labor costs will be twice as high as the cost in 1979 rate. These figures confirm the significance of the maintenance activity throughout the U.S. in both government and private industry.

Productivity problem

As a result of his study of maintenance productivity, Chester Lin observes, "Analysts and programmers generally view the maintenance function as an inferior, noncreative, nonchallenging activity."

As this quote illustrates, maintenance is a problem

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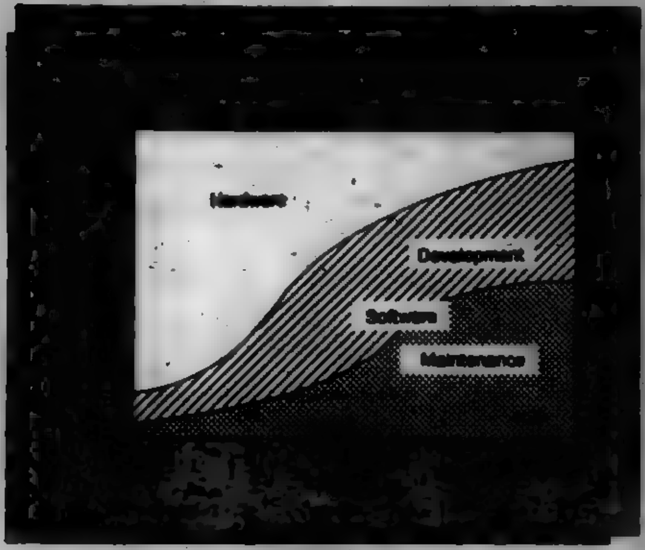

Figure 2

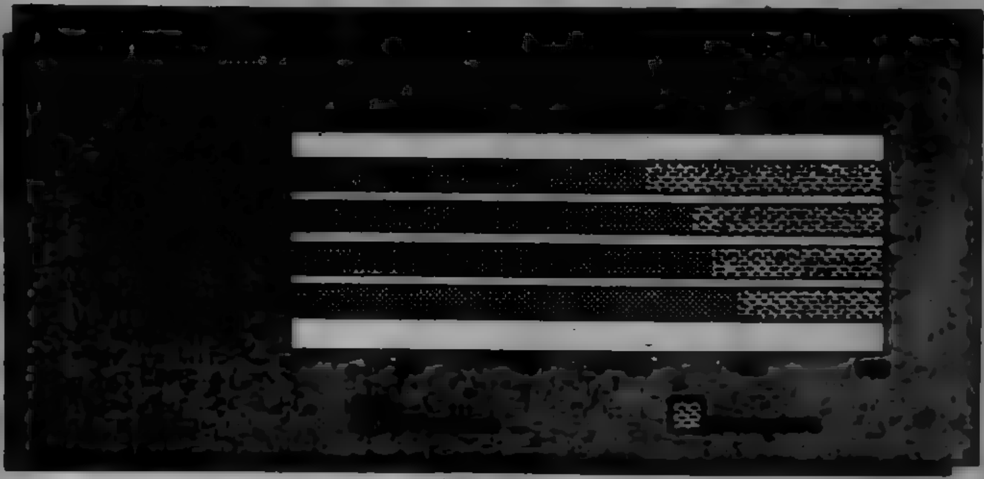

Figure 3

area for management not only because of the high cost but also because of the way the work is perceived by computer professionals.

Gerald Weinberg tells a story about a programmer who frequently changes firms — always after his new development project is installed and he is assigned to maintain it. Weinberg observes that, though apocryphal, the story is representative of what is happening in the industry.

The high cost of turnover

Although the U.S. economic decline has reduced turnover rates, turnover in the computer field is still high compared with other professions, and it is costly.

The cost of replacing maintenance personnel includes the cost of hiring and training. Here, the learning curve for incoming personnel is significant for the following reasons:

- Documentation tends to be poorer on older systems.
- The systems are less structured.
- They are written in assembly language or early versions of a high-level language.
- Few people who originally worked on the system are available in case questions arise.

However, turnover costs that result from loss of personnel dissatisfied by maintenance assignments are negligible compared with the cost of maintaining these systems by using dissatisfied people.

If the industry view of maintenance work as characterized by the comments of Lin and Weinberg is valid, more than half of the analysis/programming work in a computer department is being performed by people who consider the work unchallenging — even boring. The resulting loss in productivity amounts to millions of dollars per year.

Misguided approaches

Some organizations have attempted to lessen the negative attitude about maintenance by renaming the activity. One organization insists that all employees refer to maintenance as "retrofit activity." Several other organizations call the activity "enhancement."

Such a change is merely a superficial approach to correcting the problem. Just as the janitorial field has learned, if you change the name of a dull and boring job, you do not change the job content — it remains a dull and boring job. If you are in maintenance, a new title may help increase status when explaining your job to a person outside the company, but it does not make your work any more motivating.

Although a name change will produce little positive effect, there is promise for improving the situation. Analysis of the Couger-Zawacki survey results for individuals, supplemented by the interview process, reveal some individuals who were not demotivated by maintenance work and who were considered by their supervisors to be quite productive. These individuals believe their maintenance assignments to be challenging and interesting.

Research enables us to identify the job characteristics and personnel characteristics of a productive maintenance environment so that other organizations can emulate these situations.

Growth and motivation

Our prior research [CW, March 10, 1980] shows that people who have a high need for personal growth and development will respond more positively to a job high in motivating potential than will people with low growth need. Obviously, not everyone is able to become internally motivated — even when the motivating potential of the job, measured by a motivating potential score (MPS), is quite high.

Behavioral research shows that the psychological needs of people determine who can, and who cannot, become internally motivated at work. Some people have a strong need for personal accomplishment — for learning and developing beyond where they are now, for being stimulated and challenged and so on. These people are high in growth need strength (GNS).

The key reason for computing GNS is to compare it with the job's potential to fulfill an employee's need for growth. A job low in motivating potential will frustrate a person with high GNS — like trying to fit a square peg in a round hole.

GNS is quite high for computer professionals; compared with other professionals and other job categories, it is the highest of 500 occupations that have been measured.

Computing a job's MPS enables a comparison of employee GNS and the job's potential to motivate that person. MPS reflects a job's potential for eliciting positive internal work motivation on the part of employees. Our previous motivation research shows the degree of "richness of a job" (the MPS level) needs to be matched with the individual's need for a rich job. Not all individuals are seeking enrichment in their jobs.

The most important characteristic in the MPS/employee matchup is GNS. High GNS people are seeking

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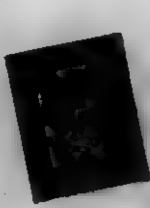

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MOTOROLA

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> *The ideal situation would be a DP department that had 50% of its personnel with low GNS and the other 50% with high GNS. . . . Unfortunately, that ideal situation exists in few organizations.*

high MPS jobs. Assignment of a low GNS person to a high MPS job cannot be expected to result in satisfactory productivity. Conversely, a high-GNS individual will be unchallenged and unproductive in a low MPS job. Figure 4 shows the four-cell matrix that characterizes those MPS/GNS matchups and mismatches.

■ *Cell 1 — High-Scope Task + High GNS = High-Level Congruence*

Individuals in Cell 1 have high GNS. They desire tasks that are challenging — complex, nonstructured tasks that they perceive as significant. They want a high-scope task for which they feel responsible and are aware of expected performance. If we have a match in scope of task and GNS, we have a high level or congruence between task and individual need. Examples of high-scope tasks include new applications development, data base design or telecommunications design.

■ *Cell 2 — High-Scope Task + Low GNS = Low-Level Congruence*

Cell 2 reflects the situation where an employee with low GNS is assigned a high-scope task. The level of congruence is low, and a poor motivational environment results.

An example of this is the promotion of a person from operations, where GNS is lower, into the systems development area. One would not expect good productivity in this situation unless changes are introduced to correct the disparity between task and individual need.

■ *Cell 3 — Low-Scope Task + High GNS = Low-Level Congruence*

In the situation depicted in Cell 3, an employee with high GNS is assigned a low-scope task. The level of congruence in low, and the employee is likely to be frustrated and dissatisfied. There is no assurance that the level of productivity will be high. One example is a routine maintenance task assigned to a high GNS person.

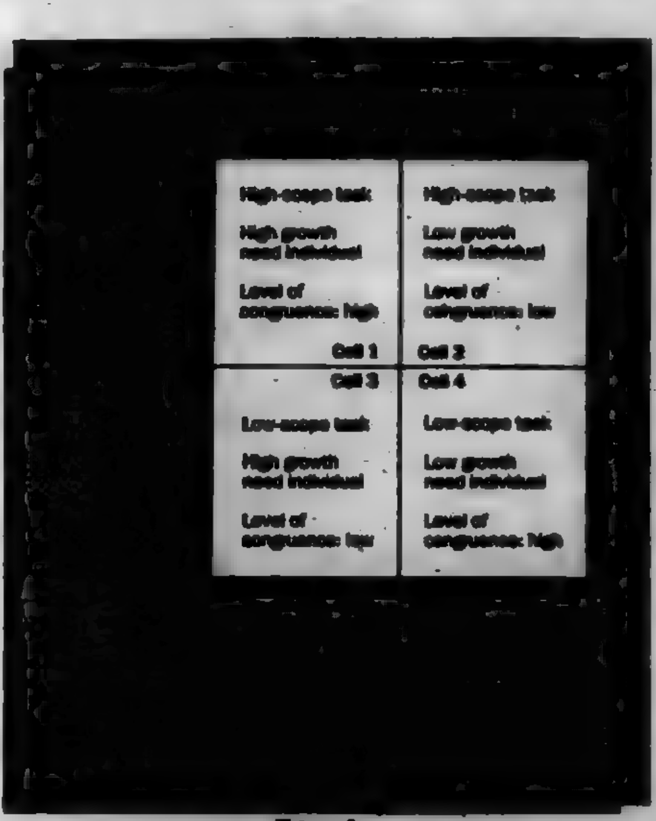
■ *Cell 4 — Low-Scope Task + Low GNS = High-Level Congruence*

The fourth cell reflects the situation where lower GNS employees (like the former computer operator described above) are assigned less demanding tasks such as routine program maintenance. A high level of congruence exists between task and individual need. The motivational environment is good, and a concommitant high level of productivity can be expected.

The ideal situation

With maintenance constituting approximately 50% of the work load, the ideal situation would be a DP department that had 50% of its personnel with low GNS and the other 50% with high GNS. New systems development could be assigned to the high GNS personnel and maintenance to the others. The Cell 1/Cell 4 situation would exist — high congruence and high productivity could be expected. Unfortunately, that ideal situation exists in few organizations. Managers must intervene to produce a better MPS/GNS mix.

The key point to recognize concerning MPS is that it is comprised of five variables, or job dimensions: skill variety, task identity, task significance, autonomy and feedback from the job. The survey results indicate that the job dimension of skill variety is a key cause of employees perceiving maintenance work as less challenging.



High-scope task High growth need individual Level of congruence: high Cell 1	High-scope task Low growth need individual Level of congruence: low Cell 2
Cell 3 Low-scope task High growth need individual Level of congruence: low	Cell 4 Low-scope task Low growth need individual Level of congruence: high

Figure 4

However, to lower MPS to the nonchallenging level, more than one of the core job dimensions must be low. For example, the autonomy variable may be rated low by individuals — not necessarily because their bosses do not give them freedom to operate but because procedures or policies provide little flexibility.

An illustration of this is the constraint caused by procedures under which the original system was designed and programmed, such as being unable to use structured techniques to maintain a system because the original system was nonstructured and having to write changes in an obsolete assembly language because the programs were originally coded in that language.

Even though supervisors may be unable to redesign the job to enhance all five dimensions, they can work on enhancing two or three to compensate for the low value of the other job dimensions.

Stated another way, if skill variety and autonomy are low, perhaps task identity and significance can be enhanced to raise MPS enough to produce the proper GNS/MPS matchup.

Even the skill variety dimension can be enhanced for maintenance employees. That dimension has two elements — a variety of activities and use of a variety of skills and talents in carrying out the tasks.

When one component of skill variety is constrained — such as confinement to a batch application when the person has the skill to work on on-line systems — the other component can be emphasized.

For example, two people can be assigned to maintain two systems jointly instead of each being required to specialize on one system. In this way, skill variety is enhanced for both employees.

In summary, the research proves that maintenance jobs can be enhanced to the point that motivation levels are comparable to those in new systems development. Such a condition already existed in some of the firms selected for the research, and we were able to document the differences in those jobs. In addition, we have been involved in other job enhancement projects that raise the motivation level of maintenance to that of new development.

The firms selected for the research project have been quite creative in devising approaches to enhance the motivation of maintenance personnel. Some enhancement activities were peculiar to that company's unique situation and are not capable of generalization.

On the other hand, many enhancement activities are portable in the same sense that software can be generalized. Those examples are recorded using a standard reporting format:

- Identification of the specific motivational issue or issues.
- Explanation of the resolution process.
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The generalized solutions can be applied in most companies with an expectation of similar positive results. As the result, there is a high potential for improved productivity — for individual organizations and for the industry as a whole.

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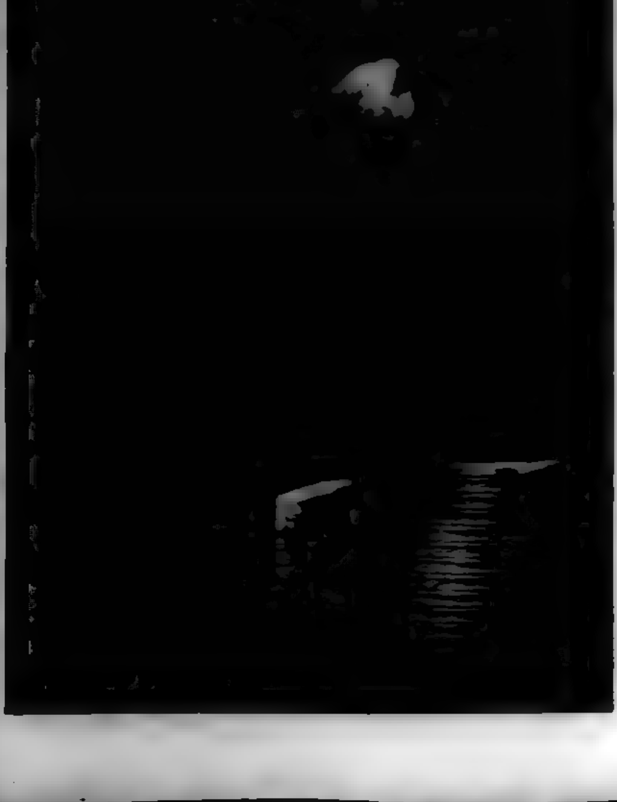

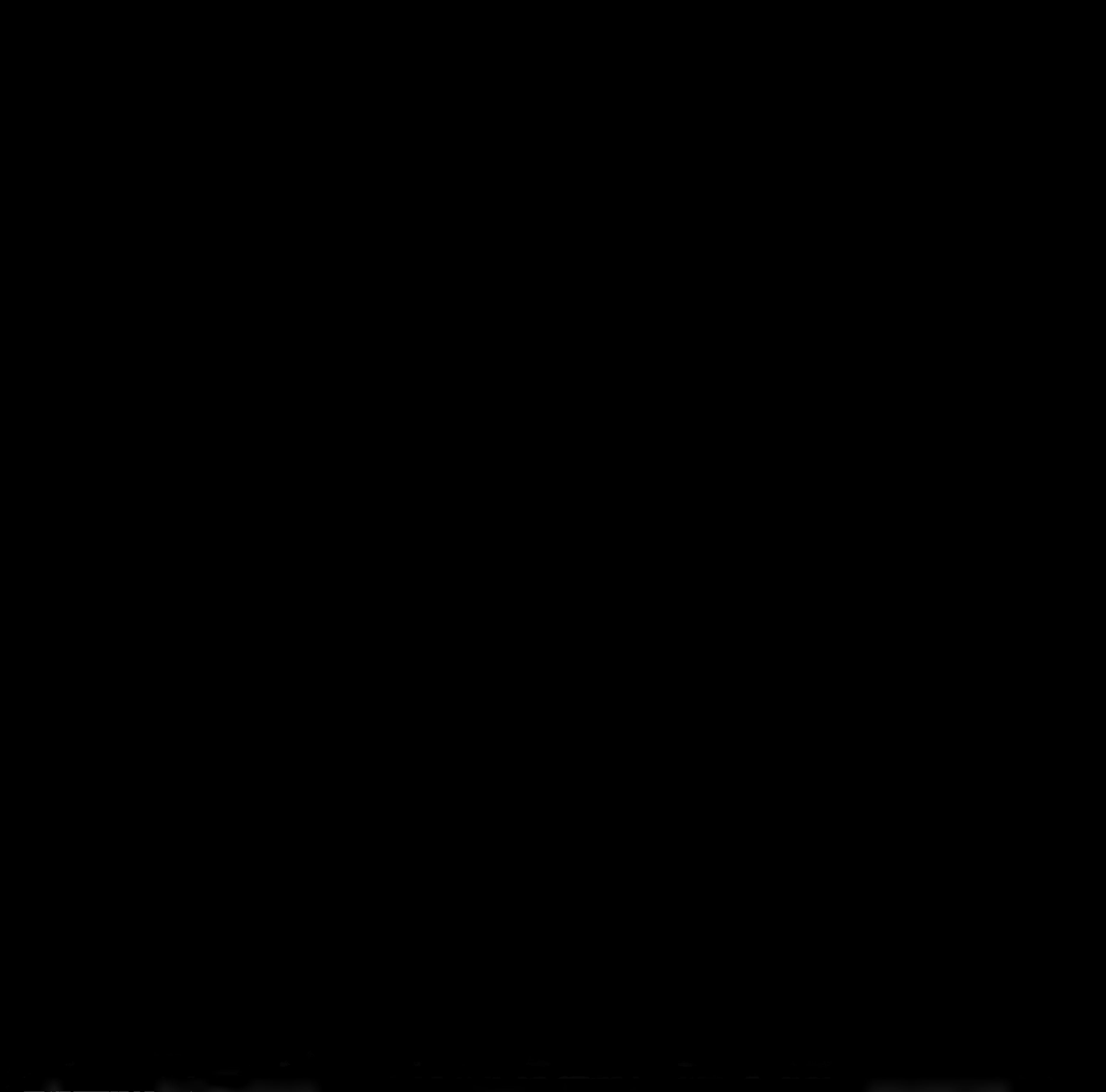

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Maintenance motivation profile: Problems and solutions

Even though supervisors may be unable to redesign a job to enhance all five core job dimensions, they can work on enhancing two or three of the dimensions to compensate for the low value of the others.

In one of the companies we investigated, maintenance productivity was low in the opinion of both the DP manager and the user.

■ **Job description.** The job — maintenance of the inventory system — involved a team of three persons. Change requests were initiated by both the user and the DP manager. User change requests involved the effectiveness of the system, such as revised output formats and incorporation of additional features. DP change requests involved the efficiency of the system — speeding up throughput and sharing data with other applications such as cost accounting and purchasing. Both types of changes were negotiated by the supervisor of the maintenance group. An average of 20 lines of code was required to accomplish the typical change.

The system originally had been implemented five years earlier, and the documentation, not unlike most DP applications, was weak. The code was unstructured; modules were quite large, each involving several hundred instructions.

The system had been patched hundreds of times by more than a dozen programmers, who had progressed through this assignment to more senior positions. One of three programmers presently assigned had worked on the system for 2¼ years; the others for 13 months and five months, respectively. However, the latter two each had more than three years' experience in programming.

Change requests were first analysed by the first programmer, who then suggested an approach to facilitate the modification. He also performed a quality review of the complete code and test results before they were passed on to the supervisor for approval.

Although input was on-line, processing was batch mode. The system was non-data base-oriented but shared data with many other files. More than 30 people used reports from the system daily, and another 15 or so inputted transactions. The view of the programmers as nonproductive was based on their inability to meet a schedule for completing change requests and to reduce the large backlog.

The maintenance programmers griped about not being sent to the training course on the new computer, where the inventory system was being developed and would be processed once completed. They mentioned not being trained in Cobol-74, the language of the new system.

They also cited environmental factors, including the noise level in their area, the lack of individual work space and the deteriorating condition of their furniture.

Finally, in response to performance reviews, the programmers maintained that schedules for change requests were often unrealistic — that management did not take into account the difficulty of modifying a poorly documented, heavily patched, unstructured system.

They said test run turnaround time was poor because they were using the production computer instead of the computer devoted largely to development. Personnel working on a new inventory system, which would replace this one, were using the latter computer.

■ **Motivation analysis.** The manager of this activity also managed 30 other people involved in maintenance. He had attended a Couger-Colter seminar on motivation of maintenance personnel and wanted to apply his new knowledge.

He chose as a test the problematic inventory maintenance job. He tutored the supervisor of that activity on motivation and asked her to read key portions of his notes from the seminar. He had already determined, through discreet discussions with the supervisor's employees, that her supervisory capability was not part of the problem.

The two began a motivation analysis of the job. The supervisor was a "quick take," as are most high growth need strength (GNS) personnel, and quickly separated the hygenic factors from the core motivating potential score (MPS) factors.

■ **MPS/GNS comparison.** The two discussed the GNS of the inventory group. "When I compare characteristics of these three people to others in the unit, I see them as average in growth need," the supervisor said.

"It looks like we have a mismatch in the individual's need for growth (GNS) and the job's ability to provide that growth (MPS)," the manager noted. "As presently designed, this job is not rich enough to challenge these people."

■ **Work redesign.** Having determined that there was a mismatch in GNS and MPS, the supervisor and the manager began the process of redesigning the job to enhance motivation. They used the framework of the five core job dimensions as their analytical approach.

Skill variety. "Concerning the tools and techniques, we have little flexibility," the supervisor said. "We could allow the use of structured programming techniques, but it

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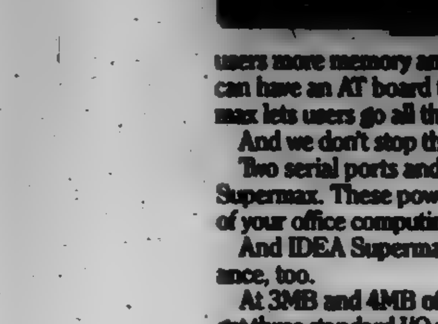

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> *Having determined that there was a mismatch in growth need strength and motivating potential score, the supervisor and the manager began the process of redesigning the job to enhance motivation. They used the framework of the five core job dimensions as their analytical approach.*

makes little sense to change the design when the system will soon be replaced by the new inventory system."

The manager agreed. "We can provide variety by letting them work on other applications," he said. "We could combine the teams maintaining the inventory and purchasing systems to increase skill variety for both groups. The reduction in specialization has some disadvantages, though, that might offset the benefit of increased variety."

Task identity. "We should let all three programmers review change requests instead of one screening them first," the supervisor said. "The disadvantage of the lesser experience of the other two is more than offset by enlarging task identity."

"What do you think about letting them in on the negotiation of change requests with the user?" the manager asked. "That way, they'd be in on each phase of the change process and have their task identity increased significantly."

"I agree," the supervisor said. "We can also do something similar at the tail end of the process by letting the two newer programmers participate with the other in the quality review of the completed change."

"These changes will also increase skill variety," the manager added.

Task significance. "Permitting the three to occasionally sit in on the change request negotiations should increase task significance," he added. "Can you think of other ways to help them recognize that the work they're doing is important?"

The supervisor hesitated. "That's tough. It's obvious to everyone that the new inventory system is the significant work. Although," she added, "I might arrange with the project manager on that system to invite my people in on some of the user discussions in implementation to make them more aware of the value of inventory systems to the company."

The manager brightened. "That's how we'll attack the skill variety problem, too. We'll start training them to take over the maintenance of the new system. With its on-line, data base, structured methodology and Cobol-78 characteristics, skill variety will be optimum.

"They won't be able to use these new skills for almost a year, but they will be encouraged, in that they are keeping up-to-date in their field."

Autonomy. "Our earlier ideas will increase autonomy, too," the manager said, "by letting each of them work a change request from beginning to end without intervention."

"Yes, but we can't do much about the autonomy constraint of their being confined to the existing program design and language," the supervisor said. "I'm afraid we're hamstrung on increasing autonomy otherwise."

Feedback. "The one job dimension that looks satisfactory is feedback from the job," the manager suggested. "The small tasks provide continuous feedback."

"However," the supervisor noted, "because they're not meeting schedule, the positive feeling of completing the change request is greatly reduced."

"Could you let them be involved more in the process of schedule determination? That way it's their schedule, too, not just yours," the manager asked.

The supervisor frowned. "You keep coming back to that, don't you? I've got lots of change requests to negotiate for all my groups. I just don't have the time to include all the programmers in these discussions."

"But this is your only problem group," the manager replied. "Once these job enhancements take effect, productivity should improve, and these people should begin meeting schedule. Thereafter, mutual schedule setting should be less time-consuming. Why don't you give it a try?"

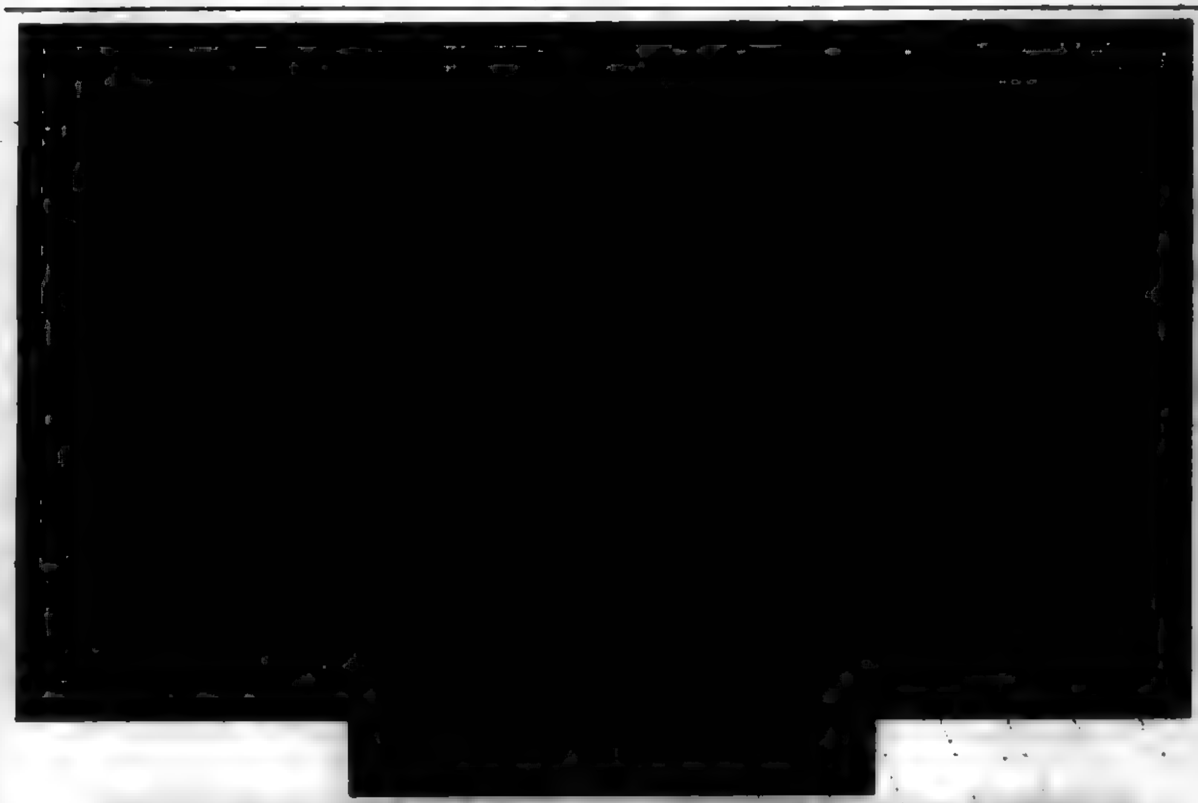
■ **Results.** The problem was diminished. These job enhancements produced positive results in the programmers' output and attitudes, and complaints about peripheral issues subsided. Motivation was enhanced, and productivity increased more than 30%.

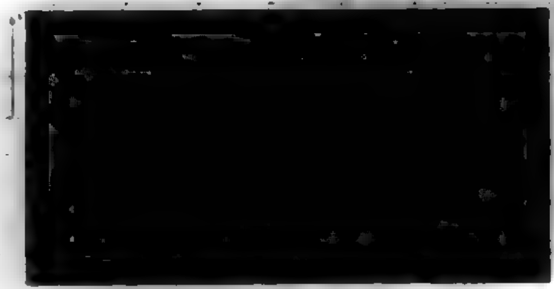
About the author

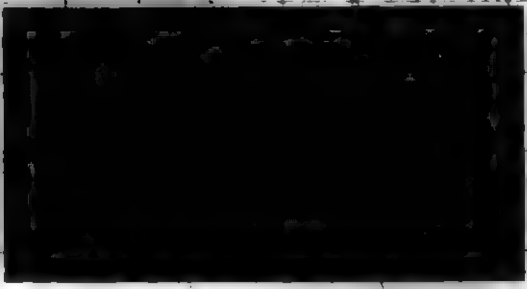
J. Daniel Couger is Distinguished Professor of Computer and Management Science at the University of Colorado, Colorado Springs.

After 20 years in the technical area, Couger began his motivation research in 1977; that research has produced 11 papers, two books and a monograph. Couger has served as a consultant to more than 30 organizations, including many Fortune 500 firms.

He is the author, with Robert A. Zawacki, of Motivating and Managing Computer Personnel. *Most recently he has coauthored* Maintenance Programming: Improved Productivity Through Motivation *with Mel A. Colter.*







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IN DEPTH

4GLs vs. Cobol

4GL packages offer three distinct advantages over Cobol or any other third-generation language: easier customization, such as changing names of data elements; easier maintenance because there is so much less code to maintain; and easier accessibility because end users can write their own inquiries.

By Robert Morison

Software vendors are starting to announce, and even deliver, mainframe application packages written in or accessible by fourth-generation languages, or 4GLs. These include financial, human resources and manufacturing planning and control packages.

These products offer enormous potential: A good 4GL package can be quickly implemented and then modified, as no Cobol package can, to meet the unique requirements of a business. However, with these new products come new pitfalls. Systems development may be constrained not so much by the functionality of the package as by the functionality of the underlying 4GL.

These packages also will change the ways you select software, work with vendors and implement systems. The record to date of 4GL packages is limited, but it is apparent that they present an exciting alternative for application development,

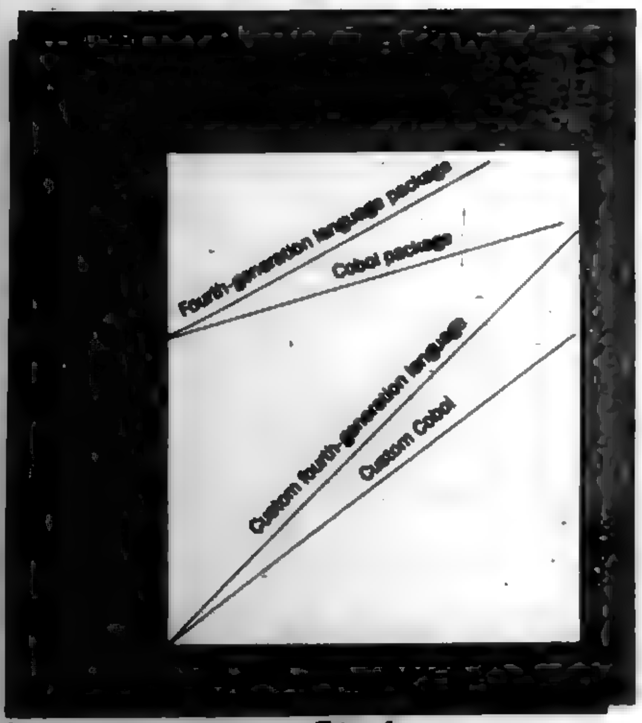

Figure 1

compared to any third-generation language.

Fourth-generation languages are essentially shorthand programming languages. An operation that requires 100 lines of code in a third-generation language such as Cobol typically requires only five to 10 lines in a 4GL. However, beyond this basic criterion of conciseness, 4GLs as a class can be difficult to describe.

Some 4GLs are nonprocedural, meaning that the programmer states only the desired results, not the method of delivering the result. Other languages are largely procedural, with familiar constructs like DOWHILE and GETNEXT. Some are true source programming languages — the statements can be interpreted on the fly and/or compiled into the functional equivalent of a load module. Others are better termed "generator languages" — the statements generate Cobol code, which is then compiled and run.

This variety notwithstanding, the practical value of 4GLs is simply stated: Using a more direct and concise programming language allows you to build applications faster and maintain them with less effort. Hence, 4GL packages offer three distinct advantages over Cobol or other third-generation language packages:

- Easier customization, whether changing names of data elements, coding custom reports or adding extended functionality.
- Easier maintenance, because there is much less code to maintain.
- Easier accessibility, because end users or information center personnel can write their own inquiries using the 4GL.

Fourth-generation language packages can dehorn an old dilemma — Do you buy a package that never really fits the business or attempt a custom implementation that consumes too much time and too many resources? A 4GL package, like the Cobol variety, presents most of your code already written. You can implement it as quickly as your organization can absorb it. But a 4GL package can then evolve into the customized system your business needs much faster than a Cobol package can be modified or a custom system developed in-house.

Figure 1 plots the relative time and resources required to fit an application's requirements for each of four approaches to development.

Take an integrated application, such as an on-line order service or production control system. Even allowing for training programmers in a new language, a custom implementation using a 4GL can generally be accomplished in under half the time required for a custom Cobol implementation. The savings come both in coding time and in time saved through prototyping.

The 4GL's relative performance naturally depends upon its robustness as a programming language. Any functions that the 4GL simply cannot handle will have to be written in Cobol, lengthening the implementation time.

A Cobol package might meet 80% or so of the application requirements to begin with, but modification can be slow and painful. Although cosmetic changes such as output formats should be easy for experienced Cobol programmers, adding data elements and modifying programs to reference them is not.

Any modifications to program logic or processing and the addition of new programs can be extremely difficult. In fact, some Cobol packages in complex applications such as manufacturing are so unwieldy that vendors themselves are finding incorporating upgrades extremely difficult.

Given the problems of modification, it is probably impossible ever to get very close to a 100% fit with a Cobol package. If anything, the business must change to fit the package's constraints, and the package cannot evolve as the business changes.

With its comparative ease of modification and extension, a 4GL package can quickly surpass the fit of a more comprehensive Cobol package. Of the four approaches mentioned above, the most direct path to full fit is to begin with a package based on a solid 4GL and then add the savings a 4GL provides in ongoing maintenance and system evolution.

The 4GL controversy

Before being taken to task for promoting a pipe dream, let me confront a primary issue surrounding 4GLs today: Can they be used as Cobol substitutes? In other words, can you build with 4GLs large production applications of the type traditionally done in Cobol? These are the core systems that help to run businesses, systems characterized by large integrated data bases and high volumes of updates.

In a recent report titled "Fourth Generation Language," International Data Corp. (IDC) reports that, contrary to vendors' marketing claims, 4GLs generally fail as Cobol substitutes: They haven't the required functionality, and they are CPU hogs.

IDC finds these 4GLs best suited for modest-size decision support and information center applications or for prototyping systems to be rewritten in Cobol [CW, Jan. 28].

These findings may stem in part from the way IDC segments the market for analysis. Another class of products, application development systems, often incorporate 4GLs as part of a series of development tools. Some of these languages are very powerful, and their vendors generally claim them to be effective Cobol substitutes. Large and complex applications are written using the application generators, but most of these are actually implemented in a combination of a 4GL and Cobol (to do what the 4GL cannot do or cannot do efficiently).

The lesson in today's market is clear: Caveat emptor. The litmus test of a 4GL's power is indeed whether it can function as a Cobol substitute. Many 4GLs fall short of their vendors' claims; nonetheless, powerful 4GLs are emerging and replacing

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Cobol on an application-by-application basis. The most powerful 4GLs are superior to Cobol in providing a more direct path to more responsive systems.

On the one hand, these 4GLs will not quickly overcome Cobol's inertia and obviously will not supplant Cobol in the near future, nor will they quickly break the Cobol maintenance backlog in most DP shops. However, ignoring proven 4GL tools can be foolish, and limiting large systems development to Cobol will only increase backlogs. With 4GL systems, the maintenance effort per application will decline, even if the absolute size of maintenance loads does not.

The move toward higher level languages, data base management systems and end-user computing is accelerating. More people are discovering firsthand the power of computers — but not by learning the power of Cobol. The trend is toward more accessible, dynamic and responsive systems. Fourth-generation languages, and especially 4GL packages, are excellent tools for such systems, both for the professional programmers who develop them and the end users who employ them.

A wide spectrum of packages

You should distinguish among three types of packages being marketed in conjunction with 4GLs.

The first is simply a Cobol package made compatible with a 4GL. You can access data either with the supplied Cobol programs or by writing new ones in the 4GL. Such a package offers the convenience of a 4GL for ad hoc inquiry and new programs, but you must maintain the system using two languages, predominantly Cobol.

The second is a hybrid Cobol/4GL package, with some supplied programs written in each. Complex functions are written in Cobol or in Cobol with some embedded 4GL statements. The 4GL tends to be used for interactive inquiries and perhaps updates, and it is available for new programs.

Such packages need close scrutiny. They enjoy the benefits of a 4GL on the surface, but maintenance and modification to the guts of the system must be done in Cobol. The limitations of the 4GL may actually dictate some of the package's functionality. For example, if all interactive programs are by definition written in the 4GL, many updates may be unnecessarily relegated to Cobol batch processing. The limits of the tool, not the needs of the application, may decide what happens when.

The third type is a package written entirely in a 4GL. The advantages for maintenance and modification are obvious. Although only a rare 4GL can serve as the source language for complex update programs and application functions, 100% 4GL packages are available today, even in applications like finance and manufacturing.

Thus, we are really talking about a sliding scale with pure 4GL packages on one end and predominantly Cobol packages on the other. The closer a package comes to pure 4GL, the greater the potential benefits in accessibility, maintenance and modification.

Figure 2

Assessing 4GL packages

The No. 1 criterion in selecting a 4GL package is obviously its applications functionality. After all, you are considering packaged software because many of your requirements are common, and a package gives you a big head start in system development. However, the traditional ways of assessing functionality must be adjusted for 4GL packages, especially if you are matching them against Cobol ones.

Package selection commonly centers on a checklist of primarily functional criteria (Figure 2), which normally reflect a combination of how the business operates today and how it would prefer to operate in the future. The vendor is asked whether the package contains each function or whether the function can be added. Each criterion has a weight, and the package a total score. By this method, the best established Cobol package with the most options frequently appears to be the best choice.

The fallacy in this approach is that, except in very standard applications, packages are seldom good fits. Yet most checklists give insufficient weight to ease of modification and maintenance. So companies purchase what appears to be the best Cobol package, which in fact provides maybe an 80% fit and no hope of coming much closer.

If your requirements are standard, if a Cobol package provides a close fit, if you have little need for modifications or end-user ad hoc access and if you do not wish to maintain the system yourself, then by all means choose the pure Cobol package. Alternatively, if the 4GL package philosophy suits you, if you have unique requirements and if your goal is really something close to a 100%

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fit, then give ease of modification some 25% of the weight in your criteria checklist.

Remember that a relatively lean 4GL package can quickly surpass the fit of a Cobol package full of often extraneous options or even the fit of a hybrid Cobol/4GL package. You must simultaneously assess the package's functionality, the amount of customization you will require and the power of the 4GL and associated DBMS for customization and maintenance.

The bottom line ultimately rules, and it must consider the total cost of producing the degree of fit your business demands plus the ongoing cost of maintenance. This financial analysis should also estimate the future business paybacks, such as improved cash flow through better control of receivables or improved profitability through reduced inventory.

These paybacks often offset the entire cost of software purchase and system development and make any marginal computer overhead associated with a 4GL insignificant. The package that can be effectively implemented more quickly will regularly outperform that which seems to have the better initial fit.

Pitfalls and considerations

Even though 4GLs represent a new technology in most companies, the pitfalls in implementing a 4GL package can be much more organizational than technical. New tools and methods may force changes in how people work. The 4GL approach spawns new expectations, both positive and negative, which must be controlled.

To end users, the 4GL package approach should mean greater opportunity to participate in designing the eventual system. All directly affected users, not just the managers who commonly land on project teams, should have the opportunity to participate.

The quick programming turnaround time with a 4GL allows users to work directly with programmer analysts to design and prototype programs and modifications. Ideally, the 4GL will be used both to do ad hoc inquiries and to work on the implementation team. End users must view the 4GL package not as just another system dropped on them but as a chance to help build a system that truly fits their needs.

Introducing a 4GL poses two problems for programmers in particular and the MIS organization in general. The first is a learning curve. A good 4GL is easy to learn — to do the simple functions vendors stress in their presentations and literature. Mastering the 4GL well enough to write complex programs may take a few months of practice. Thus, it is important to train programmers in the 4GL as early and thoroughly as possible. Note that 4GL packages offer an extraordinary aid in learning the 4GL: a cohesive set of sample programs in the package itself.

The second problem is people's natural resistance to the unfamiliar. Programmers may feel that their current skills (like Cobol) are perceived as obsolete and worry about how good some vendor's proprietary 4GL looks on a resume. Some programmers will take to the 4GL instinctively; others may be reluctant. The key here is internal education in the project's goals and how these contribute to individual productivity and growth. The challenge is to introduce a new tool while capitalizing on the experience and discipline developers already possess.

Computer operations is another group that must be solidly behind the 4GL package implementation. A new system means an added load on computing resources, and (vendor claims notwithstanding) a 4GL package will probably require more runtime resources than would a well-written Cobol equivalent. Again, check the vendor's track record with similar installations and budget for any additional hardware resources. Operations must be ready to provide needed CPU and I/O resources and to tune the application in its production environment.

Most of the burden of organizing a 4GL package implementation naturally falls on the project leader and team. Key to its success is being conservative, even though the 4GL power tempts them to be ambitious. Disciplined project management techniques are vital because the 4GL package changes the ways and speed in which some things get done. Don't let the 4GL's flexibility encourage laxness in project control.

Especially if 4GLs are new to the company, it is sensible to install the package pretty much as is, then gradually employ the 4GL's power for modifications and enhancements. Alternatively, install the package as a pilot for a segment of the business and implement and test necessary modifications before putting the package into general use.

Overcustomization may be a danger, actually prolonging implementation and undermining the purpose of using a 4GL in the first place. If possible, limit initial customization to changing names of data elements, reformatting screens and reports and adding essential data elements.

Also remember that because changes are easier with a 4GL, they can become uncoordinated more easily. Developers must work closely to avoid stepping on one another's toes, and they should use data dictionary and documentation tools to help ensure that modifications to the system are consistent. Develop clear specifications for package modifications — don't try to "ad hoc" your way to a coherent system.

This conservative approach may seem opposed to the ambitious implementation schedules that 4GL packages invite. In fact, disciplined project management will further accelerate, not delay, the implementation.

Planning for implementation

Because things can happen quickly, having a solid project plan for implementing a 4GL package is just as essential as having a project plan for developing a traditional system. The plan must take into account the new 4GL tools as well as the education and revised procedures necessary to use them effectively (Figure 3). It also must specify when to stop the initial modifications in favor of installing and shaking down the system, thus demonstrating its prowess.

The task of controlling expectations and securing cooperation rests not only on the project team but also on management. Because the organization is probably breaking new ground, management must judge whether timetables and goals are realistic. Using a 4GL package invites greater cooperation between the MIS and user communities, but any old organizational barriers must be removed carefully. A sense of complete and exclusionary ownership on either side can sidetrack the project.

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Figure 3

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Management may have to intervene occasionally to resolve frictions and jealousies.

Top management should energize all parties by backing the project and its business objectives. They must invest the project team with a clear charter, as well as the authority and visibility to carry it out. The 4GL project must be viewed as part of the business plan, not a renegade action. Management, too, must consciously adopt the 4GL philosophy and recognize that this is not an ordinary implementation. You have purchased a vendor's package, but you are really building your own system.

Developing a 4GL package

A few years ago I was part of a vendor's team developing a 4GL package. The package, a complete manufacturing planning and control system, included standard functions such as bill of material, purchasing, and material and capacity requirements planning (MRP/CRP). It also incorporated shop floor tracking and a sales order system tied directly to factory production schedules.

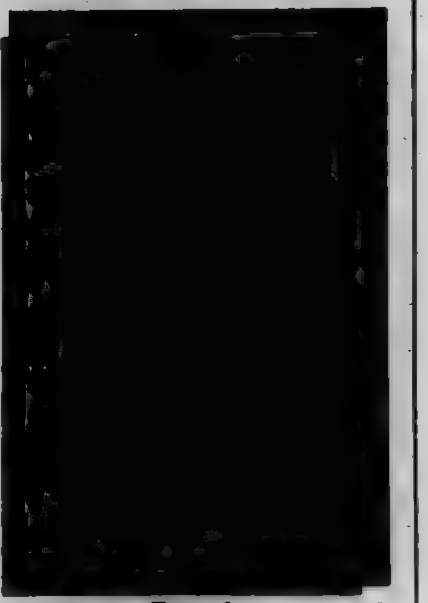

Figure 4

Pure 4GL development was possible because the language and associated DBMS, while general-purpose tools, have extensions for manufacturing application functions. The 4GL extensions include concise commands to do bill of material explosions and cost roll-ups as well as to generate MRP.

In Figure 4, for example, the TOTALIZE command is designed to roll up numeric data through all levels of a bill of material, chart of accounts or similar data structure. This simple 4GL statement replaces many hundreds of lines of Cobol and probably 50 or so lines of 4GL code using general-purpose operators.

Developing the package seems swift and easy only in retrospect, however. The team did not start with an existing package. A new tool and a new approach called for a new design. Our stated objective from the start was to build a package designed to be modified.

If the delivery vehicle was Cobol, and, hence, modification was much more difficult, we would have been obliged to incorporate dozens of additional optional features, maybe even modules. This pool of features would make for a slightly better degree of fit with each client, even though the majority of clients would ignore a majority of the features.

Instead, we decided that the package should include the most fundamental and commonly required functions and that the 4GL should be used to customize the rest of a given client's requirements. We adopted an "80% rule," whereby a function would have to be useful to 80% of the basic market (discrete manufacturers) to get into the package.

Within a chosen function, however, we vowed to provide full capability. For example, having decided to handle blanket purchase orders, we decided to include having MRP distinguish between the need to release against an old blanket order and the need to negotiate a new order.

This 80% rule was, of course, much easier to state than to adopt. The resulting package was very capable but seemed uneven in its capabilities. It had few outright "bells and whistles," but it was elaborate in many functions.

The package development, although rapid, took longer than anticipated. The 4GL accounted for much of the speed, but it accelerated prototyping and coding more than analysis and specification. It also created a propensity to revise programs constantly, even at the last minute, and tracking changes became difficult.

About 80% of the programs were simple and were coded in no time. Other programs proved tricky, both because they performed complex functions and because we were sometimes pushing the 4GL beyond its common uses. Though shorter and simpler than their Cobol equivalents, some of the 4GL programs were longer and more complex than we were accustomed to.

We alleviated many of these problems by using an application development tool, which was built as a by-product of the package development. The tool served as an extension to the DBMS' internal data dictionary as well as a repository and clearinghouse for transaction program specifications.

Developers worked on different portions of the package but used a single copy of the application development system. The latter detected inconsistencies such as redundant data elements, and it enforced standards on program documentation. It also printed up-to-date documentation at will — mercifully reducing the documentation manager's hair-tearing over last-minute program changes.

The end results — both the package itself and the demonstration that such products can, and should, be

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Changing the ground rules of software selection

Consideration of a fourth-generation language (4GL) package changes not only the ground rules of software selection but also the relationship between user and vendor. An installation of a Cobol package tends to be rigid, and local modifications are relatively few. A 4GL package, on the other hand, is designed and destined to be modified. Presumably you purchased it because no Cobol package fit your needs, and you wanted to be able to change the package, not your business. The 4GL package allows rapid local modifications, and soon after installation, the system may look far different from the original package.

What happens, then, when the 4GL package vendor supplies upgrades? Using the 4GL, the vendor may be able to integrate enhancements to the package easily and often, but can you integrate them into your system? Here the 4GL is a two-edged sword, and the sharper it is, the quicker your system gets out of sync with the vendor's. A practical solution to this synchronization problem may be the disciplined use of data dictionary and application documentation tools.

In short, if your are considering 4GL packages, do not approach the 4GL package vendor the way you would a Cobol package or software tools vendor. This redefined relationship leads to three basic rules for choosing 4GL packages:

Buy a complete package, not an embryonic one. Banking on vendor "futures" is always risky, but perhaps even more so with 4GL packages. If you modify the package extensively, you may have trouble utilizing the vendor's upgrades. Beware of packages or essential modules advertised as being in alpha, beta, gamma or even omega test. Working with 4GL packages is undoubtedly a new game for the vendor, too.

Be sure the vendor has and can articulate a clear maintenance philosophy. Does the vendor's philosophy mesh with your plans for modifying the package? Does the vendor offer or recommend a data dictionary that will help you incorporate upgrades? Does the vendor provide upgrades and fixes only in the form of new programs? Or do you also receive listings of how the original programs (and your modified versions) were changed?

Recognize that you will be maintaining and enhancing your system far more than the vendor will. This should be a definite advantage: You control more of your own fate. But it also means that your staff must learn to use the 4GL and underlying data base management system. All 4GLs claim to be easy to learn, but some are deceptively difficult when you cross the threshold between simple inquiries and complex updates. Note the quality of vendor documentation, training and direct support both in the package and in the 4GL and DBMS. Remember, you will, by choice, be largely on your own.

Package assessment

Evaluating a 4GL package's ease of modification and maintenance requires two answers. First, how much of the package (and especially the portions you need to modify) is written and maintainable in the 4GL? Second, just how good is the 4GL and its associated DBMS? The latter may be of paramount importance if you have the luxury of choosing between 4GL packages. Here are some basic categories for analyzing a package's underlying technology:

4GL robustness. Can you write the most complex programs you require in the 4GL? How often must you revert to Cobol? If some functions do require Cobol, how smooth is the product's interface to same? Try to check the vendor's experience in writing packages in its own 4GL.

DBMS robustness. For complex and integrated applications, the 4GL must operate on a true DBMS, as opposed to a file manager. The distinction is that a DBMS helps you manage logical relationships between different categories of data such as orders and the items they specify. Consider the underlying data model of the product. Many 4GLs are based on the relational model, which makes them ideal for many functions but may pose practical problems when it comes to enforcing data relationships and handling high transaction volumes efficiently.

Production worthiness. Will the product allow you to run an on-line application with the simultaneous user population and on-line transaction volume you require? Vendor claims are notoriously unreliable in this area. One suspects that they benchmark themselves on very modest applications, then claim the ability to support production systems in general. For large production applications, the DBMS should approach the efficiency of, for example, IMS, just as the 4GL approaches that of Cobol. In other words, the system should handle transaction loads traditionally associated with hierarchical-model DBMS.

Application experience. Has the product been used to build the types of application functions you require? Ideally, the vendor can point to other users who have modified the package in much the same ways you plan to. Be sure to look for direct experience — presentations stressing the vendor's size, growth and number of beta sites can be a smoke screen for lack of a real track record with applications.

In short, evaluate the record of both the package itself (which is likely to be brief) and the underlying software. You must also look to the future to gauge the 4GL's ability to handle your planned modifications. Probably the best way to prove a package's viability — and probe the underbelly of the 4GL — is to arrange a trial installation. Then tackle a complex function in the package and try to modify it.

built with 4GLs — were impressive. Subsequent releases succeeded in rounding out the package's capabilities and cleaning up the inevitable bugs. In addition, the 4GL continues to be used to develop packages in manufacturing and other applications.

Users of the package are pleased with it and are enthusiastic about the 4GL approach. The package meets a good 80% of their needs and quickly evolves into the custom systems they wanted but hadn't the time and resources to develop. The major implementation problems have been organizational, not technical: Users too often adopt the 4GL package idea without selling it to management and MIS.

Breaking from tradition

Starting with 4GL packages, you can build responsive systems faster and maintain responsiveness over their full life spans. You can thus avoid the drawbacks of rigid packages — incomplete to start, impervious to change thereafter.

Despite its proven advantages, the market for 4GL packages remains embryonic. Most prospects still think "package" rather than "system." Those who consider their needs and costs over the lifetime of a system are attracted to the 4GL package. Those looking for a quick fix live by lists of immediate needs and choose Cobol packages with better initial fit. The irony is that the latter are often choosing a package that is slow to implement, never really fits and costs much more in the long run.

The 4GL packages are not widespread, and they are not for everyone. However, the organizations that are already benefiting from these packages recognise business needs that no traditional package or implementation effort can meet. To realise the great benefits of 4GL packages, they are willing to change old methods as well as old technology.

About the author

Robert Morison is the manager of Technical Consulting, Mims Systems, at General Electric Information Services Co. in Burlington, Mass. Mims is a data base management systems and fourth-generation language used to build custom applications and software packages primarily for manufacturing systems.

UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK
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In re

INFORMATION DISPLAYS INC.,
INTELIS INCORPORATED,

Debtors.
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Case No. 84B 20229(HS)
Case No. 84B 20230(HS)
Chapter 7

NOTICE OF ORDER FIXING LAST DATE FOR FILING OF CLAIMS AGAINST DEBTORS IN SUPERSEDED CHAPTER 11 CASES

Cases of the above-captioned Debtors having been filed under Chapter 11 of Title 11 of the United States Code (the "Bankruptcy Code") on May 23 and May 25, 1984, respectively and the cases having been substantively consolidated by order of the Court dated November 8, 1984 and an order for conversion having been entered on February 20, 1985 directing that liquidation under Chapter 7 of the Bankruptcy Code be proceeded with, and Harvey S. Barr having been appointed Chapter 7 trustee, and the Trustee having filed a list of creditors who may have unpaid Chapter 11 obligations incurred by the debtors-in-possession.

PLEASE TAKE NOTICE THAT an order was entered in this case on July 15, 1985, by the undersigned Bankruptcy Judge, fixing October 1, 1985, as the last date for the filing of claims against Information Displays, Inc. and Intelis Incorporated, as debtors-in-possession, including all claims of the United States, any state or any subdivision thereof, in the Office of the Clerk, United States Bankruptcy Court, 101 East Post Road, White Plains, New York 10601.

PLEASE TAKE FURTHER NOTICE THAT the proofs of such claims shall be in the form prescribed by Section 501 of the Bankruptcy Code and the Bankruptcy Rules and Official Forms thereunder, and shall contain a written statement signed by the claimant setting forth the claim, the consideration therefor, what security if any is held therefor and what payment if any has been made thereon, and that the claim is justly owing from the debtors-in-possession to the creditor or his assignor or otherwise constitutes an allowable claim which arose during the aforesaid Chapter 11 case. All proofs of claim filed pursuant hereto shall be entitled in this case, shall clearly indicate the period in which the claim arose, and shall designate the address to which all notices to the creditor shall be mailed.

PLEASE TAKE FURTHER NOTICE THAT pursuant to Section 348(c) of the Bankruptcy Code, any contract which was entered into or assumed by the debtors-in-possession which was executory in whole or in part at the aforesaid date of entry of the Order converting the case to Chapter 7 shall be deemed to have been rejected unless they were expressly assumed by the Trustee on or before July 6, 1985.

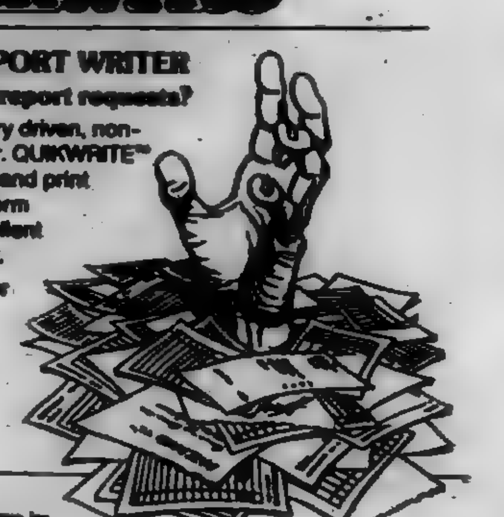
PLEASE TAKE FURTHER NOTICE THAT claims arising from the rejection by the Chapter 7 Trustee as aforesaid of executory contracts entered into or assumed by said debtors-in-possession shall be filed herein in form and manner as hereinabove provided on or before October 1, 1985.

PLEASE TAKE FURTHER NOTICE THAT any claims directed to be filed by the terms of the Court's order as set forth herein, but not filed within the time herein provided, shall not be allowed and shall be barred, and Information Displays, Inc. and Intelis Incorporated, debtors-in-possession, shall be forever discharged from any liability with respect to such claims.

Dated: White Plains, New York
July 15, 1985

BY ORDER OF THE COURT
s/ Howard Schwartzberg
UNITED STATES BANKRUPTCY JUDGE

MOSES & SINGER
Attorneys for the Trustee
1271 Avenue of the Americas
New York, New York 10020
(212) 246-3700



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MICROCOMPUTERS

Fortune blitz boosts multiuser line

High-end SX micros, local-area net debut

By Eric Bender
CW Staff

REDWOOD CITY, Calif. — Fortune Systems Corp. significantly extended its line of AT&T Unix-based 32:16 multiuser microcomputers in late July, rolling out more than 25 products and product enhancements. All will ship this quarter, according to James Campbell, Fortune's chairman and chief executive officer, who expects the products to strengthen Fortune's recent return to profitability (see story page 72).

The debuts included the high-end Fortune 32:16 SX series, a local-area network and other communications offerings, graphics software and hardware products, window management software, a new release of the For:Pro operating system and a host of software applications from Fortune and third-party suppliers. The company also announced upgrade kits and price cuts for earlier system models.

Fortune's SX series machines support up to 24 terminals, using any combination of standard Fortune terminals, Fortune 1000 MS-DOS Workstations, Fortune 1000 Graphics Workstations or IBM Personal Computers and compatible systems, the company said. Based on a 12-MHz Motorola, Inc. 68000 processor, the systems are said to improve performance 35% over the Fortune XP, the company's previous top-of-the-line systems.

A basic $12,995 SX45 configuration includes 1M byte of internal memory, expandable to 2M bytes, a 45M-byte formatted hard disk drive, an 800K-byte floppy disk drive and the For:Pro operating system. Console, keyboard and CRT controller board are not included. The SX70, a similar model with a 70M-byte hard disk drive, sells for $14,995. Among other options, two additional 70M-byte drives can be added for $11,490. An internal 60M-byte streaming tape drive is a $2,595 option.

The Fortune:Link local-area network is based on Datapoint Corp.'s Arcnet design and can connect up to 255 32:16 systems, the company said. The controller board and networking software cost $1,795. A passive hub costs $175, and an active hub costs $1,295.

Fortune also announced communications products, including the 3270 SNA Emulator package, which emulates an IBM 3274 cluster controller, 3278 display terminal and 3287 printer. The package costs $1,195, and an Intelligent Communications Controller that acts as a Synchronous Data Link Control server costs $995. Additionally, the firm announced an implementation of the CCITT X.25 standard, with X.25 development software priced at $1,195.

Fortune:Windows, a window management package that supports up to eight active applications concurrently, is priced at $695. Extended Fortune:Word 2.1.2, an en-

See FORTUNE page 72

■ Microsoft enhanced its Chart program for IBM microcomputers and compatible systems/62

■ Large corporations ignore the IBM Personal Computer AT's multiuser capabilities/68

Puzzles, problems and 'solutions'

SMALL TALK
Eric Bender
CW Senior Editor

Two years ago the word was "support."

Manufacturers supported distributors that supported dealers that supported customers. In short, support was everywhere. If you closed your eyes, you could imagine yourself surrounded by undergarment sales representatives or a therapy group.

Not much of that support actually was visible, but it sounded good.

Today the word is "solutions," which now seems more familiar in the computer industry than in the chemicals business. Nobody except mail-order houses sell microcomputers and software anymore.

Those of us who buy micros don't go home and tell our friends what a great solution we just bought — no, we mention the IBM Personal Computer AT compatibility and the clock speed and all that good stuff — but the phrase is not quite meaningless.

Personal computing has seen a great deal of take-the-money-and-run action from everyone in the chain of distribution, which is one of the main reasons that hundreds of thousands of desktop micros are gathering dust. All those disappointed user expectations, in turn, represent one of the main reasons for the current industry slump.

Genuine solutions to the puzzles of using micros do exist. From the seller's side, they require some pixie dust and a lot of sweat in the system design and configuration, plus continued and teeth-gritting attention to detail — and a real willingness to listen to the user.

We in the trade press don't necessarily cover these points very well, for several reasons.

For one thing, "solution" can't be defined in a press release. The reasons a system actually works fall into the cracks between the company hype and the product specifications, along with all those hidden costs.

For another, a smooth operation doesn't necessarily make a good story, lacking the classic computer-bites-man slant.

And, of course, we're all off chasing technologies that won't have widespread payoffs until the 1990s — a perennial problem in trade journalism.

See SOLUTIONS page 72

Microsoft to back memory spec

By Kathleen Sullivan
CW West Coast Bureau

BELLEVUE, Wash. — Microsoft Corp. late last month said it was joining forces with Lotus Development Corp. and Intel Corp. in support of the Lotus/Intel Expanded Memory Specification. In its statement, Microsoft announced plans to integrate expanded memory capabilities into its future systems software products.

Introduced last spring, the expanded memory specification is an interface that allows the system memory of an IBM Personal Computer, Personal Computer XT or AT to be expanded up to 8M bytes above the 640K-byte memory limit.

In conjunction with the announcement, Intel released a new version of the specification.

Enhancements in Revision 3.2

The enhancements included in Revision 3.2 allow multitasking operating systems to support more easily multiple application programs sharing expanded memory, said Rich Bader, operation manager of Intel's Personal Computer Enhancement Operation.

According to Bader, Revision 3.2 will not affect current software development efforts by companies developing products that support expanded memory. The scheme will now be known as the Lotus/Intel/Microsoft Specification, he said.

When Lotus and Intel introduced the expanded memory scheme, Intel unveiled Above Board, an add-on board that supports the expanded memory scheme and also provides specialized support for applications software that adheres to the specification.

Other hardware vendors also have introduced memory products supporting the specification.

Lotus recently began shipping a new version of Symphony that takes advantage of the expanded memory scheme, as will a new version of its 1-2-3 package scheduled for release this fall.

Other software companies have indicated their support, including Ashton-Tate, whose upcoming release of Framework will support expanded memory, and Computer Associates International, Inc.'s Micro Products Division, formerly Sorcim/IUS, which has said its Supercalc 3 will adhere to the specification.

IBM micros get ISPF/PDF

RYE BROOK, N.Y. — As an aid to programmer productivity, IBM has announced a Personal Computer implementation of its mainframe Interactive System Productivity Facility/Program Development Facility (ISPF/PDF), called ISPF/PDF PC Editor.

The package enables programmers familiar with ISPF/PDF to develop mainframe applications on a Personal Computer. Most commands in ISPF/PDF PC Editor are the same as in ISPF/PDF, and the two programs have a consistent editor, the vendor said. ISPF/PDF PC Editor allows programmers to delete, repeat, move or modify sections or lines of code or elements within a line by typing the appropriate command.

Users can transfer files from the host system to the Personal Computer, use the ISPF/PDF PC Editor, then transfer the files back to the host for further processing, IBM said.

A prerequisite for ISPF/PDF PC Editor is EZ-VU Runtime Facility, which provides a conversational interface between the user and an application program.

ISPF/PDF PC Editor requires an IBM Personal Computer with a minimum of 256K bytes of memory. The product costs $150. EZ-VU Runtime Facility is priced at $55.

More information is available from IBM at 900 King St., Rye Brook, N.Y. 10573.

Communications drivers announced for Symphony

CAMBRIDGE, Mass. — Lotus Development Corp. has announced that it will develop two communications drivers for its Symphony integrated package for the IBM Personal Computer.

The drivers reportedly will be offered free to Symphony users. One will be developed for use with the Compuserve, Inc. information utility's B protocol; the other will be for use with Communications Research Group, Inc.'s Blocked Asynchronous Transmission (Blast) communications software.

The B protocol driver will aid file transfer between Symphony and Compuserve's World of Lotus bulletin board on Lotus-related news, Lotus said.

The Blast driver reportedly will permit users to communicate with other Blast users.

Both drivers reportedly will be distributed this fall on the World of Lotus.

The Blast driver will be distributed on request to Blast users by Communications Research Group, Lotus said.

Lotus is located at 55 Cambridge Pkwy., Cambridge, Mass. 02142.

Version 2 of Chart out

BELLEVUE, Wash. — Microsoft Corp. has announced Version 2 of its Chart business graphics program for the IBM Personal Computer and compatible machines. Enhancements to the product include increased output device support and direct links to Lotus Development Corp.'s 1-2-3 and Symphony spreadsheet packages.

Microsoft Chart, first introduced in 1984, allows users to select from among 45 predefined chart formats. Users can custom design charts by moving, sizing, reformatting, adding text, overlaying charts, adding arrows and positioning all elements of the chart. The enhanced version now supports up to 128 data points and eight statistical functions, including a function that allows users to combine more than one data series, the vendor said.

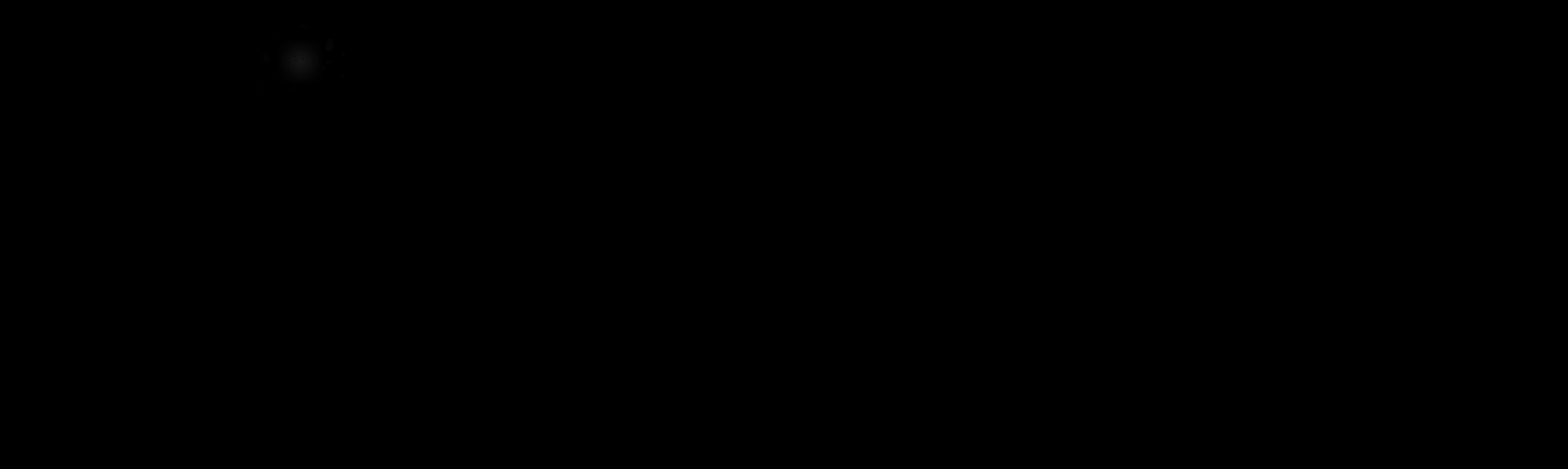
With the link function, Microsoft Chart 2 allows users to execute a built-in command and transfer data directly into Chart from 1-2-3, Symphony, Microsoft's Multiplan, Dbase or other programs that utilize WKS, Data Interchange Format or text files, the vendor said. Users can also select a permanent link between Chart and other programs to allow data that is changed in that program to be automatically updated in Chart, a spokesman said.

Version 2, scheduled to ship in September, will support IBM's Enhanced Graphics Adapter, which permits the use of 16 different colors on the screen. Support has also been added for a number of output devices, including Polaroid Corp.'s Palette image recorder, Hewlett-Packard Co.'s 7510 vector film recorder, Matrix Instruments, Inc. PCR/QCR digital film recorder, Lasergraphics' advanced micrographics system and General Parametrics Corp.'s Videoshow presentation system.

Microsoft Chart Version 2 requires a Personal Computer or compatible machine with 256K bytes of memory, one double-sided disk drive and the IBM EGA, Color/Graphics Monitor Adapter or the Hercules Computer Technology Graphics Card. Version [illegible] costs $295.

Microsoft can be reached through Box 97200, 10700 Northup Way, Bellevue, Wash., 98009.

At $395, still no competition.



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CONTROL DATA

Micro Focus boosts line with enhanced Cobol compiler

By Jeffry Beeler
CW West Coast Bureau

CHICAGO — Micro Focus, Inc. has added to its Cobol product line with the introduction of an enhanced compiler that reportedly out-performs the company's existing offerings by fivefold to tenfold and supports all the leading Cobol dialects.

Announced last month at the National Computer Conference here, VS Cobol is aimed at the same IBM-style microcomputer users as the other compilers in the Micro Focus product line.

VS Cobol executes code three times faster than the company's previous top-of-the-line compiler, High Performance Level II Cobol, according to Micro Focus sales manager Mike McCandless.

The latest addition to the firm's compiler family also compiles twice as fast as Level II, McCandless said.

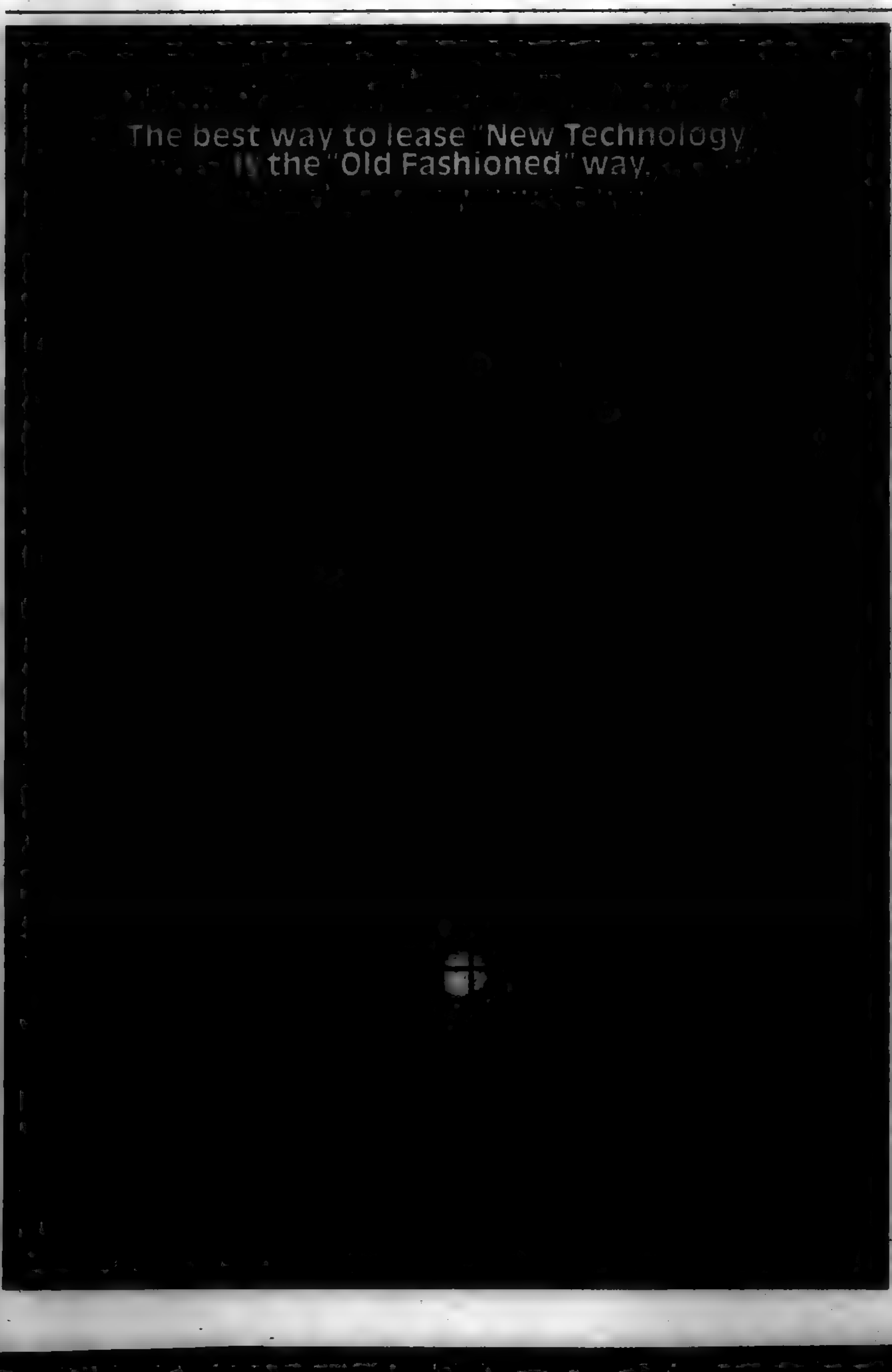
Included in the product's repertoire of supported dialects are IBM's OS/VS Cobol and VS Cobol II, Micro Focus' Level II, plus Ansi 74 and Ansi 85 Cobol, according to the company's cofounder and technical executive, Stewart Lang.

In an interview, Lang characterized VS Cobol as one of the software components that form Micro Focus' existing Workbench product, which off-loads program development tasks from mainframes to IBM-style microcomputers.

Although VS Cobol can be acquired as part of the larger Workbench package, it is also available as a stand-alone offering for first-time Cobol users or for customers who would use it as a development utility, according to Lang.

VS Cobol costs $1,600.

Micro Focus is located at 2465 E. Bayshore Road, Palo Alto, Calif. 94303.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is the "Old Fashioned" way.

Corona cuts prices

THOUSAND OAKS, Calif. — Corona Data Systems, Inc. has announced price cuts averaging 45% for its 400 series line of transportable and desktop IBM-compatible personal computers.

Two transportable micros, the PPC-400-22 and the PPC-400-XT, were reduced in price from $2,795 and $4,295, respectively, to $1,495 and $2,295. The desktop models PC-400-12, PC-400-22 and PC-400-HD2 were reduced to $1,345, $1,495 and $2,295, respectively. They had been priced at $2,445, $2,650 and $4,150.

The transportable versions each include 256K bytes of memory and a built-in 9-in. green phosphor display. The PPC-400-22 also includes two 360K-byte diskette drives, while the PPC-400-XT includes one 360K-byte diskette drive and one 10M-byte hard disk.

The desktop machines come with 256K bytes of memory but do not include a monitor. The PC-400-12 includes one 360K-byte diskette drive; the PC-400-22, two 360K-byte diskette drives; and the PC-400-HD2, one 360K-byte diskette drive and a 10M-byte hard disk. A monitor for use with any of the systems has been reduced in price from $245 to $200.

Corona Data Systems is located at 275 Hillcrest Drive, Thousand Oaks, Calif. 91360.

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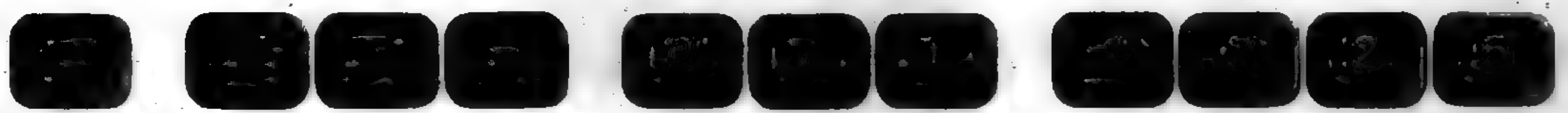

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Large firms ignoring IBM AT's multiuser capabilities

Poll finds preference for single-user service

By Edward Warner
CW Staff

ELLICOTT CITY, Md. — Most Fortune 1,000-size firms responding to a recent survey are using the IBM Personal Computer AT as a high-powered single-user machine and only rarely as a multiuser micro. This was the finding of a report on corporate microcomputer usage trends published by the Newton-Evans Research Co. here.

The report, based on the responses of 101 DP and MIS managers, also found a strong preference for IBM micros, including a laptop portable that exists only in rumors. Specifically, IBM was mentioned as the most important future supplier of desktop micros by 96% of respondents.

Though IBM does not currently market a laptop portable personal computer, nearly 60% of respondents said they were looking to IBM to be their most important vendor of laptops in the future. Data General Corp., manufacturer of the Data General/One IBM-compatible laptop, placed second with a 50% mention rate.

According to Newton-Evans, the survey's questionnaires were mailed to 982 potential respondents and 101 actually responded. The largest group of respondents (36%) worked for firms with annual revenues of $1 billion to $2.4 billion. Thirty-two percent worked for firms with between 5,000 and 9,999 employees. Though 38% of the respondents were from industrial firms, Newton-Evans Research said the next largest group (28%) was from the financial industry and included 16 large banks and 10 insurance companies.

Half of the respondents reported more than 100 personal computers in use in their firms, and 20% of that group said they expected their firms to have more than 100 personal computers by the year's end. Ninety-eight percent of the respondents' firms had at least one IBM Personal Computer installed.

AT&T made strong showing

While IBM was picked by most respondents as their most important future desktop computer vendor, AT&T made a surprisingly strong showing by capturing second place with a 51% mention rate from respondents.

IBM's grip on the Fortune 1,000 market, however, was more strongly emphasized by the report's finding that a full 41% of respondents plan to buy personal computers from no mini or mainframe computer vendor other than Big Blue.

Of the IBM line of micros, the Personal Computer AT was the machine respondents said would be their most likely choice to buy at any time from 1985 to 1987. According to the report, 84% of respondents planned to purchase an AT during that period.

Ninety percent of the report's respondents said their firms' ATs are not currently being used nor will they be used as multiuser machines. Overall, the report said, only one-quarter of respondents have multiuser personal computer systems from any vendor, and, of those, 28% use their systems less than 30 minutes a day.

The means by which micros are acquired and disseminated in the respondents' corporations was also explored by the report.

The report found that 67% currently use an information center to educate end users. Respondents divided almost evenly, however, as to whether a formal request for proposal is required before the firm can purchase a micro.

The report, titled "Microcomputer Usage Trends in Fortune 1,000 Corporations, 1985 Edition," is priced at $750 and is available from Newton-Evans Research, Suite 204, Bethany 40 Center, 10176 Baltimore National Pike, Ellicott City, Md. 21043.

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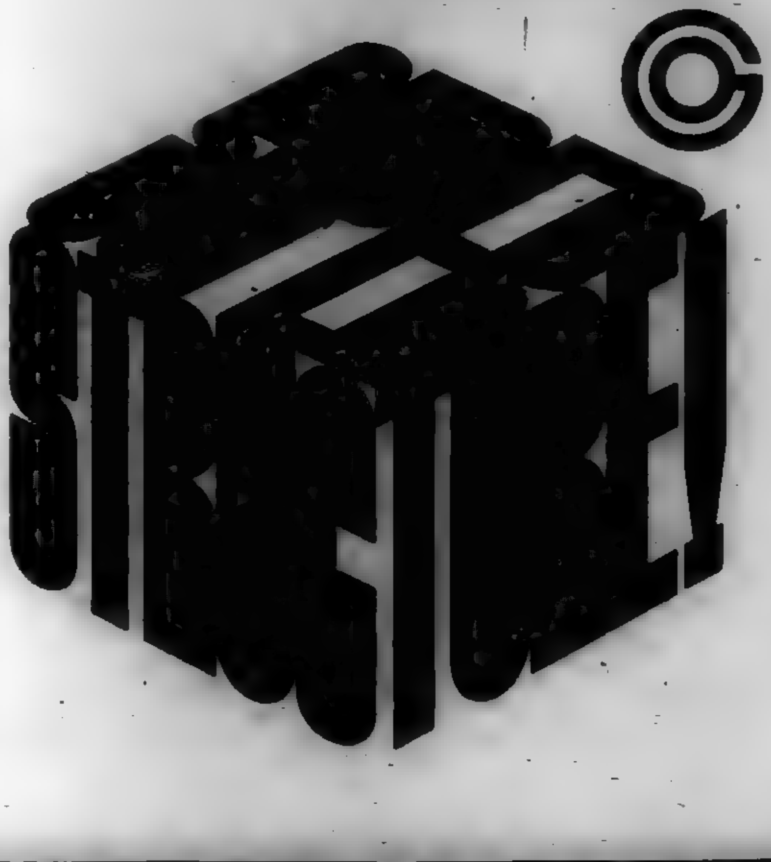

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Mapper package debuts for Sperry, IBM micros

ST. PAUL DE VENCE, France — Sperry Ltd.'s Information Systems Group, a unit of Sperry Corp., last month announced that its Mapper applications development system is available for use on certain Sperry and IBM microcomputers.

The product, called the Personal Mapper System (PMS), is a $2,000 hardware and software package that includes a micro version of the Mapper software used on Sperry 1100 series mainframes, officials said at a press briefing here.

PMS is a package of nine software diskettes and a standard expansion board, for use on any hard-disk model of the Sperry Personal Computer or the IBM Personal Computer XT, the vendor said.

Mapper software is designed to enable end users to develop, control and maintain forms-oriented applications programs using English language commands, the vendor said.

The PMS expansion board has a Motorola, Inc. MC68010 processor as well as a virtual-memory management unit.

More information is available from Sperry through P.O. Box 2191, Princeton, N.J. 08540.

Novell announces system software for IBM network

OREM, Utah — Novell, Inc. has introduced Advanced Netware/PCN, operating system software said to provide the features of the firm's Advanced Netware software designed for networks based on the IBM PC Network.

Advanced Netware/PCN is compatible with IBM's PC-DOS 2, 2.1, 3 and 3.1, according to a Novell spokesman. The software supports multiple file servers and Netware Bridges, which permit communications between networks with different hardware configurations, according to the vendor.

A Netware Remote feature allows remote workstations to connect via modem to an Advanced Netware/PCN network and function as fully networked workstations.

The Netware Electronic Mail Systems software also is included, according to the company.

Advanced Netware/PCN is available immediately for $1,595. A version that includes a disk interface for use with a Netware disk subsystem is priced at $1,845.

More information is available from Novell at 1170 N. Industrial Park Drive, Orem, Utah 84057.

Firm releases upgraded drives for IBM Personal Computer

BILLERICA, Mass. — Ideassociates, Inc. has added internal 40M-, 70M- and 120M-byte disk drives to its line of IBM Personal Computer storage units.

Because of limitations in IBM's PC-DOS operating system, an IBM disk controller cannot support more than 32M bytes of storage. The larger capacity drives come preformatted into multiple segments supported by Ideassociates' software. With the product, larger capacity disks can be partitioned into multiple PC-DOS drives, according to a vendor spokesman.

The products supply self-booting and disk cache features. Prices for the drives range from $1,595 to $9,995.

Ideassociates is located at 35 Dunham Road, Billerica, Mass. 01821.

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ITT INTRODUCES THE FASTEST PC IN THE WORLD. BECAUSE TIME IS MONEY.

FORTUNE

from page 61

hanced version of the vendor's word processing software that works with Fortune:Windows, debuted with a $1,495 price tag.

Fortune also introduced a monochrome graphics coprocessor board that supports 800- by 500-pixel displays and costs $1,995. A Tektronix, Inc. 401X emulator that works with the board is priced at $795. In addition, the company announced that it has adopted Graphics Software Systems' Virtual Device Interface, offering several development packages that allow users to run device-independent graphics packages. Graphics Software Systems' Drivers software will cost $295.

Release 1.8 of the For:Pro operating system was also announced. The package, available as a $150 upgrade for current multiuser Fortune customers, reportedly improves disk I/O performance and includes For:Prog, a hard disk drive optimization program.

Several CPU upgrade kits for current Fortune installations are available, with prices beginning at $2,995. Substantial price cuts for existing 32:16 systems also were disclosed, with the cost of a standard XP45 dropping from $14,995 to $9,995.

Additionally, new releases of Microsoft Corp.'s Multiplan and Graphic Communications, Inc.'s Graphwriter were announced, selling for $295 and $495, respectively, along with several other third-party software packages.

Additional information is available from Fortune, which is located at 101 Twin Dolphin Drive, Redwood City, Calif. 94065.

Fortune redirects strategy

NEW YORK — Today's Fortune Systems Corp. is a slimmed-down version of the firm that exceeded $20 million in sales in first-quarter 1983. The firm posted revenue of $14.6 million for the quarter ended this June 30.

Interviewed here two weeks ago, Fortune Chairman and Chief Executive Officer James Campbell emphasized the latest quarter's $220,000 profit. He also noted that the Redwood City, Calif., office automation vendor has maintained a 7:1 asset-to-liability ratio.

Downsizing the company to reach a level where it becomes profitable represents a shift of approach. Last summer Fortune moved toward buying North Star Computers, Inc., and "the strategy was that size is good," Campbell said. But, "I don't believe any more that putting together a $50-million company and a $70-million company makes any difference," he said. "A $120-million company doesn't have any more survivability."

Fortune now has completed the pruning required to maintain itself in healthy financial shape, Campbell said. Employment, which once reached 700, has stabilized at 330 since April, and the company has promised its employees that no more layoffs will occur this year.

The company competes in two main market arenas: multiuser AT&T Unix machines and corporate markets. In the latter, Fortune concentrates on the automotive and communications industry, which limits overall opportunities but "gives us a better win record," Campbell said.

Fortune intends to move further into the academic market. "There's a big push in the universities for Unix and C," according to Fortune Marketing Vice-President Richard Siegel.

Sales to federal agencies, which may sign very large contracts, also hold a great deal of promise, Campbell added.

— Eric Bender

SOLUTIONS

from page 61

Twenty-five years ago ocean development was high technology, and everyone and his brother was busily building little submarines or other fancy undersea toys. No one was quite sure how the equipment would pay for itself. Eventually, to most people's surprise, the offshore oil industry emerged to pay the bills for the surviving vendors.

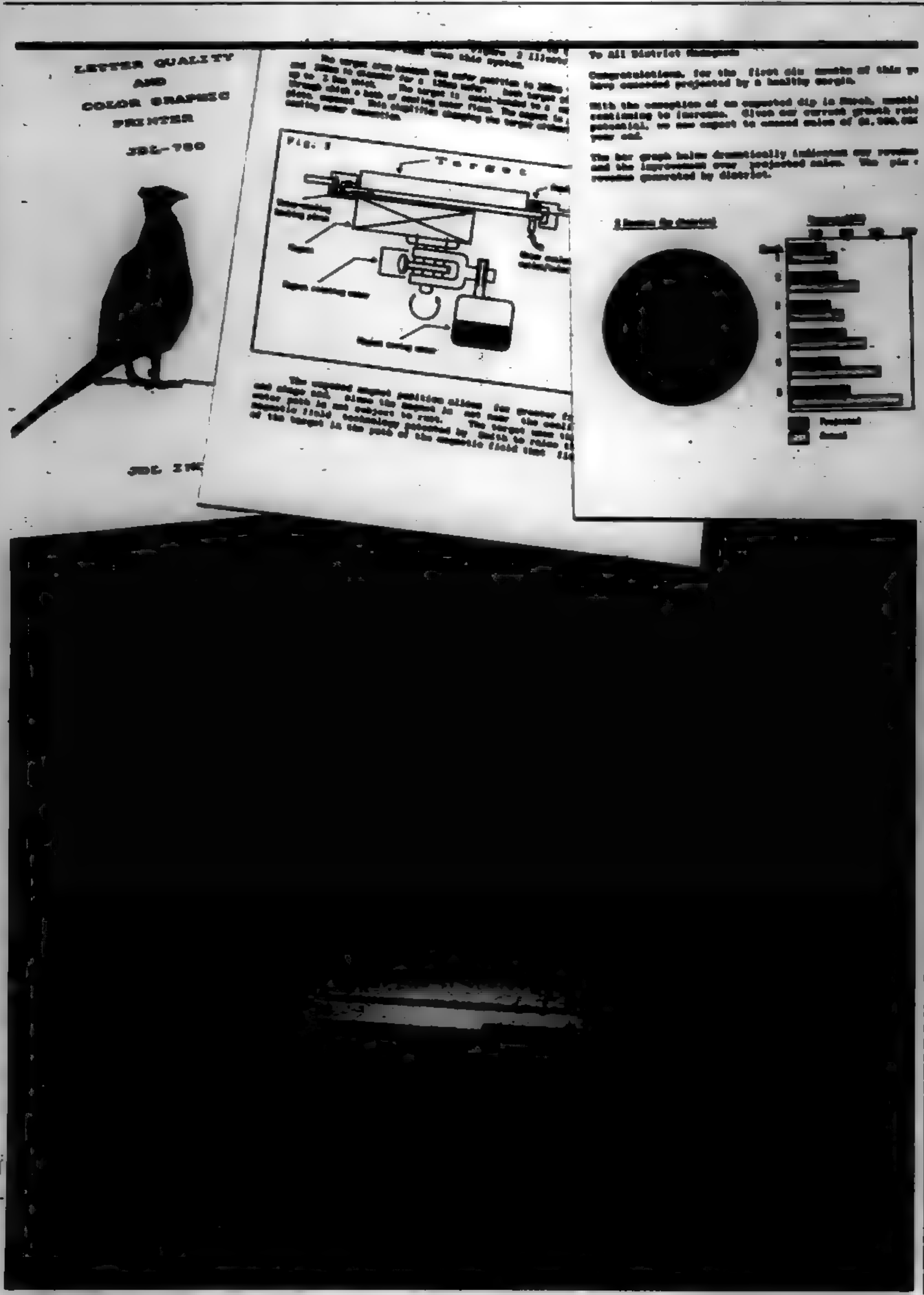
Twenty years ago firms were rushing out to buy the first commercial lasers. Those were tricky and low-power devices, and many customers found that, for a mundane task like cutting Styrofoam blocks, the devices primarily represented a fiendishly clever way of boosting the electricity bill. Over time, other firms did find important roles for lasers in manufacturing, medicine, telecommunications and other areas.

In both of these examples, the technologies received a huge amount of publicity, and multibillion-dollar markets emerged, but the lead time for a lot of practical applications was years longer than expected.

Currently in the information processing world, artificial intelligence and other emerging technologies such as image transmission and optical storage receive tremendous attention, far more than the prospects for broad, near-term acceptance conceivably could justify.

We in the press spend a lot of time writing about them because they're intriguing, and we tend to ignore the time lag between a technological achievement and useful applications of the technology. One quick example is that sales haven't risen above the noise level for any single-user software specifically tailored for the Personal Computer AT. (Please, no vendor letters.)

And often the trade press is part of the problem, not part of the solution.



COMMUNICATIONS

WEEK TAP/DANIEL MINOLI

Network documentation high priority

Documentation is generally given low priority in data communications project development efforts. While software engineering has formally introduced a documentation phase into project management and has even produced some automated tools for the task, data communications lags behind in this area.

Lack of documentation can lead to serious operational problems and, more importantly, to unnecessary expenditures, possibly totaling hundreds of thousands of dollars a year for a medium to large Fortune 500 corporation.

A previous column addressed installation delays resulting from lack of appropriate documentation [CW, July 29]. Two other considerations are communications resource management and network operation.

Accurate record keeping is essential in all companies. Studies show that telephone bills are often fraught with errors. The carriers, for example, continue to bill long-haul circuits that should have been canceled years earlier. Other typical problems involve telephone station equipment, extensions, off-premise extension facilities, special services and local loops no longer in service. These domestic and international line charges quickly add up.

So, review of toll bills normally yields savings. Often, the tracking systems needed to keep a handle on inventories and spending can pay for themselves in a short period. In one situation, a carrier was leasing over 8,000 international circuits from several other carriers and a corresponding number of entrance facilities from dozens of other domestic carriers. The yearly cost of the facilities was close to $60 million.

The record-keeping system developed for this firm was easily justified: If it identified billing errors that accounted for 0.5% of the budget, it would more than pay for itself in a single year. A 2% to 4% savings is not atypical; in the above case that would translate to $1 million and $2 million a year savings, respectively.

This type of billing review should not be carried out ad hoc — once every several years. Automated systems should be developed by the users to study communications bills on a monthly basis.

Documentation can often help expedite operational issues such as problem resolution. Sometimes, only one individual understands the network. When that person is ill or taking a vacation, no one else can solve a problem.

Network documentation can prevent these problems. Some sophisticated installations may develop a system that uses graphics in conjunction with a facilities data base to provide on-line, scrollable and navigable circuit schematics.

A multiaccess service and facilities data base that is consulted and updated by individuals who monitor the status of the network (add, delete, move, fix or upgrade) is desirable.

For an organization that does not have this capability, it would be advisable to subcontract software development and to add temporary consultants to assemble and enter the data.

The billing inconsistencies discovered by this one-time, start-up exercise would probably pay for the temporary manpower in a matter of months.

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

■ Local Data, Inc. has announced an Ascii-to-IBM conversion board/76

■ Astrocom Corp. has added a coaxial multiplexer to its product line/76

■ Gandalf Data, Inc. has introduced channel and clock controller cards/76

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AT&T losing control of declining PBX market

Northern Telecom, NEC Telephones gain significantly, report states

NEW YORK — AT&T, once the undisputed leader in the private branch exchange market, has seen its hold on the first-place position become more tenuous recently. Northern Business Information, Inc. made that claim in "PBX Market," a 120-page report that compares PBX sales figures from 1983 and 1984. In 1984, AT&T's market share fell from 26.5% to 19.6% while Northern Telecom, Inc.'s rose from 15.9% to 19.5%.

The two giants were competing for a market that is not growing as rapidly as it has been, according to the report. In 1983, the PBX market grew by 29%, but in 1984 it increased by 18.5%, the report showed.

Another significant finding was that NEC Telephones, Inc. doubled its market share with the introduction of its latest PBX, climbing to the fifth spot behind Rolm Corp. and Mitel, Inc.

Although they are unable to manufacture PBXs, the regional operating companies played an important role. By reselling other companies' equipment, the divested Bell operating companies distributed more than 6% of the PBXs sold in 1984.

The report costs $1,475.

Northern Business is located at 157 Chambers St., New York, N.Y. 10007.

Supplier	1983	1984	% Change (by lines)
Northern Telecom, Inc.	15.9	19.5	45.0
Mitel Corp.	10.5	9.7	8.9
Others	29.3	28.8	16.4

Micom's nonblocking data private branch exchange out

SIMI VALLEY, Calif. — Micom Systems, Inc. has announced a nonblocking data private branch exchange that works with twisted-pair wiring and accomodates up to 1,016 full-duplex channels operating at speeds of up to 19.2K bit/sec.

The Instanet6000 Data PBX offers options that include interfaces for four to eight independent channels, local multiplexers supporting up to 128 devices over twisted-pair wiring, gateways for accessing IBM Systems Network Architecture/Synchronous Data Link Control or Binary Synchronous Communications networks, X.25 packet-switched networks and integral statistical multiplexers to link remote clusters of terminals or ports over a single telephone line.

System administrators can restrict access and enforce security in a variety of ways. All devices that initiate calls are assigned a list of resources that they can access, and passwords can be used to restrict access. For each password, the system administrator specifies how many attempts are allowed before the Instanet6000 Data PBX denies access and reports an attempted security violation.

System administrators configure and control the Instanet6000 Data PBX through its administration port. From a terminal connected to the administration port, the network manager can define access rights for terminals, assign names to resources, enter messages and bulletins and check network status.

Instanet6000 Data PBX pricing starts at $7,500 or $12,000 with redundancy. Interface prices range from $245 to $650 for four-channel modules, $650 to $750 for eight-channel cards, $650 to $1,500 for local multiplexers capable of supporting from four to 128 channels, $2,500 to $4,200 for statistical multiplexer modules and X.25 packet assembler/disassemblers and $3,600 to $5,400 for IBM Gateway modules. A configuration supporting 376 local terminals and ports costs $40,500.

Micom is located at 4100 Los Angeles Ave., Simi Valley, Calif. 93063.

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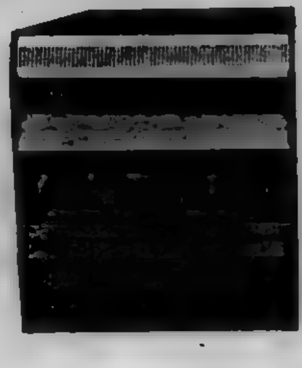

INFOTRON SYSTEMS

Source data base supports speeds up to 2,400 bit/sec.

Several hundred more cities to gain access

MCLEAN, Va. — Source Telecomputing Corp. has announced 2,400 bit/sec. transmission speed support for the Source, its on-line data base service.

Prime-time usage of the 2,400 bit/sec. service is priced at 46 cent/min, 3 cents more than 1,200 bit/sec. usage. Non-prime-time use, which includes evenings after 6 p.m., weekends and holidays, will be approximately 20 cent/min, 2 cents higher than 1,200 bit/sec. prices.

Uninet, Inc. will provide service access at the higher rate to 10 cities including Los Angeles; San Francisco; Washington, D.C.; Atlanta; Chicago; Boston; Kansas City, Mo.; New York; Dallas; and Houston.

Service access will be expanded to several hundred additional cities, the company claimed, using Uninet and GTE Telenet Communications Corp.

Additional information is available from Source Telecomputing, which is located at 1616 Anderson Road, McLean, Va. 22102.

PROTOCOL CONVERTERS

■ Local Data, Inc. has announced the Barelynx/3287 protocol conversion board, which allows an industry-standard Ascii printer or comparable device to be attached to an IBM Type A coaxial device.

With Barelynx, an Ascii printer appears to the control unit as an IBM 3287 character printer. Barelynx may be used with all models and configurations of IBM 3274 and 3276 control units, a spokesman said.

A Barelynx/3287 board includes serial and parallel printer interfaces supporting a variety of interfaces. The Barelynx/3287 includes a single 10¼- by 12.7-in. printed-circuit board suitable for internal mounting.

The Barelynx/3287 is priced at $949. A portable front panel for configuring and troubleshooting a Barelynx board costs $500.

Local Data, 2771 Toledo St., Torrance, Calif. 90503.

MULTIPLEXERS/ MODEMS

■ Astrocom Corp. has added a coaxial multiplexer to its Squeezeplexer product line for IBM 3274 users.

The Astrocom E290 supports up to eight IBM Category A or compatible terminals or printers at distances up to 10,000 ft from a controller through the use of one coaxial cable instead of eight conventional cables.

The device can be used in multidrop and star network configurations and includes individual channel diagnostic fault/status indicator lights.

The E290 is priced at $795.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

■ Gandalf Data, Inc. has announced two products for use with its GLM 528 T1 time-division multiplexer, a channel card for synchronous data transmission and a clock controller card.

The channel card enables the GLM 528 to handle synchronous data at speeds up to 64K bit/sec. and/or asynchronous data at up to 19.2K bit/sec. In addition, a controller card provides clocking to Gandalf Pacx 1000 and Pacx 2000 data-switching nodes, enabling the GLM 528 to be synchronized to these Pacx nodes for networking applications.

The existing GLM 528 multiplexers can be expanded with an asynchronous, data-only 32-channel card priced at $1,490 or with the synchronous/asynchronous 32-channel card at $1,790, the vendor said.

A basic 32-channel synchronous/asynchronous GLM 528 multiplexer is priced at $3,540, $300 more than the asynchronous-only model.

Gandalf, 1020 S. Noel, Wheeling, Ill. 60090.

LOCAL-AREA NETWORKS

■ Cabletron has announced the LAN-MD, a tool for testing components of any Ethernet and IEEE 802.3-type local network.

The LAN-MD, when used with the previously announced TDR 5000 time domain reflectometer, tests the integrity of coaxial cable on broadband and baseband local nets, including the cabling, transceivers, multiple transceivers, transceiver cables, repeaters, terminators and connectors.

The products reportedly let installers and maintenance personnel isolate faults on an Ethernet local-area network within one hour.

The LAN-MD tests Ethernet version 1, 2 and IEEE 802.3 transceiver cables over a 500-ft maximum cable length. Tests can be conducted for proper transmit, receive, collision detection, power supply, fault protection and network signal strength.

The combined cost of the TDR 5000 and the LAN-MD is $8,500, the vendor said. The LAN-MD by itself is priced at $4,000.

Cabletron, 198 Pleasant St., Ashland, Mass. 01720.

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SYSTEMS & PERIPHERALS

Honeywell beefs up DPS 6 mini line

By Tom Henkel
CW Senior Editor

WALTHAM, Mass. — Honeywell, Inc. beefed up its DPS 6 line of minicomputers with the DPS 6/70, a processor with roughly the same performance as the firm's high-end DPS 6/75 system but offering twice as much main memory. Honeywell also unveiled a mass storage subsystem for the smaller DPS 6/22 mini.

The DPS 6/70 uses 256K-bit memory chips and comes in a cabinet half the size of that of the 60-in. DPS 6/75. It is not, however, a replacement for the DPS 6/75. A spokesman said the DPS 6/75 is field upgradable to the company's larger 32-bit DPS 6/85 and DPS 6/95 processors, while the DPS 6/70 is not.

The DPS 6/70 includes 2M bytes of main memory, 8K bytes of cache memory, a commercial instruction processor geared for enhancing Cobol performance, a 16-line communications controller with a maximum of 32 communications lines, four RS-422 ports, a disk controller that can support a 64M-byte, ¼-in. cartridge tape subsystem, a 650K-byte, 5¼-in. diskette drive and a system control facility for performing remote diagnostics and installing software updates, the company said.

Required options include either 132M-byte or 412M-byte fixed-media disk drives, which can provide a maximum of 3.3G bytes of disk storage. Other requirements include a removable-media storage device, such as a ¼-in. removable-media tape drive, a ½-in. tape drive or a removable- media disk drive, the company said.

The DPS 6/70 central system has three chassis slots that can be used for several options, including a second 16-line communications controller, a second disk controller, a multiple device controller to support attachment of high-speed line printers, a scientific instruction processor, a 9-track tape controller and up to two tape drives and a magnetic ink character recognition document handler, the company said.

The DPS 6/70 will be available in September at a base price of $30,500.

The 132M-byte fixed disk drive and 413M-byte fixed disk subsystems cost $14,500 and $21,000, respectively. The ½-in., 9-track tape controller and primary drive cost $23,900. The second tape drive costs $17,900, the company said.

Honeywell also announced a fixed-disk mass storage subsystem for the DPS 6/22. The addition increases the disk storage capacity of the DPS 6/22 from 56M to 136M bytes.

A DPS 6/22 processor configured with the newly announced mass storage subsystem includes a CPU board with memory controller, 1M byte of main memory expandable to 1.8M bytes, up to two 68M-byte fixed-media disk drives, a 650K-byte 5¼-in. diskette drive and five workstation ports. One chassis slot is available for attachment of optional devices such as a second five-port workstation/printer controller, an asychronous/synchronous dual-line communications controller or a single-line IBM High-Level Data Link Control/Synchronous Data Link Control communications controller (HDLC/SDLC).

The base price for the DPS 6/22 is

See [illegible] page 85

■ Cadmus threw its hat into the crowding 68020 ring with an engineering workstation/78

■ Versatec unveiled two electrostatic color plotters and a graphics controller/78

■ AMF Logic Sciences announced a graphics processor for computer-aided design applications/83

■ System Industries, Inc. introduced Winchester disk drives for DEC, DG and HP minis/83

INSIDE

Processors/83
Data Storage/83
Terminals/83
Printers/Plotters/84
Office Systems/84

Tandem workstations, controller, emulator out

CUPERTINO, Calif. — Tandem Computers, Inc. announced two color workstations, a cluster controller and an enhanced version of its IBM 3270 emulator for the company's line of fault-tolerant transaction processing systems.

The Dynamite workstations can operate either as system terminals or as standalone microcomputers using Microsoft, Corp.'s MS-DOS operating system. Both models support a dual-mode monitor that can display both text and graphics data simultaneously. An optional bit-mapped graphics card can support three screen resolutions; a 300- by 320-pixel format, a medium resolution of 640 by 200 pixels and an 800- by 300-pixel resolution for graphics applications. The terminals feature all the standard features of other Dynamite series terminals, the company said.

The Dynamite 6548 workstation comes with dual-360K-byte floppy disk drives, and the Dynamite 6549 comes with one 360K-floppy disk drive and a 10M-byte hard disk drive. Both models come with 14-in. screens, 256K bytes of random-access memory expandable to 640K bytes and the ability to run Tandem 6530 series terminal software. The Dynamite 6548 workstation costs $3,790 and the 6549 costs $4,790. Existing users of Dynamite workstations can upgrade their units to support color monitors for $995. The optional graphics board costs $575, according to the company.

Tandem also announced the 6600 cluster controller. The unit allows clustering of terminals, which is said to reduce communications costs. The 6600 controls communications between a Tandem host processor and up to eight terminals, workstations or IBM Personal Computers and one printer. The unit can support any combination of Tandem 6530 series terminals or Dynamite series workstations, IBM Personal Computers or compatible microcomputers. The 6600 costs $3,450 for a four-port configuration. An eight-port version costs $4,250, the company said. The company also enhanced its EM3270 emula-

See [illegible] page 85

Hitachi adds storage unit

SAN BRUNO, Calif. — Hitachi America Ltd. has announced an optical disk storage product that can store up to 89G bytes of data. The OL301-2 optical disk library system costs $45,000 and is initially available only to OEMs, the company said.

The OL301-2 disk library unit was built around the 301 series optical disk drive, a write-once storage product that is said to be compatible with a variety of CPUs via either the IEEE 488 general-purpose interface bus or Small Computer Systems, Inc. (SCSI) interface buses. Included in the library unit is a formatter controller, one or two disk units and an automatic disk changer.

The optical disk library unit will be used primarily for archival applications, a spokesman said.

More information can be obtained from Hitachi at the Peripheral Systems Marketing Department, 950 Elm Ave., San Bruno, Calif. 94066.

Ramtek unwraps CAD workstations

By [illegible]
CW Staff

SANTA CLARA, Calif. — Ramtek Corp. has introduced a series of workstations for two- and three-dimensional computer-aided design applications.

The 2020-4228 desk-side unit is a Tektronix, Inc. graphics-compatible, design engineering color graphics workstation said to shorten the development time of 3-D CAD projects. It supports 3-D wireframe and finite element modeling applications using Tektronix-compatible graphics, the Graphics Kernel System and Ramtek graphics with Digital Equipment Corp.'s VT100 alphanumerics, the vendor said.

The 2020-4228 contains a Motorola, Inc., MC68010-based board that performs internal processing. It also contains a 2020 series Motorola 68000-based display list processor board for performing floating-point coordinate transformation and floating-point geometry computation functions. According to the vendor, 750K bytes of random-access memory, expandable in 1M-byte increments up to 5M bytes, allows the user to store Ramtek 3-D graphics display

See CAD page 85

Silicon Graphics Iris 2400 Turbo Option debuts

MOUNTAIN VIEW, Calif. — Silicon Graphics, Inc. has announced an enhanced version of its Iris Series 2000 graphics workstations, dubbed the Iris 2400 Turbo Option, based on the Motorola, Inc. 68020 microprocessor.

The Iris 2400 Turbo Option comes with 2M bytes to 4M bytes of memory and an optional floating-point processor board. The 2400 Turbo Option includes a software upgrade for faster file handling and very large-scale integration (VLSI) geometry engines that increase three-dimensional transformations by 33% — to 80,000 per second — over the Iris 2400, according to the vendor.

The Turbo Option's CPU uses a 32-bit data path to memory, and the memory boards use 256K-byte random-access memory chips.

The product's software upgrade requires no source code changes from the company's AT&T Unix 2.3 release, and it is based on the University of California at Berkeley's 4.2 version of Unix. The 240 Turbo Option, including CPU board and 2M-

See TURBO page 85

Versatec unveils color plotters, graphics controller

RPM can handle more than 15,000 vector/sec.

SANTA CLARA, Calif. — Versatec, Inc. has announced two electrostatic color plotters for 24-in. and 36-in. wide media and a modular graphics processing controller called the Raster Plotting Machine (RPM).

The RPM controller drives the newly announced electrostatic plotters, off-loads the host processor and orders and rasterizes graphics data. The RPM can handle more than 15,000 vector/sec., according to the vendor.

Up to 4M bytes of dual-ported memory per modular board is said to increase bandwidth and prevent contention.

Upgraded with add-in processors

The modular RPM series can be upgraded with add-in processors and memory up to 14M bytes. Disk drive storage can be expanded to 140M bytes.

The RPM controllers cost from $16,000.

The color plotters operate at up to 1 in./sec. with a resolution of 200 point/in. on paper or film. The 24-in. model can plot a D-size color drawing in 5¼ minutes. The 36-in. model can plot an E-size color drawing in 6¼ minutes, the vendor said.

The plotters use a multipass technique to produce multicolor plots, eliminating the need for multiple writing heads and associated electronics, the vendor said. The color plotting software provides for seven line colors and 256 predefined area colors.

The 24-in. plotter costs $49,900, and the 36-in. model costs $72,200.

An enhanced accuracy option for the company's 7000 series of monochrome electrostatic plotters is also available.

The option reportedly makes adjustments for changes in the media and humidity. Adjustments are self-calibrated on the plotter through the control panel. The option is priced at $4,900, according to the vendor.

An automatic media cutter for the 7000 series is said to eliminate the need for a manual operator to cut plots.

Automatically deposited in bin

Once the plots are cut by the cutter and mounted on top of the plotter in place of the media winder, they are automatically deposited into a wire bin.

Cuts are initiated at the end of a plot or through a special command and are made within a ½ in. of the desired area. The cutter is available for $3,750.

Versatec is located at 2710 Walsh Ave., Santa Clara, Calif. 95051.

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ITT processor targets IBM 3270, PBX users

PHOENIX — ITT Courier Terminal Systems, Inc. has introduced an applications processor system for local processing targeted at users of IBM 3270 workstations and voice/data private branch exchanges.

The ITT applications processor is said to give terminal users the option of communicating on-line with the 3270 host computer or accessing the local processing power of the applications processor.

The product connects to an IBM host computer via an ITT 9400 series controller and can provide port connections for up to 32 terminals and printers from the ITT 9000 product line. According to the vendor, up to 16 devices can simultaneously access Microsoft Corp. Xenix-based applications.

Users of the 3270 can log on to the applications processor and toggle back and forth between local applications and a mainframe 3270 session.

The applications processor includes an Intel Corp. 80286-based CPU board, ISBC 214 intelligent I/O board, 1M byte of directly addressable random-access memory expandable to 13M bytes and up to 300M bytes of storage. The unit can include a 1.2M-byte floppy disk drive, 60M-byte streaming tape drive, four 5¼-in. hard disk drives, 12 Multibus boards, a Centronics Data Computer Corp.-compatible parallel printer port and an RS-232C asynchronous terminal port.

Model I of the applications processor costs $18,500 and includes a 20M-byte fixed disk drive. Model II costs $24,000 and includes a 60M-byte fixed disk drive and a 60M-byte tape streamer. Both come standard with the Xenix 286 operating system, a 1.2M-byte floppy disk drive, a Centronics-compatible parallel printer port, an RS-232C asynchronous terminal port and a device adapter that supports eight coaxial attached devices.

ITT Courier Terminal Systems is located at 1515 West 14th St., Tempe, Ariz. 85281.

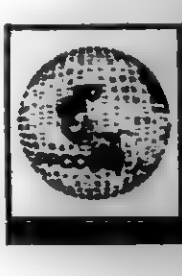
Cadmus unit gets upgrade

LOWELL, Mass. — Cadmus Computer Systems has announced a version of its OEM-oriented engineering workstation that incorporates a Motorola, Inc. 68020 microprocessor.

The Cadmus 9800 uses the 16.7-MHz version of the 68020 said to offer a 300% performance improvement over earlier workstations based on Motorola's 68010 chip.

The Cadmus 9800, including 1M byte of random-access memory, memory management unit, small computer systems interface and VME interface, a 40M-byte Winchester disk drive and controller, a 5¼-in. floppy disk drive and controller, the company's Cadmac graphics subsystem, a VME card cage with 10 slots, two RS-232C communications lines, and AT&T's Unix System V operating system costs $21,500. Deliveries will begin in the fourth quarter.

The company is located at 600 Suffolk St., Lowell, Mass. 01852.



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We started with competitive word processing in virtually every area and developed superiority in the crucial area of file management.

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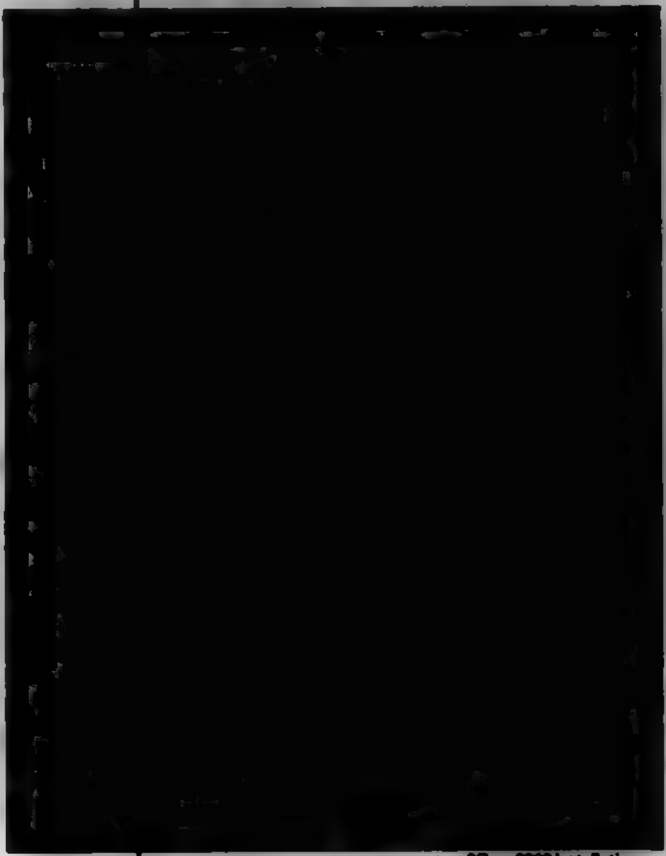

*Over 2000 installations.

And when it comes to writing new applications, we offer a full complement of programming languages that include BASIC, COBOL, FORTRAN, ASSEMBLY, ADA, C, RPG, and PASCAL.

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SYSTEMS & PERIPHERALS

PROCESSORS

■ AMF Logic Sciences has introduced a vector-to-raster graphics processor that converts graphics data supplied by a host computer into a format that can be output to a variety of ink-jet, electrostatic and laser printers and plotters.

Turbograph 700 is a stand-alone processor for processing either monochromatic or color graphics data. It includes a very large-scale integration graphics engine and user-configurable I/O options. It can draw up to 400,000 vector/sec., the vendor said.

Geared for computer-aided design, manufacturing and engineering applications, Turbograph 700 allows users to define graphics elements for custom-tailored output. Shaded areas can be filled with patterns selected by the user.

Raster image memory and input memory are expandable to up to 2M bytes each. Optional interfaces include the RS-232C 9.6K bit/sec. serial interface and the Centronics Data Computer Corp. 8-bit parallel interface, the vendor said.

Turbograph 700 costs $6,995.

AMF Logic Sciences, 10808 Fallstone Road, Houston, Texas 77099.

DATA STORAGE

■ System Industries, Inc. has announced Winchester disk drives for Digital Equipment Corp., Data General Corp. and Hewlett-Packard Co. minicomputers.

The 9733 offers a transfer rate of 2.458M byte/sec., a 28.3-msec average access time and 337M bytes of unformatted capacity. The 9733 can be used within a System Industries cluster that supports a number of drives, allowing multiple CPUs to access a large common data base.

The 9733 is priced at $10,100, including all hardware and cables needed.

System Industries, 1855 Barber Lane, Milpitas, Calif. 95035.

TERMINALS

■ Ann Arbor Terminals, Inc. has announced an Ansi X3.64 standard alphanumeric and graphics terminal that is said to be compatible with the Tektronix, Inc. 4010 and 4014 with enhancements of the Digital Equipment Corp. VT640.

The Ambassador GXL Plus adds a user-definable character set to the previous capabilities of the GXL. Characters can be preset with graphics instructions, including alternate fonts, schematic symbols or layers of graphics displays.

The terminal includes a 15-in. green phosphor screen with 768- by 600-pixel resolution.

The standard configuration features 18- to 60-line by 80-char. display, two pages of memory, editing capabilities and transmission speeds of 110 to 19.2K bit/sec., according to the vendor.

The product reportedly supports graphics packages such as Tektronix Plot-10, Issco Graphics' Disspla and Tell-A-Graph and SAS Institute, Inc.'s SAS/Graph.

Cost of the GXL Plus is $3,950.

Ann Arbor Terminals, 6175 Jackson Road, Ann Arbor, Mich. 48103.

■ Falco Data Products, Inc. has released its Fame 1078 terminal designed for use in local-area network and protocol converter systems.

The Fame 1078 features an IBM-style keyboard, Digital Equipment Corp. VT102, VT100 and VT52 terminal emulation and IBM 3278 compatibility through the use of a protocol converter.

DEC's PF keys one through four are included. The unit features two pages of memory, 24 shiftable PF keys, double-width, double-height characters and a 14-in. screen. Split-screen operation is said to be standard, as are a pair of independently configured RS-232C communication ports.

It costs $1,095.

Falco Data Products, 1286 Lawrence Station Road, Sunnyvale, Calif. 94089.

■ CIE Terminals, Inc. has introduced an enhanced keyboard for its Digital Equipment Corp. VT220-compatible CIT-220+ monochrome terminal.

The keyboard includes Escape, Backspace and Linefeed keys that allow users to execute special functions in applications programs, editors and operating systems, the vendor said. The keys are also functional in the terminal's VT52, VT100 and VT220 operating modes.

CIE's keyboard includes a Shift-lock LED. The keyboard will be shipped with all CIT-220+ terminals, which are priced at $995.

CIE Terminals, 2505 McCabe Way, Irvine, Calif. 92714.

■ C. Itoh Electronics, Inc. has introduced a series of 14- to 19-in. monochrome and color monitors.

The QMD-1535 is a 15-in. screen monochrome monitor with a dot/line resolution of 750 by 790 pixels and a 0.31 dot pitch. It includes a 256 by 192 display size and is priced at $550.

The QMD-1735 is a 17-in. monochrome monitor with the same resolution and pitch as the 15-in. monitor. It has a diplay size of 300 by 225 pixels, the vendor said. Both monochrome monitors have a 50-MHz video bandwidth and weigh 22 lb. Monitors are available in green, amber and white phosphors.

C. Itoh's QCD-1455 is a 14-in. screen with a dot/line resolution of 720 by 790 pixels, 0.31 dot pitch and a 240- by 180-pixel display. It can display up to 27 colors and includes a 50-MHz frequency raster scanning

Continued on page 84

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Continued from page 83

system. The QCD-1455 is priced at $840.

The QCD-2011 is a 19-in. color monitor with 1,280- by 1,024-dot resolution and a 120-MHz video bandwidth. It has a display size of 338 by 270 pixels and a 0.31 dot pitch. The QCD-2011 is priced at $3,000.

C. Itoh Electronics, 5301 Beethoven St., Los Angeles, Calif. 90066.

PRINTERS/ PLOTTERS

■ **Televideo Systems, Inc. has introduced two daisywheel printers for use with personal computers.**

The TP 760 printer is an enhanced version of Televideo's TP 750 unit. It prints bidirectionally, and it is compatible with the Diablo Systems, Inc. 630 API command set.

The TP 780 letter-quality daisywheel printer features bold and shadow print and is compatible with the Diablo 630 API command set.

The TP 760 costs $419. The TP 780 costs $1,195.

Televideo Systems, P.O. Box 6602, 550 E. Brokaw Road, San Jose, Calif. 95150.

■ **Philips Peripherals, Inc. has introduced its Elpho 20 nonimpact page matrix printer.**

The Elpho 20 is said to produce letter-quality resolution for text and graphics by using electrophotographic recording technology, the vendor said. The machine, which was designed for use in a clustered workstation environment, is said to print 20 page/min with a noise level of less than 50db.

The system has both parallel and serial RS-232 interfaces. The RS-232 interface transfers data at up to 19.2K bit/sec. in full duplex mode.

The system costs $24,900 for the printer with a paper-feed module, a sorter, a paper cassette and toner. The printer alone costs $19,800.

Philips Peripherals, Unit 12, 385 Oyster Point Blvd. S., San Francisco, Calif. 94080.

■ **Dataproducts Corp. has announced three laser printers for its LZR-2600 product line: the LZR-2660, LZR-2665 and LZR-2630 daisywheel emulator model, compatible with the Diablo Systems, Inc. 630 printers.**

The LZR-2660 and LZR-2665 use the Postscript page composition language developed by Adobe Systems, Inc. Postscript is a page description language with bit-mapped image graphics capabilities, containing 13 resident type fonts that can be scaled to any size and placed in any orientation on the page.

The LZR-2630 can be used to replace several daisywheel printers. It can mix up to 64 resident, on-line type fonts on the same page.

All three models feature two input paper cassettes and a manual feed tray.

The LCR-2630 is priced at $14,900, the LZR-2660 is priced at $20,900, and the LZR-2665 is priced at $22,900.

Dataproducts, 6200 Canoga Ave., Woodland Hills, Calif. 91365.

OFFICE SYSTEMS

■ **NBI, Inc. has announced three products that reportedly expand its office automation systems capabilities in document management, micro networking and office communications.**

The Oasys 64/ES cluster integrated control unit is a shared resource system for clustering word processing and personal computing workstations.

It provides 1M byte of memory and is available with 38M, 76M or 168M bytes of disk storage.

Oasys 64/ES is priced from $14,900 to $31,400.

The Team-Up data base management system reportedly allows users to access, update and manage specialized departmental data base applications. Team-Up may be used with any Oasys 2000 workstation attached to the Oasys 64 or 64/ES.

It costs $795 to $2,795.

Multinet Office-Link is an adapter that reportedly allows nodes in an NBI local-area network to be connected with standard telephone wiring instead of special cabling. It allows workstations to be connected to Oasys 64 and Oasys 64/ES interface control units.

Each Multinet Office-Link allows attachment of eight workstations and is priced at $395.

NBI, P.O. Box 9001, Boulder, Colo. 80301.

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Your Connection to Industry Networks

There are also cases where an industry benefits from the efficient exchange of information.

In the property and casualty insur-

CAD

from page 77

lists and graphics picture segments. Base price of the 2020-4228 is $17,995.

Ramtek also announced the 2020-4225 Tektronix-compatible desktop workstation for two-dimensional design applications. The product uses Ramtek's advanced architecture and very large-scale integration circuits and can perform segment creation and editing functions as well as pan and zoom functions, the vendor said.

The 2020-4225 can emulate Digital Equipment Corp.'s VT100 alphanumeric capabilities. The product drives a high-resolution, color raster display monitor and permits a four-color display. A standard RS-232C serial host interface permits asynchronous communications up to 19.2K bit/sec. Base price of the Ramtek 2020-4225 is $10,995.

The company also announced a display controller that reportedly can integrate computer graphics into custom configurations for two-dimensional drafting applications. Ramtek's 2020-4220 can support high-resolution graphics on the IBM Personal Computer and Personal Computer AT, the vendor said. The 2020-4220 is priced at $6,995.

For additional information, Ramtek is located at 2211 Lawson Lane, Santa Clara, Calif. 95050.

TURBO

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byte memory board, is priced at $6,000. The floating-point processor board costs $7,500. The product is scheduled for fourth-quarter availability.

The company also announced the Iris 2300 Unix-based terminal for its 2000 family of graphics workstations. The product is based on the company's Unix implementation and a Motorola, Inc. 68010 microprocessor.

The Iris 2300 was designed to run a terminal emulator program under the company's Unix version, allowing programs developed on the company's stand-alone engineering workstations to run on the Iris 2300 without modification.

The Iris 2300 terminal includes two disk drives, a 20M-byte Winchester disk system and a floppy disk drive for loading software. The product uses the company's Geometry Engine and Geometry Accelerator, two proprietary VLSI circuits that allow the Iris 2300 to perform real-time 3-D graphics computations.

The Iris 2300 is priced at $39,500 and is scheduled for availability this month.

Silicon Graphics is located at 630 Clyde Court, Mountain View, Calif. 94043.

MINIS

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$15,995. A second 68M-byte fixed-disk subsystem and controller costs $5,000. An upgrade kit, which allows DPS 6/22 users to replace an existing 28M-byte fixed-disk subsystem and controller with the newly announced 68M-byte counterpart, costs $7,000. A 64M-byte cartridge tape unit and controller costs $2,700 and memory upgrades to the 1.5M-byte maximum are made in 256K- and 512K-byte increments, which cost $1,750 and $3,500 respectively.

A dual-line communications controller costs $1,250, a second workstation/printer controller and five RS-422 ports costs $1,500, and an HDLC/SDLC controller costs $2,200. A two-slot expansion chassis costs $1,000. The products will be available in September.

The vendor is located at 200 Smith St., Waltham, Mass. 02154.

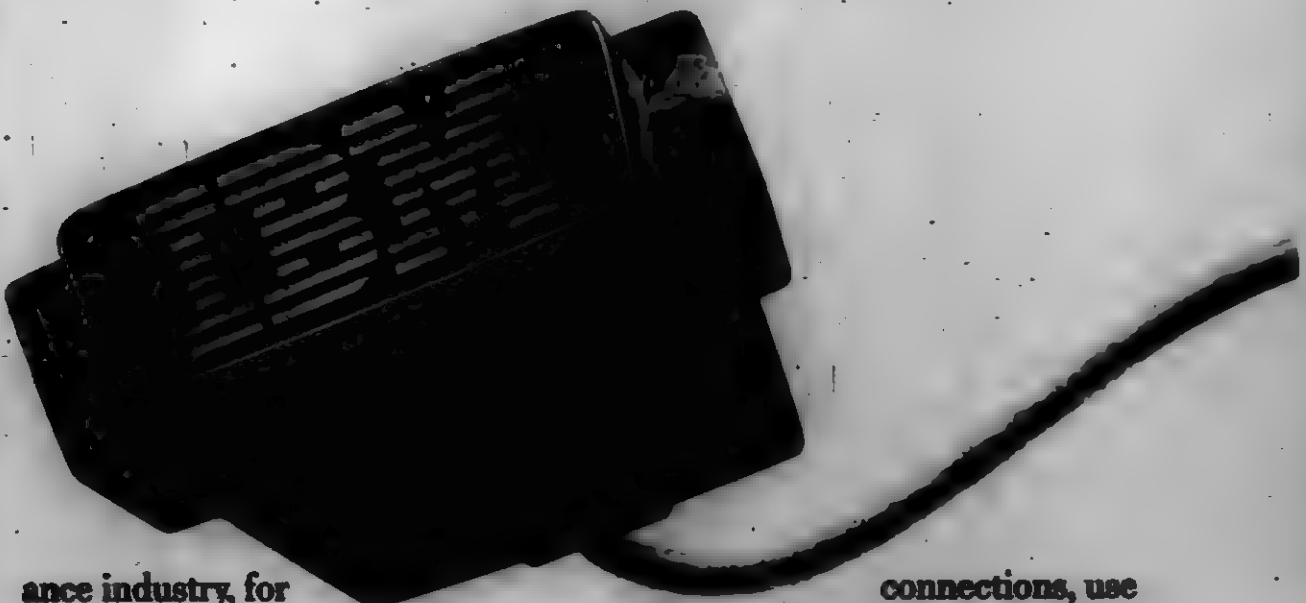
UNITS

from page 77

tion package. The enhancement allows Tandem users to access, from a single terminal, 3270 applications from up to six IBM host processors via IBM's Systems Network Architecture (SNA) or binary synchronous protocols. Users of Tandem 6530 series terminals, Dynamite 6540 series workstations or IBM Personal Computers can run IBM 3270 and Tandem applications at the same time. Those users can also alternate between IBM SNA and binary synchronous host processors through the use of menus. The enhanced emulator has a license fee of $500 for new licenses; however it is a no-charge upgrade for current users of Tandem's 3270 emulation package.

All four products are available immediately.

Tandem is located at 19333 Vallco Pkwy., Cupertino, Calif. 95014.



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IBM Information Network...The Smart Connection

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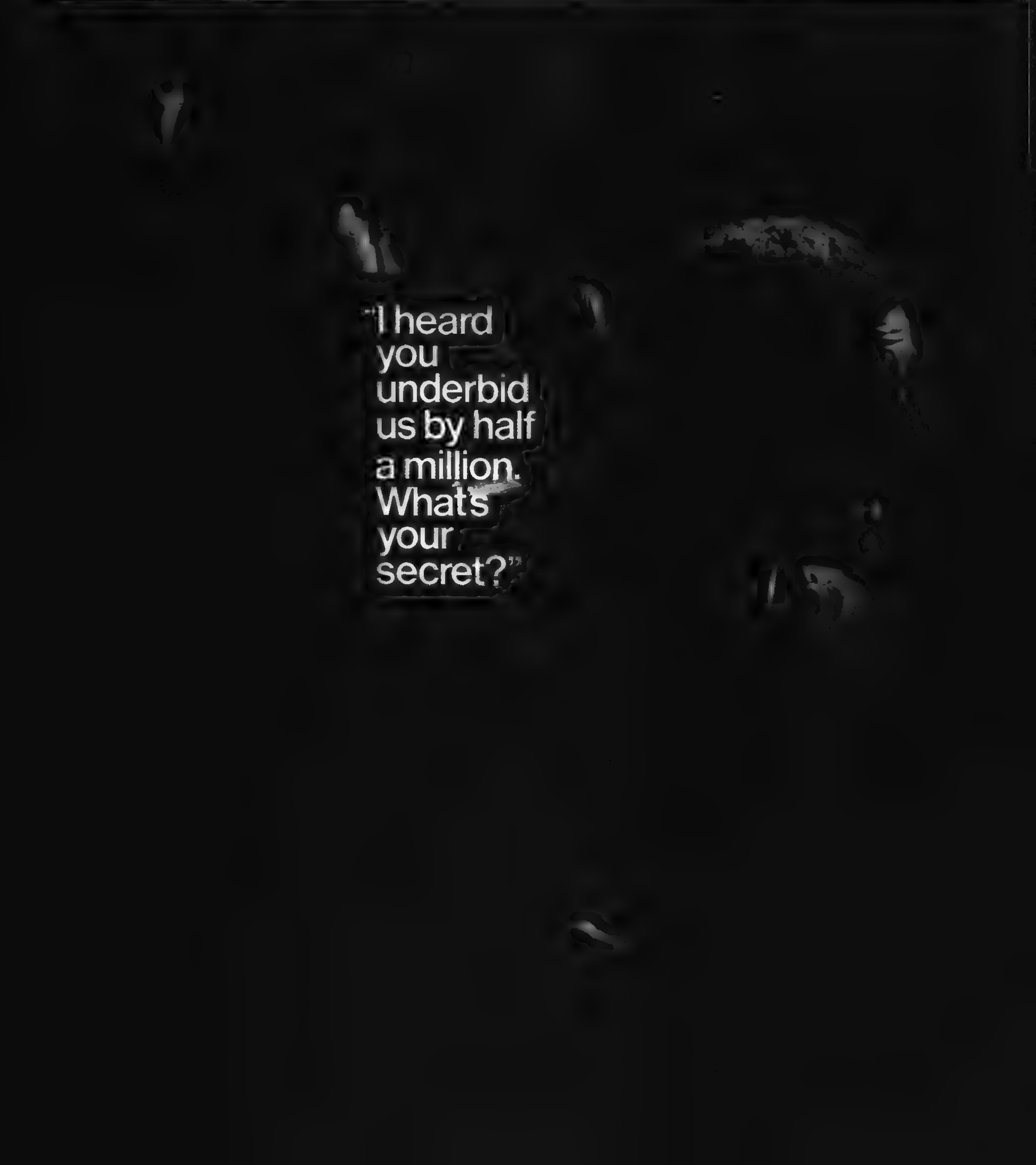
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COMPUTER INDUSTRY

SIA doubts Japanese promises

By Clinton Wilder
CW Staff

SAN JOSE, Calif. — The trade association representing beleaguered U.S. semiconductor vendors has reacted skeptically to plans by the Japanese government and Hitachi Ltd.'s to increase the U.S. share of Japanese markets.

"Hitachi got the train on the right track but didn't move it very far," said Daryl Hatano, manager of governmental affairs for the Semiconductor Industry Association (SIA) based here. With U.S. chip makers' share of the domestic market dwindling, the SIA filed a petition recently with the U.S. Trade Representative seeking more Japanese purchases of American-made chips.

Hitachi announced last month at a Washington, D.C., teleconference that it will increase its purchases of U.S. products by $120 million by the end of 1986. But the SIA claimed that the planned increase represents just 0.5% of Hitachi's projected sales this year and will not significantly alter the current semiconductor trade imbalance.

"If semiconductors represent one-fourth of the U.S. products Hitachi buys this year, we calculate that to be about a $10 million increase in 1985," Hatano said. "Even if the other leading Japanese vendors follow suit for a $50 million increase in U.S. sales, we would still be short of [U.S. sales to Japan in] 1984. That is not the substantial increase in market share that we seek in our petition."

For long-term market share goals to be realized, U.S. chip makers must be treated as primary rather than residual suppliers to Japanese electronics vendors, Hatano said. Without a long-term commitment, U.S. firms will continue to be vulnerable to the boom-and-bust cycles of the volatile semiconductor market, he added.

See JAPAN page 100

Dataserv — third-party IBM hardware store

By Peter Bartolik
CW Staff

HOSKINS, Minn. — A used IBM 4331 Model 1 can be picked up for 11% to 15% of the IBM list price these days. But that same computer is worth more than double the list price to a company based here.

Dataserv, Inc. adds value to the 4331 not by bundling in software and peripherals, but by dismantling the CPU and selling components to third-party maintenance organizations.

Primarily involved in leasing, trading and maintaining IBM equipment, the company initially built its parts operation to service its own third-party maintenance efforts but quickly discovered a profit center opportunity. "We started the business to service ourselves," recalled company President Ronald G. Olson. "Then people started calling us and it turned into a real business."

Started in late 1983, the parts sales grew steadily to generate revenue of $2.3 million in 1984 and is expected to generate more than $7 million this year. The company boasts an inventory valued at $20 million in sales but readily admits it costs much less to accumulate the stocks.

"We're the hardware store for the third-party maintenance industry," said Craig Gillaspey, the head of the parts department who maintains an on-line data base of parts in stock and component alternatives that can be switched among different IBM machines. He said the company has even sold off "five-pound boxes of assorted IBM screws, nuts and bolts" for field maintenance engineers, adding that he would be embarrassed to say how profitable that sideline was.

Like many companies involved in the so-called third-party industry dealing in

See RESALE page 101

Computer industry update

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Unless it can be proven that Japanese semiconductor manufacturers really are engaged in dumping practices, U.S. government involvement in chip trading makes little sense.

If there is one thing we do not need in the computer industry, it is the kind of protection that U.S. car makers received in the past few years. Several studies have pointed out that the result of quotas on Japanese car imports resulted in higher costs all around and little impact on imports.

One striking element of protectionism is that it rewards the lack of ability to compete.

To their credit, most U.S. chip makers have not sought tariffs on imports, rather, they have urged the U.S. government to pressure the Japanese to buy more U.S.-made products.

But the basic creed of the entrepreneurial spirit that supposedly dominates Silicon Valley is that you buy the best product from the most reliable source at the lowest price. If the Japanese truly are able to produce at lower cost, no amount of pressure is going to make U.S. chips a better buy.

As much as cost, the intertwining na-

See CHIP page 100

■ There may be a slump in some segments of the computer industry, but Compaq officials recently declared that the business market for personal computers is still wide open/91

■ Anticipating a decline in revenue, Apollo Computer recently announced its work force will take unpaid leaves during the current quarter/96

■ Computervision recorded its second consecutive quarterly loss but attributed part of it to the costs of cutbacks implemented in the previous quarter/100

Acquisition, merger activity on rise

Software, services survey shows 49% increase in 1985

FORT LEE, N.J. — In the software and services industry, today's buzzword is mergers.

A study from Broadview Associates, compiled twice a year here for members of the Association of Data Processing Service Organizations, Inc. (Adapso), reported the software and services industry experienced a 49% increase in merger and acquisition activity during the first half of 1985. The study also revealed a 42% increase over last year in the number of firms considering mergers. The figures do not include General Motors Corp.'s $2.5 billion acquisition of Electronic Data Systems Corp. (EDS) last year.

There were 82 merger deals consummated during the first half of the year, compared with 55 during the first half of 1984, according to the "Broadview Index," which attributed the rise to the unavailability of funding from venture capitalists and the public market. Of those 82 acquisitions, 63% occurred in software products firms, the study said.

Merger considerations totaled $846.4 million during the first half of 1985, compared with $597.5 million through June of last year, the index said. Among the more notable acquisitions during the first six months of the year is Sterling Software, Inc.'s offer to acquire Informatics General Corp. of Woodland Hills, Calif.

Not only are there more mergers, but this year's mergers are more expensive, the index noted. "Excluding last year's General Motors-EDS deal, the 10 top deals in the first half of 1985 had a greater value than all deals in the first half of last year," said George Grodahl, a partner with Broadview Associates. According to the "Broadview Index," firms looking for acquisitions are seeking older, more mature companies and not burgeoning start-ups.

About 62% of the merger deals consummated during the first half of the year were made by companies seeking an expanded role within the software industry, while 28% came from major corporations seeking to expand their position within the software and services industry.

Broadview Associates is located at 2115 Linwood Ave., Fort Lee, N.J., 07024.

Bankruptcy court approves Ztel plan

WILMINGTON, Mass. — Ztel, Inc. recently announced it had received approval of its reorganization plan from the U.S. Bankruptcy Court and emerged from U.S. Federal Bankruptcy Act Chapter 11 proceedings only 79 days after filing for protection.

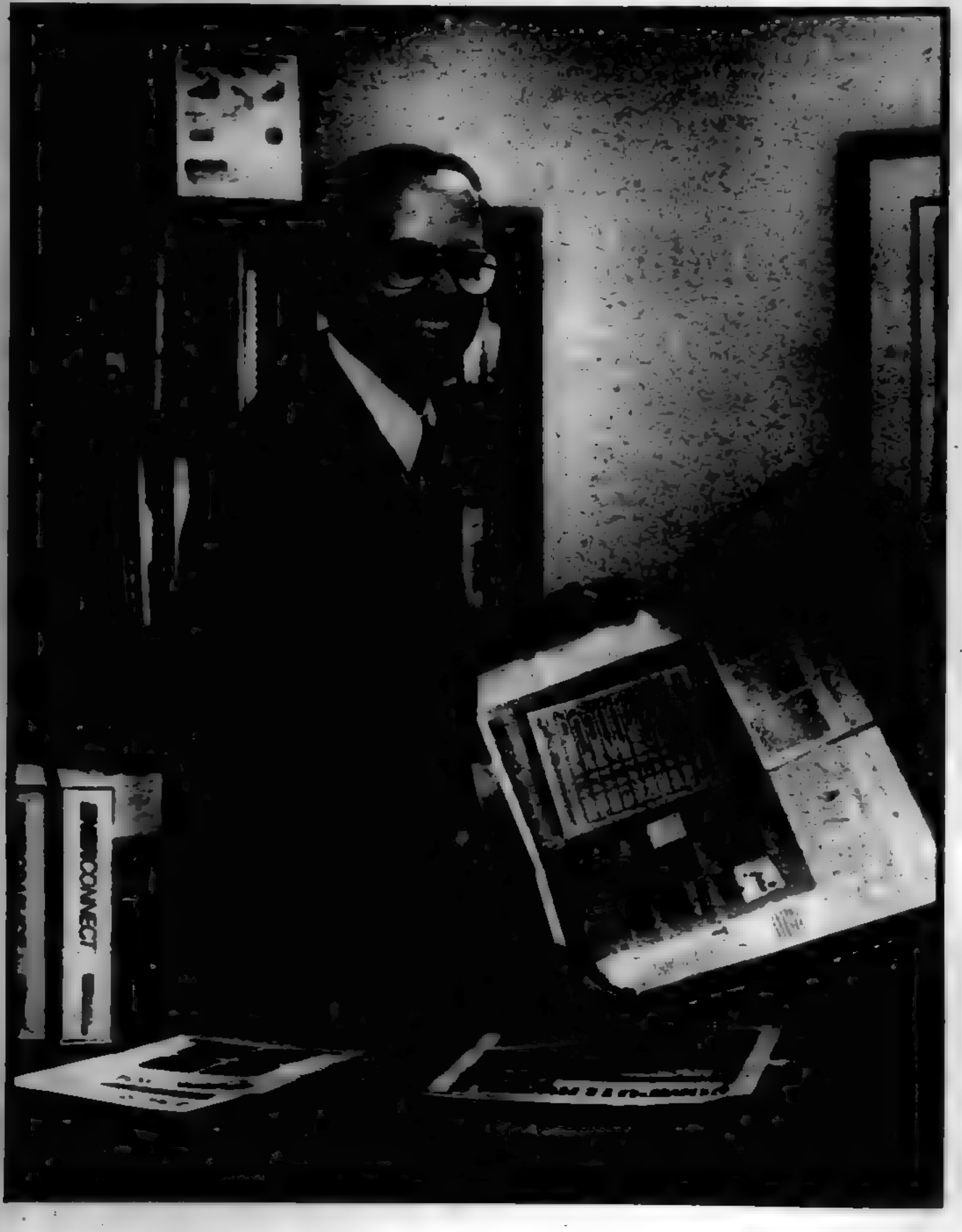
The company said the plan calls for 100% repayment of creditors.

Ztel will receive $17 million in capital in exchange for new Class A preferred stock issued to investors General Electric Venture Capital Fund, NCR Corp., Hillman Co. and subsidiaries and Harvest Ventures.

Murray H. Bolt, president and chief executive officer, said that the firm is now in a position "to pursue [actively] new distributor agreements and additional end-user installations and to step up our manufacturing and marketing operations to meet those demands."

The company, based here, is a manufacturer of an integrated voice/data private branch exchange system.

“Two ads in Computerworld Focus flooded us with inquiries on our new micro product, EnerConnect.”



EnerConnect is the second major micro product from Enertronics, developers of the successful EnerGraphics package. As the ad for EnerConnect says, it is “. . . the first software package that puts mainframe graphics capability into the hands of anyone with an IBM PC . . . or 3270 PC.”

When it came time to announce EnerConnect, Randy Andes decided to use *Information Week*, *Business Week*, and *Computerworld Focus*. As Randy puts it, “. . . we knew *Computerworld* reached the people we need to talk to from past ads for EnerGraphics, and we decided to test *Focus* because, as the name says, each issue focuses on a topic. So, we could select an appropriate editorial environment.”

The results? “*Computerworld Focus* has produced the most response of any of the publications used and, by far, the best response. In fact, total response (via the 800 number) has far exceeded expectations. We further intend to continue to tie into *Computerworld's* editorial calendar where appropriate.”

The moral? Well focused advertising in a well focused medium will produce the best results every time.

Call your *Computerworld* advertising representative for more details on upcoming issues of *Computerworld Focus*.

Randy T. Andes, Director of Marketing,
Enertronics Research, Inc., St. Louis, Missouri.

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Compaq bucks trend, posts second-quarter gains

Cites unsaturated business market

By Eric Bender
CW Staff

NEW YORK — Claiming that the business micro market keeps growing despite the overall industry slump, Compaq Computer Corp. recently posted second-quarter sales of $118.9 million, showing a 22.5% increase over first-quarter results and an 80% boost over second-quarter 1984 revenue.

Net income for the quarter just ended reached $5.7 million, a 536% gain over $892,000 in the corresponding quarter last year.

"We're in the strongest position we've ever been in," President Rod Canion told securities analysts here.

> ”
>
> *'We still have 70% to 80% of the market ahead of us.'*
>
> — Michael Swavely
> Compaq Computer Corp.

Despite industry reports of slowing sales, "the business personal computer market is clearly not saturated at this point," Marketing Vice-President Michael Swavely said. Estimating that between 10 million and 12 million micros have been placed among the more than 53 million U.S. white-collar workers, Swavely maintained that "we still have 70% to 80% of the market ahead of us."

Canion said he expects Compaq to maintain current pricing on its systems, noting that the Houston firm traditionally has pegged its prices to IBM's and predicting that IBM will not announce major price reductions this year. "They learned a good lesson last year," he said. "They cut prices 20%, and unit sales didn't go up. That kind of performance doesn't go unnoticed in Armonk [N.Y.]."

Demand among large corporations continues to be strong, Swavely said, citing a recent survey of the Westchester County Corporate Micro Users Group, which found member companies planning to purchase 39% more microcomputers during the next 12 months than the total number in their installed bases.

"We're still seeing a number of companies that have only just made a commitment to personal computers," Swavely said. The share of Compaq products going into Fortune 1,000 firms has increased in the past year, he added.

The Houston manufacturer also has found that "the majority of today's personal computer buyers are repeat buyers," Swavely said. Studies showed that 57% of the company's customers were repeat buyers in April, up from 37% last September.

"This plays to Compaq's strength," as experienced users look for added functionality, Swavely said. These users pass their micros along to first-time users, and "the importance of [IBM] compatibility is magnified by the trickle-down effect," he said.

More than 10,000 of Compaq's new Intel Corp. 80286-based systems shipped in the two months following their April introduction, Canion said, adding that he expects production to catch up with demand in the third quarter.

Compaq has shipped more than 300,000 personal computers, which represents almost one-tenth of IBM's estimated deliveries, Canion said. He presented estimates of overall U.S. retail sales of business micros that showed IBM with a 63% share, Compaq with 16%, Apple Computer, Inc. with 12% and AT&T with 4%. Other contenders "have just about gone away," he said.

He also noted that the firm's Compaq Telecommunications Corp. subsidiary began volume shipments of its Telecompaq voice/data workstation to OEM customers in July and said that the firm is "very close to additional major deals."

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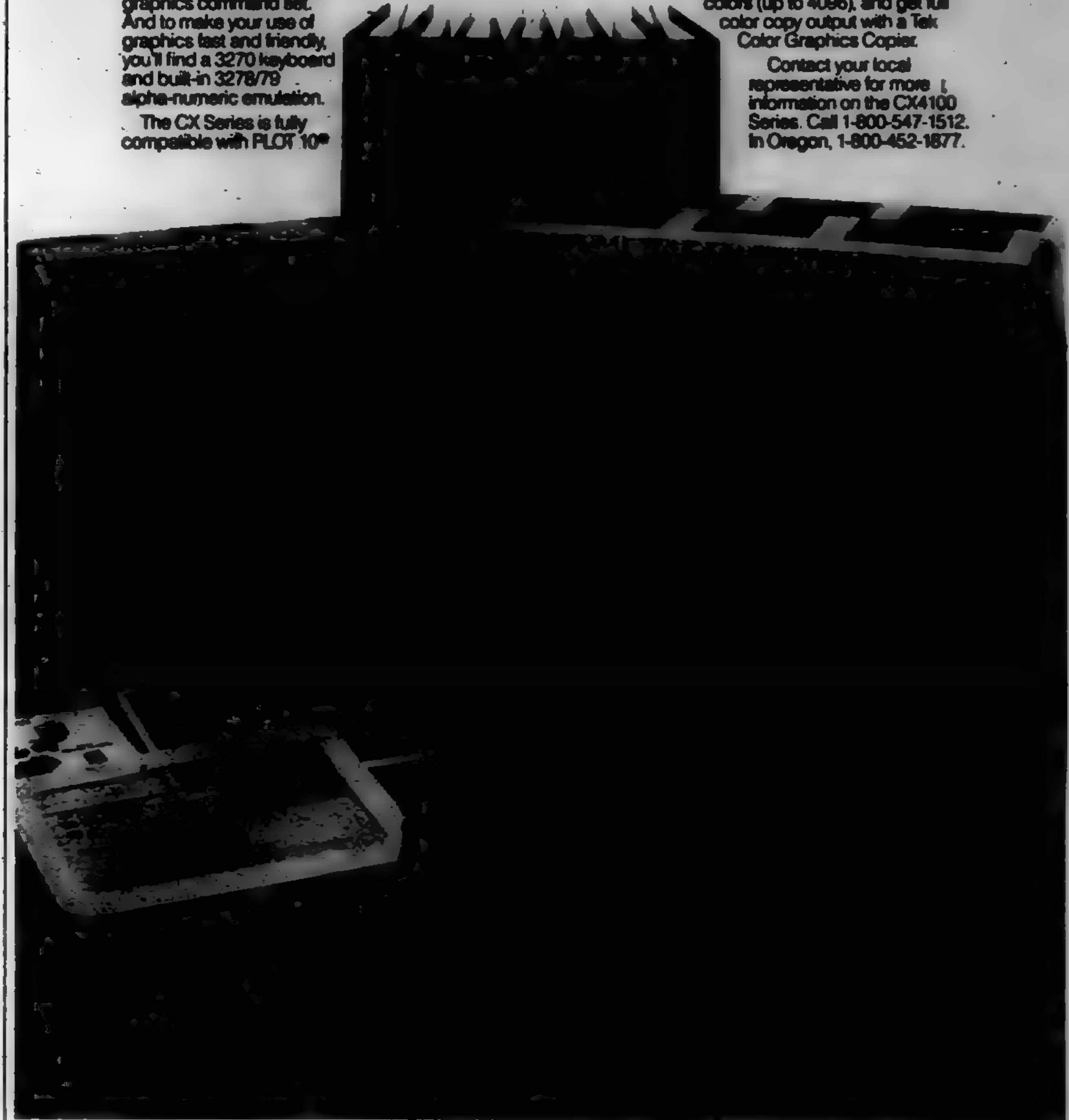

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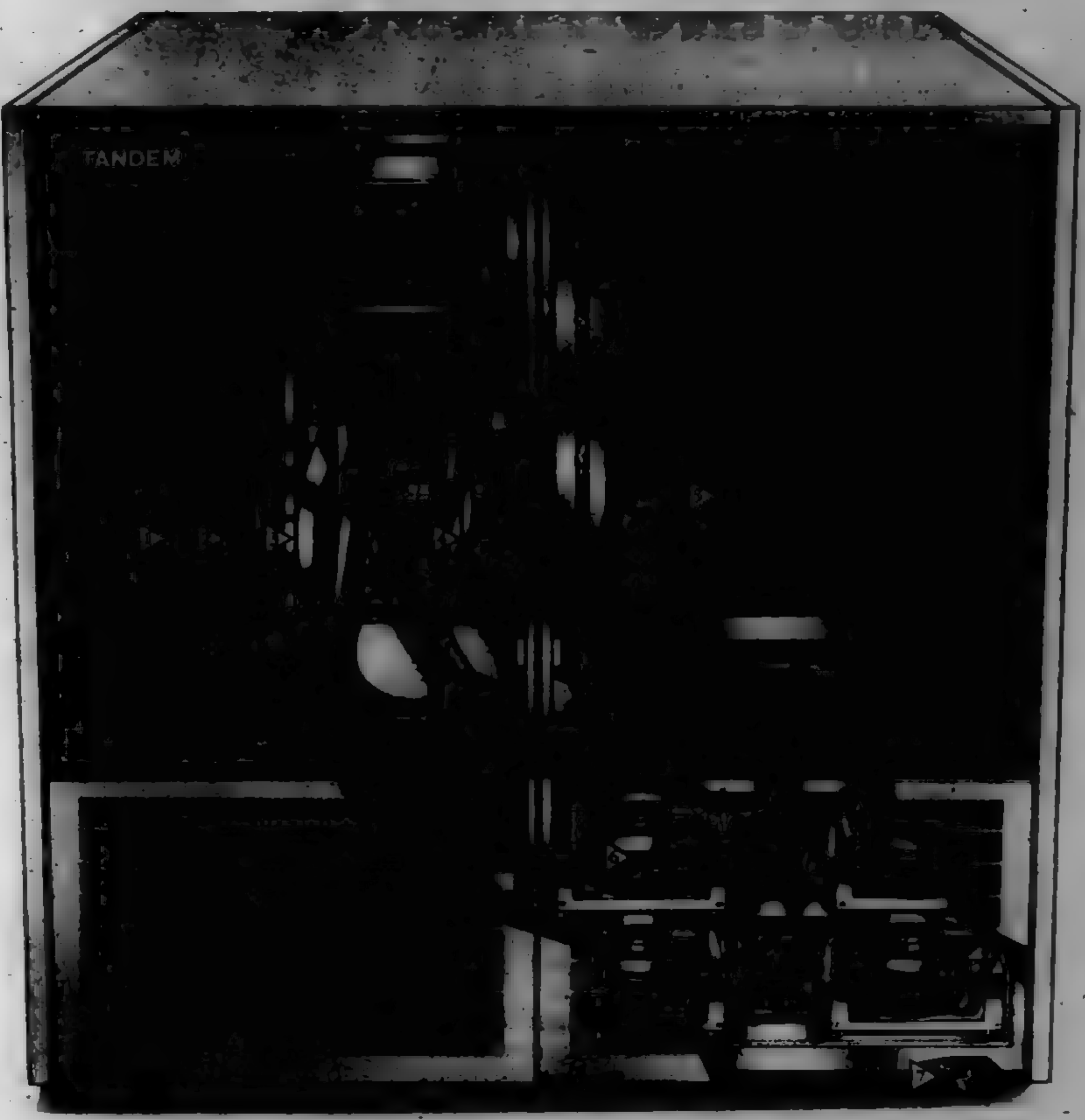

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Vendor restrictions should not stifle user's creativity

OUTSIDE LINES

L. J. Kutten

Do developers of computer programs have any claim to works created with the help of their programs?

Until recently I assumed without thinking the answer to such a question was no. But then I received the Videoworks software program from Hayden Software Co.

Videoworks is an animation package for the Apple Computer, Inc. Macintosh. It allows the user to produce professional-quality animation that can be used to create cartoons, business presentations and the like. It is an excellent program that does what it is advertised to do. However, product literature says the program cannot be used in a commercial setting. Right below the copyright notice is the following statement:

"Warning: This reservation covers art shown by this software as well as the software itself. Purchasers of copies of this software may view and reproduce such art for noncommercial enjoyment purposes only."

A Hayden representative initially maintained that this statement meant exactly what it said: any commercial use, including in-house commercial use, was prohibited. If commercial use was intended, an additional license would have to be obtained from Hayden.

After I had several discussions with both Hayden and the author of the program, Hayden reversed itself and announced that commercial use was not prohibited.

But the incident started me thinking about the nature of a work "co-authored" by a computer program.

Why couldn't this reservation be legal? From Hayden's viewpoint, one could argue that actually displaying a finished product with Videoworks is only possible because of the creative contribution of Videoworks' creators. Without it, no one could create this type of animation. The problem with accepting this argument is that it can equally apply to data base, word processing, spreadsheet and other programs.

After some serious reflection, I realized why Hayden's analysis was wrong. Copyrighted software has one fundamental difference from all other types of copyrighted material; it is nothing more than a tool to accomplish an end.

No tool manufacturer would claim that the tool created the work. A tool is just an instrument to create something.

A typewriter or Micropro International Corp.'s Wordstar does not write a book, a person does; a paint manufacturer does not create a painting, a person does. Likewise, Videoworks does not create the animation, a user does. In this sense Videoworks is no different than any other tool used by people to express their creativity.

Society benefits from encouraging creativity; new products are constantly being developed. Limiting the ways people can use a particular tool limits their creativity. And even Hayden itself must acknowledge that without creativity Videoworks itself would never have been created.

Kutten is a writer specializing in computer law topics. He is a member of the bar in Illinois and Missouri and the author of Computer Buyer's Protection Guide, *published last year by Prentice-Hall, Inc.*

Profits rise at Comdisco

ROSEMONT, Ill. — Comdisco, Inc., the largest publicly held computer dealer and lessor, recently announced third-quarter profits of $18 million, or 67 cents per share, including approximately $7.7 million in revised estimated tax benefits.

The profit compared with year-earlier profit of $6.99 million, or 25 cents per share.

The company said that during the quarter just ended, it filed for a refund of $14.6 million in federal income taxes paid in prior years due to a carryback of investment tax credits. The refund will be received during the fourth quarter and added to investment tax credits recognized in estimating the tax rate for the current year. This resulted in reducing the previously reported six-month tax rate of 19% to 1% for the entire year.

Pretax profits in the quarter amounted to $12.6 million, compared with $8.8 million a year earlier.

Revenue for the quarter was $149.3 million, up from $133.1 million a year earlier.

Kenneth N. Pontikes, chairman and president of Comdisco, said that IBM's recently announced products and expedited delivery schedules for the 3090 mainframe "will stimulate market activity for both new and used equipment, further enhancing our earnings opportunities." He said the company's diversified subsidiaries continued to contribute steadily to overall results.

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Zaisan files Chapter 11 plea

HOUSTON — Zaisan, Inc. a manufacturer of integrated voice/data workstations, recently announced it has filed for reorganization protection under Chapter 11 of the U.S. Federal Bankruptcy Act.

The company said it will continue operations and named Donald F. Bynum as president and chief executive officer. Bynum previously guided Dallas-based Micro Craft Corp. through Chapter 11 proceedings. Mark Fowler, former Zaisan president, resigned in the spring.

In its Chapter 11 petition, the firm cited high start-up costs and costs attributed to an earlier attempt to sell its products through retail distribution channels. The company manufactures the ES.1 voice/data terminal and ES.3 IBM Personal Computer-compatible workstation.

The company had been reevaluating its situation since January, when it brought in a team of consultants to examine operations, according to spokeswoman Wendy Roloff. In April, the company reduced employment to fewer than 35 people, down from a high of 180 last summer.

Digital Research inks buy-in pact

MONTEREY, Calif. — Digital Research, Inc. recently announced that both Northern Telecom, Inc. and Motorola, Inc. signed agreements to purchase minority equity interests in the microcomputer software firm.

Gary Kidall, founder and chairman of the board at Digital Research, said "This vote of confidence from these two companies provides strong capital support to continue the development and launch of our very well-received [Graphics Environment Manager] product line and the family of Concurrent DOS operating systems."

Digital Research said the investments are not a step toward acquisition and that both firms are limited to holding minority shares in the company.

The agreement reportedly provides Northern Telecom with 15% of Digital Research shares and Motorola with 7.5%, for an estimated total cash infusion of $9 million.

Privately held Digital Research has reportedly been under financial pressure in recent months as it sought to formalize product strategies to duplicate its earlier success with CP/M.

Apollo institutes cost-cutting acts

CHELMSFORD, Mass. — Anticipating a third-quarter decrease in revenue, Apollo Computer, Inc. recently announced it has implemented cost-reduction measures, including a mandatory six-day leave for most employees.

The company said that employees will not be paid for the leaves, which are to be taken during this quarter. Salesmen will not be affected by the mandatory leave but will receive a 7.5% reduction in base pay, the company said.

Additionally, the company's component manufacturing operations will be moved to a new facility in New Hampshire, and all affected employees will be offered positions there in New Hampshire, the company said.

"We currently face the probability of a sequential quarterly decrease in revenue in the third quarter, due to a depressed order rate, seasonal factors in international markets and product transitions," said Thomas A. Vanderslice, Apollo's president and chief executive officer. However, he added that the company is well positioned to benefit from a recovery in sales.

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Revenue rises at Informatics

WOODLAND HILLS, Calif. — Informatics General Corp., manufacturer of the Answer/DB data base management system, reported a 25% increase in revenue for the second quarter ended June 30 compared with the same quarter a year ago.

Informatics said second-quarter revenue was $55.4 million compared with $44.5 million the previous year.

Although it realized a jump in sales, Informatics reported a net decline of $579,000 in profits compared with a gain of $611,000 during the second quarter of 1984. The company attributed the loss to $2 million in expenses incurred during its proxy contest earlier this year with Sterling Software, Inc. of Dallas.

Paradyne takes quarterly loss

LARGO, Fla. — Paradyne Corp. reported a loss of $9.2 million, or 41 cents per share, for the second quarter ended June 30, compared with a profit of $2.4 million, or 11 cents per share, during the like 1984 quarter.

Revenue at the data communications equipment company was $66 million for the second quarter compared with $70.5 million during the second quarter of 1984.

For the six months ended June 30, Paradyne reported a net loss of $9.04 million compared with a net profit of $5.3 million for the same six-month period a year ago.

The loss included a $10 million pretax provision for slow-moving and obsolete inventory and off-lease equipment, a spokesman said. Paradyne President Robert Wiggins attributed the profit loss to an industrywide sales slowdown, losses in its UK subsidiary and an $800,000 pretax expense related to the company's new circuit board facility.

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Lotus adds three divisions in company reorganization

CAMBRIDGE, Mass. — Lotus Development Corp. recently created three additional divisions to reorganize the company around a total of five divisions.

Previously, Lotus had operated the Engineering and Scientific Products Division and the Publishing Division.

The Business Products Division was created to market the company's existing software products and develop and market new products targeted at general business managers. Charles Digate, former vice-president of marketing, was named vice-president and general manager of the division.

Irfan Salim, former director of international operations, was named vice-president of the International Division to direct worldwide operations.

The Information Services Division was formed to manage and expand products produced by Dataspeed, Inc., of San Mateo, Calif. Shareholders of Dataspeed, which manufactures two products that receive real-time stock quotations, recently approved the $6.5 million sale of the company to Lotus.

Multinational forum eyes office systems technologies

Managers to exchange corporate information

By Peter Bartolik
CW Staff

BOSTON — Managing the implementation of advanced technologies in the office may soon take on a multinational flavor with top executives on both sides of the Atlantic exchanging information on the changing corporate environment.

The Office Technology Research Group, based in Los Angeles, recently announced it had established European offices in London and Brussels. Office Technology Research Europe will emulate the 8-year-old U.S. group's history of bringing together senior executives from major corporations to address management issues arising from the introduction of advanced technologies in the office.

John J. Connell, executive director of the U.S. group, said in a recent interview here that the European venture will provide a forum for European executives to learn from each other, provide them with implementation strategies adopted in the U.S. and give U.S. and Canadian executives some insight into what is going on in Europe.

"There will be information flowing both ways," Connell said. North American executives may gain valuable insight in "those areas where the Europeans have perhaps more progressive ideas than we have — ergonomics for example," He noted that "a concern for the impact of technology on people is much stronger in Europe than it is here."

Connell started the group in 1977, and it has met semiannually "as a forum where managers from large companies can share with each other what they are doing in the world of advanced office systems and what they are learning from it." The group also distributes newsletters and updates of its 10-volume "Office of the Future" library to members.

Connell's group focuses on the impact technologies have on management processes, organizational relationships and other factors involved in determining how a business should be run. One area of continuing concern "is how do you measure the gain that you may receive from these systems," he said. "How do you estimate it, and then after you put the system in, how do you measure it? If you want to call it productivity, how do you measure productivity?"

North American subscribers to the group number approximately 44 from among the Fortune 200, including Hughes Aircraft Co., Security Pacific National Bank, Atlantic Richfield Co., Northern Telecom, Inc. and General Dynamics Corp.

"The member companies are of a size where they are willing to experiment a bit with very advanced technology," he said. In addition to swapping case histories, the members have formed a networking resource, and Connell said he hopes to extend that network across the Atlantic.

Prior to forming the group, Connell was deeply involved in technological implementation as vice-president of administrative services with Atlantic Richfield where he functioned as the top MIS person. "But I was also responsible for telecommunications and all the office administration," he said.

"When the drive to move machines into the office really took off, in the mid-70s, I was responsible for that at [Atlantic Richfield], and it became apparent to me there were a . . . lot more answers than questions." That led him to create a forum for executives to discuss how to manage the vast technology resources being tossed on the market.

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The offer is made only by the Prospectus.

CTG

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NICKELS AND DIMES

Tektronix, Inc. reported revenue of $86.3 million and a net loss of $19.4 million, or 93 cents per share, for the fiscal quarter ended June 29.

This compared with revenue of $121.5 million and profits of $8.8 million, or 42 cents per share, for the same period a year ago.

■

Lee Data Corp. announced revenue for its first quarter ended June 30 of $21.8 million, compared with $23.9 million in the same quarter last year. Profits were $866,000, or 6 cents per share, compared with $2 million, or 15 cents per share, in the same period one year earlier.

■

Software AG recently announced revenue for its fiscal year ended May 31 of $52.3 million, compared with $39.6 million in the prior year. Profits were $6.7 million, or $1.12 per share, compared with $5.1 million, or 83 cents per share, in the comparable period last year.

For the fourth quarter, revenue was $14.1 million, or 17 cents per share, compared with $10.5 million, or 17 cents per share, for the same period of the prior year.

■

Computer Task Group, Inc. reported revenue for the second quarter ended June 30 of $28.2 million, an increase of 51% over $18.6 million reported in the same quarter one year ago. Profits were $893,000, or 26 cents per share, compared with $511,000, or 17 cents per share, in the comparable period one year earlier.

The company's revenue and earnings per share for the 12 months ended June 30 were $101 million and 90 cents, respectively.

■

Compugraphic Corp. reported revenue of $105.1 million for the quarter ended June 29, compared with $94.8 million for the second quarter last year. Profits were $8.3 million, or $1.01 per share, compared with $6 million, or 72 cents per share, in the same quarter last year.

During the quarter, Compugraphic sold its French and West German subsidiaries, resulting in a gain on the sale and the recognition of income related to previously eliminated intercompany profit in inventory. The effect of these transactions was net income of $1.9 million, or 23 cents per share, which is included in the reported figures.

■

Teradyne, Inc. reported revenue for the quarter ended June 29 of $85.9 million, compared with $93.6 million in the year-earlier quarter. Profits were $3.8 million, or 16 cents per share, compared with $10.6 million, or 46 cents per share, in the comparable quarter one year earlier.

■

Quantum Corp. announced revenue for the first quarter of fiscal 1986, ended June 30, of $34 million, compared with $25.3 million in last year's quarter. Profits were $5.7 million, or 60 cents per share, compared with $4.2 million, or 45 cents per share, in the same period last year.

■

VM Software, Inc. reported revenue for the second quarter of $4.2 million, compared with $2.7 million in the same quarter last year. Profits were $590,543, or 16 cents per share, compared with $527,113, or 15 cents per share, for the second quarter last year.

■

Lexidata Corp. reported revenue of $6.3 million, with a net loss of $1.2 million, or 17 cents per share, for the 13-week period ended June 29.

These results compare with revenue of $9.4 million, and a net loss of $300,000, or 5 cents per share, for the comparable period in the last fiscal year.

SUPERSHORTS

Atex, Inc., a subsidiary of Eastman Kodak Co., recently announced it has reduced its U.S.-based work force by 260 people. The company said it eliminated redundant positions and consolidated administrative operations.

Atex said there is continued strong demand for its computer-based publishing systems.

■

Fujitsu America, Inc., a telecommunications, computer and office automation products firm, officially broke ground in Hillsboro, Ore., for a $30 million, 144,000-sq-ft plant.

The Fujitsu facility, located 20 miles west of Portland, Ore., will open in the spring of 1986. It will reportedly manufacture computer disk drives and related disk products, eventually employing more than 400 workers.

■

U.S. Bankruptcy Court Judge Lawrence Dilason signed an order dismissing the Federal Bancruptcy Act Chapter 11 case of **Digidyne Corp.** of San Diego, based on the company's commitment to pay all undisputed trade claims in full.

■

The **Data Systems Group of Texas Instruments, Inc.** announced it has signed a three-year, multimillion-dollar contract to deliver systems, including hardware and software, to **Sperry Corp.**

■

A consolidation of **ITT Industrial Credit Co.** into the operations of ITT **Commercial Finance Corp.** has been announced by Melvin Brown, president and chief executive officer of ITT Commercial Finance.

Computervision posts second-quarter loss

BEDFORD, Mass. — Computervision Corp., which dismissed 950 workers in April, recently announced its second consecutive losing quarter.

The company said it posted a loss of $19.6 million, or 68 cents per share, for the quarter ended June 30. In the year-earlier quarter, when the company was growing at a 40% rate, profits were $11 million, or 38 cents per share.

The second-quarter loss was slightly more than the first-quarter loss of $18.7 million.

Revenue in the quarter just ended was $112.2 million, down from $133.6 million a year earlier.

James R. Berrett, Computervision's president and chief executive officer, said the second-quarter loss included $5.7 million related to streamlining expenses. Included in those costs, he said, were provisions for disposal of surplus facilities, severance costs and other adjustments.

Xerox reports profits, revenue up for quarter

STAMFORD, Conn. — Xerox Corp. recently announced that continuing operations of its Reprographics and Informations Systems business generated second-quarter revenue of $2.14 billion, up 3% from $2.07 billion a year earlier.

Profits from that group were $102 million, up 9% from $94 million a year earlier, the company said.

Overall, including Xerox's financial services operations, the company posted profits from continuing operations of $118 million, or $1.11 per share, up 35% from year-earlier profits of $88 million, or 79 cents per share.

Including discontinued operations, Xerox reported profits of $221 million, or $2.17 per share, compared with year-earlier profits of $96 million, or 87 cents per share. In the fourth quarter of the previous fiscal year, the company discontinued operations of its Shugart subsidiary and is currently selling off several publishing units.

JAPAN

from page [illegible]

"The Japanese didn't cause the current industry downturn, but they have intensified it," Hatano said. "When there's a drop in the market, being a residual supplier amplifies the down cycle, because purchases from the residuals are cut back more than those from the main [Japanese] suppliers. We want to be treated equally."

Echoing the generally cool response from the U.S. Congress and the Reagan administration, Hatano said the three-year, market-opening plan the Japanese government unveiled would have little effect on the U.S. semiconductor industry woes. Practices such as easing Japanese standardization requirements would have no impact on the key issue — the buying patterns of Japan's largest electronics firms, Hatano contended.

"The government plan doesn't hit at all what we're dealing with," he said.

Last week, the International Trade Commission (ITC) ruled favorably on a petition filed by Micron Technology, Inc. of Boise, Idaho, alleging dumping of 64K-byte memory chips. The ITC ruling, a preliminary finding that dumping is hurting domestic manufacturers, will result in a formal investigation by the U.S. Department of Commerce.

CHIP

from page [illegible]

ture of the Japanese business community is said to result in Japanese businessmen buying from Japanese businessmen. There is little anyone can do to halt such a practice. But there is also nothing to prevent U.S. businessmen taking the same approach and buying domestic products — except the creed for getting the best deal.

■

Ah, if only I had a big brother like the one Electronic Data Systems Corp. (EDS) has.

EDS was acquired last year by General Motors Corp. In a recent financial report, EDS said profits for the second quarter jumped 126% to $42.4 million. Revenue jumped 236% from $224.4 million a year ago to $755.2 million.

Although revenue from outside customers increased respectably, it was the $514.1 million that GM and subsidiaries payed into EDS that made the big difference.

■

The "Bring Back PCjr" campaign [CW, July 22] aimed at IBM has gone national, with chapters now in Framingham, Mass., and Provo, Utah. Can an Armonk, N.Y., chapter be far behind?

With the ground swell growing, it remains to be seen how long IBM can ignore users who want the processor pachyderm to live up to its marketing promises for future PCjr add-ons.

Although the opening of the western chapter marks a significant victory, the timing coincided with a stinging defeat. *Computerworld*'s media cousin, *PC World*, after running "The PCjr Survival Kit" in its July "PCjr World" insert, apparently has given up hope. With nary a word to the faithful, the West Coast magazine dropped the PCjr insert from its August edition. The ghost of microprocessors past shall surely start visiting Publisher David Bunnell.

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RESALE

from page 89

resale of new and used IBM equipment, Dataserv has found success by offering something that IBM is unable or unwilling to deliver. In the parts business, overnight delivery of used IBM components can be worth more than a six-month lag time for new components; the company also stocks new parts from IBM.

But Dataserv is not bashful about competing directly with IBM. Armed with studies designating it the sixth-largest third-party computer maintenance organization, the firm has implemented a depot maintenance and service agreement with State Farm Life Insurance Co. in contiguous sales territories dividing the nation from the Canadian border to Texas.

Jim Meyers, company founder and president of the Dataserv Computer Maintenance, Inc. division, said he hopes to win a national agreement with State Farm but readily admits that "IBM will fight us dearly for that."

Concerned about IBM

The company also is concerned that IBM may become more aggressive in the parts business if the U.S. Department of Justice recommends approval of IBM's request to eliminate a 1956 consent decree. That court-sanctioned decree not only required IBM to end its lease-only equipment practice but also required it to sell parts and subassemblies on a nondiscriminating basis.

"If the consent decree is irrelevant [as IBM has claimed], why not leave it in place?" Meyers said. "Since the decree was put in place, nothing has really changed."

The supply of IBM parts is crucial to the maintenance business. And, Olson noted, "The greatest profit opportunity over the next five years is in the maintenance business."

Dataserv has revolved around IBM's world since Meyers started the company in 1969. IBM-related operations contributed greatly to the firm's 1984 revenue of $109.9 million and profits of $2.1 million.

Its initial thrust, and still a vital component of total revenue, was in trading and later leasing IBM 1490 check sorter devices. Although 12 years old and since replaced by the 3890 document processor, the 1490 still retains one-third of its value, according to Meyers. "We provide more check sorters [both older and newer models] than anybody other than IBM," he said. The company claims as customers 15 of the top 20 U.S. banks.

According to Meyers and Olson, equipment sales and lease revenue is about evenly derived from check sorters, 80% of which are leased; CPUs, about half of which are leased and half traded; and point-of-sale (POS) equipment, which is mainly a trading business and the only segment not dominated by IBM equipment. Trading in used POS equipment and reselling replaced equipment has been a profitable business that has gained the company an entry to provide maintenance service to retail operations, the company said.

Dataserv does much of its business on a transcontinental basis. For several years, the company had conducted business with a similarly structured firm based in London, the Premier Computers Ltd. group, which operates in several European countries. In 1980, the firms merged, retaining the officers of both companies.

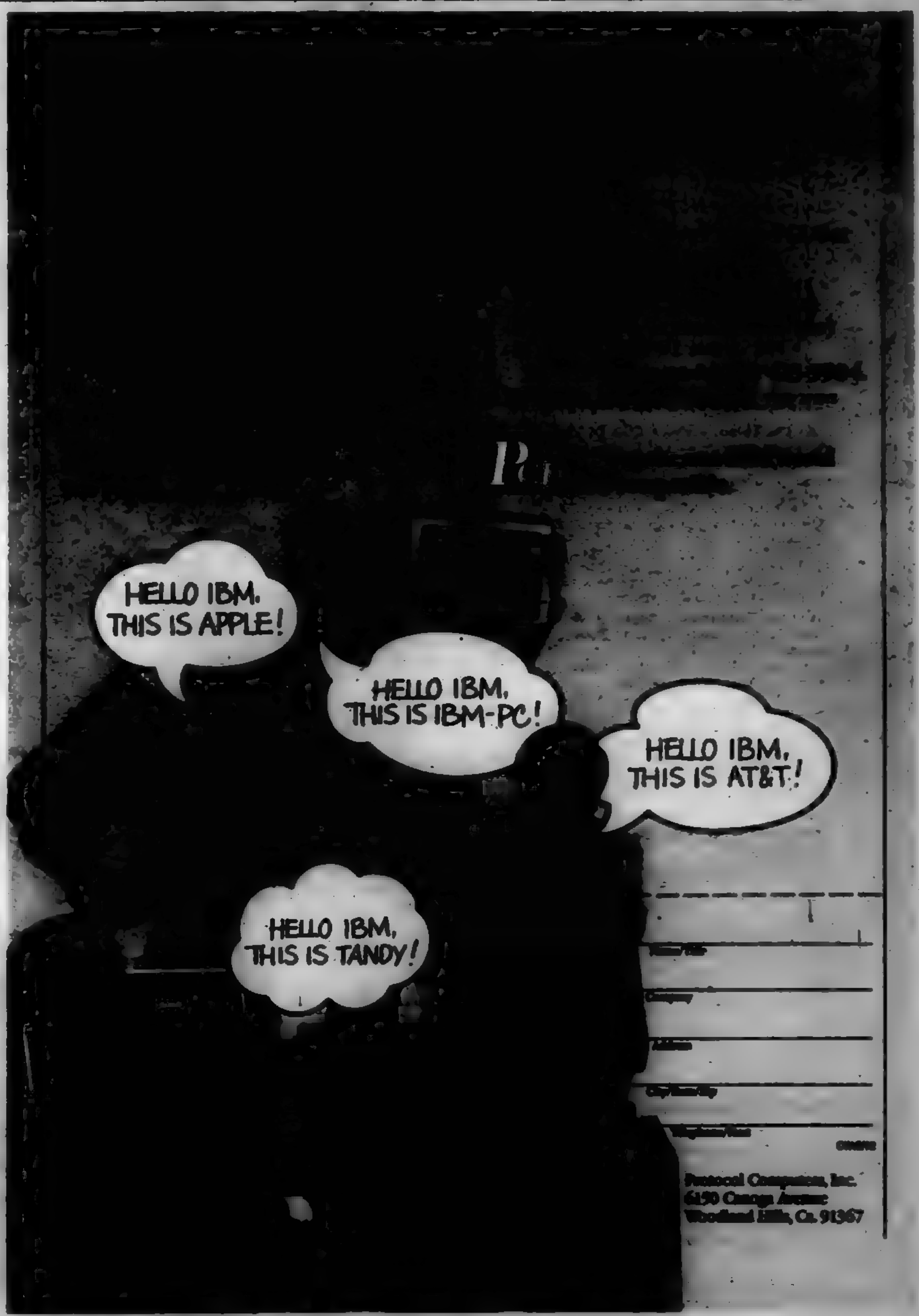
Before the merger, Olson said that Premier "would provide us with a lot of check sorters from big banks in London; we'd bring them over here and convert them [to U.S. power configuration]."

Buy-out talks led to merger

When the companies started running into competitive conflicts, buy-out discussions eventually led to a merger, he said. In 1984, U.S. operations generated revenue of $64.5 million, and European operations generated $45.5 million.

In late 1983, faced with the need to raise outside capital to fund expansion plans, the merged company issued a public offering in London. "We thought the cost of the offering [in London] was about 60% to 70% of making the offering in the U.S.," Olson said.

In addition to a more receptive market in the UK than in the U.S. at the time, the move adds a little prestige. "We have a listing on the London exchange, instead of being listed over the counter in the U.S.," he said.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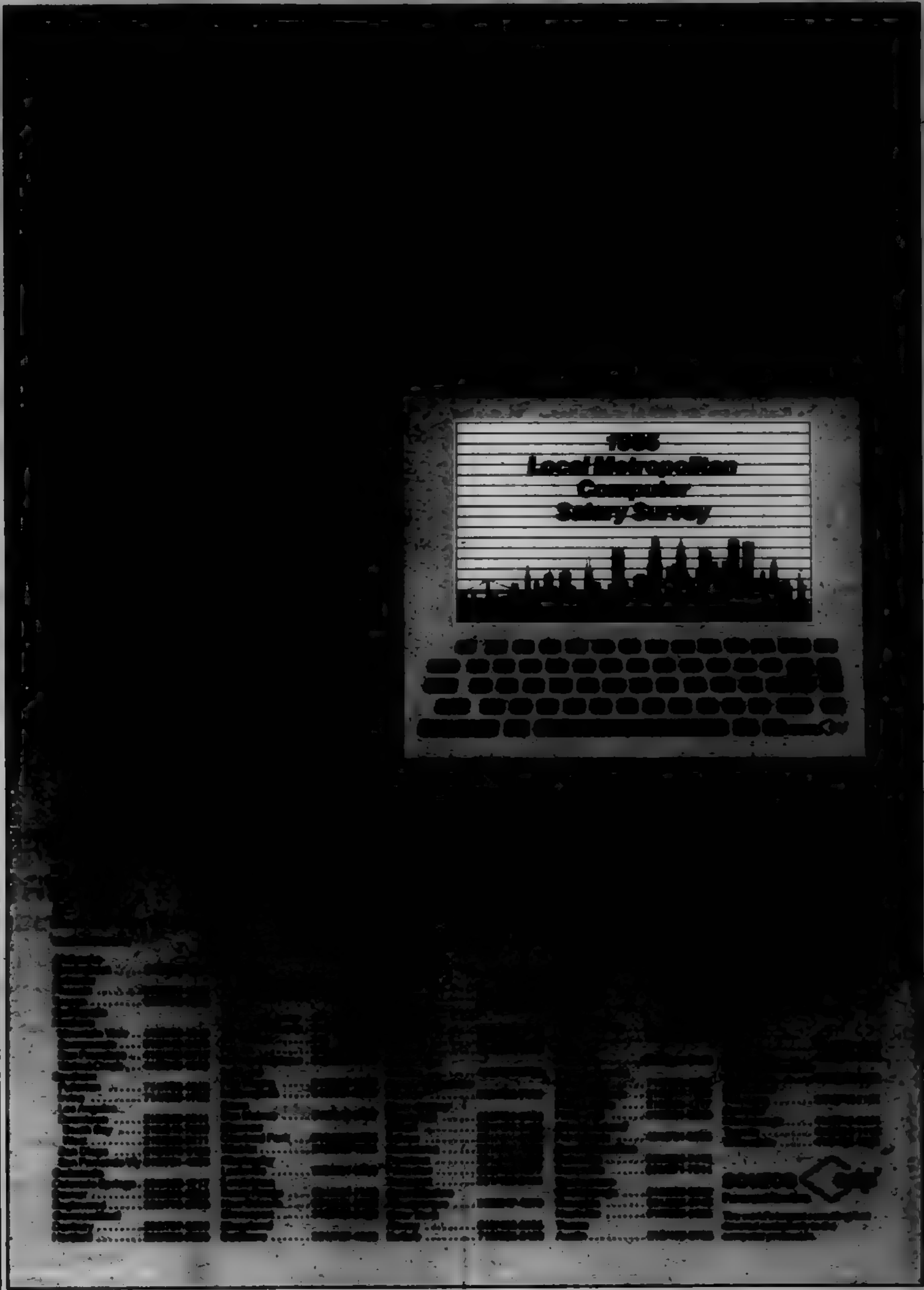

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Candidates for both the Programmer and Analyst/Programmer positions must have a demonstrated proficiency with IBM 4381 or equivalent mainframe running OS; OS JCL; IBM system utilities; programming on-line applications and COBOL.

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Send application material to:

Statewide Office of Human Resource Development
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Data Processing

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The Ministry of Planning of the Kingdom of Saudi Arabia is responsible for the preparation of the national 5-year development plans and the monitoring of their implementations.

The mandate of the Computer Department in the Ministry of Planning is to provide computer support to its different departments by developing necessary models and systems, and maintaining existing ones.

These systems are being developed on an IBM 4341 VSAM/TSO/ISPF using mainly ADABAS/NATURAL but also COBOL, FORTRAN and SAS.

A number of immediate opportunities are available for DP professionals in the following areas:

OFFICE AUTOMATION MANAGER

MS required in Computer Engineering or Computer Science or equivalent. At least 8 years experience in Data Processing out of which at least 4 years must be in managing and implementing office automation technology. Must have the experience of using the microcomputer software (DBASE II, WP, Spread-sheet etc.). Ideal candidate will also be familiar with the Arabic language business systems and development software. Interpersonal skills and ability to train users.

SYSTEMS ANALYSTS

BS/BA required as a minimum. Must have at least six years experience in DP and a proven track in the following areas: Requirement analysis, project responsibilities from inception through completion, excellent written and verbal communication skills, familiarity with conventional languages, hands-on experience in ISPF, knowledge of data base concepts, experience in using systems development methodologies and in preparing documentation for all phases of the systems development life cycle, experience in statistical modelling is a plus.

PROGRAMMER/ANALYSTS

BS/BA required in CS or related discipline, must have at least four years experience analyzing, designing, programming, testing and maintaining business application systems on IBM mainframe, good knowledge of COBOL and/or PL/1 essential, familiarity with FORTRAN and NATURAL is a plus, good communication skills. Familiar with systems development methodologies and documentation of application systems.

COMPUTER PROGRAMMERS

BS/BA or equivalent diploma required. Must have at least three years experience in preparing program design and specifications, programming and testing business application systems on IBM mainframe, experience in using different access methods including VSAM and data base management systems, good communication skills.

TRAINING INSTRUCTOR

BS/BA required in CS or related discipline. Must have at least five years experience in DP two of which in computer teaching and preparing training materials, excellent written and verbal communications skills.

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SYSTEMS PROGRAMMER

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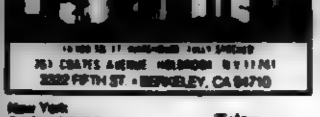

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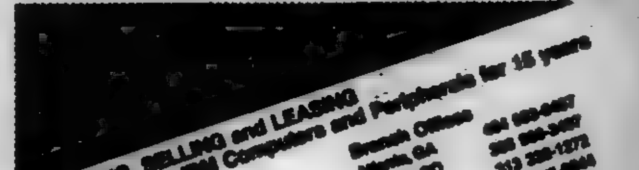

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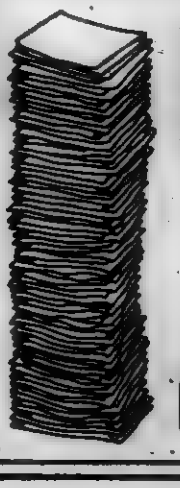

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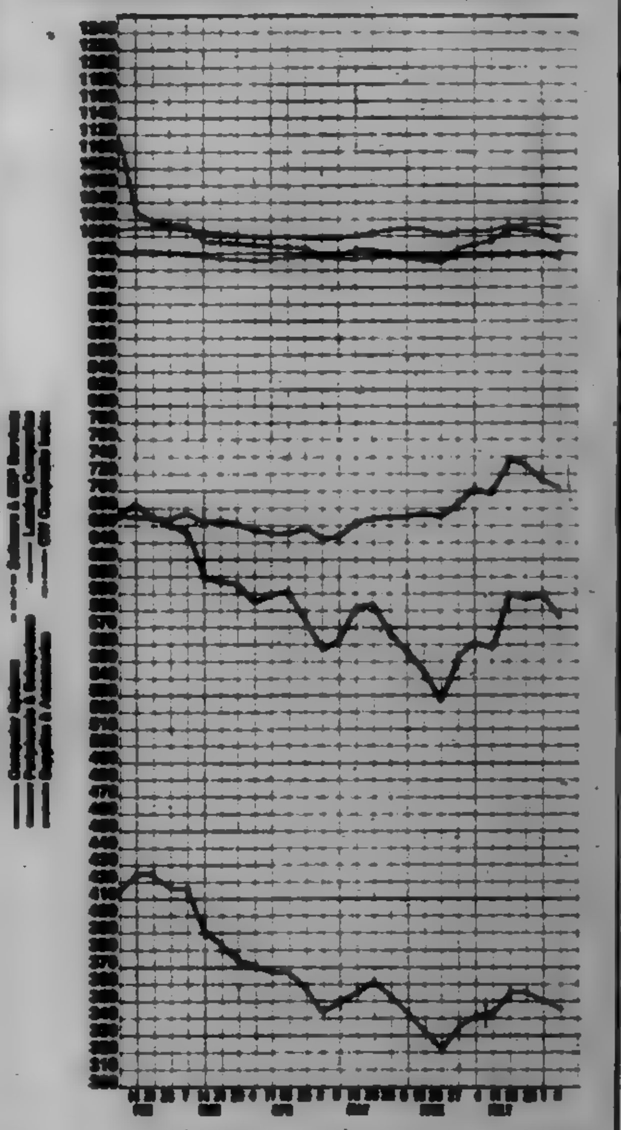

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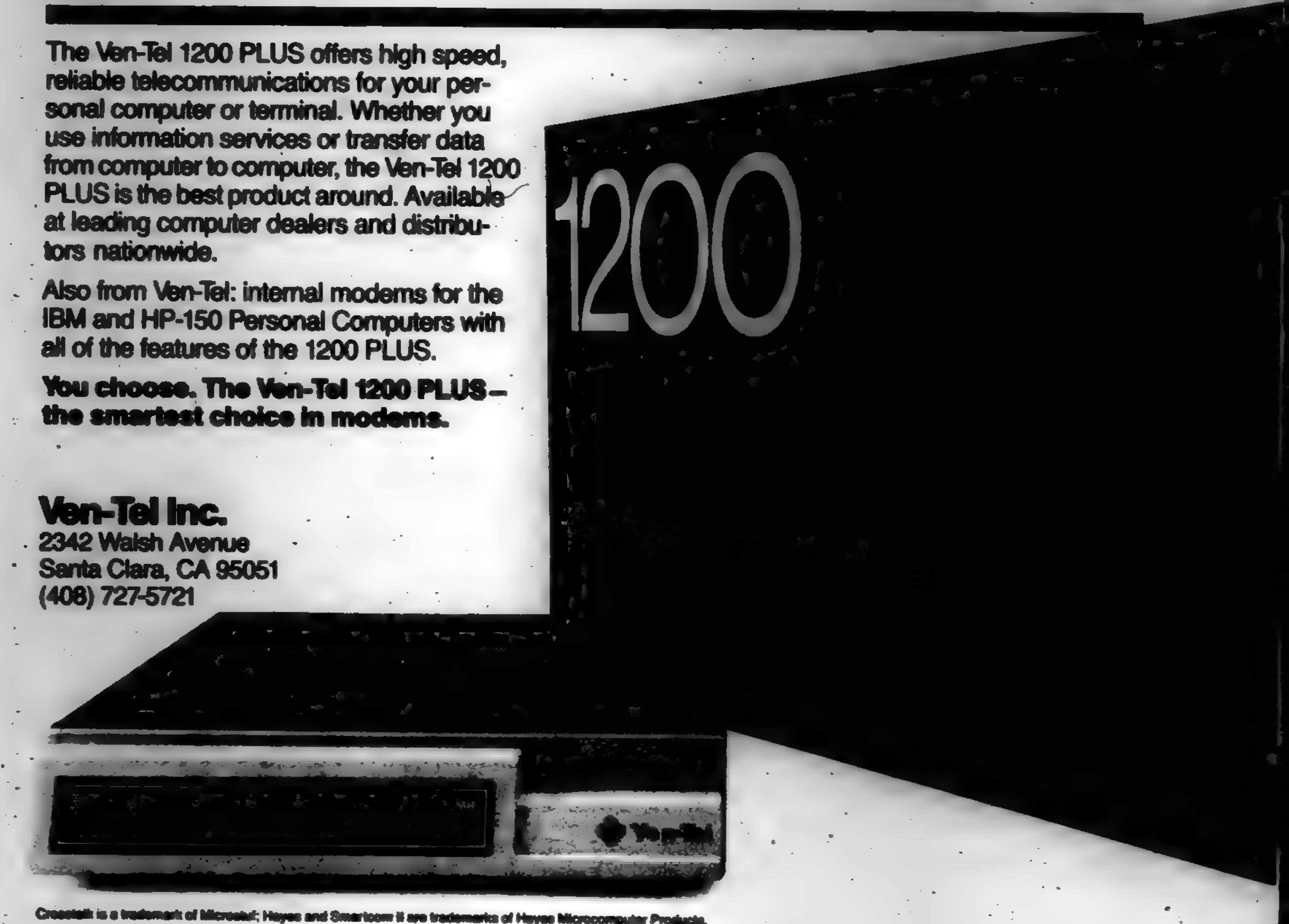

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Mainframes and superminis
Part One of CW's annual Hardware Roundup/23

AI product deluge hits DP market

Mainstream vendor releases on eve of major conference seen hastening corporate acceptance of AI technology

Will 'big boys' hurt pioneers?

By John Gallant
CW Staff

Recent artificial intelligence product unveilings by IBM, Digital Equipment Corp. and Control Data Corp. indicate that AI is growing out of its infancy. The spate of announcements may have been prompted by the International Joint Conference on Artificial Intelligence, being held in Los Angeles this week, where a number of AI-related products are expected to be introduced and demonstrated.

The availability of AI tools from mainstream manufacturers, analysts said last week, will make it easier for DP managers to begin experimenting with the emerging AI technologies. On the other hand, they lamented the fact that the entrance of what one of them called "the big boys" into the AI market could also spell trouble for the firms that first broke ground in the field.

"In one sense, you can say that IBM and DEC have legitimized AI by offering products," said Howard Dicken, publisher of "AI Trends," a newsletter put out by DM Data, Inc., a Scottsdale, Ariz.-consulting firm. "DP managers now have an easier path to follow in experimenting with AI."

Karl Wiig, director of Cambridge, Mass.-based Arthur D. Little, Inc.'s Artificial Intelligence Program, agreed. Wiig said companies will be more willing to explore potential AI applications that use existing hardware, software and personnel.

"We think more firms will begin to ex-

See AI page 5

> ”
>
> *'IBM and DEC have legitimized AI by offering products. DP managers now have an easier path to follow in experimenting in AI.'*
>
> — Howard Dicken
> "AI Trends"

DEC: workstation CDC: AI languages

Artificial intelligence products unveiled this month by Control Data Corp. and Digital Equipment Corp. further highlight a market segment gathering momentum.

DEC's AI Vaxstation was built around the Microvax II and comes bundled with VAX Lisp, DEC's implementation of the Common Lisp language standard. The firm also announced agreements with third-party vendors to provide high-level AI tools to complement DEC's base-level language offerings (see story page 4).

CDC offered users of its Cyber 180 mainframes two high-level AI programming languages as well as an expert system development environment, which takes advantage of the 180's large virtual and real memory capacities. The company also announced a package of programming tools for its NOS/VE operating system (see story page 5).

IBM unwraps expert tools

By John Gallant
CW Staff

WHITE PLAINS, N.Y. — IBM has brought the worlds of artificial intelligence and mainstream DP more closely into line with the introduction of an expert system development tool and a Prolog language environment for its VM operating system. IBM unveiled the products earlier this month but did not distribute the information to users until last week.

IBM's Expert System Environment/VM and its VM Programming in Logic, slated for September availability, were both designed to aid users in building expert systems and other AI programs — which can draw information from existing IBM systems — in an IBM mainframe environment.

The tools facilitate research and development without requiring specialized AI hardware, IBM said. The debuts were met with praise from AI analysts and researchers, many of whom nevertheless criticized IBM for its wait-and-see approach to providing commercial AI tools for its users (see story far left).

IBM's low-key announcement came amid a flurry of recent AI-related activity that saw additional product unveilings from Digital Equipment Corp. and Control Data Corp.

According to an IBM spokeswoman, VM Programming in Logic is IBM's implementation of Prolog — one of two symbolic manipulation languages, Lisp being the

See IBM page 4

TOP OF THE NEWS

The beating goes on. Recent actions by some minicomputer vendors and rumblings from AT&T indicate the computer industry has yet to scrape bottom. **Page 2.**

■

A computer modeling program is the focus of a debate about what caused a delay in residents being notified of a toxic gas leak in West Virginia. **Page 6.**

■

Business overhead. Graphics users polled at Computer Graphics '85 East say they prefer using overhead transparencies to slides in presentations. **Page 10.**

■

After she was arrested, strip searched and jailed, based on inadequate information fed into an FBI computer, a New Jersey woman is suing for damages. **Page 12.**

Go ahead, make my DEC: Olsen speaks

By Clinton Wilder
CW Staff

The overstuffed armchair in the corner of the corporate interview lounge is wasted on Ken Olsen. The 59-year-old founder and president of the world's second largest computer company is usually on the chair's edge, stridently defending Digital Equipment Corp.'s microcomputer strategy or attempting to quash the latest rumors of a marriage between DEC and AT&T. When someone is as supremely confident of the future success of his company as Olsen is and wants the world to know it, it is not easy to relax.

In an interview with *Computerworld* last week that touched on many topics, Olsen disclosed that he has set a date when he will relinquish the DEC helm, but he would not divulge the details.

"Without a date, one never leaves," Olsen said, adding only that the date is still not imminent. When it does arrive, he predicted, DEC will have sailed through a minicomputer industry shakeout to strengthen further its position as the leading vendor of mid-range computer systems.

"Right now or very soon, we might be able to make all the minicomputers the world needs," Olsen said. "There is not room for many manufacturers in that market. That means there are going to be exciting changes in this world of ours. There will be some things that we want nothing to do with because they're too easy for others. But there are some things that take size and technology to

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NEWSPAPER

Mini firms eyeing more cuts

By Peter Bartolik
CW Staff

Actions by several minicomputer systems vendors last week demonstrated that the widespread sales slump has yet to run its course.

AT&T Information Systems responded to a printed report of impending layoffs by telling employees that it is considering cost-cutting measures. Motorola/Four Phase Systems, Inc. announced a consolidation and reorganization. Meanwhile, Harris Corp. reported a loss in its semiconductor operations and reduced profits in its information systems businesses, with no likelihood of any improvement by the end of the year.

Additionally, Westford, Mass.-based Massachusetts Computer Co. (Masscomp) said it has cut salaries by 6% to 12% and instituted other measures to lower expenses "during the current period of unfavorable business conditions." Masscomp manufactures 32-bit systems.

> *Masscomp said it has cut salaries by 6% to 12% to lower expenses 'during the current period of unfavorable business conditions.'*

AT&T Information Systems declined to respond to a *Wall Street Journal* report that a large round of layoffs is imminent, but the top executive of the AT&T division informed employees that some cost-cutting measures are likely.

A company official told *Computerworld* that Robert E. Allen, chairman and chief executive officer of the group, reassured several hundred employees that they would be the first to hear of any cost-cutting decisions.

Allen's meeting was Wednesday morning, the same day as the *Journal* report, but had been scheduled previously. The executive reportedly told employees that the group has had successes in its markets but that the company must now make those successes pay off "on the bottom line."

The group is attempting to cut costs and is currently trying to determine how, in what way and when to do so, Allen said.

At Motorola/Four Phase, a minicomputer and microcomputer systems manufacturer, there has been a restructing into two separate business units, according to Dan Halloran, Motorola/Four Phase's vice-president of human and physical resources. The company's minicomputer business unit will remain based in Cupertino, Calif., where the company is headquartered. The microcomputer business unit, which manufactures systems that use AT&T's Unix operating system, will be relocated to existing facilities in Tempe, Ariz.

Approximately 500 employees will be affected throughout the company, but all affected employees of the micro business unit will be invited to relocate to the Tempe facility, Halloran said. In a prepared statement, the company said the reorganization was initiated "to increase emphasis on our product lines and to position ourselves [better] to come out of the current industry slump." Halloran said that efforts will be made to relocate employees within the company and that others will be offered services for outplacement. He declined to reveal total employment figures.

Melbourne, Fla.-based Harris reported last Tuesday that revenue for the fiscal year ended June 30 was up 14% from the previous year to $2.3 billion but that profits declined to $80.3 million, or $2 per share, from year-earlier profits of $80.4 million, or $2.02 per share.

In the fourth quarter, however, profits were $16.1 million, or 40 cents per share, down 33% from the year-earlier level of $23.9 million, or 60 cents per share. Revenue increased 4% to $610.4 million.

Harris reported that semiconductor sales were up for the year, but profits were down because of reduced demand and lower prices. The company also reported that operations from that sector posted a loss in the fourth quarter. Information systems products had a marginal increase in sales for the year, but profits were down substantially because of price competition and the strength of the dollar in overseas markets, the company said.

Joseph A. Boyd, chairman of the company, said in a prepared statement that there are no signs of an upturn in the DP and chip markets during the remainder of the calendar year and that profits for that period are expected to be significantly lower than the comparable period last year.

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CORRECTIONS

The quarterly financial results reported for Tektronix, Inc. last week were incorrect [CW, Aug. 12]. For the fourth quarter ended May 25, the Beaverton, Ore., company posted profits of $29.9 million, or $1.45 per share, down from $31.2 million, or $1.60 per share, in the year-earlier quarter. This figure excludes a one-time extraordinary gain. Revenue was $373.7 million, down from $378.9 million in the 1984 fourth quarter.

Tektronix earned $90.2 million, or $4.41 per share, in the fiscal year ended May 25, up from $79.3 million, or $4.06 per share, in fiscal 1984, minus the one-time gain. Tektronix's sales for the year were $1.43 billion, up from $1.33 billion in fiscal 1984.

An article on Digital Equipment Corp.'s fourth-quarter financial results incorrectly referred to a first-ever fourth-quarter-to-first-quarter revenue dip [CW, Aug 12]. The company traditionally experiences a first-quarter decline in revenue from the proceeding quarter.

The Update section on printers contained a cost-justification chart on page Update/17 in which several of the recommended calculations were incorrectly stated [CW, Aug. 5]. A correct version of the chart can be obtained from its creator, C. A. Pesko Associates, Inc., which is located at 1 Snow Road, Marshfield, Mass. 02050.

The number of printers predicted to be shipped will grow from 6.4 million units this year to 15 million printers in four years, unlike previously reported in the Update section on printers [CW, Aug. 5].

WHODUNIT

Sortland Yard warns against "Raffles-type sort programs."

Call (201) 568-9700.

Ask for Inspector SyncSort!

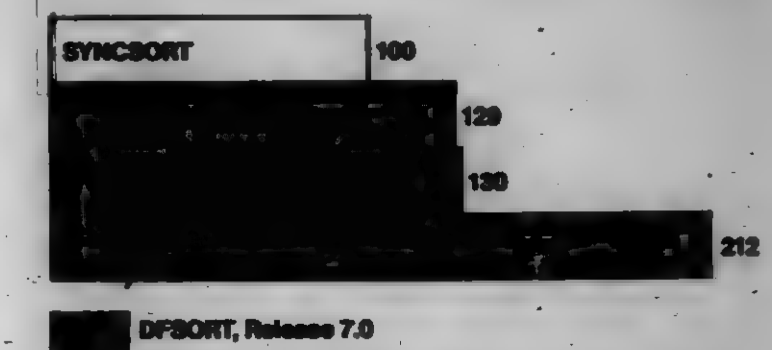
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied. "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

syncsort INC.

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DEC unwraps AI workstation based on Microvax II

Inks third-party software agreements, upgrades OPS5

By Eric Bender
CW Staff

HUDSON, Mass. — Joining this month's parade of new artificial intelligence products, Digital Equipment Corp. has introduced an integrated AI workstation built around the Microvax II. The AI Vaxstation is a fully integrated system that comes bundled with VAX Lisp, the company's implementation of the Common Lisp language standard, and carries a starting price of $48,690.

DEC also announced an upgraded version of its OPS5 expert system development language; an agreement with Quintus Computer Systems, Inc. to sell the Quintus Prolog language for VAX systems; and plans for Artificial Intelligence Corp. to develop VAX versions of its Intellect natural language information management software.

The third-party software announcements demonstrate DEC's AI software strategy of offering base-level languages and development tools itself while working with other vendors to provide higher level tools, said Art Beane, manager for product management and product marketing in DEC's Artificial Intelligence Technology Group.

Scheduled for December availability, the AI Vaxstation is targeted at aerospace, petrochemical, finance, government and academic/scientific research markets, Beane said.

Fortune 1,000 firms most likely initial buyers

Fortune 1,000 corporations are the most likely initial commercial buyers, because "the technology is a fairly expensive technology to look into, and only the largest companies now have the funds," he said.

The AI Vaxstation offers compatibility with standard VAX software, hardware and communications, including hooks into IBM mainframe environments.

"We're taking a general-purpose computer and allowing it to extend the current computing environment," said Joel Magid, senior product manager in DEC's Artificial Intelligence Technology Group. This approach preserves customer investments and simplifies the task of integrating the new machine into DP/MIS operations, he said.

In academic and research markets, the system is not expected to replace dedicated Lisp machines in AI work that demands very high performance and for which price is not an issue, Beane said.

However, he predicted a larger role for the Vaxstation in general computer science courses, because "you can't afford a $170,000 Lisp machine for every student."

A base configuration includes a Microvax II processor with 5M bytes of internal memory (expandable to 9M bytes), 71M-byte hard disk drive, 95M-byte tape subsystem, Decnet/Ethernet interface, a 19-in. monochrome monitor with 1,024- by 860-pixel resolution, keyboard, mouse, VMS operating system and a version of VAX Lisp that integrates more than 150 graphics functions. Disk storage can be expanded to 213M bytes.

The main difference between the new system and a standard Vaxstation is the absence of a floppy disk drive in the AI Workstation.

Version 2 of the VAX OPS5 software tool, available in October, is now a fully supported member of DEC's family of VMS layered products, the company said. Among enhancements, both compile and runtime performance have been significantly improved. Prices range from $3,000 for the Microvax II to $7,500 for the VAX 8600.

Under DEC's three-year marketing agreement with Quintus Computer Systems, Quintus Prolog is being offered for both VMS and DEC's Ultrix-32 operating systems. Cost is $6,000 for the Microvax II and $17,000 for the VAX-11/730 through VAX 8600.

A five-year agreement with Artificial Intelligence will permit DEC to sell VAX versions of Intellect software that run under VMS and interface to the VAX RDB relational data base software. No prices or scheduling details were released.

DEC is located in Maynard, Mass. 01754.

IBM

from page 1

other, which are currently the most widely used AI development languages. In general, Lisp has held sway among U.S. AI researchers, while Prolog has won the allegiance of developers abroad, most notably in Japan.

In addition to its usefulness in building expert systems — programs that capture and apply the knowledge and reasoning of a specialist in a given field — IBM's Prolog is geared to the development of AI systems for automated deduction, natural language processing, relational data base management system access, knowledge representation and processing and robotics.

Extensive data base searching

Most AI processing is not based on algorithms, as are the majority of traditional applications, but rather on extensive data base searching. As a result, VM Programming in Logic is said to provide what IBM called a built-in mechanism for "nondeterministic top-down, left-right searching with controlled backtracking."

The product also features debugging facilities and the ability to communicate with IBM's VM/SP, SQL/DS and the Lisp/VM environment. VM Programming in Logic will have a one-time charge of $8,000.

The spokeswoman said the Expert System Environment/VM, implemented in Pascal, consists of two complementary systems for the development and execution of expert systems under VM.

The Expert System Development Environment/VM (ESDE/VM) allows a developer, known as a knowledge engineer, to work with an expert to build a knowledge base made up of facts about a particular subject, definitions and rules describing relationships between objects.

The Expert System Consultation Environment/VM (ESCE/VM) enables a user to consult the system to obtain advice or information. ESCE/VM must be in place to operate ESDE/VM, but once a knowledge base has been developed, it can be copied and used by ESCE/VM without ESDE/VM.

ESDE/VM incorporates what is known as an editor program that lets a knowledge engineer build a knowledge base by inputting English-like rules, parameters and controls. The system also provides utilities for syntax checking and debugging. Manipulation of the knowledge base for the creation, deletion, replacement and retrieval of objects and values takes place in main storage. Although that results in the need for additional virtual storage, IBM said it facilitates more rapid searching.

ESCE/VM sets the expert system's inference engine — the reasoning and dialogue manager — in motion. It boasts two basic inference processing functions known as backward and forward chaining. The process of backward chaining allows a user to start with a goal and search backward to find supporting data. Forward chaining involves working with known data to discover facts or goals.

Reduces required storage space

Expert System Environment/VM allows a designer to break a complex problem into smaller subproblems that can be solved independently. Objects entered into the knowledge base are compiled automatically by the system into a form that reduces the amount of required storage space and improves processing. The system offers on-line Help and allows a user to ask what, why and how to receive more detailed explanations of requests for information and reasoning processes involved.

The tool also allows a knowledge base developer to invoke external procedures or acquire data from external sources such as an IBM CMS file or data base.

IBM identified a wide variety of possible expert system applications that it said could be developed efficiently and rapidly with Expert System Environment/VM. Such applications include insurance underwriting and claims processing, financial planning and investment analysis, medical diagnosis, quality assurance, training, product configuration, network and project management and shop floor scheduling.

Expert System Environment, according to the spokeswoman, requires the use of its VM/CMS, the Graphic Data Display Manager, the Pascal/VS compiler and the DCF. The development portion has a one-time fee of $35,000 or a monthly charge of $1,750; the consultation portion has a one-time fee of $25,000 or a monthly charge of $1,250.

Additional information is available from local IBM sales representatives.

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CDC AI tool offerings capitalize on memory capacities

By John Gallant
CW Staff

MINNEAPOLIS — Contributing to the deluge of artificial intelligence tools unleashed recently by large systems hardware vendors, Control Data Corp. offered users of its Cyber 180 computers two high-level AI programming languages and an expert systems development environment. CDC said the AI tools take advantage of the 180's virtual memory and large real memory capacities.

Lisp/VE, CDC's implementation of the emerging Common Lisp standard embraced by a variety of important industry players, can process massive amounts of both symbolic and numeric data, a spokesman said. Full implementation of the Common Lisp specification will be achieved in two releases of the product.

The initial release described by CDC provides a base of functions for most AI programming applications. A future release is slated to complete the specification and offer a compiler designed to improve the performance of production Lisp code and a debugger to increase productivity.

Lisp/VE features a command that allows users to execute operating system commands from within Lisp. Communications between Lisp/VE and external programs are handled by executing the external programs through the command and transmitting data using Ascii files. The Cyber 180's System Command Language provides for data exchange between Lisp/VE and Fortran files.

A version of C-Prolog, CDC's Prolog/VE is a programming language that uses English-like statements of logical relationships together with rules governing the interaction of the relationships. The product consists of an interpreter and an interactive programming environment with tools for incremental program construction, debugging and program modification. A user can edit programs while still within the Prolog system, the spokesman said.

The Knowledge Engineering System/VE (KES/VE), jointly developed by CDC and Arlington, Va.-based Software Architecture and Engineering, Inc., is a set of tools simplifying the development of expert systems.

KES/VE is said to incorporate a range of inference techniques that allow an expert system built with the product to address problems in the most effective processing fashion. The system features a parser for detection of errors.

In addition to the AI programming tools, CDC also unveiled a package of programming tools for its NOS/VE operating system.

The NOS/VE Programming Environments, which support both Fortran and Cobol, combine compilers, editors, debuggers and reference aids. The tools allow a user to develop, debug and install NOS/VE applications without knowledge of the system's command language.

Lisp/VE is priced from $5,166 to $40,614; Prolog/VE from $4,620 to $36,330; KES/VE from $11,424 to $70,594; and the NOS/VE Programming Environments from $1,848 to $14,832, depending on the host.

More information is available from CDC, Computer Systems, P.O. Box 0, HQW09G, Minneapolis, Minn. 55440.

AI

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periment, and that is desirable," Wiig said. "Organizations will be able to bring this new technology in-house and begin to form opinions about it."

But Wiig and Dicken, along with David Hertz, director of the University of Miami's Intelligent Computer Systems Research Institute, pointed out to smaller firms the danger of the growing role of large vendors.

"Who will this hurt? The small guys," Hertz said. "If the Fortune 500 users start talking to the mainframe manufacturers about AI, then it has indeed become a legitimate field. It is no longer blue sky, so to speak. But the small guys will have to have something very good to stay in the market. The AI people have earned their successes by doing things nobody else wanted to bother with. That will not be quite so easy to do in the future. They will have to find special niches."

According to Dicken, an analogy can be drawn to IBM's introduction of its Personal Computer. "IBM's AI systems announcements will not really affect anybody just yet," Dicken said. "But there are some parallels to the micro industry. IBM seems to be doing the same thing it has done in that area. It waited until the early companies broke ground, and then it came in with its own offerings. Some of the smaller companies are bound to get hurt."

While all of the analysts contacted pointed to next week's IJCAI as an immediate spark for the the flurry of product announcements, they also stressed that user interest in AI technologies is also a major factor.

"Nobody would argue that the vendors aren't trying to sell more hardware or make their boxes more useful," Hertz said. "But [the announcements] are primarily a response to what is happening out in the field. Mainframe customers are asking their vendors, 'What are you doing with AI? What should we be doing?' This is clearly more user driven than vendor driven."

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Union Carbide modeling program given wrong data

By John Desmond
CW Staff

INSTITUTE, W. Va. — A computer modeling program is the focus of a debate on what caused a delay in notifying neighbors of a West Virginia chemical plant that a toxic gas cloud had been released.

Approximately 135 people were hospitalized after the aldicarb oxime gas cloud from a Union Carbide Corp. plant here passed over a four-town residential area early in the morning of Aug. 11.

The modeling program, a package called Safer System from Safety Emergency Systems, Inc. of Westlake Village, Calif., reportedly predicted the gas cloud would remain stable over the plant. Therefore, Union Carbide officials delayed notifying local authorities about the leak for 20 minutes, and an emergency siren was not sounded until after 36 minutes. The gas cloud, however, moved off site and caused illness.

Union Carbide officials said that the company's Safer System was not programmed to track aldicarb oxime, a pesticide ingredient. Instead, an operator relied on methyl isocyanate (MIC) data to judge the behavior of the cloud, the officials said.

The modeling software, which runs on a 32-bit Wicat Systems, Inc. microcomputer, combines the dispersal rates and properties of specific gases with weather factors such as wind speed and direction. The model then predicts where and how fast a cloud will disperse. The Wicat micro, based on the Motorola, Inc. 68000 microprocessor, needs 1M byte of main memory and runs the company's WMCS operating system.

The president of Safety Emergency Systems, Gary Gelinas, said the use of substitute chemical data would result in an incorrect prediction. "It's the old story — garbage in, garbage out," he said.

Thad Epps, Union Carbide's regional coordinator for public affairs, conceded that the program had no data on aldicarb oxime and the model's prediction was inaccurate. "There was gas in places where the system said it would not be," he said.

A spokesman for a competing modeling software firm agreed that the substitution of data on a different gas than that released may have caused the model to make the wrong prediction. Anish Puri, a lead software engineer with Environmental Research and Technology, Inc. of Concord, Mass., said, "The type of chemical would strongly affect the information from the model. The model gives you as good a result as the input it gets. Evidently, [the Union Carbide operators] didn't ask it the right questions."

Programmed for three chemicals

The Safer System program was programmed with data on three chemicals. Data on seven additional chemicals of the hundreds used in the plant was available but had not been added to the system yet, Gelinas said.

The Safer System was installed at the Institute plant after the Dec. 3 leak of MIC from the Union Carbide plant in Bhopal, India, which killed at least 2,000 people. When asked why aldicarb oxime was not part of the program, Epps responded, "We've got literally hundreds of chemicals here. We must make some sort of judgment."

Richard H. Schulze, president of Dallas-based Trinity Consultants, Inc., specialists in emission dispersion modeling, said the wrong prediction could also have been the result of inadequate weather data. "Their problems may have been with meteorology," Schulze said. "They almost would have been better off without the system. They trusted equipment that gave them erroneous information."

The fact the aldicarbe oxime is located 150 yards away from the MIC at the plant would have created a location error, he said, suggesting that this error would not have caused the model's prediction to be so far off. Gelinas said Union Carbide did have two weather stations on-line to the Wicat.

Schulze questioned the reliance on emission dispersion models based on on-line data such as wind speed. "These programs have been sold to safety people as opposed to engineers, because [the systems] provide good [public relations], are attractive visually and can provide a fairly inexpensive way of dealing with a problem you hope you'll never have," he said. "You're better off planning ahead of time and then implementing an emergency plan when the disaster occurs."

Asked whether Union Carbide would have been better off not using the Safer System without the correct chemical data, Gelinas said, "That's a hard question to answer. If they tried to use it to verify a visual sighting, I would say 'no.' But to use the system set up for warning and evacuation with incorrect data would lend itself to a result that was not appropriate. If you put the wrong information in, you won't get the right information out."

IBM to drop disk supplier

By Edward Warner
CW Staff

CHATSWORTH, Calif. — IBM has decided not to renew its 1985 contract to buy 20M-byte hard disk drives from Computer Memories, Inc. (CMI), located here, for use in its Personal Computer AT. The contract expires Dec. 31.

Sales to IBM had accounted for 67% of CMI's revenue in the fiscal year ended March 31 and for 81% of CMI's revenue for the first quarter of the 1986 fiscal year, CMI said.

The Personal Computer AT, introduced one year ago this month, had been plagued with hard-disk problems, some of which IBM has since attributed to a flaw in a chip on the disk's controller card.

Complaints about the AT's hard disk were strongest in the first months after the product shipped. IBM has said that CMI was its sole supplier of Personal Computer AT hard disk drives until the second quarter of this year. The drives are now being made by other suppliers, including IBM.

In confirming reports of IBM's decision, an IBM spokeswoman denied it had anything to do with the high failure rate of the drives. The decision to drop CMI as a hard-disk supplier was made, she said, because "the demands of the marketplace" had changed. That did not mean, she added, that AT sales were in a slump.

CMI's chairman and Chief Executive Officer Irwin Rubin said CMI was disappointed by the decision, but will continue its product development and marketing efforts.

CMI faces a "difficult marketing task" to recoup the sales that will be lost because of IBM's decision, according to David Moy, a computer storage systems analyst with Morgan Stanley & Co., Inc. in New York. The market for personal computer storage systems, he said, is currently depressed.

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Big Blue's baby turns four

Micro given credit for changing industry

By Edward Warner
CW Staff

President Reagan was celebrating the biggest tax cut in U.S. history, the air traffic controllers were on strike, and Lady Diana and Prince Charles were basking in matrimonial bliss.

It was August 1981, the month in which the IBM Personal Computer was born.

A story in *Computerworld* told of how the machine's debut Aug. 12, 1981, marked a departure from IBM tradition; it was to be sold by retail stores — Sears Roebuck & Co. and Computerland Corp. — and third-party software developers were being encouraged to write programs for it. An air-conditioned room would not be required, the story noted.

One software developer, Dave Tarrant, president of Graphic Communications, Inc., was so intrigued that he phoned IBM for details on the new machine. He received a photocopied sheet of technical specifications.

The technical specifications were far more simple than those for today's Personal Computer. When introduced, the machine offered from 16K to 256K bytes of memory and, among other things, a port for use in storing data on a cassette tape recorder. With a monochrome monitor, two diskette drives and 64K bytes of memory, it cost about $4,000.

Today, a Personal Computer comes standard with two diskette drives and 256K bytes of memory and is priced at $2,295.

In the four years since its debut, the Personal Computer "pretty much changed the whole personal computer industry," according to Egil Juliussen, chairman of the board of Future Computing, Inc., a Dallas-based research firm specializing in personal computer topics. The machine, he said, "was the one thing that got the businesses to go on a buying binge for personal computers."

By the end of this year, approximately 4.4 million Personal Computers will be in use around the world, according to Chris Christiansen, senior analyst with the Boston-based Yankee Group.

The Personal Computer, Christiansen observed, "lessened the domination of the data processing department" over its users.

Cigna Corp.'s Bloomfield, Conn., life insurance and investments division was an early user of the Personal Computer and has since installed more than 100 of them.

When Rich Reed, the man who was to become that division's manager of office systems, first saw IBM's future wunderkind, he said he knew its potential exceeded that of any personal computer then in use there, but he had no idea of just how much memory his firm's users would eventually want.

"We thought that 256K [bytes] was a pretty big machine," he recalled. "Something like 320K [bytes] or 512K [bytes] was just enormous."

Sales of the Personal Computer are currently in a slump, and, with four years under its belt, the machine is looking like a mature product, at least in IBM's standard product life cycle. For those reasons, analyst Juliussen predicted the Personal Computer is unlikely to reach age five and will be replaced by its hard disk-equipped big brother, the Personal Computer XT.

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do, but boy, once we get going with ours . . . That [Microvax II], when we get orders and start pouring those out, we're going to pour them out in huge quantities."

Olsen predicted the minicomputer industry will soon follow the pattern micro vendors experienced, in which those vendors saw their overcrowded ranks thinned drastically largely due to plummeting demand and bloodletting price wars.

"Even if it was 500 [micro vendors] down to 12, that's a major 1,000 change, and it's probably a thousand down to five," he said. "We're going through the same sort of change in many other areas; it's clear the world doesn't want a hundred different general ledger software systems."

One thing the world definitely does want, in Olsen's view, is networking. Corporate users need the means to link micros, minis, mainframes and communications, Olsen said, and the shortage of solutions is partly to blame for buyer hesitation in the current computer industry slump.

"DEC may have helped cause this computer depression," Olsen said, "because I finally convinced people that they need networking and that a bunch of independent computers won't really solve the problem. People, once they get a hint of what networking can do, are afraid to make a move."

DEC's challenge, Olsen said, is to convince users that the minicomputer pioneer can also be the networking solution vendor of the 1980s and beyond. He regales listeners with tales of DEC executives linking VAXs, Decmates, Microvaxs and workstations together over Ethernet but admits the technology will not sell itself. The company's No. 1 priority in 1985 is not to batten down using cost cuts to weather the slump, but to master the hard sell of networking, he said.

"Things people have been looking for, we've got, and no one else will have them for a while," Olsen said. "We've got a message to get across; it just takes time, it takes work. We're not doing too badly, considering the economy. Cutting back is not the challenge. People expect us to cut back, just because everyone else does. With everyone else cutting back, we should go the other way."

DEC is not out rescuing laid-off production line employees from Wang Laboratories, Inc. or Data General Corp., however. Olsen admitted that DEC has scaled back its manufacturing work force, attributing the drop to increasingly automated and streamlined production as well as to the industry slump.

The DEC sales force has grown, but Olsen stressed that all future staffing decisions, including one that would break from the DEC no-layoff tradition, will depend on the business climate.

"The nature of the whole business is [such that] we're always reshuffling things," he said. "Things change, so we have some products we're not making anymore and some we're not selling anymore. We never promised there will be no layoffs, but we see an increasing demand for our products, and the summer's going better than it went last summer. We feel our job is to get that [product] message out, so we're not planning any layoffs."

DEC's next moves on the networking chessboard will probably be on the microcomputer end. "I am not going to announce anything, but we obviously have to have small desktop Microvax workstations, and it's obvious which two we need," Olsen said. "We need one that has got a lot of industry software and one to keep what we have in word processing. . . . The Decmate we have, we still believe, is the best [for] word processing. We've got to integrate that for other things, but we're not quite ready to announce how we'll do that."

Any talk of the future of networking invariably evokes a long shadow emanating from Armonk, N.Y. — and most everyone not wearing blue pinstripes castigates IBM for aiding and abetting the confusion over standards. Olsen, whose suit bears a gray stripe, is obviously among them.

"I don't understand what [IBM is] doing, and I don't think [it has] told anybody completely what [it is] doing," he said. "If you look at what [IBM has] brought out, it's kind of a messy thing, all kinds of wires. I suspect [IBM is] going to go Ethernet because I don't think there's any other really nice way of doing it. That's my guess, I don't know; I shouldn't even say it publicly.

"When we picked Ethernet, we and a number of others tried to make it industry standard," Olsen continued. "Now, there are two companies [IBM and AT&T] that want to get a monopoly, so they didn't join in. I suspect that IBM will join into that, because I don't think [its] ever going to get [its system] to work. . . . Well, we'll see what happens."

Deflecting recent industry rumors, Olsen stressed that DEC is categorically not interested in reaching out and touching AT&T — in the form of a merger, that is. "We have no interest in the telephone business, and we would be of no value to them if we're not interested," he said. "There have been very few, if any, . . . high-technology unfriendly mergers that have worked out."

Olsen called DEC's recent decision to resume production of the Rainbow micro "absolutely unimportant," and denied any corporate frustration in the world of the IBM Personal Computer standard that DEC belatedly and begrudgingly accepted. "We made our mistakes that we shouldn't have made, but that's not frustrating, that's part of the computer business," he said.

"We'd probably be dead if we were that successful," Olsen added with a grin. "I'd hate to have that much production and have it disappear suddenly, too. We don't do well with too much success. You know, after many years of success, it's awfully hard to cover."

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Maintenance programmers have long regarded themselves as members of an unsung, even downtrodden, minority. With the possible exception of operations personnel, no class of information systems professionals ranks lower on the MIS totem pole than the specialists who fix and modify existing software.

Compared with their colleagues who write programs from scratch, maintenance people have traditionally drawn lower salaries and have borne the brunt of departmental budget cuts. Their specialty has also typically been viewed as a mere springboard to applications development rather than as a skilled occupation with its own inherent value. Even the word "maintenance" conjures up images of a blue-collar work force engaged in menial labor, according to Joe Podolsky, Hewlett-Packard Co.'s manager of quality information systems.

For years, maintenance programmers have accepted their lot in life with quiet resignation. But lately, a new assertiveness has begun to emerge among the MIS field's "second-class" citizens. Today, maintenance programmers are demanding the professional respect and recognition they feel they have always deserved but have seldom received.

This mood of rising activism manifested itself at a recent meeting in San Francisco of the Software Maintenance Association (SMA), a new organization that aims to promote the interests of the field and its practitioners. The gathering marked the debut of the nationwide association's Northern California chapter.

During an organizational meeting that lasted roughly two hours, more than 40 attendees discussed a broad range of maintenance-related problems, including their field's widespread disrepute. Virtually no one in the crowd disputed the contention that systems managers and applications developers hold maintenance programmers in low esteem and treat them accordingly.

In the eyes of many of their systems coworkers, maintenance lacks the glamour that is usually associated with applications development, Podolsky said during an interview. Like operations personnel, maintenance programmers daily confront the "real-world messiness" from which their counterparts in development are often insulated.

But Podolsky, who spoke briefly at the SMA meeting, rejected the stereotypical image of maintenance programmers as information systems grunts who necessarily play second fiddle to applications developers. On the contrary, he said, "if I were forced to choose between development people and maintenance people, I think I'd probably choose maintenance people, because in most cases they are the guts of a company."

In its own way, maintenance demands as much technical skill as does development. For one thing, maintenance specialists need to be accomplished detectives merely to pinpoint a software problem in the first place.

Then, they have to be able to "remodel a program in the style of the original architecture so that they are not causing more problems for future programmers," Podolsky said. "That's a challenging task. One of the problems that is almost a legend in software is that once it has been maintained by dozens of people over the years, the code itself becomes virtually unmaintainable."

But technical know-how by itself is insufficient to make a maintenance programmer effective. Maintenance requires at least as much knowledge of business and interpersonal communications as it does of pure programming. "Not only do maintenance people have to fix software itself, but they also have to understand how their organization changes, how software should be adapted and how they should consult their users," Podolsky said.

Because their jobs frequently require them to serve as user advisers, Podolsky prefers to label maintenance programmers as "software support specialist" rather than with their usual job titles.

Podolsky's zeal for maintenance programming apparently typifies the views of many of his peers. "There's certainly more talk these days about software maintenance in a constructive sense than I've seen in the 25 years that I've been in the business," he said.

As evidence of maintenance's growing prestige, Podolsky pointed to recent developments such as the formation of the SMA. The association's mere existence, he said, reflects a growing determination on the part of maintenance programmers to clarify their role for other DP workers, to boost their image and visibility and to improve their own sense of professional self-worth.

A special target of the maintenance field's consciousness-raising efforts is MIS management, which should view the discipline "not as a mechanical process but as the adaptation of a living organism, software, to the real world," Podolsky said.

If a firm's maintenance programmers are discontented, he added, its MIS director will have problems with a group that accounts for half of departmental expenses and that plays a crucial role in determining whether a system succeeds or fails.

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Graphics users prefer transparencies to slides

By Edward Warner
CW Staff

BOSTON — Business graphics users surveyed by *Computerworld* on the floor of the Computer Graphics '85 East conference here last week overwhelmingly preferred to use overhead transparencies rather than slides for business presentations.

Nationwide, the question of whether to use transparencies or slides for business presentations is coming to the fore as computer graphics becomes the dominant means of producing graphs and charts. The cost of slide film recorders is falling, but slides are still limited by technology — they cannot be used in well-lit rooms, for example — and they buck tradition in many firms.

The corporate tradition at Avco Systems Division, a subsidiary of Textron, Inc. in Wilmington, Mass., is to use transparencies, as many as 2,000 a month, according to information center consultant Elizabeth Deware. The company, she said, prefers transparencies for their ease of use and because it has very few slide projectors on site.

At a General Motors Corp. manufacturing plant in Shreveport, La., cost was the deciding factor in favor of overheads, according to H.S. Robbins, a cost analyst there. The facility, he said, produces 100 to 200 overheads per month, at a cost of about $1 each.

Cost is not the main reason why the U.S. Department of Energy (DOE) office in Albuquerque, N.M., prefers transparencies to slides, according to David Begley, a systems analyst there. Bagley said the DOE wanted speed and volume production, both of which he said it gained by using overheads.

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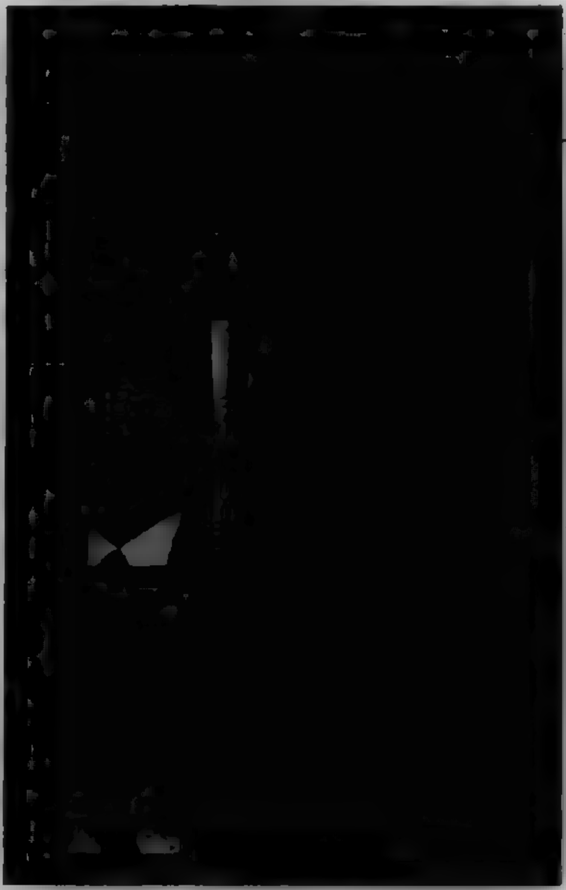
> *The cost of slide film recorders is falling, but slides are still limited by technology — they cannot be used in well-lit rooms, for example — and they buck tradition in many firms.*

Ease of use led Zellweger Uster, Inc., a Charlotte, N.C., computer maker, to prefer transparencies to slides. According to Lenny Furlough, manager of product development, the firm produces 20 to 50 transparencies a month for in-house presentations. Acknowledging that slide technology is becoming less expensive, Furlough said he is giving it a second look.

Of those interviewed, only Paul Holzwarth, audio visual manager for State Mutual Life Assurance Co. of America in Worcester, Mass., said his employer preferred slides to transparencies. State Mutual produces about 7,500 slides annually, he said, using an Autographics computer graphics workstation. Holzwarth said that slides remain in use at State Mutual because they have become a traditional part of a business presentation. Managers, he added, said there is a quality advantage in slides.



Report to eye terminal issues

New technologies have dramatically changed traditional data communications terminals.

The *Computerworld* October Special Report on data communications terminals will examine some of these new terminal technologies, specifically high-resolution color graphics terminals and terminals with integrated voice/data telecommunications options.

Articles for submission to the report should take one of the two following forms:

- A tutorial article discussing an issue or a trend.
- An application story outlining a particular user's experience with data communications terminals.

The deadline for contributions is Aug. 30. Articles must be typed and double spaced and must range in length from three to five pages. Artwork such as charts, graphs and photos is encouraged.

If you have a story you would like to tell or an opinion you would like to express, contact Janet Fiderio, Special Reports Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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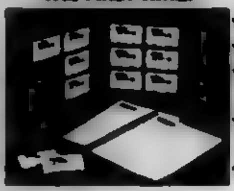

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On-line crime suspect system implicated in false arrest

By Charles Babcock
CW New York Bureau

NEWARK, N.J. — A New Jersey woman was arrested, strip searched and jailed on the basis of inadequate information fed into a National Crime Information Center computer, according to a suit filed in U.S. District Court here.

The center is a national clearinghouse for information on suspected criminals. The system is maintained by the Federal Bureau of Investigation in Washington, D.C. A spokesman for the FBI said local police agencies are responsible for what information goes into the system and how it is used in making an arrest.

Elaine Smith of Dover, N.J., was held for eight days in the Morris County jail in July 1983 after a check with the National Crime Information Center indicated a woman with the same name and birth date was wanted in Texas for welfare fraud, said Smith's lawyer, Patrick C. English of Clifton, N.J. Smith had been stopped on a traffic violation, he said.

The target of the Texas search had a different middle name, social security number and physical description from that of the New Jersey Smith, but none of the information except the suspect's weight — 140 lb — had been included in the center's records, English said. His client weighed "less than 100 pounds" at the time of the arrest, he said.

According to English, Smith was arrested a second time and taken "screaming and hysterical" from her place of work by sheriff's deputies in August 1983 for another three-day stay in jail. She was released after it was established she was employed at her job at the time the welfare fraud was committed. The woman said she has never been to Texas, English said.

Classic computer misuse case

English, who has taken the case for the American Civil Liberties Union (ACLU), called it "a classic case of misuse of the computer. [The National Crime Information Center] doesn't have a system sophisticated enough to distinguish between common names."

"It is true of any technological advance. People start depending on the computer and consider it infallible," claimed Deborah H. Karpatkin, staff counsel of the ACLU.

Named as defendants in the suit are: Morris County, N.J., the city and county of Dallas and the state of Texas. The Morris County Prosecutor's office, which sent a representative to accompany sheriff's deputies on the second arrest, is defending the public agencies in the case, but the first assistant prosecutor, Karen Lee Barrett, declined to comment. Her office has not received copies of the suit, she said.

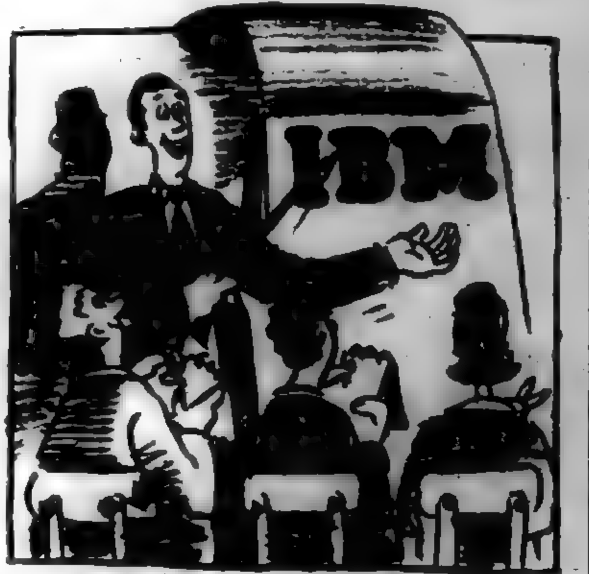
No Social Security number entered

English said he has obtained the documents governing procedures at the National Crime Information Center system. He said it calls for a Social Security number to be entered for each suspect, but none was provided in the Smith case.

The National Crime Information Center uses an IBM 3033 Model S with 12M bytes of memory and a dedicated backup to maintain around-the-clock, on-line files of criminal suspects. About 16,000 law enforcement agencies use the system, accessing it through terminals placed in their offices or at a central law enforcement agency, said a center spokesman.

The center's operating manual, provided to local police agencies, states that finding a "hit," or the name of the party a policeman has stopped in the center's system, "is not probable cause for arrest. A hit is one fact that must be added to others," the center spokesman said.

The suit does not list the amount of the damages sought. New Jersey law requires damages to be left out of the case until it has been heard.



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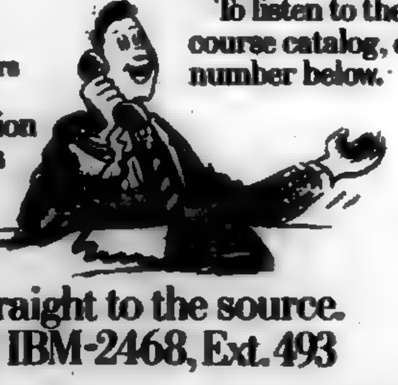

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Software/Expo scheduled for Sept. 17-19

DALLAS — The sixth annual Software/Expo will be held Sept. 17-19 at Infomart here.

Topics to be covered in early conference sessions include the micro-to-mainframe link, software development, project management, graphics, expert systems and micro-based decision support. Later sessions will cover subjects including prototyping, micro uses in business, automated applications development tools, fourth-generation languages, the future of AT&T Unix and strategies for success in the information center.

Thomas M. Nies, chief executive officer of Cincom Systems, Inc. will deliver the keynote address Sept. 17.

Registration fees are $325 for the full conference and $110 for each single day. On-site fees are $50 extra for the full show and $20 for a single day.

More information is available from Software/Expo, Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

USPS plans bigger rate discount for nine-digit Zip users

Savings of 1 cent per item expected

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Postal Service (USPS) plans to increase the financial incentive for using nine-digit Zip codes, a move that may prompt hundreds of businesses to convert their computerized mailing lists to the Zip + 4 system.

Today, only about 600 of the nation's biggest mailers use nine-digit Zip codes, but a bigger postal rate discount may increase that figure to 6,000 users, according to James Pehta, vice-president of List Processing Co. (LPC), a software vendor in Glen Ellyn, Ill.

Pehta is also a member of the Mailers Technical Advisory Committee to the Postmaster General.

> *The USPS announcement sends the market a signal that the USPS is firmly committed to Zip + 4.*
>
> — **Ronald F. Friedman**
> **Group 1 Software**

In an effort to entice more converts, Postmaster General Paul N. Carlin announced Aug. 8 that the USPS would urge the independent Postal Rate Commission to increase rate incentives for presorted business mail using the nine-digit Zip codes. The present discount is one-half cent per piece.

Although Carlin did not state the amount of the proposed discount, USPS commissioners and industry observers expect the discount to be doubled to about 1 cent per piece.

Could be available by April

Assuming the USPS proposal gets expedited treatment at the Postal Rate Commission, the larger discount could be available by April 1986, Pehta said.

Ronald F. Friedman, vice-president of sales and marketing for Group 1 Software, a division of Computer Network Corp. in Washington, D.C., said the USPS announcement is important because it sends the market a signal that the USPS is firmly committed to Zip + 4.

He said many business mailers had been reluctant to convert because of the apparent ambivalence of USPS management toward the program.

Friedman said the predicted rush of new customers will be a boon for software vendors such as Group 1 and LPC, the dominant vendors in the market, as well as for dozens of service bureaus that use the software to provide conversion services.

The turnkey software packages typically read a company's mailing list — with five-digit Zip codes — and assign each address a nine-digit Zip code from the USPS directory.

Complementary software products can also clean up the mailing list by identifying duplicate and inaccurate addresses.

Attract certain businesses

Pehta and Friedman agreed that the bigger discount will attract businesses with medium-size mailing volumes because the discount will make the payback on conversion investment more attractive, perhaps less than one year for certain firms.

For business mailers, the advantages of Zip + 4 include the USPS discount, targeted delivery and the cleansing effects of the conversion process. For the USPS, Zip + 4 helps to reduce the high labor costs of mail sorting.

In the future, the USPS hopes to have equipment that can read the nine-digit Zip code and then print a bar code on the envelope that can be read by automated sorting machines at destination post offices.

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U.S. lead in disk storage mart threatened by foreigners

Government action needed, report says

By [illegible]
CW Staff

WASHINGTON, D.C. — Foreign competition threatens to topple the U.S.' worldwide preeminence in the disk storage market, according to a government report on the state of the industry.

The U.S. government should establish tax benefits, set realistic export control policies and combat violations of U.S. patents and trademarks as part of a multipronged approach to rectifying the U.S.' slipping hold on the market, according to the U.S. Department of Commerce's report, "A Competitive Assessment of the U.S. Disk Storage Industry."

The study presents the results of an assessment of that industry undertaken by the Commerce Department's Office of Computers and Business Equipment/Science and Electronics. It was written by industry specialists after consultation with various Commerce Department agencies and representatives of industry trade associations, marketing research firms and individual companies in the U.S. and the Far East.

The disk storage industry can be stratified into high-, medium- and low-capacity segments by various parameters, including storage capacity, performance, price and technical complexity, the study said.

Foreign competition — especially from Japanese manufacturers — has been strongest in the market's low-capacity segment, which accounts for 25% of the market's value, the report said. The Japanese have devoted considerable effort to developing optical storage devices, which could lead to their preeminence in the potentially significant high-capacity market segment.

The chief U.S. opportunity lies in the fact that the largest and fastest growing market for storage is in the U.S. To retain their current domestic market share, U.S. firms must turn to automated design and production to ensure high quality and low costs, especially in the low- to medium-storage ranges. Many U.S. manufacturers have moved offshore to remain competitive through lower labor and component costs instead of through automation, the report said.

U.S. companies that manufacture storage devices overseas have inadvertently diffused storage technology knowledge to foreign entrepreneurs, the report said. As a result, countries such as Singapore, Taiwan and Korea have began to emerge as competitors to the U.S. industry.

If these foreign suppliers are successful in gaining a foothold in the low and medium markets, it is possible that they will ultimately challenge U.S. suppliers at increasingly higher levels of performance and for greater shares of the market's value.

> ”
>
> *To retain their current domestic market share, U.S. firms must turn to automated design and production to ensure high quality and low costs*

According to the report, a number of policy options arise from the following: the U.S. transfer of technology to foreign competitors, a shortage of engineering talent, the need to maintain leadership in innovation and product technology, the offshore movement of component and disk drive production and the need to automate production and design.

Incentives for the expansion of domestic production and job creation, including tax breaks and subsidies, could result in a slowdown of technology transfer and the movement of U.S. production offshore.

Other tacks the government could take in its effort to guide the course of U.S. industry include the following:

- Encourage research and development activities and increase joint university and private sector programs and private sector R&D consortia.
- Offer tax and other financial incentives to encourage automation of U.S. industry.
- Advocate efforts that lower foreign barriers to free trade and work with U.S. industry to explore other avenues where developing nations can promote domestic high-technology industries without imposing restrictions on U.S. suppliers and without damaging their own interests.
- Continue efforts to ensure that signatory nations adhere to international conventions on intellectual property rights. The government could step up efforts to combat violations of U.S. patents, trademarks and secrets, including the use of trade sanctions where necessary.
- Strike a balance between national security and commercial interest. This could include giving strong support to the Export Administration, which tries to promote better understanding of export control regulations and the licensing process and is establishing a data base on the foreign availability of disk drive products.
- Step up efforts to recruit small- to medium-size and new firms into export promotion programs and encourage the use of export trading companies as a means of penetrating foreign markets. It should also encourage greater dissemination of foreign market research to these firms.

The report — stock number 003-009-00461-6 — is available for $2.50 by writing to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

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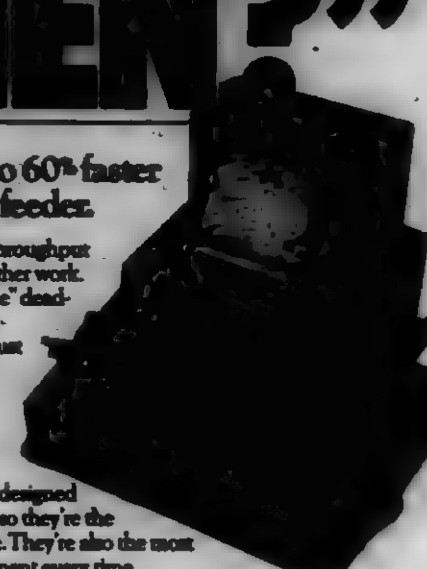

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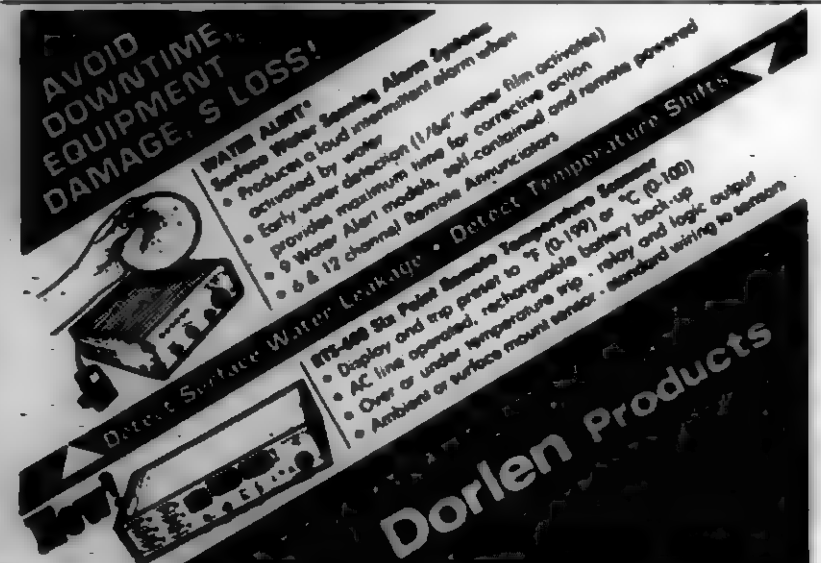
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WORLD DIGEST

CW International News Network

TOKYO — Three companies of Sanyo Electric Group — Sanyo Electric, Tokyo Sanyo Electric and Sanyo Electric Trade — along with U.S.-based Icon Systems and Software, recently announced plans to co-develop and market a 32-bit supermicrocomputer. The companies, working together since December 1984, have drawn up the blueprints for the MPS 020-2 model supermicrocomputer. Based on Icon's design concept, the MPS 020-2 features two Motorola, Inc. 68020 microprocessors, processing speeds up to 3 million instructions per second (Mips) and the ability to connect 32 terminals.

Software will run under the AT&T Unix and MS-DOS operating system and will also support IBM 370-era machines. The system is slated for November production and will be manufactured by Tokyo Sanyo Electric, according to the vendor. The MPS 020-2 will cost less than $20,000.

Also being developed is a workstation for the MPS 020 that features a 1,024- by 1,024-pixel monochrome display and graphics processor. Future plans include a 5-Mips Unix machine to support three 32-bit microputers slated for release in 1986 and a 64-Mips machine, capable of linking 32 32-bit systems in 1987.

SYDNEY — The Queensland government's plan to establish its comprehensive Q-Net communications network have upset Telecom Australia, the national government's telecommunications authority. Telecom is worried that a monopoly-breaking precedent could be established because Q-Net will be linked to the public switched telephone network and will effectively become a value-added net operated by the Queensland government. Although Telecom policy allows a common-interest business group to interconnect public net traffic through its private network and then reenter the public net, it does not take the view that departments of a state government have a common interest.

BEIJING — The U.S. Commerce Department announced plans to bring a U.S. consortium of companies here this fall for a conference on telecommunications technology. The Sino-American Conference on the Application of Telecommunications Technology will be held Oct, 28 to Nov. 1. U.S. participants include IBM, AT&T, ITT and RCA Corp.

LONDON — Personal computer users here will face heavy fines or imprisonment if they fail to comply with new legislation governing software copying. A bill passed by Parliament last month makes the copying of software programs, outside the terms of the license agreement, a criminal offense. The act goes into effect on Sept. 15. While the legislation is deemed a step in the right direction, Ian Fraser, chairman of the IBM Personal Computer users group, doesn't think the bill will prove much of a deterrent. "It may make people think twice," he noted, "but when departmental budgets run out, there's a big temptation to use what you've got."

SYDNEY — A government subsidized training program for the unemployed has failed to attract applicants because of a lack of publicity. The scheme, which was the brainchild of the Australian Computer Society, is operated by the society with the assistance of the New South Wales and the Australian national governments.

The program finds and subsidizes employers to take on unemployed people interested in becoming computer programmers. But, according to the scheme's originator, Ormonde Browne, prospective employer-sponsors outnumbered applicants by a staggering 25:1 ratio. The program, which involves an eight-week intensive course, has trained 300 programmers in its five years of operation.

LONDON — IBM Personal Computer ATs are now available off the shelf here, but the British feel like they are getting the machines U.S. buyers do not want. Insiders reported the initial surge of demand in the U.S. for IBM's high-performance AT has not been sustained, and many dealers are having to discount their machines. The Personal Computer XT, on the other hand, is enjoying renewed popularity as buyers find it a much better value than the higher priced AT. The AT glut is being partially attributed to a widespread slump in the industry and to incompatibilities between the AT and other IBM Personal Computers. Some dealers, on the other hand, view it as a general leveling out after initial panic ordering. Therefore, the unwanted machines are finding their way to UK dealers, who are complaining that one out of five of the machines comes with a U.S. power supply.

LONDON — More than 80% of personal computer users feel they are not getting maximum benefit out of their machines, according to a survey just published by Manpower Ltd., a market research firm based here. Users indicated a need for more and better training on their machines. The survey also revealed that, of the 600 people interviewed, only 27% have exclusive use of their Personal Computers, while another 24% said they shared the machine with their secretaries. Some 35% of the respondents said they used IBM Personal Computers, which proved the favorite in industries such as oil, finance and utilities. The report is the first in a series of quarterly surveys to be published by Manpower, at Manpower House, 270-272 High St., Slough, UK.

CALENDAR

WEEK OF SEPT. 15

SEPTEMBER 16-18, SAN FRANCISCO — **Computers in Finance.** Contact: California Datamart, Showplace Sq., San Francisco, Calif. 94103.

SEPTEMBER 16-18, SAN JOSE, CALIF. — **Datastorage '85: An International Forum.** Contact: Cartlidge & Associates, Inc., Suite M-259, 1101 S. Winchester Blvd., San Jose, Calif. 95128.

SEPTEMBER 16-20, CHARLOTTE, N.C. — **Vtam for Practitioners.** Contact: American Data Group, Inc., 3685 Woodbury Drive, Duluth, Ga. 30136.

SEPTEMBER 16-20, MCLEAN, VA. — **Knowledge Engineering 1: Acquiring the Expert's Knowledge.** Contact: Expert Knowledge Systems, Inc., 6313 Old Chesterbrook Road, McLean, Va. 22101.

SEPTEMBER 16-20, NEW YORK — **IMS/DB (DL1) Application Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

SEPTEMBER 16-20, SAN FRANCISCO — **Analysts' Skills Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

SEPTEMBER 16-20, SAN FRANCISCO — **Fiber-Optic Communications and Local-Area Networks Exposition.** Contact: Information Gatekeepers, Inc., 214 Harvard Ave., Boston, Mass. 02134.

SEPTEMBER 16-21, CHICAGO — **CICS Command-Level Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

SEPTEMBER 17-18, SAN FRANCISCO — **Computers in Finance — Datamart.** Contact: Alice Gibons, Inter Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

SEPTEMBER 17-19, BOSTON — **Semicon/East '85.** Contact: Semiconductor Equipment and Materials Institute, Inc., 625 Ellis St., Mountain View, Calif. 94043.

SEPTEMBER 17-19, DALLAS — **1985 Software/Expo.** Contact: Software/Expo, Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

SEPTEMBER 18-20, LAS VEGAS — **American Production and Inventory Control Society's Fall Seminar.** Contact: American Production and Inventory Control Society, Inc., 500 W. Annandale Road, Falls Church, Va. 22046.

SEPTEMBER 18-20, LOS ANGELES — **Financial Information Systems: The New Generation.** Contact: National Institute for Management Research Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

SEPTEMBER 18-20, NEW YORK — **The Unix Operating System Exposition and Conference.** Contact: National Expositions Co., Suite 12A, 49 W. 38th St., New York, N.Y. 10018.

SEPTEMBER 18-27, PARIS — **Salon International D'Informatique, Telematique, Communication, Organisation du Bureau et Bureautique (Sicob).** Contact: Sicob Press Service, 4 Place de Valois, 75001 Paris, France.

SEPTEMBER 19-20, LOS ANGELES — **Data Processing Alternatives for Independent Banks: Service Bureau vs. In-House Systems.** Contact: Alice Gibons, Inter Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

SEPTEMBER 19-20, NEW YORK — **DOS/VSE for Programmers.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

SEPTEMBER 19-20, NORFOLK, VA. — **Federal ADP and Telecommunications Procurement.** Contact: International Data Corp., Washington Division, Suite 240, 1600 Planning Research Drive, McLean, Va. 22102. Also being held Oct. 3-4 in St. Louis and Oct. 17-18 in Denver.

SEPTEMBER 21-22, PALO ALTO, CALIF. — **Seventh Annual Forth Convention and Banquet.** Contact: Forth Interest Group, P.O. Box 8231, San Jose, Calif. 95155.

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EDITORIAL

Forging better links

Industry leader John Cullinane came up with a new twist to an old joke when he was recently asked what his data base management software customers were asking for these days: "Three things — integration, integration, integration." Although Cullinane was addressing a particular software application, it is a fact that integration is now a byword in the computer industry.

Attention to product and application integration by disparate vendors would clearly serve users handsomely and go a long way toward rescuing elements of the computer industry from impending insolvency. For example, a June 1985 *Business Week*-Louis Harris poll asked DP managers at 600 leading U.S. corporations to explain recent cutbacks in computer-related purchases. Fifty percent of the sample said that companies have acquired so much equipment that they cannot digest what they have, and available hardware has outstripped the networking capability to use it fully.

This evidence sounds a single theme, a lament that organizations have too many computer products that do not work together efficiently. Before DP managers invest in additional equipment, vendors must offer more integration. Most of this integration must, given the reality of the workplace and the marketplace, involve products and applications relating to the IBM Personal Computer. Although many manufacturers have been scrambling for IBM compatibility for years, it is especially heartening to see such firms as Digital Equipment Corp. and Wang Laboratories, Inc., which have fought that trend, increase their links to the Personal Computer.

It was just three weeks ago that DEC offered VAX terminal emulation for the IBM Personal Computer — it was previously available only through third parties — and Wang announced products allowing the Personal Computer to run its word processing software and link its VS minis to the Personal Computer.

These are encouraging signs of a trend that can do nothing but benefit users and one that vendors should continue to pursue with all deliberate speed.

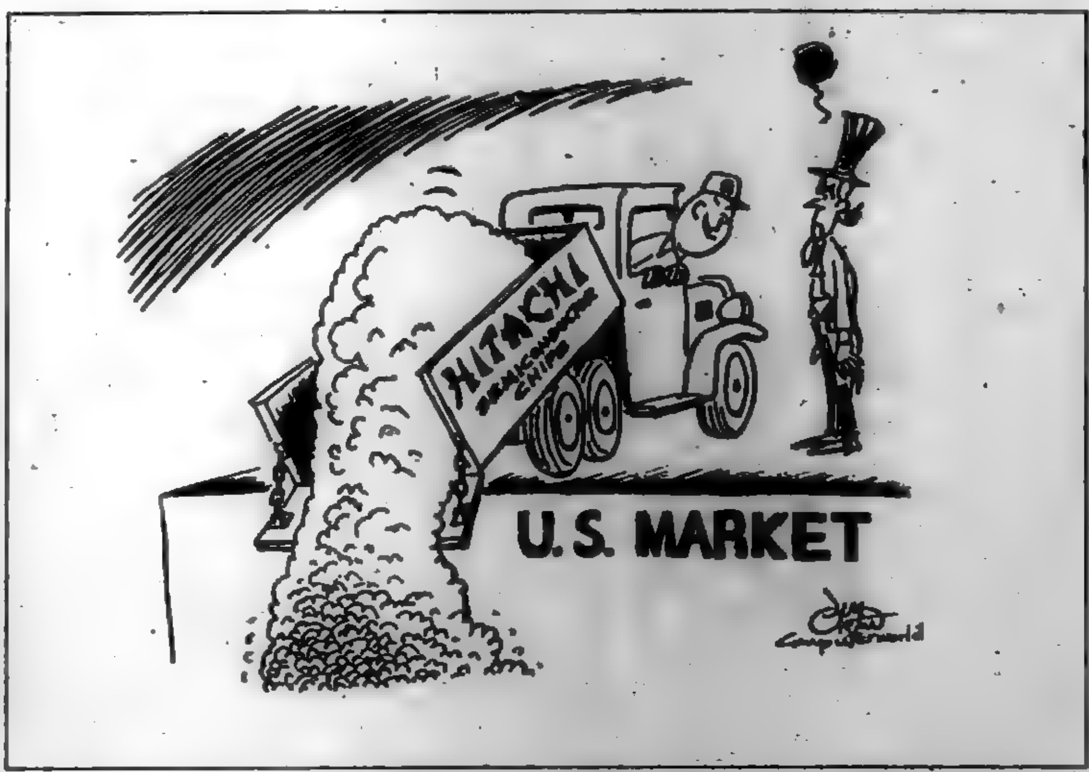
Different strokes

A little more than a year ago at a major trade show, one of Apple Computer, Inc.'s young marketing evangelists hunkered down over a cup of coffee, cast an eye over the field of competitors and pronounced, "Take it from me, Compaq Computer Corp. will be bankrupt by this time next year."

For the record, two weeks ago Compaq checked in with second-quarter profits five times larger than those of a year earlier, making it one of the very few micro companies to register substantial financial gains in the past year. Last we heard from Apple, it was undergoing the latest upper management reorganization. Or was it the latest work force reduction?

Compaq has always been run like a major manufacturing business, an organization that was once described as "a Fortune 500 company waiting to happen." Industry insiders say to expect that to happen by the end of this year. Meanwhile Apple, which has too frequently been run like a religious cult waiting to happen, retains its Fortune 500 status through dint of its early market leadership.

Accordingly, we take our hats off to Compaq while keeping our fingers crossed for Apple.



"Instead of "dump truck," honorable Uncle, please call it "enhanced-efficiency-of-delivery vehicle."

LETTERS

Hacker coverage propagates myth

In the article, "All-star teen hacker's team beat hundreds of systems," [CW, July 8], *Computerworld*'s acceptance of the published bragging of Bill Landreth, a high school dropout hacker, is an interesting phenomenon.

Not only have you given his book a rave review, but your staff writer gave credibility to this juvenile's vaunting by saying that he was an "all-star" and a "major league hacker" and that he accessed "800 computer systems" by presenting them as facts.

Your flattering coverage of a convicted teenage hacker and his book propagates the myth that outside hackers are the greatest threat to computer security.

This, despite the fact that two authoritative studies [CW, June 10 and July 1] have ascertained that insiders are the greatest threat to computer security and not outside hackers.

J. Van Duyn
Loomis, Calif.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or fewer. Letters may be edited for the purposes of clarity and brevity. Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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VIEWPOINT

Management sets tone for project success

THE DATA CENTER
John P. Murray

Information systems development projects usually succeed or fail because of department-level management. It must be firm from the first day of the project cycle, and it must remain firm throughout the project.

How can a project's success or failure be judged? The project should not exceed the allocated funding, it must be completed by the original deadline, and it must deliver what was promised.

The information processing department may be organized so that the requirements for systems success are in place. These include a formal project management system, the use of structured programming and design, peer reviews and a careful testing regimen prior to operational turnover.

Senior management may have a strong interest in the project. Adequate systems and programming staffs may be available. Sufficient test time, with an assurance of a high priority from the data center manager, may be assured. Yet without a true commitment from the DP department management, there is no assurance of success.

For example, consider this common situation: The person leading the information processing portion of the project walks into the office of the department manager and announces that the project, which has been under way for eight months and was scheduled to take 15 months, is two months behind schedule. One week before, during the monthly staff review of project status, this project had been reported as being "essentially on schedule." The department manager now faces a predicament.

Judged by the criteria already cited, this project has failed unless it can somehow be brought back on schedule. If the current assessment is correct, and if nothing is done, the project will take not 15 but 17 months to complete.

> *Deadlines will not be met unless all involved know that department management expects them to be met. If games are played — such as saying a project is on schedule when in fact it is not — then managers are only encouraging undesirable behavior.*

If additional staff is assigned to complete it within the deadline, the cost of the project will increase. The only hope is to find some method that will end the project on time and within budget without any sacrifice in required results. Considering the current situation, success appears unlikely.

The correct response may be to fire the DP project leader, not for allowing the project to fall behind schedule but for failing to present a factual assessment of its status. Although such draconian action may be justified, it is seldom taken. The usual reality is that the project leader is not dismissed and not even chided.

In fact, such a situation may elicit sympathetic understanding from the department manager. "Yes, I understand, these projects are difficult to manage. No problem, we'll just adjust the schedule by setting a new, let's call it the 'revised,' schedule date. When do you think the project will be finished?"

The answer may be, "Well, gee, that's hard to say, we do have a lot of problems. Why don't you give me a couple of weeks, let me see where we are at that time, and maybe I can give you a better idea." Deadlines will not be met unless all involved know that department management expects them to be met. If games are played — such as saying a project is on schedule when in fact it is not — then managers are only encouraging undesirable behavior.

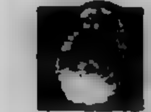
Allowing such occurrences to develop with apparent impunity sends a signal to the rest of the staff that a lower than agreed on standard of performance will be tolerated. If poor performance is condoned, after a time most of the performance in the department will be poor.

Human nature being what it is, it will not take people very long to realize that failing to meet deadlines will not bring retaliation, or if it does, that retaliation will probably not be harsh. Once that becomes evident, it will be increasingly difficult to enforce project deadlines. At this juncture, deadlines become targets rather than deadlines.

The track record on information processing projects can be improved in any organization. Doing so requires considerable time, effort and attention at all levels. Many new methods and procedures may have to be instituted to make progress. But, unless the manager of the department is willing to exercise firm control and to demand a consistently high level of performance, actual progress will be difficult, if not impossible.

Murray is director of management and information services for American Breeders Service, a DeForest, Wis., division of W. R. Grace & Co. and is the author of Management Information Systems as a Corporate Resource.

Entering the bedazzling bastion of bits and bytes



HUMAN CONNECTION
Jack Stone

The plain truth is that in spite of the enormous strides made in recent years toward simplifying user interfaces, today's computer machinery — be it micro, mini or macro — is still too formidable for many business people.

Aside from the technical intimidation, business users say they feel that the payoff is too meager when compared with the effort exerted in the tedious, often frustrating, learning process.

In my last column, I introduced the views of one data center manager who is developing a scheme for bringing the hard-core computer illiterates — estimated to be 90% of the population, according to one recent survey — into the bedazzling bastion of bits and bytes. Here are more of his thoughts on the matter:

"However hard-working, dedicated and intelligent the novice users may be, learning the productivity systems that run on the smallest of our machines is a bear. What is particularly discouraging is their difficulty in visualizing how the systems will help them achieve personal goals, other than having some data processing experience that embellishes their resumes or merely looking good to their managers.

"To be effective, initial training has to be much more sophisticated than before. Instead of tossing out a jumble of system commands and keyboard procedures, we must figure out ways to relate the learning experience to personal needs. We must think beyond systems that are merely easy to use to those that really meet organizational requirements. Specifically, individuals must perceive systems to be as indispensible to them in their career development as their eyeglasses, fountain pens and briefcases.

"Notebook-class portables, like the Tandy [Corp.] TRS 100/200, offer interesting possibilities in this regard. The base hardware/software complement has the functionality, operational simplicity and reliability that are needed, at least as far as the manufacturer [Kyocera of Japan] went. Most desirable from a training point of view is the invisibility of the operating system and concurrent RAM [random-access memory] residency of programs and data files.

"Of course, one of its greatest virtues is its feather weight — 4 lb — truly making it a machine that can be toted around without fear of breaking some vertebrae — and thus always accessible. Furthermore, during recent months, in addition to providing impressive add-on hardware, the independent vendors have really gone to town with software enhancements aimed specifically at improving the productivity goals of the individual.

"Let me cite some examples. Traveling Software, Inc. [in Seattle] offers independent modules for managing appointments, calendar and travel expenses. For the sales folks, there is a package for handling sales data, and for the team leaders, there is one for project management.

"The firm even sells a relational data base management system that allows the linking of files and the creation of custom reports and screen displays, plus a built-in spreadsheet-like capability. Not bad considering that user-accessible RAM is limited to 29K bytes.

"Also impressive are the products of Chattanooga Systems [in Chattanooga, Tenn.]. They specialize in personal programs that typically occupy less than about 4K bytes of RAM and merchandise quite a collection on one cassette tape: a text formatter, a [26-by 99-cell] spreadsheet, a list manager, a sort, a calculator, a trip expense accountant — even a personalized letter generator.

"Where cassette storage is too cumbersome — in the majority of cases, to be sure — the industry is providing read-only memory in pop-in program cartridges. Where the applications truly require bulk storage, one can obtain battery-operated [3½-lb] disk drives that handle 200K-byte-plus minidiskettes.

"Most important, one independent [vendor] has come forth with a beautiful package for effecting the transition to the IBM Personal Computer from the noncompatible Kyocera. Instead of downsizing MS-DOS or its ilk to a notebook machine, Telecommuter software from Sigea Systems [in Weston, Mass.] has [expanded] Kyocera operating system features and provided a simple hookup to transfer files. In this way, business users find themselves in the Personal Computer environment without fuss or bother.

"Oh, I'm aware of the cost problem with these small machines, such as RAM that is about 30 times the cost of add-on RAM for our Personal Computers. On the other hand, because overall cost is low, particularly when compared with the cost and effectiveness of more conventional training, the idea is appealing."

Stone is a Washington, D.C.-based independent management consultant, educator and writer, specializing in DP human communications and personal development.

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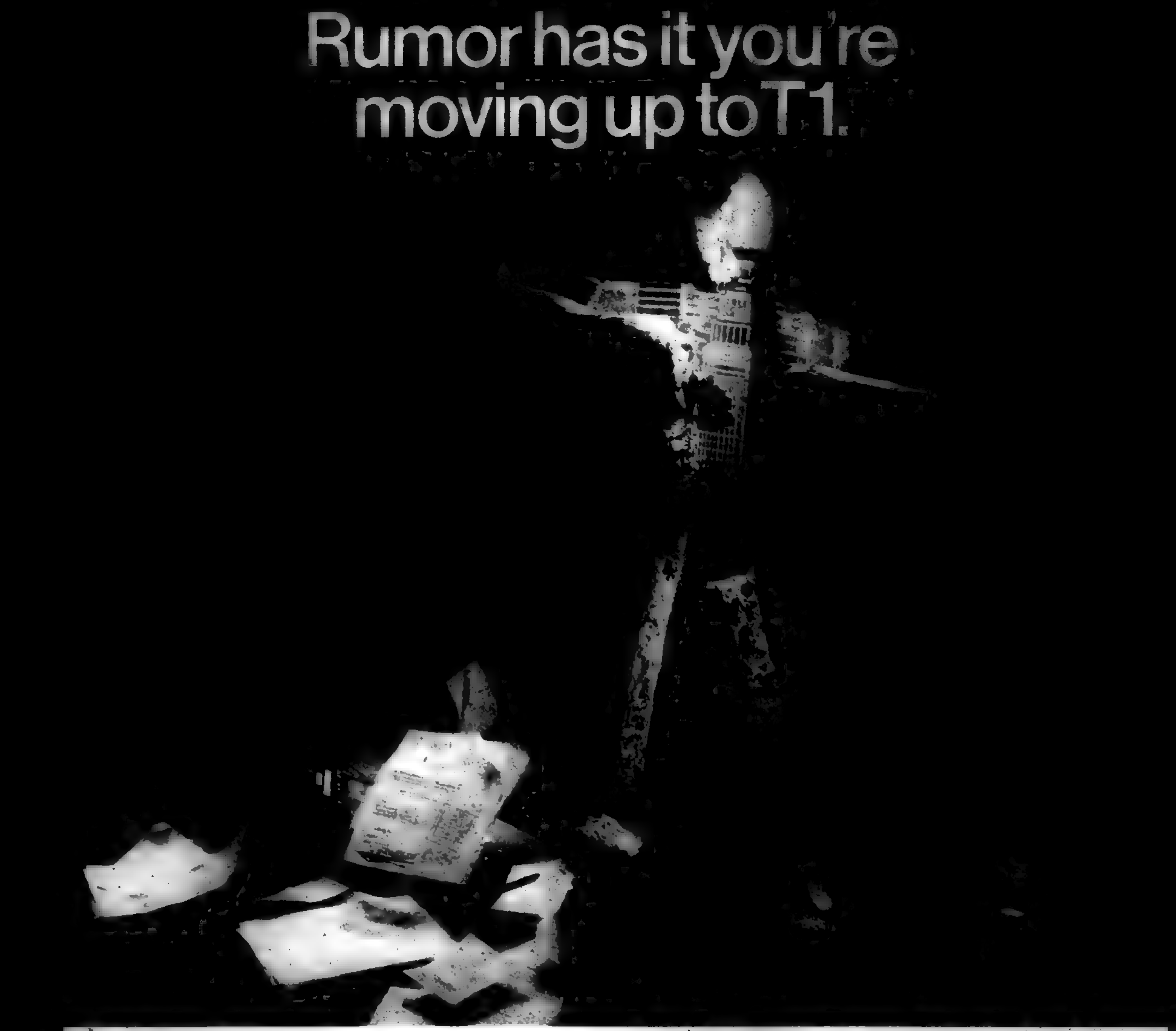

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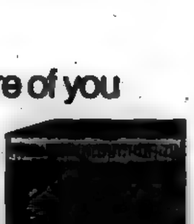

INFOTRON SYSTEMS

Hardware Roundup

By Tom Henkel CW Staff

A look at 212 systems from 28 vendors

For mainframe users, the past year was special. Like the rare times when all the planets are in alignment, most of the major mainframe makers participated in an event that happens roughly every four or five years — they made major enhancements to their top-end product lines.

As is tradition, IBM started the round of mainframe announcements by unveiling the long-awaited Sierra line — two systems called the 3090 Model 200 and Model 400. National Advanced Systems Corp., Burroughs Corp. and Honeywell, Inc. quickly followed suit by announcing the two-model AS/XL, the three-model A15 and the five-model DPS 90 product lines, respectively.

Sperry Corp. got into the act with enhancements to its 1100/90 series mainframes aimed at making those systems perform better in scientific environments. The three remaining domestic makers did not enhance their top-end products, however. Control Data Corp. rested on the laurels of its Cyber 180 series enhancements of a year earlier, and Amdahl Corp. stuck with the 5890. NCR Corp. also chose to keep its current top-end product line.

The superminicomputer marketplace of the past year was volatile, a combination of boom and bust. Slumping supermini sales and fallout from a massive buying trend over the past two years spawned a rash of corporate layoffs that hit even the most stalwart firms like Wang Laboratories, Inc. and Data General Corp. But before the slump in supermini sales put the damper on new product introductions, Digital Equipment Corp. and Prime Computer, Inc. unveiled top-end superminis — the VAX 8600 and the 9955, respectively.

It was the year of parallel processing — the concept of using multiple CPUs operating concurrently to equal, or in some cases surpass, the performance of larger mainframe processors. Parallel systems architecture, although by no means a new concept, became the preferred system design for several companies. Start-up Encore Computer Corp. unveiled its Multimax parallel system early this summer. Intel Corp. also this summer began deliveries of its IPSC hypercube system announced last September. And Perkin-Elmer Corp. beefed up its commitment to parallel processing by unveiling two high-end parallel systems — the 3260MPS and the 3230MPS.

> ”
>
> *It was the year of parallel processing — that is, using multiple CPUs operating concurrently to equal the performance of larger mainframe processors.*

Perhaps the underlying impact of activity in the mainframe and supermini markets was the continuation of an ongoing trend whereby the already blurred distinctions between classes of computer systems becomes more clouded each year.

For example, the high-end mainframes announced by IBM, Burroughs and Honeywell appear to tread on ground typically held by supercomputer vendors such as Cray Research, Inc. and CDC.

In response to the ever-evolving computer marketplace, this year's three-part Hardware Roundup is a little different.

This first installment, mainframes and superminis, remains for the most part in its usual format. But because of the growing number of superminicomputer-class processors, those that appear to have a specialized focus will appear in next week's issue.

Included in this group of specialized systems are transaction processing systems, such as those manufactured by Tandem Computers, Inc. and Stratus Computer, Inc., and superminicomputers that appear to be geared to scientific/engineering applications, artificial intelligence and so on. The determination of which systems would appear in this group is admittedly subjective, since many vendors claim their systems can function in either the commercial or the scientific environment. Also, for the first time, next week's installment of the Hardware Roundup will include information about supercomputers.

The final segment of the Hardware Roundup will focus on traditional 16-bit minicomputers and the new breed of so-called supermicrocomputers. It will also address, in a somewhat abbreviated fashion, traditional microcomputers. The intent of this section is to address those microprocessor-based systems that would most likely fit into a business environment, as opposed to a home setting.

Furthermore, *Computerworld* offers the usual provisos on relative performance and million instructions per second throughput ratings. These ratings are provided in an attempt to put the systems in the Hardware Roundup into perspective by offering approximations of their power.

These numbers are not intended to be used as a buyer's guide. Clearly, many factors can influence the actual performance a user will experience with a given computer system.

Finally, CW does not endorse any product listed in the Hardware Roundup.

IBM mainframes and plug compatibles

IBM

System / Characteristics	3083 Model CX	3083 Model EX	3083 Model BX	3083 Model JX	3081 Model GX	3081 Model KX	3084 Model QX	3090 Model 200	3090 Model 400
Mips[1]	2.4	3.3	6	8.4	12.5	16.3	29.1	28.3	52.7
Purchase Price[2] (Memory Size)	$605,000 (8M)	$695,000 (8M)	$125,500 (16M)	$185,000 (32M)	$219,000 (16M)	$261,000 (16M)	$8,010,000 (64M)	$4,600,000 (64M)	$9,300,000 (128M)
Machine Cycle Time (Nsec)	24	24	24	24	24	24	24	18.5	18.5
Cache (Buffer) Size	16K	16K	32K	64K	64K[3]	64K[3]	64K	128K	256K
Price per 1M Byte of Main Memory	$12,520	$12,500	$12,500	$12,500	$12,500	$12,500	$12,500	$12,500	$12,500

[illegible]

IBM

System / Characteristics	4361 Model 3	4361 Model 4	4361 Model 5	4381 Model 1	4381 Model 2	4381 Model 3
Mips[1]	0.38	0.79	1.14	2.1	2.7	4.8
Purchase Price[2] (Memory Size)	$126,900 (2M)	$126,900 (2M)	$200,000 (2M)	$370,000 (4M)	$500,000 (4M)	$340,400 (8M)
Machine Cycle Time (Nsec)	100 (Per 4 bytes)	100 (Per 4 bytes)	100 (Per 4 bytes)	56 (Per 4 bytes)	56 (Per 4 bytes)	56 (Per 4 bytes)
Cache (Buffer) Size	8K	8K	16K	8K	32K	64K
Price per 1M Byte of Main Memory	$7,500	$7,500	$7,500	$10,000	$10,000	$10,000

[illegible]

IBM

System / Characteristics	System/38 Model 4	System/38 Model 6	System/38 Model 12	System/38 Model 20	System/38 Model 40	8130A	8130B	8140	8150A	8150B
Mips[1]	0.2	0.3	0.57	0.67	0.88	0.2	0.3	0.36	0.86	0.86
Purchase Price (Memory Size)	$39,140[3] (1M)	$64,000[4] (2M)	$120,000[5] (4M)	$145,000[6] (4M)	$205,000 (8M)	$19,040[7] (768K)	$37,800[8] (1M)	$80,000[9] (1M)	$82,500 (2M)	$115,000 (2M)
Machine Cycle Time (Nsec)	1,100 (Per 4 bytes)	400 (Per 4 bytes)	400 (Per 4 bytes)	400 (Per 4 bytes)	166.5 (Per 4 bytes)	1,500	1,500	800	Not available	Not available
Cache (Buffer) Size	None	None	None	None	None	None	None	None	None	None
Price per 1M Byte of Main Memory	$7,500	$7,500	$7,500	$7,500	$7,500	$10,000	$10,000	$10,000	$10,000	$10,000

[illegible]

Amdahl Corp.

Characteristics \ System	5840	5850	5860	5867	5868	5870	5880
Mips[1]	8.4	11.6	14	22.0	22.0	26.6	26.6
Purchase Price[2] (Memory Size)	$1,550,000 (16M)	$1,850,000 (16M)	$2,150,000 (16M)	$2,850,000 (24M)	$3,410,000 (32M)	$3,470,000 (32M)	$3,930,000 (32M)
Machine Cycle Time (Nsec)	23.25	23.25	23.25	23.5	23.5	23.25	23.25
Cache (Buffer) Size[4]	64K	64K	64K	64K	64K	128K	128K
Price per 1M Byte of Main Memory[3]	$12,500	$12,500	$12,500	$12,500	$12,500	$12,500	$12,500

National Advanced Systems Corp.

Characteristics \ System	AS/8023	AS/8043	AS/8053	AS/8063	AS/8083	AS/8040	AS/8050	AS/8060	AS/8070	AS/8080	AS/XL Model 60	AS/XL Model 80
Mips[1]	2.9	5.24	6.52	8.43	15.2	7.2	9	11.2	16.2	20	28	50
Purchase Price[2] (Memory Size)	$730,500 (16M)	$1,092,000 (16M)	$1,492,000 (16M)	$1,880,000 (16M)	$2,871,000 (16M)	$1,402,000 (8M)	$1,794,000 (8M)	$2,156,000 (16M)	$3,041,000 (16M)	$3,878,000 (16M)	$4,840,000 (64M)	$8,470,000 (64M)
Machine Cycle Time (Nsec)	40	40	40	35	35	38	38	30	38	30	Not available	Not available
Cache (Buffer) Size	32K	32K	64K	64K	128K	64K	256K	256K	128K[4]	512K[4]	256K	512K[4]
Price per 1M Byte of Main Memory[3]	$11,800	$11,800	$11,800	$11,800	$11,800	$11,800	$11,800	$11,800	$11,800	$11,800	$11,800	$11,800

National Advanced Systems Corp.

Characteristics \ System	AS/6620	AS/6630	AS/6650	AS/6660
Mips[1]	1.6	2	2.4	2.8
Purchase Price[2] (Memory Size)	$255,000 (8M)	$341,500 (8M)	$417,500 (8M)	$475,000 (8M)
Machine Cycle Time (Nsec)	60	60	50	43
Cache (Buffer) Size	64K	64K	64K	64K
Price per 1M Byte Of Main Memory[3]	$8,000	$8,000	$8,000	$8,000

IBM mainframes and plug compatibles

[illegible] Ultimate Systems Inc.

Characteristics \ System	[illegible]	[illegible]	[illegible]	[illegible] Model 2
Mips[1]	0.65	1.2	1.2	2.2
Purchase Price (Memory Size)	$18,750 (2M)	$37,500 (4M)	$37,500 (4M)	$90,625 (8M)
Machine Cycle Time (Nsec)	100	100	100	100
Cache (Buffer) Size	16K	32K	32K	64K
Price per 1M Byte of Main Memory[3]	$3,700	$3,700	$3,700	$3,700

[illegible]

IPL Systems Inc.

Characteristics \ System	4443	4445	4460	4480
Mips[1]	1	1.5	1.6	2.7
Purchase Price[3] (Memory Size)	$93,500 (2M)	$165,000 (4M)	$195,800 (4M)	$443,000 (8M)
Machine Cycle Time (Nsec)	50	50	50	50
Cache (Buffer) Size	8K	24K	24K	48K[4]
Price per 1M Byte of Main Memory	$8,250	$8,250	$8,250	$8,800

[illegible]

Nixdorf Computer Corp.

Characteristics \ System	8890/CP[5]	8890 Model 12	8890 Model 22	8890 Model 52	8890 Model 72
Mips[1]	0.25	0.25	0.25	0.5	0.7
Purchase Price[3] (Memory Size)	$90,950 (1M)	$28,750 (1M)	$146,500 (2M)	$53,500 (2M)	$85,500 (4M)
Machine Cycle Time (Nsec)	200	200	200	200	200
Cache (Buffer) Size	None	None	None	None	64K
Price per 1M Byte of Main Memory	$6,350	$6,350	$6,350	$6,350	$6,350

[illegible]

[illegible]

Characteristics \ System	1636 Model 10	1641 Model 1	1641 Model 11	1651 Model 1
Mips[1]	0.60	0.72	0.90	1
Purchase Price[3] (Memory Size)	$98,500 (1M)	$130,000 (2M)	$155,000 (2M)	$215,000 (4M)
Machine Cycle Time (Nsec)	50	50	50	50
Cache (Buffer) Size	8K	8K	8K	8K
Price per 1M Byte of Main Memory	$7,500	$7,500	$7,500	$7,500

[illegible]

Other vendors' mainframes

Honeywell Inc.

Characteristics \ System	DPS 88/81	DPS 88/82	DPS 88/82T	DPS 88/81	DPS 88/82	DPS 88/82T	DPS 90/91	DPS 90/92	DPS 90/92T	DPS 90/93	DPS 90/94
Mips[1]	4.8	4.8	4.8	7.2	13	13	10.8	19.4	19.4	28	36.7
Purchase Price (Memory Size)	$1,850,000 (16M)	$2,950,000 (16M)	$3,700,000 (16M)	$2,850,000 (16M)	$4,050,000 (16M)	$4,800,000 (16M)	$3,950,000 (32M)	$6,000,000 (32M)	$6,250,000 (64M)	$7,300,000 (64M)	$8,350,000 (64M)
Machine Cycle Time (Nsec)	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available
Cache (Buffer) Size	64K	64K	64K	64K	128K	128K	32K	64K	64K	96K	128K
Price per 1M Byte of Main Memory	$16,250	$16,250	$16,250	$16,250	$16,250	$16,250	$12,500	$12,500	$12,500	$12,500	$12,500

Honeywell Inc.

Characteristics \ System	DPS 8/47	DPS 8/49	DPS 8/52	DPS 8/62	DPS 8/70
Mips[1]	0.73-1.2	1.1-4.5	1.1-4.9	1.2-5.9	1.8-7.2
Purchase Price (Memory Size)	$153,000 (2M)	$253,000 (4M)	$450,000 (4M)	$550,000 (4M)	$700,000[2] (4M)
Machine Cycle Time (Nsec)	Not available	Not available	Not available	Not available	Not available
Cache (Buffer) Size	32K	32K	32K	32K	32K
Price per 1M Byte of Main Memory	$10,000	$10,000	$20,000	$20,000	$20,000

Honeywell Inc.

Characteristics \ System	DPS 6/[illegible]	DPS 6/[illegible]	DPS 7/[illegible]	DPS 7/[illegible]
Mips[1]	1.2	1.8	0.5[3]	1.36[3]
Purchase Price[2] (Memory Size)	$57,000 (2M)	$104,900 (2M)	$85,200[3] (1M)	$215,700[3] (2M)
Machine Cycle Time (Nsec)	300	125	320	140
Cache (Buffer) Size	8K	8K	None	None
Price per 1M Byte of Main Memory	$7,000	$8,000	$10,000	$10,000

Sperry Corp.

Characteristics \ System	System 80 Model 4	System 80 Model 6	System 80 Model 8	System 11UP	System 11MP	1100/71 H2	11/70 H2	1100/91 SV	1100/91	1100/92SV	1100/92	1100/93	1100/94
Mips[1]	0.20	0.37	0.70	0.5	0.9	1.6	2.9	5.5	7.5	10.2	14	20	26
Purchase Price[2] (Memory Size)	$86,082 (512K)	$85,905 (512K)	$123,900 (1M)	$77,644 (4M)	$114,841 (4M)	$301,080 (2M)	$509,370 (4M)	$2,006,982 (8M)	$2,435,811 (8M)	$2,896,972 (8M)	$3,620,221 (16M)	$4,818,631 (16M)	$6,447,041 (32M)
Machine Cycle Time (Nsec)	180	180	124	108	108	116	116	30	30	30	30	30	30
Cache (Buffer) Size	None	None	None	None	None	32K	64K	64K	64K	128K	128K	192K	256K
Price per 1M Byte of Main Memory	$2,956	$2,956	$14,400	$7,500	$7,500	$12,180	$12,180	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000

Other vendors' mainframes

NCR Corp.

System / Characteristics	[illegible]	[illegible]	[illegible]	[illegible]	V-8670[illegible]	[illegible]	[illegible]
Mips	1	1.9	2	2.8	3.7	5.5	7.3
Purchase Price (Memory Size)	$455,000 (4M)	$695,000 (4M)	$970,000 (8M)	$1,215,000 (8M)	$1,455,000 (8M)	$2,190,000 (12M)	$2,895,000 (16M)
Machine Cycle Time (Nsec)	38[10]	38[10]	38[10]	38[10]	38[10]	38[10]	38[10]
Cache (Buffer) Size	32K	128K	64K	160K	256K	384K	512K
Price per 1M Byte of Main Memory	$16,200	$16,200	$16,200	$16,200	$16,200	$16,200	$16,200

NCR Corp.

System / Characteristics	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips	0.15	0.30	0.25	0.42	0.61	0.77
Purchase Price (Memory Size)	$20,340 (1M)	$33,765 (1M)	$54,000 (1M)	$70,000 (2M)	$123,000 (4M)	$170,000 (4M)
Machine Cycle Time (Nsec)	150	150	56	56	56[6]	56[6]
Cache (Buffer) Size	None	None	None	None	None	None
Price per 1M Byte of Main Memory	$6,500	$6,500	$7,500	$7,500	$7,500	$7,500

Control Data Corp.

System / Characteristics	Cyber/180 810	Cyber/180 [illegible]	Cyber/180 [illegible] (Dual CPU)	Cyber/180 [illegible]	Cyber/180 [illegible]	Cyber/180 [illegible]	Cyber/180 [illegible] (Dual CPU)	Cyber/180 [illegible]	Cyber/180 [illegible] (Dual CPU)
Mips	0.8	1.2	2	3.7	5.6	8.5	15.2	42[9]	63[9]
Purchase Price (Memory Size)	$125,000 (2M)	$180,000 (2M)	$290,000 (2M)	$760,000 (16M)	$1,115,000 (16M)	$1,575,000 (16M)	$2,430,000 (16M)	$3,350,000 (8M)	$6,100,000 (8M)
Machine Cycle Time (Nsec)	50	50	50	56	16	16	16	16	16
Cache (Buffer) Size	None	None	None	16K or 32K	16K or 32K	16K or 32K	16K or 32K	32K	32K
Price per 1M Byte Of Main Memory	$5,000	$5,000	$5,000	$12,500	$12,500	$12,500	$12,500	$60,000[8]	$60,000[8]

1. [illegible]
2. Performance [illegible]
3. Million instructions per second [illegible]
4. Includes processor, [illegible]
5. [illegible]

HARDWARE ROUNDUP

[illegible]

Characteristics / System	AS-D	AS-F	[illegible]	[illegible]	[illegible]	[illegible]	A 15 Model F	A 15 Model I	A 15 Model L	A 15 Model N
Mips	1.5	1.8	1.6	6.6	11.2	28	17.1	32.4	46.2	88.5
Purchase Price (Memory Size)	$433,900 (8M)	$613,000 (8M)	$1,000,000 (8M)	$1,550,000 (12M)	$2,500,000 (24M)	$3,400,000 (32M)	$2,820,000 (24M)	$4,530,000 (24M)	$6,790,000 (32M)	$8,435,000 (32M)
Machine Cycle Time (Nsec)	72.5	72.5	125	125	125	125	67	67	67	67
Cache (Buffer) Size	None	8K	144K	144K	144K	144K	Not available	Not available	Not available	Not available
Price per 1M Byte of Main Memory	$10,000	$10,000	$17,000	$17,000	$17,000	$17,000	$12,000	$12,000	$12,000	$12,000

[illegible]

Characteristics / System	[illegible]	[illegible]	[illegible]	V340	[illegible]	AS-D	AS-F	AS-K
Mips	0.56	0.86	0.88	1.37	2.2	0.65	0.85	0.93
Purchase Price (Memory Size)	$89,300 (512K)	$125,000 (1M)	$198,000 (2M)	$380,400 (10M)	$702,800 (10M)	$85,500 (3M)	$120,800 (3M)	$200,000 (6M)
Machine Cycle Time (Nsec)	168	180	143	110	110	Not available	Not available	Not available
Cache (Buffer) Size	8K	None	None	None	None	None	None	None
Price per 1M Byte of Main Memory	$10,000	[illegible]	[illegible]	[illegible]	$10,000	[illegible]	[illegible]	[illegible]

[illegible]

Characteristics / System	Series 30 Level 30/1	Series 30 Level 30/2	[illegible]	[illegible]	[illegible]	Series 80 Level 80/1	Series 80 Level 80/2
Mips	1.3	2.4	1.7-3.1	2.7-4.9	4.9-8.6	11	19.8
Purchase Price (Memory Size)	$194,000 (4M)	$434,000 (16M)	[illegible] (8M)	[illegible] (16M)	$878,000 (16M)	$1,863,000 (16M)	$3,331,000 (32M)
Machine Cycle Time (Nsec)	180	180	80	80	80	25	25
Cache (Buffer) Size	52K	52K	17K	17K	17K	20K	20K
Price per 1M Byte of Main Memory	$7,920	$7,920	$9,550	$9,550	$9,550	$13,220	$13,220

[illegible]

THE BEST WAY TO KEEP YOUR COMMUNICATIONS FROM BEING TIED UP IS TO TIE THEM TOGETHER.

NETWORKING LINKS ALL YOUR VOICE AND DATA TERMINALS, WHEREVER THEY MAY BE. IT'S ONE OF MANY INTEGRATED FUNCTIONS OF AT&T SYSTEM 85 AND AT&T SYSTEM 75.

Everyone knows the old adage, "there's strength in numbers." That holds true only if the various elements, however numerous, are working together.

The Networking function of System 85 and System 75 from AT&T Information Systems unites all the elements of our business communications systems so everything works together. Whether you have offices spread throughout a building or throughout the country, they can all be linked productively into one network.

A NEW BUSINESS ASSET

A network should be looked at not simply as a communications tool, but as a business asset. Like any other asset your business holds, it too can be controlled and managed and made to work for you.

All our networks let you incorporate new applications, making your system more powerful than ever. And thanks to our integrated digital T-carrier interface, you can speed up and control the flow of not only voice, but data transmissions as well.

In a small area, like a campus, or even nationwide, look into our Distributed Communications System. With it, multiple systems serving up to 100,000 lines can function as one. It also offers extensive voice and data terminal transparency and attendant transparency, so attendants can control the entire system from one location.

Remote Groups let you extend System 85 capabilities to small locations via DS-1 facilities. Remote Modules serve larger locations, up to 2½ miles away, over fiber optics. Voice communications and data from host computers are transmitted with complete user transparency.

An Electronic Tandem Network can also be used to link locations anywhere in the country. Through a mix of analog, high-capacity digital, and public facilities, virtually any number of voice and data terminals can be connected.

CONTROL AND ECONOMY

Once you've linked your communications into one network, you'll have a host of powerful features working to increase productivity, reduce costs and give you more control over your communications. Automatic Route Selection, Automatic Alternate Routing, and Queuing choose the least expensive path for all network calls. And "Authorization Codes" grant calling privileges to appropriate employees.

With all your offices under the umbrella of one system, networking can help create another business asset—a single, consistent corporate identity for every branch of your organization.

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System 85 and System 75 are designed according to the guidelines of Information Systems Architecture. This ensures that any upgrades or future generations of the system will be compatible with the current one. So your investment is protected.

There are over 350 ETN's and DCS's already in place. More than half of the *Fortune 500* companies have chosen private networks from AT&T Information Systems. Besides our features, function and investment protection, there's one more compelling reason why—our service.

Our systems are backed by the largest sales and service staff in the industry. Network support includes predesign, cutover coordination, post-cutover administration, and ongoing maintenance. Add to that a century of communications experience and leadership, and your decision is easy. Of all your alternatives, only one is the right choice—AT&T.

To find out more about the Networking capabilities of System 85 and System 75, call your AT&T Information Systems Account Executive or 1-800-247-1212.

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The right choice.

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The superminis

Perkin-Elmer Corp.

Characteristics / System[1]	[illegible]	[illegible]	3210	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[2]	0.39	0.39	0.61	0.98	1.33	1	1.7-8.5	1.9-7.2
Purchase Price[3] (Memory Size)	$22,100 (1M)	$30,000 (1M)	$58,900 (1M)	$98,700 (1M)	$193,000 (2M)	$85,000 (1M)	$125,000 (2M)	$222,100 (2M)
Machine Cycle Time (Nsec)	Not available	Not available	250	250	Not available	Not available	Not available	Not available
Cache (Buffer) Size	None	None	None	1K	8K	4K	4K-24K	8K
Price per 1M Byte Of Main Memory	$4,900	$4,900	$7,000	$7,000	$7,000	$7,000	$7,000	$7,000

Hewlett-Packard Co.

Characteristics / System	HP 3000 37	HP 3000 42	HP 3000 48	HP 3000 58	HP 3000 68
Mips[2]	0.25	0.5	0.5	0.75	1.5
Purchase Price[3] (Memory Size)	$21,950 (512K)	$57,735 (1M)	$98,256 (2M)	$125,256 (4M)	$226,740 (4M)
Machine Cycle Time (Nsec)	Not available	105	105	Not available	75
Cache (Buffer) Size	None	None	None	32K	8K
Price per 1M Byte of Main Memory	$8,000	$9,000	$8,000	$7,500[4]	$8,750[5]

Wang Laboratories, Inc.

Characteristics / System	VS65	VS85	VS100	VS300
Mips[2]	0.6	1.3	1.3	3.3
Purchase Price[3] (Memory Size)	$19,950 (1M)	$77,700 (2M)	$99,750 (2M)	$170,000 (4M)
Machine Cycle Time (Nsec)	200	160	140	120
Cache (Buffer) Size	16K	None	32K	32K
Price per 1M Byte of Main Memory	$6,300	$8,000	$8,000	$10,000

Prime Computer, Inc.

Characteristics / System	Series 50 2250	Series 50 2550	Series 50 9650	Series 50 9750	Series 50 9955
Mips[2]	0.47	0.73	0.9	1.75	4
Purchase Price[3] (Memory Size)	$29,900 (512K)	$98,500 (2M)	$135,000 (2M)	$240,000 (4M)	$360,000 (4M)
Machine Cycle Time (Nsec)	160	160	160	100	80
Cache (Buffer) Size	2K	16K	16K	16K	64K
Price per 1M Byte of Main Memory	$7,900	$7,900	$7,900	$7,900	$7,900

Motorola Four-Phase Systems, Inc.

Characteristics / System	Series 2000 Model 280	Series 2000 Model 290
Mips[2]	0.5	1
Purchase Price (Memory Size)	$10,930 (512K)	$14,095 (1M)
Machine Cycle Time (Nsec)	825	450
Cache (Buffer) Size	None	None
Price per 1M Byte of Main Memory	$3,625	$3,625

HARDWARE ROUNDUP

System / Characteristics	Universe 68/05	Universe 68/35	Universe 68/137	Universe 2402	Universe 2406	Universe 32/35	Universe 32/115
Mips*	1.25	1.25	1.25	1.25	1.25	2.7	2.7
Purchase Price* (Memory Size)	$13,500 (512K)	$16,700 (1M)	$26,700 (1M)	$8,980 (512K)	$17,000 (1M)	$23,000 (1M)	$24,900 (4M)
Machine Cycle Time (Nsec)	320	320	320	320	320	Not available	Not available
Cache (Buffer) Size	4K	4K	4K	4K	4K	8K	8K
Price per 1M Byte of Main Memory	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200

Formation Inc

System / Characteristics	F4000 Model 100	F4000 Model 200	F4000* Model 200AP	F4000* Model 300	F4000* Model 300AP
Mips*	0.20	0.32	0.36	0.24	0.38
Purchase Price* (Memory Size)	$57,000 (1M)	$70,000 (1M)	$82,500 (1M)	$97,000 (2M)	$123,400 (2M)
Machine Cycle Time (Nsec)	800	800	800	800	800
Cache (Buffer) Size	None	None	None	None	None
Price per 1M Byte of Main Memory	$10,000	$10,000	$10,000	$10,100	$10,100

System / Characteristics	[illegible]	[illegible]
Mips*	1	1.8
Purchase Price* (Memory Size)	$190,000 (2M)	$245,000 (2M)
Machine Cycle Time (Nsec)	400	400
Cache (Buffer) Size	8K	16K
Price per 1M Byte of Main Memory*	$3,780	$3,780

System / Characteristics	[illegible]
Mips*	0.54
Purchase Price* (Memory Size)	$88,950 (512K)
Machine Cycle Time (Nsec)	150
Cache (Buffer) Size	None
Price per 1M Byte of Main Memory	$14,000

Digital Equipment [illegible]

System / Characteristics	VAX-11/725	VAX-11/730	VAX-11/750	VAX-11/780	VAX-11/782	VAX-11/785	VAX 8600
Mips*	0.36	0.36	0.72	1.05	1.9	1.7	4.4
Purchase Price* (Memory Size)	$24,900* (1M)	$21,500 (1M)	$51,000 (1M)	$146,000 (2M)	$320,000 (4M)	$195,000 (2M)	$350,000 (4M)
Machine Cycle Time (Nsec)	810	810	400	200	200	166	80
Cache (Buffer) Size	None	None	4K	8K	16K	32K	16K
Price per 1M Byte of Main Memory	$4,900	$4,900	$4,900	$4,500*	$4,500	$4,500*	$4,500

The superminis

[illegible]

Characteristics / System	Harris 60	Harris [illegible]	Harris 700	Harris 800	Harris 1000	Harris 1200	HCX-7
Mips	0.76	0.76	0.89	1.1-1.6	4.9	5	7.5
Purchase Price (Memory Size)	$66,900 (768K)	$38,900 (768K)	$49,900 (384K)	$139,000 (768K)	$250,000 (1.5M)	$294,000 (1.5M)	$275,000 (2M)
Machine Cycle Time (Nsec)	300	300	300	180	75	75	100
Cache (Buffer) Size	8K	8K	8K	8K	8K	288K	44K
Price per 1M Byte of Main Memory	$10,000	$10,000	$10,000	$10,000	$10,000	$8,000	$7,000

Gould Inc. Computer Systems Division

Characteristics / System	Concept 32/27	Concept 32/67	Concept 32/97
Mips	1	3	10.1
Purchase Price (Memory Size)	$55,000 (2M)	$99,000 (1M)	$245,000 (4M)
Machine Cycle Time (Nsec)	150	150	75
Cache (Buffer) Size	None	32K	32K-64K
Price per 1M Byte of Main Memory	$9,500	$9,500	$9,500

[illegible]

Characteristics / System	Classic 32/85	Classic 32/85A
Mips	2.5	2.5
Purchase Price (Memory Size)	$148,500 (2M)	$166,500 (8M)
Machine Cycle Time (Nsec)	110	110
Cache (Buffer) Size	64K	64K
Price per 1M Byte of Main Memory	$6,000	$6,000

[illegible]

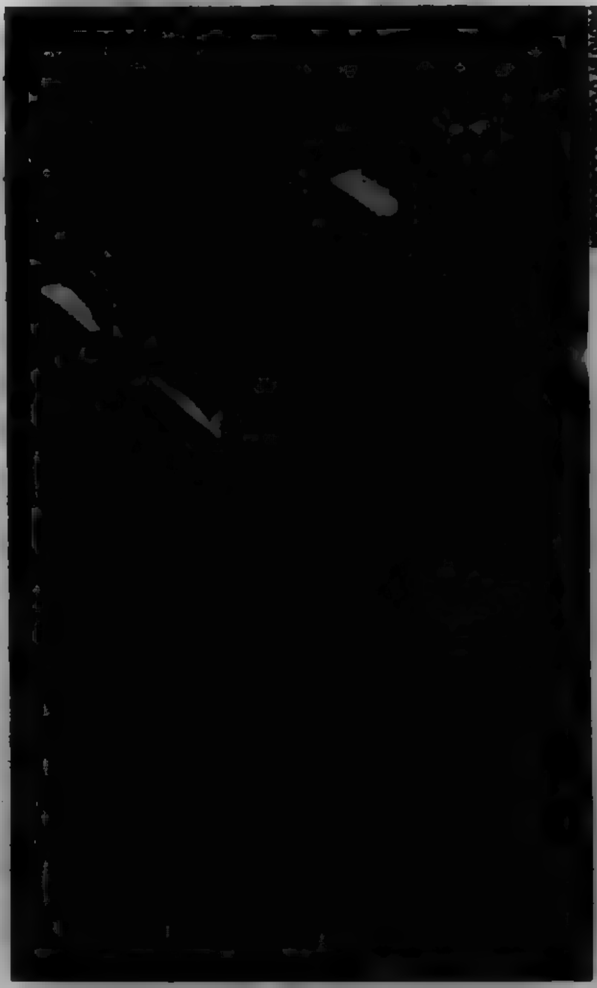
Characteristics / System	MV/2000DC	MV/4000	MV/8000 II	MV/10000
Mips	0.6	0.6	1.2	2.5
Purchase Price (Memory Size)	$38,200 (2M)	$63,400 (1M)	$125,300 (1M)	$211,070 (2M)
Machine Cycle Time (Nsec)	200	200	220	140
Cache (Buffer) Size	None	None	16K	16K
Price per 1M-Byte of Main Memory	$4,900	$4,900	$4,900	$4,900

[illegible]

Characteristics / System	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips	0.4	1	0.4	1	1.2
Purchase Price (Memory Size)	$9,900 (1M)	$15,900 (2M)	$28,500 (1M)	$35,500 (2M)	$39,500 (4M)
Machine Cycle Time (Nsec)	Not available	Not available	Not available	Not available	Not available
Cache (Buffer) Size	None	64	None	64	20K
Price per 1M Byte Of Main Memory	$3,000	$3,000	$3,000	$3,000	$3,000

The science and art of debugging

By James H. Bradley



Debugging programs is the most scientific and systematic part of software work, provided the code is reasonably structured and economically documented. Because testing and debugging soak up about 25% of software development and maintenance costs — nearer 50% when maintenance costs are suballocated — systematic debugging is important.

Unfortunately, even the best books on testing regard debugging as a black art. In *Software System Testing and Quality Assurance* (Van Nostrand Reinhold, 1984), Boris Beizer suggests that "... debugging, so far, has not been amenable to theoretical treatment."

He adds, "Testing can and should be designed and scheduled beforehand. The procedures for, and duration of, debugging cannot be so constrained."

Beizer rightly says, "Debugging demands intuitive leaps, conjectures [the polite term is working hypotheses], experimentation, intelligence and freedom." Yet he contrasts debugging with testing, describing the latter as "predictable, dull, constrained, rigid and inhuman."

In my view, both testing and debugging are all these things. Debugging is a straightforward application of the scientific method that has been developed over 2,500 years. The basis of debugging is to locate a problem's source by binary partitioning, through working hypotheses that predict new values to be examined.

Take a simple, nonsoftware example: A lamp in my house does not work. If nothing in the house works, the cause must be in the main circuit breaker or outside; I look around to see whether the neighborhood is blacked out. If some things work, I plug the suspect lamp into a working socket and a working appliance into the suspect circuit. So goes the alternation of hypothesis and test.

Note that much of the testing uses substitution techniques; software designers call these techniques drivers and stubs. Software designed to be testable and debuggable has a judicious number of built-in drivers, stubs, trace features, counters and means for listing internal variables — all controlled by flags listed in the maintenance and support manuals. Often one of the stubs is the previous version of the code.

Possibly the bug may act up intermittently, or multiple bugs may be present. In this case, confirmatory evidence of these incidences is sought.

What is a bug, anyhow? Most alleged bugs are enhancements, errors and gaps in manuals or incorrect documentation. Errors in test plans are about as common as errors in code. Unsuitable numerical methods are often at fault.

I define a bug as a discrepancy between actual and expected system behavior, caused by a few local errors in a few lines of code or a few entries in a table. Redesign, research and development are not debugging. There must be documentation of the intended system behavior separate from its actual performance; otherwise, the system is lousy, not buggy. Ambiguous specifications and test plans are common; in counting people over age 60, for example, does everybody agree on how to count somebody who is between 60 and 61?

It is ironic that structured, rigorous specifications are so popular just when the market is booming in products that require less rigid specifications. Software for general sale, such as word processing tools, spreadsheets and data bases, is flexible and has many trade-offs, with minor effects on its marketability. Specifications are often given in general terms for responses to user and data errors, error checking of inputs, demands for confirmation of unusual inputs and backup code to handle supposedly impossible situations. Users shopping around for a commercial item or evaluating an existing product for a new application necessarily have both set and flexible requirements.

However, debugging requires documentation of the intended functions of code, even if somebody has made some variable, arbitrary choices. Systems have to be deloused before they can be debugged. Even in serious scientific computing, which oftens discards code after a single use and where rounding or discretization error and other perpetual problems cause incompletely predictable behavior, algorithms must be documented before they can be debugged.

Managers should note that bugs come in swarms, not singly. Check around: Much depends upon the programmer's mental state, which is profoundly affected by working conditions, noise, interruptions and excessive meetings. Where one bug is found, a whole nest is probably nearby.

Partitioning

Some bugs are hard to find because they can be intermittent (dependent upon concurrent uses of the system); insufficiently local, especially in certain types of artificial intelligence, multipass algorithms and feedback and feedforward loops; or dependent upon particular data values or upon the history of the inputs.

They can also be the result of unintended interactions and overwriting of values such as conflicting or invalid access to data; or even caused by hardware, compilers, loaders, operating systems or electrical interference. Even in these harder cases, the best method is usually partitioning through tests based on working hypotheses.

In practice, a batch run to dump a trace of execution and some intermediate values should normally record enough detail to partition the problem into four to eight pieces. In the interactive use of simple special stub code, binary partitioning is common because the mode of execution is set interactively via a few flags.

Aside from computers and accompanying peripherals, the following resources are needed in debugging:

- A test plan, discrepancy report or complaint.
- A test report or other supporting data.
- Data flow diagrams, state-transition diagrams, augmented transition networks, event analyses, detailed specifications and other structured documentation of intended system behavior. The test plan is too local a specification.
- Maintenance and support manuals showing all the nonpublic flags, trace, counters, dumps and internal interfaces as well as the basic structure chart.
- New and old listings of code and tables, with engineering change orders.
- Manuals for job control language, operating system, languages and other metafacilities.
- Suitable working space, good conditions and freedom from disturbances and interruptions.

Flow charts and program design language, if any, should be converted to the canonical form of sequence, loop and decision construct, even if the actual code is unstructured. That is how, in a radar system, I found an 18-year-old bug that had always been blamed on the weather. R. C. Tausworthe gives specific methods and examples of conversion in part one of his book, *Standardized Development of Computer Software* (California Institute of Technology, 1976). The delousing of unstructured and undocumented code starts with the preparation, in canonical form, of flow charts, then data flow diagrams and structure charts and then other structured documentation.

> ”
>
> ***Redesign, research and development are not debugging.***

Debugging is not a universal planned-response system; one does not automatically rerun the job with trace. Instead, one or more hypotheses are formed, based on data flow diagrams, event analyses or flow charts, to define what trace to print. Other steps include the following:

- Try to collect related values that may already be available. Trace the tree, or network, of causality both forward and backward. Predict indirect — backward then forward — consequences that can be examined — in the analogy of the lamp that doesn't work, check other appliances on other circuits.

Use an appropriately partitioned data flow diagram and event analysis as a tree of causality. Event analyses are used much like an expert system: Forward event analyses show what should respond in what way to each external, temporal or internal event; backward event analyses trace the circumstances and causes of each outgoing data or control flow.

- Trace the possible common origins of several known problems. Discard effects that are probably consequences of known errors/or treat them as supporting or refuting evidence. Correlate bugs that sometimes appear together, seeking the possibility of joint causes.
- Try bypasses, rearranging the input or providing information that was previously calculated. For example, some software treats trailing

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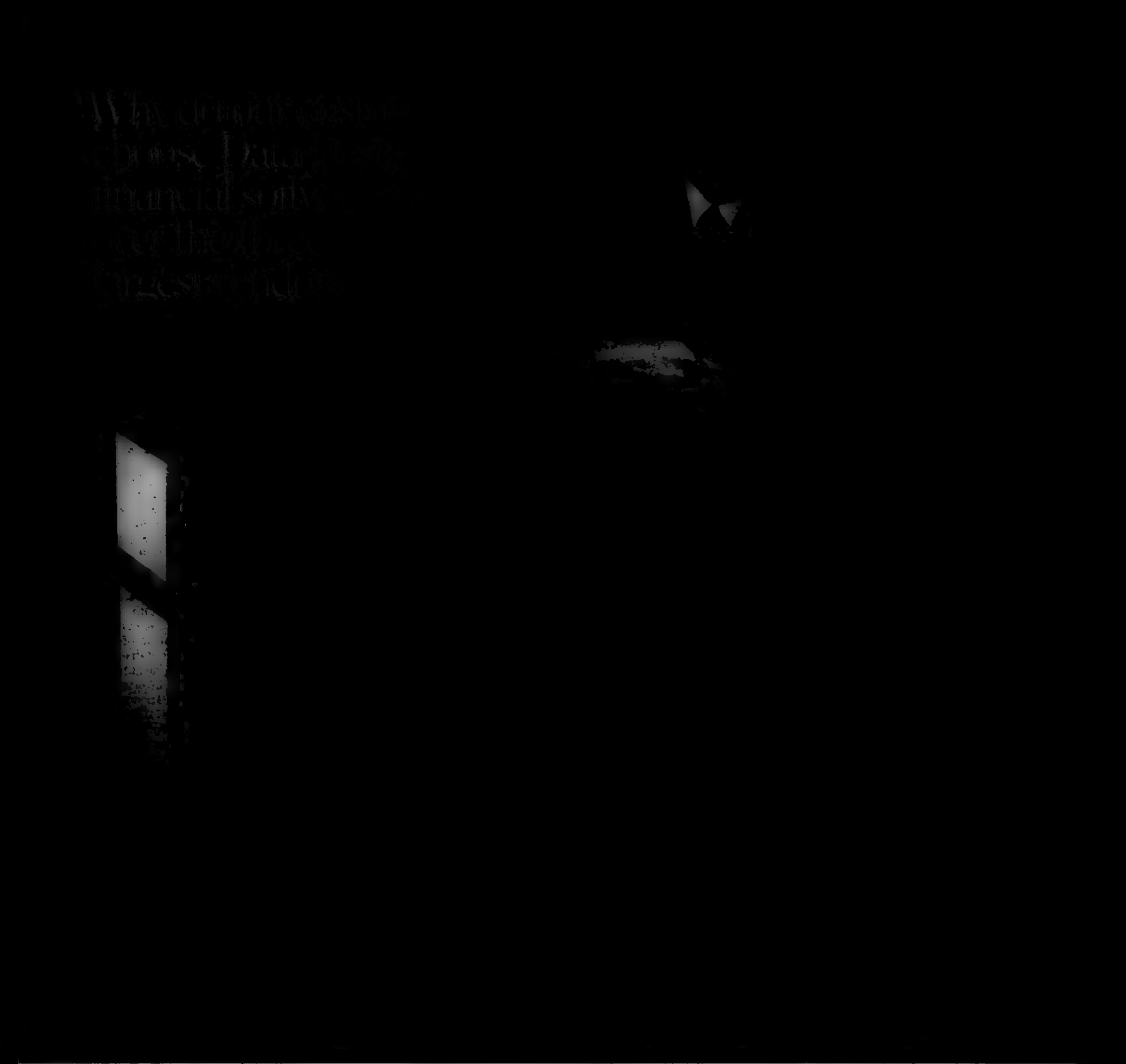

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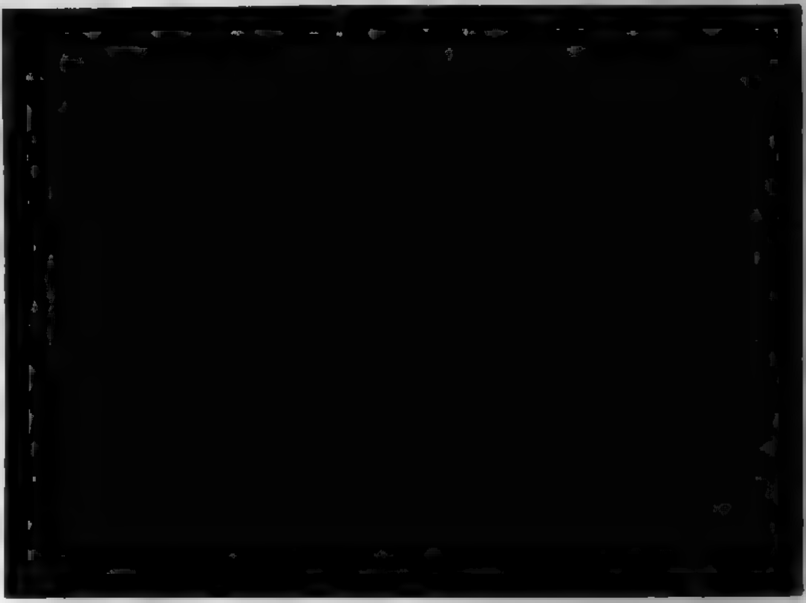

blanks as zeros instead of an end-of-field; one can give a scaling value for a graph instead of calculating it from the data.

- Look for what was recently modified and recompiled. Possibly use the previous version of the code as the backup or one of the backup codes, depending upon the scope of the modifications.

Retesting a corrected bug can be rationally scoped from analyses of causality — the doctrine of 100% retesting after every change is an economically ruinous fantasy. Remote ripple effects are rare in structured, documented software. Check for overloads on communications links, data stores that may overflow and other critical constraints approaching saturation.

- Test around the boundary values if they are known: for example, those values that cause changes in logical decisions. Where boundary values are known — even if they are incorrectly implemented — one can often avoid stumbling into changes of logical state. Minor adaptations are needed for values that are the cumulation of inputs or other statistics; they cause the operation to be history-dependent.

- Force and read the values at interfaces — for instance, at each primary input. Define the range of values (possibly close to infinite) that produce erroneous results. A bug can be in a consistency check or auditing control rather than in the main computation, and in arithmetic of finite precision, it may be only the comparison that is wrong.

As part of testing, look for the numerical outputs normally to be smooth, continuous functions of the values of the inputs. This can be of some help in debugging. Examine the repeatability of bugs to look for particular data items, values and unintended interactions via languages, linkers and operating systems.

Real-time systems interacting with external hardware cannot normally rerun identical jobs; airline flights and missile launches cannot be scheduled for the convenience of maintenance programmers. Real factories and facilities may be unusable for testing because of safety and economy. (The maintenance programmer may be debugging the response of a safety system to malfunctions that must not be recreated.)

In such cases, and in many data processing applications, it is possible to spawn or create a separate task with dummy output files and recorded input files. Good supervisory control and data acquisition systems have one or more simulated modes of operation. For example, airlines and nuclear power facilities have large logging systems with files that are used primarily for postmortem problem analyses, including software bugs.

Testing and debugging

Existing textbooks talk only of deterministic testing, not of testing with any unpredictable or possibly predefined random or uncontrollable elements. Statistics go largely unmentioned. The theory and practice of the analysis of variance is absent. Consistency, not correctness, should be tested often; there should be at least as many people over 59 as over 60. Results predictions are often qualitative, semiquantitative or Boolean. Often the prediction is for no externally visible change in the state of the system (but, of course, normally the input is not totally ignored and is never scrutinized).

The textbooks also talk about testing by or on behalf of the organization that built or commissioned the software. Testing of commercial or existing products for acceptability in a new application has a lower degree of results predictability. Debugging such systems is more difficult, but the same methods work.

Testing requires special access to interfaces and theoretically unreachable backup code. Debugging should not require an additional access facility but may use special trace. Testing and debugging can often be partially combined, in that testing may generate output needed only if a bug is found. Backup code should be designed so that its automatic — unexpected — invocation preserves information about circumstances, states and relevant values, possibly including the invocation path. Debugging may require predictions of values that are not spelled out in the test plan and documentation.

Trace can be hierarchial (several levels), selective (several subtrees) or tabular (a list of modules, entrances and exits to be recorded). Good systems provide flags for selective execution of modules and a data assignment and retrieval facility running in apparent concurrency with the main job. In real-time, an apparently concurrent facility, such as an externally interactive system, is vital.

Debuggability design

Design for debuggability is related to, but not identical to, design for testability. In testing, a sequence of inputs relates more to internal states and outputs; internal states and memories may be viewed as outputs, while in debugging they must be viewed as outputs. Testing predicts certain consistency relations; debugging finds out why they are not obeyed. Testing may be concerned with coverage, but debugging is concerned only with coverage along the paths of intended or unintended causality.

A poor architecture is one in which data structures are identified by function. Each module should normally write into one (rarely two or three) data structure, with one module writing each structure.

This process may seem unnatural in systems with queues and stacks, and the structured analysis may or may not show the guardian access machines (which prevent invalid or conflicting access to stored data), but it is normally so. It may be especially unnatural in large data base systems, where one user may cause many files to be updated, but even there it is normally true at the module level.

Errors due to misuse of names or to overwriting are difficult to catch. One can, however, turn off the code that may be overwriting. Examine the data structures into which each module writes and from which it reads; good preprocessors have a list of the data structures into which each module is allowed to write.

A few data structures must be writable by many modules, chiefly via indivisible TEST and SET instructions for interlocks. Access may have to be masked via guardian access machines, as in airline data bases. In some cases one can use cyclic pickup, invocation of a transfer routine mapping between data stores or a triggering mechanism.

An understanding of mappings is facilitated if all data structures are shown as stored, even if little or no inherent nonconcurrency exists in the system; every data flow shown in the documentation becomes some variety of store in the electronics.

Debugging, a simple application of the oldest rules of the scientific method to software, includes the adequate definition of the software's intended operation as distinct from the actual implementation. In the future, software designed for testability and debuggability will have a major impact in the software market.

About the author

James Bradley is an independent consultant and teacher based in Atlantic Highlands, N.J. Bradley specializes in structured and numerical methods and support software applied to simulation. He is associate editor of the periodical Simulation.

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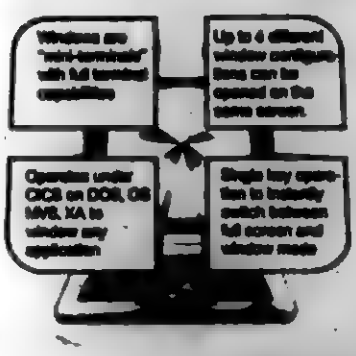
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IN DEPTH

The microcomputer and decision support

By Howard Morgan

The use of decision support system (DSS) tools has grown tremendously since the late 1970s, when microcomputing was introduced into the managerial world. DSS tools are more sophisticated and easier to use, and many managers now take advantage of them to perform complex analyses of portions of their business — an unheard-of event five years ago.

Yet with this growth have come problems: getting proper data for models; validating these models; integrating their use with standard corporate systems; and dealing with the issues of training, privacy and competition.

DSS are meant to be systems that support humans in making better decisions, not just systems that merely automate the decision-making function.

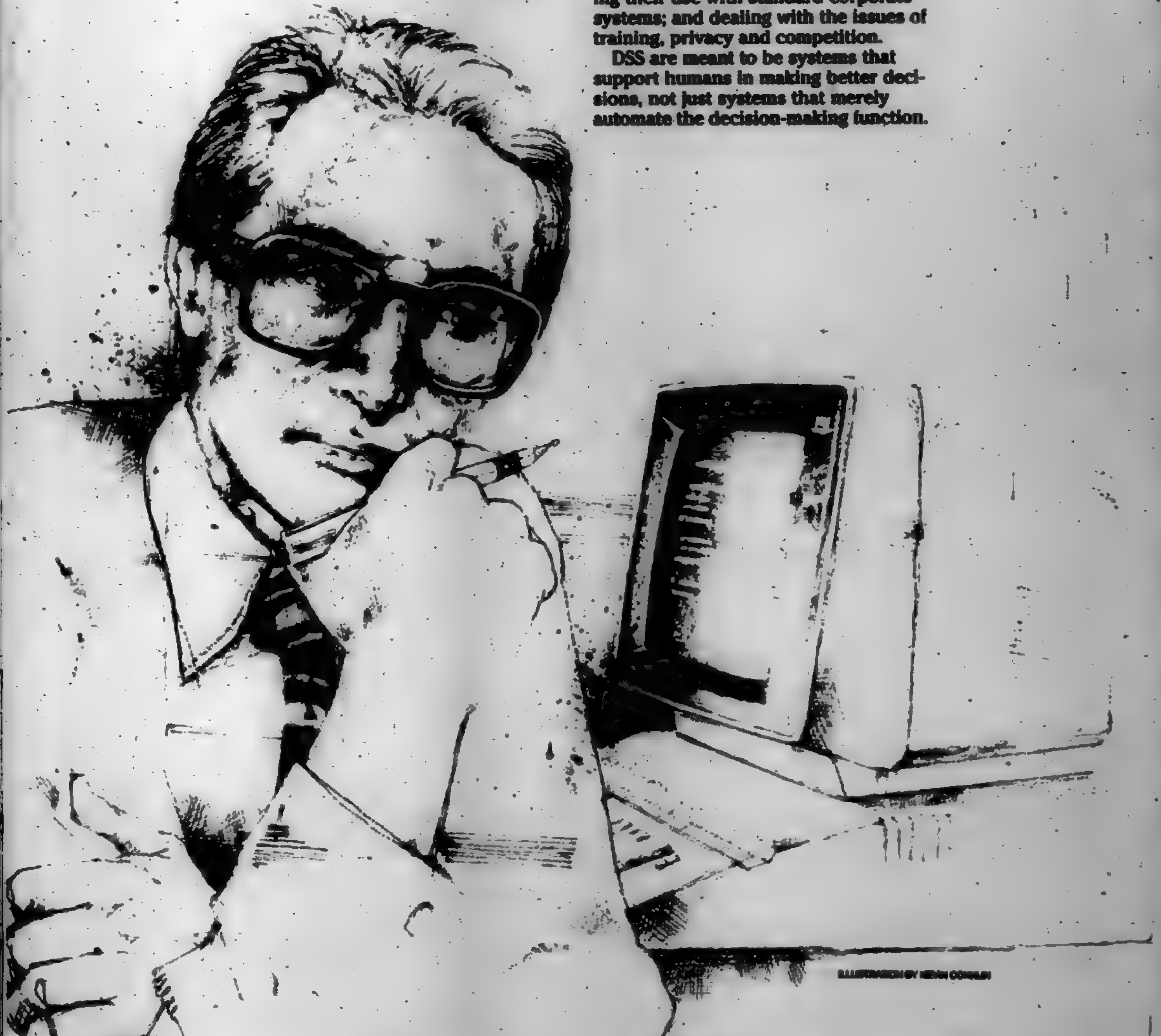

ILLUSTRATION BY KEVIN CONKLIN

This distinction gives a better perspective on how the micro can help.

The four basic elements of any DSS are decision, model, data and user interface. A wide variety of DSS, ranging from spreadsheets to artificial intelligence models of human behavior, can be constructed with these four elements.

Now, packages consistently are being announced with more specialized models already built in. A rapidly growing base of micro users with neither the interest nor the training for programming their own systems reinforces this trend toward vertical market DSS.

Spreadsheets

The most widely used modeling tool is the spreadsheet. The original one, Visicalc, was developed by Software Arts, Inc. under severe memory and processing capacity constraints. Nevertheless, with it, even a 48K-byte Apple Computer, Inc. Apple II+ could be used to model balance sheets, income statements and cash flows in hours rather than days or weeks. Spreadsheets are well understood by accountants and financial managers, many of whom found a secret wish fulfilled when they acquired the ability to build a spreadsheet that instantly showed the results of any change.

The "what-if" facility of a spreadsheet or any DSS helps support the decision-making process. For example, a food service company is required to prepare proposals. These proposals specify costs of feeding individuals in health care facilities at satisfactory levels of nutrition.

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> *Spreadsheets are well understood by accountants and financial managers, many of whom found a secret wish fulfilled when they acquired the ability to build a spreadsheet that instantly showed the results of any change.*

Prior to Visicalc, each proposal required two people's efforts for three days, during which time they tried two alternative menus and bid the lower cost menus. As the work load grew, it became difficult to train additional people for the bidding task.

When the company's president was introduced to Visicalc in 1980, his reaction was, "I can use that right now!" Within a week, employees were preparing bids in less than three hours and analyzing 12 different menus in the process. In addition, this ability to analyze differing selections of foods generated more winning bids.

Which spreadsheet program is best? For a specific application, any of the major spreadsheets — Lotus Development Corp.'s 1-2-3, Microsoft Corp.'s Multiplan or Sorcim Corp.'s Supercalc 3 — may have an advantage over one another, but the overall functionality is basically the same.

Most users prefer to stay with whatever spreadsheet they first learned. More experienced personal computer users had been staying with advanced versions of Visicalc; however, the package was recently taken off the market. Most newer IBM Personal Computer users have chosen 1-2-3. Because Microsoft has priced Multiplan very low if bundled with a system, that product has high penetration on non-IBM systems and adequate sales in the IBM market.

When introduced, Lotus' 1-2-3 took advantage of the memory available in the large, 16-bit micros and was written to be very efficient in running speed — an advantage it still retains. The integrated graphics give the user a choice on the output side — graphics often being a more efficient way to present decision variables. The 2,048 rows available in 1-2-3 allow large models and small data bases to be created and maintained without the need for learning any other package.

Multiplan, written in the C language, can be ported to a large variety of systems. A Multiplan user can easily do multipage spreadsheets, using the package's third dimension for consolidations. In addition, the use of templates has been encouraged.

Supercalc 3.2, with its earlier versions' restrictions on number of rows removed, is now a worthy competitor for 1-2-3's market.

Financial planning systems

As you reach the limits on the functions available in the simple spreadsheets, financial planning systems become more attractive. These systems lack the totally interactive model building and execution of spreadsheets, but they can work with larger amounts of data.

Systems such as Micro-DSS/Finance from Addison-Wesley Publishing Co., Finar from Finar Research Systems Ltd. or Microplan from Chang Laboratories, Inc. perform present value, cash flow, depreciation and regression analyses on models with very large amounts of data. For example, Desk Top Financial Solutions, Inc.'s DTFPS can handle 500-by-100,000-cell worksheets.

Financial planning systems are particularly useful if an organization has one central group build a model (for example, for budgeting), and many different users then work with that model on their own departmental data.

A more general interactive equation handler is TK!Solver, which is owned by Lotus but was developed by the same Software Arts team that developed the original Visicalc concept. With TK!Solver, the user inputs equations in algebraic format, along with definitions for the variables in

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the equations. You then specify values for variables on either right or left sides and let the system solve (or back-solve) the system of equations to fill in any undetermined values.

The same "what-if" concept that financial types have become used to with Visicalc is now available to civil engineers, circuit designers, econometric forecasters and others who can formulate equations to describe their decision situation. Although not nearly so popular as Visicalc, these options are being used more often, especially in the engineering field.

Traditional decision support tools have often grown out of the operations research methodologies. Linear and integer programming, queueing models, multiple linear regression and other operations research techniques are now available on micros. For example, the DSM package from DSS, Inc. integrates a number of such systems.

The user interfaces to build such models still require more work. It takes a knowledgeable user or consultant to understand how to define and structure a model. When such models are set up, however, they can yield impressive results.

Artificial intelligence

Artificial intelligence has long been a goal of many researchers and workers in the decision support field. Rather than modeling the system, AI programs model the brain of the most intelligent decision maker — thereby building on experience.

Most successful AI programs require massive computing environments. As a result, many observers believe it will be some time before micros can do much in the AI domain.

Nevertheless, several vendors have borrowed from AI in some way. One, Human Edge Software Corp. has a set of packages that are meant to aid in negotiating, sales and personnel management strategies and tactics. The set's packages require users to answer a large number of questions, first about themselves and then about the specific situation.

For example, a sales representative might characterize a customer as a bargain hunter who is concerned about features and who must make a decision by next Thursday. The system, after reviewing the salesperson's own tactics, may suggest pushing features and asking a higher price, then cutting the price at the end to give the customer the feeling of getting a bargain. This advice, which may seem simplistic, can help clarify thinking about how to approach others in similar situations.

Another support tool is a package called Lightyear, from Lightyear, Inc. It is designed to help managers work with both quantitative and qualitative information in analyzing a decision.

Like a spreadsheet package, Lightyear performs bookkeeping functions and data display; unlike spreadsheets, however, it has a lot of built-in knowledge about decision analysis. Users list the alternatives available (for example, sites in plant site selection), define criteria and their importance (cost, quality of labor, quality of life and so on) and evaluate criteria using numbers, words or positioning marks on a line.

Lightyear also permits the user to add rules (similar to expert system rules) to help eliminate alternatives. Users can then see summaries, compare alternatives and observe the effects of specific rules or models on the evaluation process.

Whether end users will take the time to input all the data in order to benefit from Lightyear's power remains to be seen, but it is clearly an interesting new concept in decision support.

Expert Ease, developed from research done at the University of Edinburgh, tries to deduce the classification rules of experts by examining attributes of specific cases of a decision. A Visicalc-type interface is used to present cases as rows of a large spreadsheet, with attributes of the decisions as the columns.

For example, the decision may be to grant or deny credit to a customer. Attributes might include salary, years in current residence, amount of purchase and so on. Given a set of cases, the system will come up with a decision rule that will yield the same results or will point out inconsistencies in the data, noting the need for additional attributes.

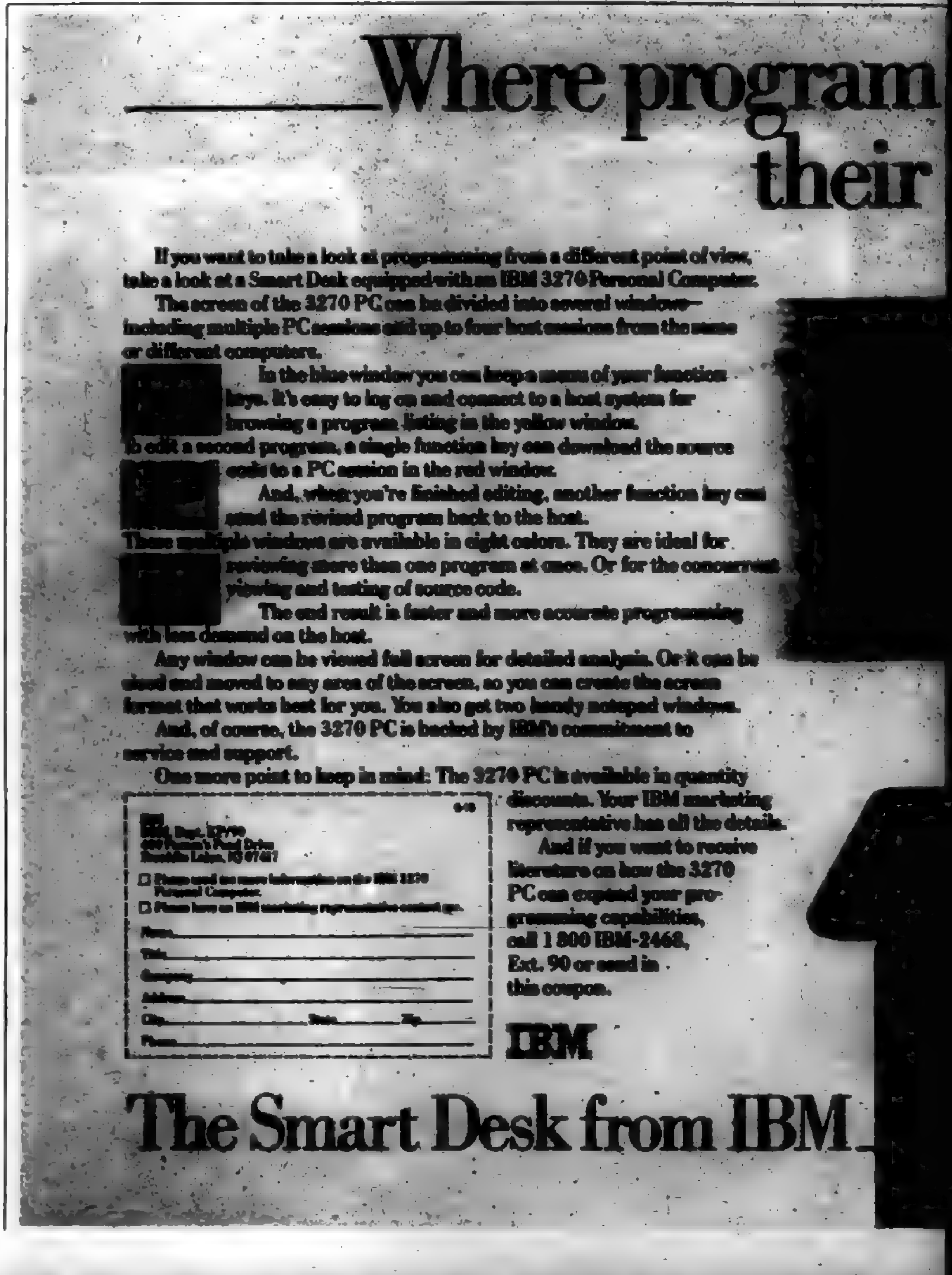
Graphics

A broad range of packages for various types of decision modeling already exists on micro-based systems and, in many ways, the intimacy of the user interface makes these packages more accessible than mainframe DSS work.

One key way that micro DSS make the user interface more appealing is through the use of graphics. Graphics can be integrated for presentation, as in 1-2-3, Symphony or Ashton-Tate's Framework, or used to speed the linkage between graphics tools and other packages, as with Supercalc and Apple's Lisagraph.

The movement toward mouse/pointing/icon-based interfaces, as typified by the Macintosh software (the long-awaited Lotus Jazz is said to be an excellent example), should lead to systems that can be learned more quickly than previous packages.

In some cases, the graphics itself are part of the interface. In the Vergin system, developed at the University of Pennsylvania, unskilled dispatchers are able to make use of a sophisticated mathematical programming model for optimal vehicle routing. The dispatchers' interface consists of pictures of trucks on a graphical map of customers, with varying colors used to link trucks and customers. Schedule modifications and their impact on total costs and variables such as overtime and



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lateness of deliveries can all be grasped by glancing at the screen. More such graphically based DSS are likely to be available soon.

Managerial role

MIS managers can play a key role in the use of DSS packages by providing data. Rarely do managers who are using DSS have easy access to the large volumes of current data required by the models they build. In fact, one aspect of the growing use of micros is the increase in computing cycles on mainframes as a result of micro data needs.

Usually, an extract from a real data base is suitable for modeling efforts. It is not necessary to tap into a real-time system for a model whose output is used to guide policies for a one-year horizon. But getting the data into proper format for use on the micro and actually communicating it has not been easy.

Cullinet Software, Inc.'s Golden Gate permits a micro user to build a data request to an IDMS data base interactively. With a heavily menu-driven interface, a user who is somewhat familiar with the data base in question can construct the query and download the Golden Gate spreadsheet. Framework, Peachtree Software, Inc.'s Peachlink and the Answer series from Informatics General Corp. all have similar facilities. They usually download using DIF or Sylk formats acceptable to Visicalc, 1-2-3, Multiplan and others.

Natural-language data base interfaces are becoming available. Clout II, from Microrim, Inc., permits English-like interfaces to its Rbase, Ashton-Tate's Dbase and other data bases and puts the output into DIF format for interface to various DSS.

Training, support, data base maintenance, analysis of offerings and hardware and software selection are ways the manager of the information center can play a role in encouraging effective use of micro-based DSS in large or small organizations. Education in modeling concepts — how to use a spreadsheet and what assumptions to make and not to make in building financial models — can be provided through central facilities.

An emerging problem with the use of spreadsheet models is lack of validation of such models before they are passed on to others. Often, assumptions are not documented in the model, and users who have not built a model may not understand the limits intended by the originator. For example, a model may not include tax tables that vary tax with amount of income; it may merely have used the marginal tax rate appropriate for the specific amounts in the first user's cases. The old Gigo (garbage in, garbage out) rules apply as well to micros as they do to mainframes.

Using the standards of mainframe software development usually does not make sense with micros; the overhead is too large for the effort. However, in the case of building templates that permit later consolidation of results, the information center can perform a service to the company. Here, a budget model can be prebuilt and distributed to end users.

The information center may also have a link program to get current information from the center's data bases into the models. Higher level management can then pull together the departmental models into a corporate budget, with the knowledge that consistent assumptions and labels have been used.

Finally, the center can help users with mundane but often ignored chores — backup of files, models and so on. Micro users seem to believe their floppy disks are invulnerable — until the first disaster.

> 99
>
> *The ability to simulate experience can save millions of dollars in wasted efforts.*

DSS can be of profound benefit to an organization and its management. The ability to learn without doing — to simulate experience — can save millions of dollars in wasted efforts. The "what-if" facilities of DSS give the user an understanding of the sensitivity of a particular decision outcome to variations in a number of input values in a way not feasible without a computer.

Competitive necessity

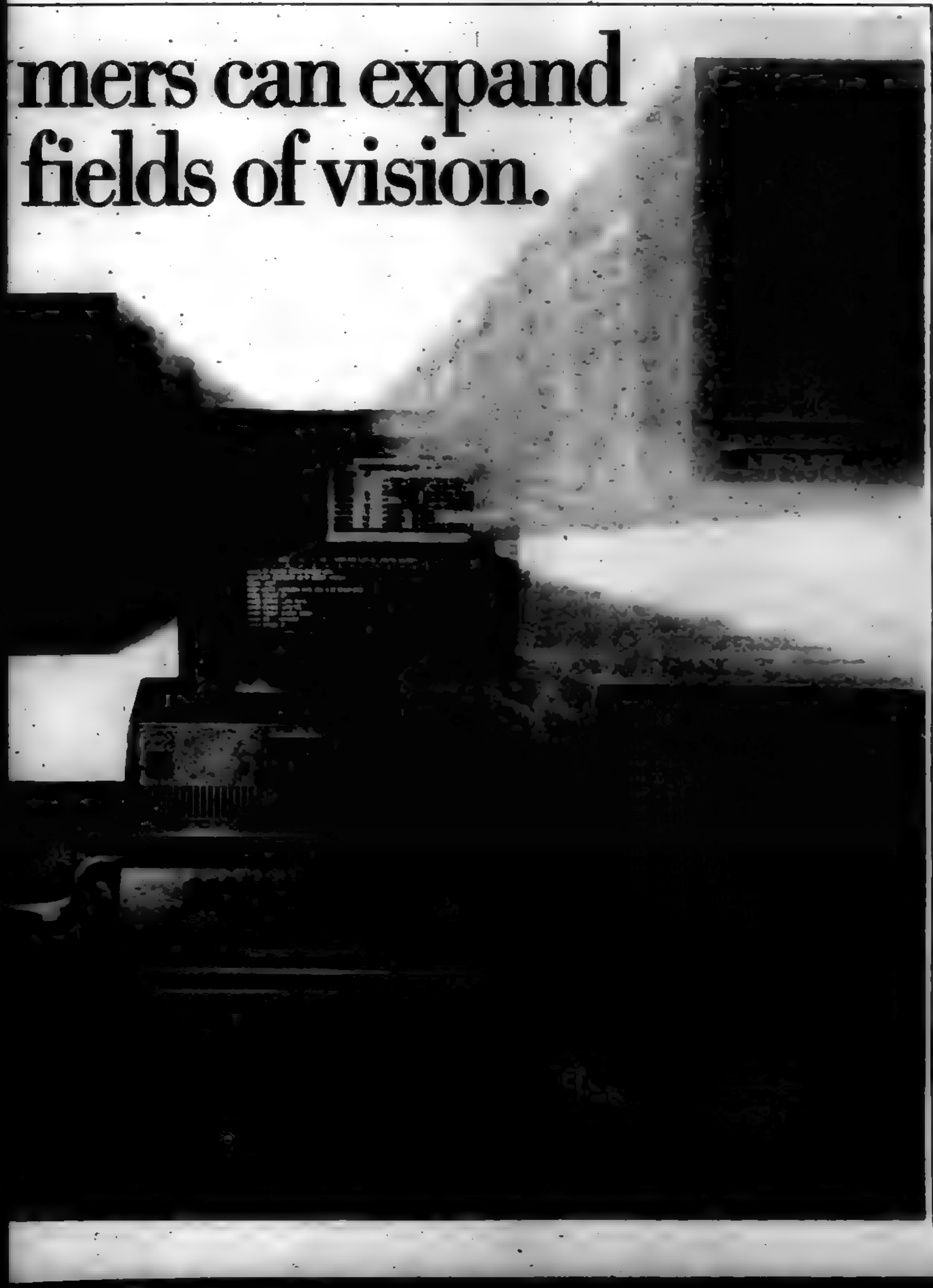
The use of DSS is becoming a competitive necessity — both internally within an organization and externally with outside competition. Just as today's airlines require reservations systems to keep up, banks require DSS models to bid on large corporate bond offerings.

Similarly, within an organization, managers who perform better, aided by DSS, will have the edge over their peers. When DSS can clarify a decision process so that the process can be replicated, decision making can move down in the organization, freeing time at higher levels.

The role of the information systems manager is to make sure that modern tools are used to their maximum advantage to benefit the organization. Although DSS use will spread with or without the assistance of information center personnel, it will be most effective with their guidance, data base resources, training and support. Getting started in micro decision support is a necessary prerequisite to an organization's effective competition in the future. The time to begin is now.

About the author

Howard Morgan is president of Renaissance Technologies Corp. in New York.



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SOFTWARE & SERVICES

SOFTLINE/STEVEN PFRENZINGER

IBM's DB2: An analysis

By now, it should be obvious that IBM's DB2 is going to have a significant impact on the mainframe data base management (DBMS) system market. The fact that DB2 can be accessed through all three MVS data communications systems — TSO, CICS, and IMS/DC — should be of interest to anyone planning for the future with these transaction managers.

DB2 is a major product with many features — more than can be covered in a single article. But a discussion of its status, along with comparisons to IMS/DB, is possible and especially relevant to the experienced IMS developer.

While DB2's impact will be felt initially within the information center in decision support applications under TSO, it will eventually see substantial use in both CICS and IMS/DC environments. Taking the time to investigate DB2 and relational DBMS in general, it should be obvious why this will happen. The list of DB2's advantages is extensive (see chart page 54).

Before continuing, a brief definition is appropriate. A relational DBMS like DB2 is one that users perceive as a collection of tables. Tables in a relational DBMS are no different from other flat file structures. A simple example of a table would be a spreadsheet with its row and column structure and a cell at the intersection of each row and column. Similarly, a

See DB2 page 54

Pfrenzinger is president of IMS Consulting, Inc., an Encino, Calif.-based consulting firm that specializes in IBM's IMS DB/DC and CICS/DL/1. He has 15 years of data processing experience and is a regular contributor to Softline.

SAS, ISPF link debuts

CARY, N.C. — SAS Institute, Inc., based here, and Morino Associates, Inc., of Vienna, Va., have announced an interactive applications development tool that is said to link the SAS System software with IBM's ISPF. The SAS/DMI software — developed by Morino and marketed by SAS — is scheduled for availability during the fourth quarter.

The SAS/DMI software allows the SAS System's fourth-generation language to implement ISPF applications more quickly than procedural languages such as Cobol or PL/I, according to a spokesman. Users of IBM 370, 30 series or 4300 series machines and compatibles under IBM's OS can convert SAS files to ISPF tables and vice versa.

Prewritten procedures within the SAS System can be used to analyze, display graphically and report on data stored in ISPF. The interface is said to employ the SAS Data facility to develop custom-tailored applications in which entries are verified and information retrieved as the Data facility executes.

The software, which supports both

See SAS page 58

IBM upgrades RACF system

WHITE PLAINS, N.Y. — In conjunction with its announcement of an enhanced release of CICS, IBM also introduced an updated version of its Resource Access Control Facility (RACF) security system for MVS and VM. Version 1, Release 7 of RACF offers a variety of new capabilities, many of which IBM said were in response to user-submitted requirements.

The major RACF security enhancements were in the areas of access control to programs, program access to data sets and Dasd erase-on-scratch support. The system is also said to offer users an opportunity to gain back some virtual storage.

In the area of access control to programs, RACF now allows only authorized users to load and execute specified load modules. Improvements to program access to data sets now ensure that authorized users or groups may access specified data sets only while executing certain programs. Erase-on-scratch support gives users the option of invoking the erasure of security-sensitive data extents on Dasd at the time the data is released for reuse.

Other enhancements to RACF include

See RACF page 55

SOFTALK
John Gallant
CW Senior Editor

Users unite

Telling users they should participate in users groups is like urging the citizenry to vote.

Users interested in the future of a product, especially a product on which their companies depend, should take an active role in determining that future — just as voters have an obligation to make their voices heard in government. Unvoiced needs often go unmet. That's such an obvious message that many users tend to ignore it. But it is one they would do well to heed.

IBM's unveiling of Version 1, Release 7 of CICS serves as a powerful reminder of the importance of making one's viewpoint known through the very effective channel of a users group.

There was much in the announcement of the enhanced CICS to grab the eyes of users. Major enhancements included the ability to define terminals automatically, a facility that allows users to define resources on-line and improved recovery and restart capabilities. The version also offers users the chance to grab back some much-needed virtual storage.

But perhaps the most significant aspect of the announcement was IBM's explicit acknowledgement of the user input that spawned the changes to CICS — a core product in most IBM mainframe environments. In fact, the opening sentence of the announcement materials — the so-called ivory sheets — stated that "CICS Version 1, Release 7 responds to a large number of user requirements with a range of enhancements that focus on improving [the] productivity of customer data processing personnel."

Deeper into the ivory sheets, IBM said that the enhancement of the transaction manager "addresses numerous user requests and satisfies the . . . requirements submitted by the Guide and Share users groups." Numerous is an appropriate word: IBM listed 56 requirements submitted by both Guide

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■ Integrated Software Systems Corp. introduced software that allows an IBM Personal Computer to act as a mainframe graphics terminal/50

■ An integrated systems development environment for Digital Equipment Corp. VAX series and IBM Personal Computer ATs and XTs was unveiled by Promod, Inc./50

■ Floating Point Systems, Inc. introduced three software development tools for its FPS-5000 series array processors/51

■ Candle Corp. unveiled Version 400 of its Omegamon/CICS real-time performance monitor for IBM's CICS/51

■ Uccel Corp. released its Resource Management System for users of Sperry Corp. processors/52

INSIDE

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Informatics to market micro link for IBM CPUs

CANOGA PARK, Calif. — Informatics General Corp. has announced that it will market a version of Micro-Tempus, Inc.'s Tempus-Link — to be known as Alpha/Link — micro-to-mainframe communications product for IBM mainframes running VM/CMS, OS and DOS/VSE and IBM Personal Computer and compatible machines.

A spokesman said that the initial release of Alpha/Link offers the same capabilities as Tempus-Link, with the exception of an added automatic logon facility, the vendor said. A virtual disk residing on an IBM mainframe can be accessed and controlled with all IBM PC-DOS commands from authorized Alpha/Link users.

Alpha/Link supports a variety of communications interfaces that permit access to virtual disks via IBM 3270 terminal emulation devices and remote and local asynchronous TTY.

Alpha/Link consists of three microcomputer floppy disks and a mainframe module. Base price of Alpha/Link is $6,200.

Informatics General is located at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Issco mainframe graphics interface for IBM micro bows

SAN DIEGO — Integrated Software Systems Corp. (Issco) has introduced PC Linkagraf, a software interface that reportedly allows an IBM Personal Computer to act as an intelligent mainframe graphics terminal.

PC Linkagraf reportedly allows plots saved on the Personal Computer to be viewed independently of the host. PC Linkagraf also permits hard copy to be produced off-line using devices connected to the Personal Computer.

The software is said to include full screen Help functions and support for user-defined function keys. PC Linkagraf enables users to transfer Personal Computer files to and from a mainframe.

The mainframe component of PC Linkagraf is priced from $2,000 to $4,000, depending upon the CPU used. The Personal Computer module is priced at $250.

A corporatewide site license is priced from $250 to $750 per month per mainframe. The license price allows any number of Personal Computers to be connected.

Issco is located at 10505 Sorrento Valley Road, San Diego, Calif. 92121.

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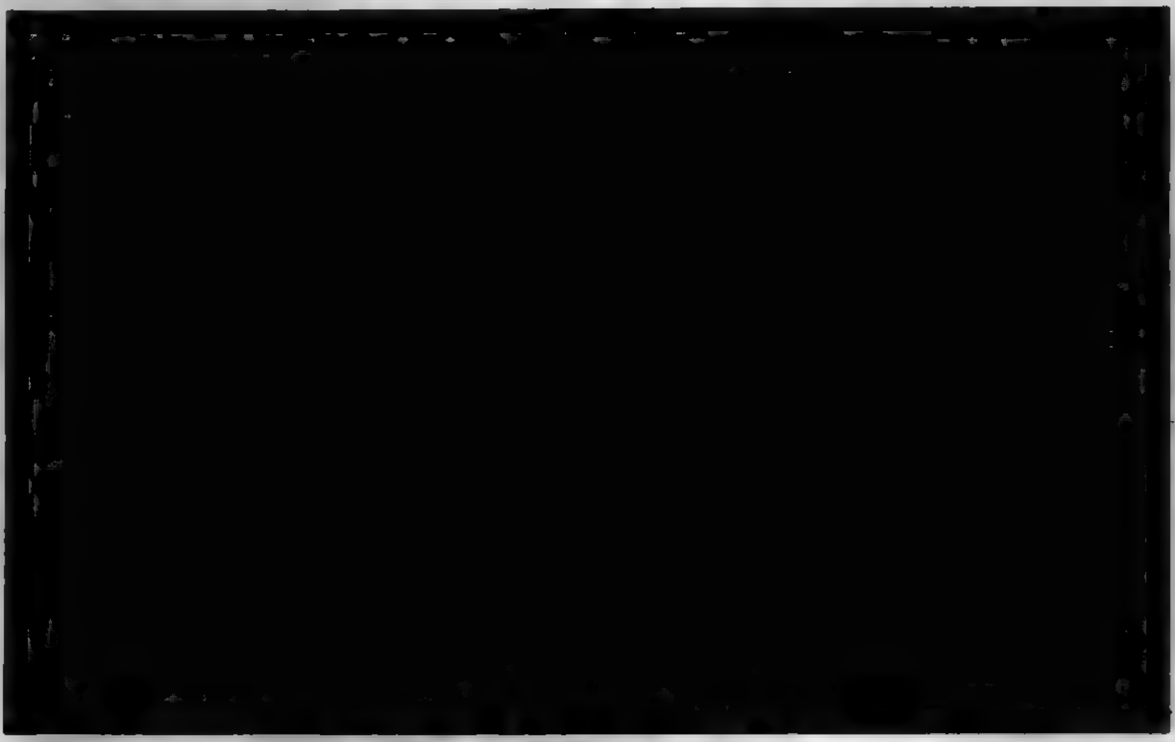

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One of the newest relational data base management systems on the scene comes from Boeing. Its cost is low, its function is extensive. It runs on IBM, CDC, DEC VAX, Data General and Prime computers, and interfaces with a micro version.

For more information about Boeing software solutions, call (206) 763-[illegible]. Or write BOEING COMPUTER SERVICES, M/S 7K-11, P.O. Box 24346, Seattle, WA 98124. Ask about our "TRY IT" evaluations.

For information about Boeing's other integrated information services — including enhanced remote computing, distributed processing, network services, office automation, consulting, and education and training — call toll free 1-800-447-4700. Or write BOEING COMPUTER SERVICES, M/S CV-26-[illegible], 7980 Gallows Court, Vienna, VA 22180.

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Software out from Promod

LAGUNA HILLS, Calif. — Promod, Inc. has announced an integrated systems design environment for Digital Equipment Corp. VAX processors and the IBM Personal Computer XT and AT.

The Promod software is said to allow analysis data to be exchanged between the mini and micro systems at any time during the design cycle. Operating independently of the target system and language, Promod integrates structured analysis, modular design and pseudocoding.

The five phases of the Promod design cycle are requirements analysis and definition, based on the Yourdon methodology of structured analysis; transformation from analysis to design, during which Promod automatically creates modules, function descriptions and data types; system design based on modular design concepts; program design based on pseudocode methodology and step-wise refinement; and implementation using code generators to automatically create program templates from pseudocode. Portions of any phase can be accessed for independent analysis, definition and editing of data or graphics.

On the micro, Promod requires 512K bytes of memory and 10M-bytes of hard-disk storage. It supports all DEC VAX systems running under VMS.

Prices for Promod range from $9,950 for the IBM Personal Computer to $37,500 for the DEC VAX-11/780.

Promod is located at 22961 Alcalde Drive, Laguna Hills, Calif. 92653.

"Hey guys — the menu is up!"

CA-Scheduler upgraded

JERICHO, N.Y. — Computer Associates International, Inc. has announced an enhanced version of CA-Scheduler, its production scheduling and management system for IBM MVS operating systems.

Version 7 is said to include an on-line and menu-driven design for more efficient monitoring of scheduling data. It also incorporates Computer Associates' standards for installation and maintenance and CA-Earl, the vendor's report writer.

CA-Scheduler 7 is available for MVS and MVS/XA and supports IBM's JES2 and JES3. It runs under IBM's TSO, CICS and VM/CMS. The cost of the software is $60,000 for a perpetual license and $40,000 for a three-year lease, according to the vendor.

Computer Associates International is located at 125 Jericho Tnpk., Jericho, N.Y. 11753.

CICS monitor version debuts

LOS ANGELES — Candle Corp. has introduced Version 400 of its Omegamon/CICS real-time performance monitor for IBM CICS transactions.

With the addition of an External Monitoring facility, Omegamon/CICS now allows users to monitor remote CICS sites through IBM's Vtam. The product also includes virtual storage constraint relief capabilities and umbrella transaction support, according to the vendor.

The External Monitoring facility is said to protect Omegamon from CICS transactions containing loops, abends or storage violations.

Version 400 of Omegamon/CICS operates under IBM's MVS/370 and MVS/XA operating systems. The product is available for $23,500.

Candle is located at Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

Tools out from FPS

BEAVERTON, Ore. — Floating Point Systems, Inc. (FPS) has announced three systems development software products for its FPS-5000 series array processors. The products are said to simplify the code writing process and to allow users to take advantage of coprocessors.

The Fortran 77 compiler allows users to use standard Fortran 77 statements in developing routines and includes a compiler, linker, librarian and debugger. The product allows programmers to use coprocessors by issuing Fortran subroutine calls and allows access to up to 4.75M bytes of system common memory.

Xpal, a coprocessor assembly language, allows users to write their own math library routines when used with a microcode simulator.

In addition, several new math library routines for specific applications use a 128-bit instruction word, accommodating multiple parallel operations and giving the programmer extensive control over data flow.

Prices are $8,500 for the Fortran 77 compiler and $5,000 for Xpal assembly language. Prices range from $975 to $1,275 for the math library routines.

FPS is located at 3601 S.W. Murray Blvd., Beaverton, Ore. 97005.

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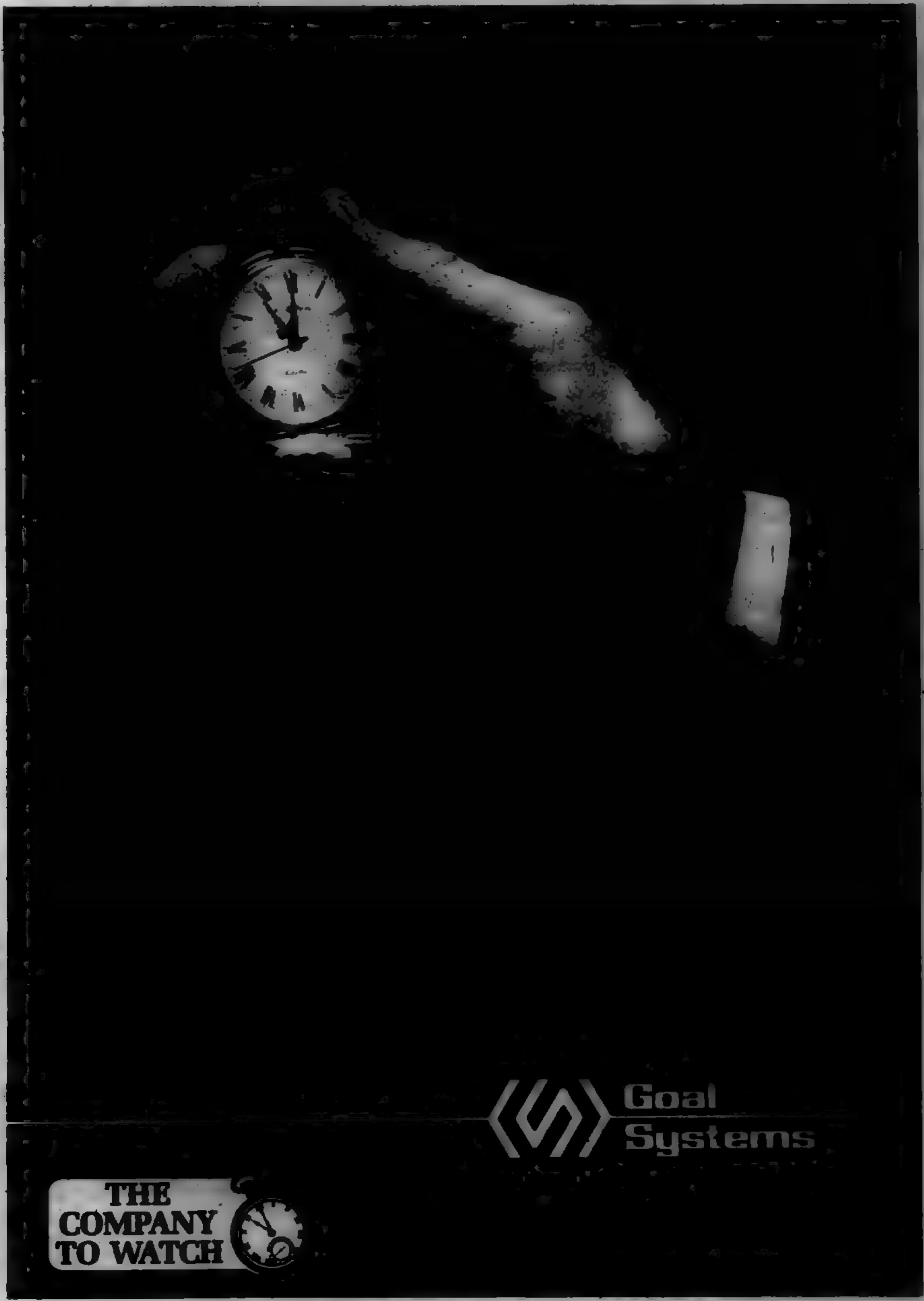

Uccel unveils data center management software

DALLAS — Uccel Corp. has introduced the Resource Management System (RMS), a software package for use in Sperry Corp.-based data centers.

RMS, an integrated set of five software packages, reportedly provides management information on data center operations. Its resource accounting module tracks connect time, storage, machine cycles and other system use data. The workload capacity planning module captures system performance and utilization statistics.

The generalized graphics system module displays, through color charts, data center information gathered by RMS.

The problem-tracking system module helps managers follow user, system or data center problems from initial report through resolution. An equipment tracking module maintains an inventory of data center hardware.

The RMS software runs on Sperry 1100 series mainframes.

Its modules cost from $10,000 to $39,000.

Uccel is located in the UCC Tower, Exchange Park, Dallas, Texas 75235.

SI offers software that links System/38, micro packages

ANDOVER, Mass. — Software International Corp. (SI) last week unveiled communications software that links its general ledger package on the IBM System/38 with micro packages on the IBM Personal Computer.

According to a spokesman, Smart Link/38 allows users of the IBM Personal Computer, Personal Computer XT and AT to download information from SI's General Ledger & Financial Reporting System, to manipulate the data with packages such as Lotus Development Corp.'s 1-2-3, Visicalc and Symphony and to upload the information to the host.

The link software is said to offer the same functionality as SI's original Smart Link, which provides data transfer capabilities between the company's IBM mainframe-based software and Personal Computer products. Smart Link/38 provides Help screens and offers the ability to download in real-time either complete files or selected file extracts. The package offers security features and audit trails.

The spokesman said Smart Link/38 also features a library for storing download and upload sessions to eliminate rekeying of data.

Smart Link/38 costs $3,500. It communicates with the System/38 through available IBM 5251 terminal emulation boards.

SI is located at 1 Tech Drive, Andover, Mass. 01810.

Pilot system versions out

BOSTON — Pilot Executive Software, Inc. has announced IBM mainframe and Prime Computer, Inc. minicomputer versions of its Command Center executive information system. The company also introduced three specialized applications designed to run with the product.

Command Center is a host- and microcomputer-based system that allows MIS departments to develop or customize micro-accessed executive information applications. It displays information in both graphics and tabular form.

A version announced earlier this year utilizes Digital Equipment Corp. VAX processors and IBM Personal Computers. The added IBM mainframe version operates under VM/CMS and is priced at $125,000. The Prime version runs on any Prime processor under Primos 19.4 and is priced at $75,000. Both are available immediately.

Pilot's application packages allow a user, through a mouse-driven IBM Personal Computer, to access specialized analyses, which are summarized in graphics, text or tabular form. The applications include Competitive Analysis, Corporate Productivity Analysis and Economic Analysis, each priced at approximately $5,000.

Competitive Analysis gives users the ability to review the performance of their company against user-selected competitors. Evaluations are based on raw financial data and other performance measurements.

The Corporate Productivity Analysis package incorporates a variety of value-added, I/O and financial leverage measurements, which are formulated into productivity ratios for comparison.

Economic Analysis allows users to combine economic time series data with internal information to forecast the impact of economic changes on a companywide or industrywide basis.

Pilot Executive Software is located at 40 Broad St., Boston, Mass. 02109.

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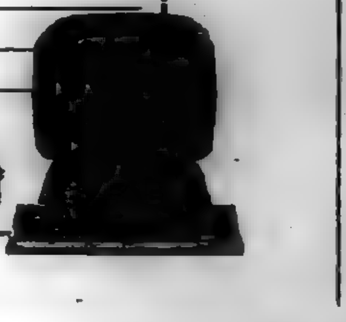

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SAS Institute Inc. Announces

Lattice C Compilers for Your IBM Mainframe

Two years ago...

SAS Institute launched an effort to develop a subset of the SAS® Software System for the IBM Personal Computer. After careful study, we agreed that C was the programming language of choice. And that the Lattice® C compiler offered the quality, speed, and efficiency we needed.

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Development had progressed so well that we expanded our efforts to include the entire SAS System on a PC, written in C. And to insure that the language, syntax, and commands would be identical across all operating systems, we decided that all future versions of the SAS System—regardless of hardware—would be derived from the same source code written in C. That meant that we needed a C compiler for IBM 370 mainframes. And it had to be good, since all our software products would depend on it.

So we approached Lattice, Inc. and asked if we could implement a version of the Lattice C compiler for IBM mainframes. With Lattice, Inc.'s agreement, development began and progressed rapidly.

Today...

Our efforts are complete—we have a first-rate IBM 370 C compiler. And we are pleased to offer this development tool to you. Now you can write in a single language that is source code compatible with your IBM mainframe and your IBM PC. We have faithfully implemented not only the language, but also the supporting library and environment.

Features of the Lattice C compiler for the 370 include:

- **Generation of reentrant object code.** Reentrancy allows many users to share the same code. Reentrancy is not an easy feature to achieve on the 370, especially if you use non-constant external variables, but we did it.
- **Optimization of the generated code.** We know the 370 instruction set and the various 370 operating environments. We have over 160 years of assembler language systems experience in our development staff.
- **Generated code executable in both 24-bit and 31-bit addressing modes.** You can run compiled programs above 16 megabytes in MVS/XA.
- **Generated code identical for OS and CMS operating systems.** You can move modules between MVS and CMS without even recompiling.
- **Complete libraries.** We have implemented all the library routines described by Kernighan and Ritchie (the informal C standard), and all the library routines supported by Lattice (except operating system dependent routines), plus extensions for dealing with 370 operating environments directly. Especially significant is our byte-addressable Unix®-style I/O access method.
- **Built-in functions.** Many of the traditional string handling functions are available as built-in functions, generating in-line machine code rather than function calls. Your call to move a string can result in just one MVC instruction rather than a function call and a loop.

In addition to mainframe software development, you can also use our new cross-compiler to develop PC software on your IBM mainframe. With our cross-compiler, you can compile Lattice C programs on your mainframe and generate object code ready to download to your PC.

With the cross-compiler, we also offer PLINK86™ and PLIB86™ by Phoenix Software Associates Ltd. The Phoenix link-editor and library management facility can bind several compiled programs on the mainframe and download immediately executable modules to your PC.

Tomorrow...

We believe that the C language offers the SAS System the path to true portability and maintainability. And we believe that other companies will make similar strategic decisions about C. Already, C is taught in most college computer science curriculums, and is replacing older languages in many. And almost every computer introduced to the market now has a C compiler.

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The competition...

If you would like to compare, the other vendors of 370 C compilers are: AT&T, Whitesmiths, Ltd., WATCOM Products Inc. (CMS only), Oracle Corp., Amdahl Corp. (UTS only), and IBM Corp. (VM/IX only). We think you will choose the Lattice C compiler from SAS Institute.

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Accessed via IMS/DC and CICS	Accessed via IMS/DC, CICS and TSO
High performance	Potential for high performance
Program specification blocks and data base definitions	Catalog

DB2

from page 49

DB2 table is made up of rows and columns with a specific item of data at each intersection. In DB2, these items are called values and cannot be part of a repeating group, that is, they cannot occur more than once.

The term "collection of tables" in the DB2 definition is analogous to a hierarchical structure made up of a collection of segment types. As for the language interface, IBM's SQL is to DB2 what DL/1 is to IMS/DB.

Besides the ease-of-use factor, one of the major benefits of SQL over DL/1 is its set-at-a-time orientation vs. the segment-at-a-time orientation of DL/1. SQL will return one or more rows on a retrieval call, whereas DL/1 will return only one segment on a retrieval call. This would equate in DL/1 to a series of calls, each retrieving a single segment.

For the IMS developer unfamiliar with DB2, there are several additional analogies that can be drawn to help relate a DB2 data base to an IMS data base. One of the comparisons between IMS/DB and DB2 that may be helpful during a conversion, for example, is that each segment type in an IMS hierarchical structure would equate to an individual DB2 table.

In other words, an IMS structure with three segment types would usually convert to three DB2 tables. An individual IMS segment occurrence would equate to an individual row in a DB2 table. A field type in an IMS segment definition would equate to a column, the vertical component of a DB2 table. A field in an individual IMS segment occurrence would equate to a value, that is, data at the intersection of a row and column in a DB2 table.

Another comparison involves converting a simple two-level hierarchy into DB2 tables. If there is a root segment, called an order header, and a dependent segment, called an order item, the developer would have to create two DB2 tables, one for order headers and the other for order items. In DB2 there are no pointers from rows in the order header table to associated rows in the order item table — as with IMS/DB pointers between segment types — so developers have to add an order number column to the order item table so that DB2 can navigate from one individual order header to its associated order items.

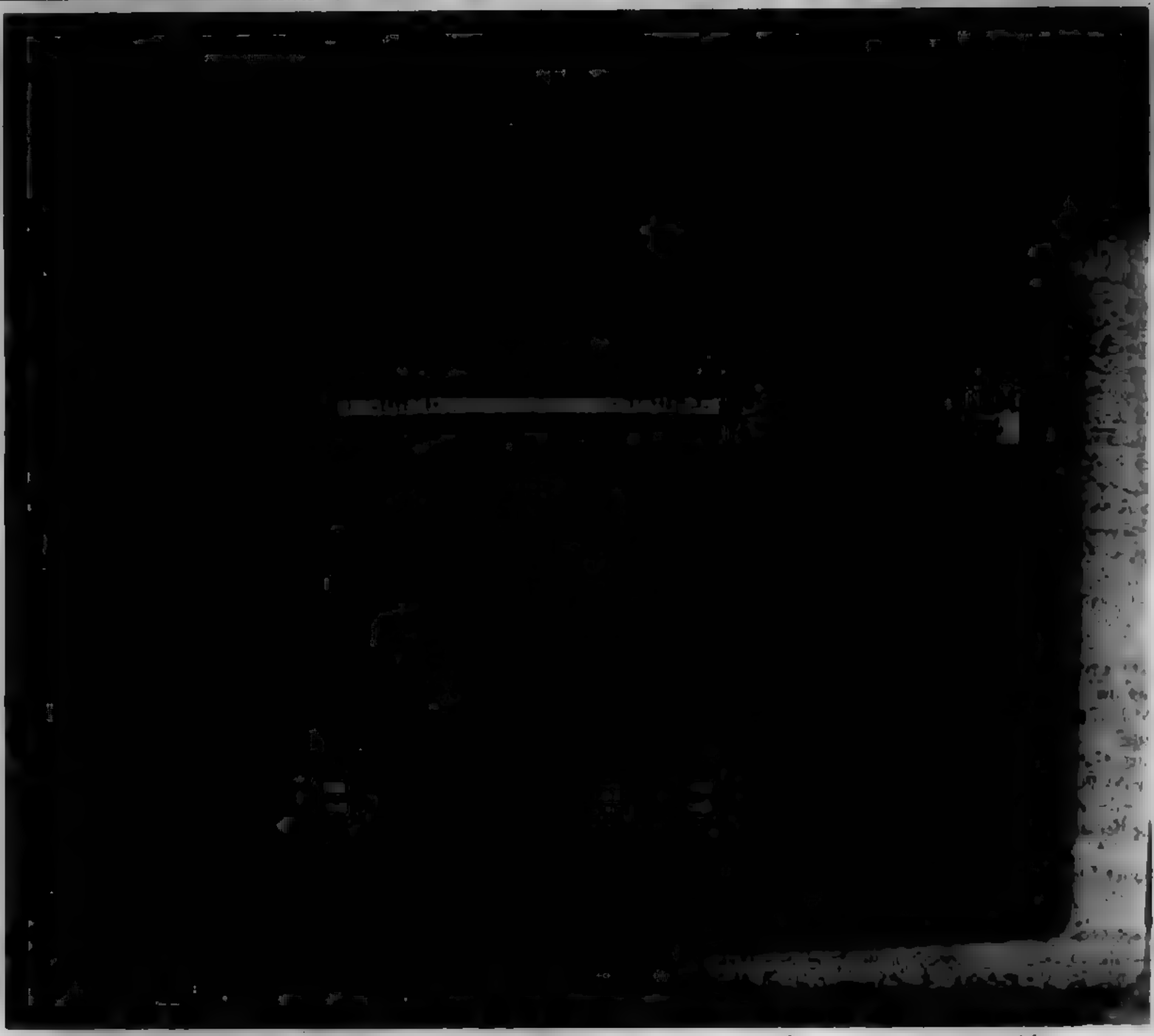
Three issues keep DB2 from achieving success in the production environment of CICS and IMS/DC: poor performance, absence of referential integrity and lack of applications development tools.

The performance issue is one that has received much attention and the conclusion is that rapid index management is the key to achieving high-performance processing. In IMS terms, this equates somewhat to having the same index pointing to several different IMS segment types. Currently, DB2's performance is roughly 50% to 60% that of IMS/DB.

The referential integrity issue must also be addressed. What is referential integrity? It is easier to describe an IMS/DB example than to describe it in DB2 terms. When a root segment in an IMS hierarchy is deleted, dependent segments are also deleted. That is referential integrity. In DB2, if a row in one table is deleted, these same cascading effects are not felt by related rows in other tables.

Referential integrity also dictates, for example, that a purchase order may not be written for a nonexistent vendor and, conversely, that a vendor cannot be removed from the data base if purchase orders are assigned to it.

The lack of DB2 applications development tools is a significant problem. Many of the current productivity tool vendors will find it difficult to mix SQL interfaces and DL/1 interfaces within their products — a necessary requirement during the transitional period when both DBMS will be in use. Cobol-based applications generators have the best chance to combine these two data base interfaces successfully into a single development environment and provide the required development tools for both DB2 and IMS/DB.



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USERS

from page 49

and Share and their international counterparts.

Why the recognition of users groups? It's certainly not a common IBM practice to highlight users group efforts in its many product announcements.

Some IBM watchers claimed the recognition was all a marketing or public relations ploy, a sort of "you asked for it, you got it" routine. In part, that's the case. But that view is also an oversimplification.

Most users questioned about the recognition, including some users involved in Share and Guide, felt IBM was trying to stress the importance of user involvement in such organizations. They also claimed IBM was acknowledging that Share and Guide are effective channels for user input.

Considering the sheer number and diversity of its users, even the seemingly omnipotent IBM needs some help in finding out what its customers in the field need.

"I think the users group acknowledgment was very significant," said William Ray, manager of data and network services for Corning Glass Works, Inc. in Corning, N.Y. "It was not a concession on IBM's part but an effort to emphasize its involvement with Guide and Share. It was a way for IBM to say, 'we are listening to you and trying to provide the things you need.' It is a good course for IBM to take."

The users groups, according to Harvey Kramer, senior information systems consultant with Southern California Edison Co. in Rosemead, Calif., also provide an effective method for prioritizing user needs — something the Armonk, N.Y., giant may have trouble doing on its own.

"IBM was clearly showing that it is trying to listen to a vast audience," he said. "I think IBM published that to show everyone that you should be part of a users group and get your voice heard."

'A good business move'

"IBM, despite its size, cannot take care of everybody. But the things that are of high priority to a variety of companies it will address. It's a good business move to take care of as many people as possible, and I think it was smart to show that," Kramer said.

The intent here is not to focus solely on IBM or Guide and Share. For nearly every important product, be it hardware, software or whatever, there is a users group — though an uninterested user may not know it.

Rather, the issue here is involvement. One voice alone may not draw attention. But many voices joined as one can penetrate the walls of even the biggest company.

> ”
>
> *Perhaps the most significant aspect of the CICS announcement was IBM's explicit acknowledgment of the user input that spawned the changes.*

RACF

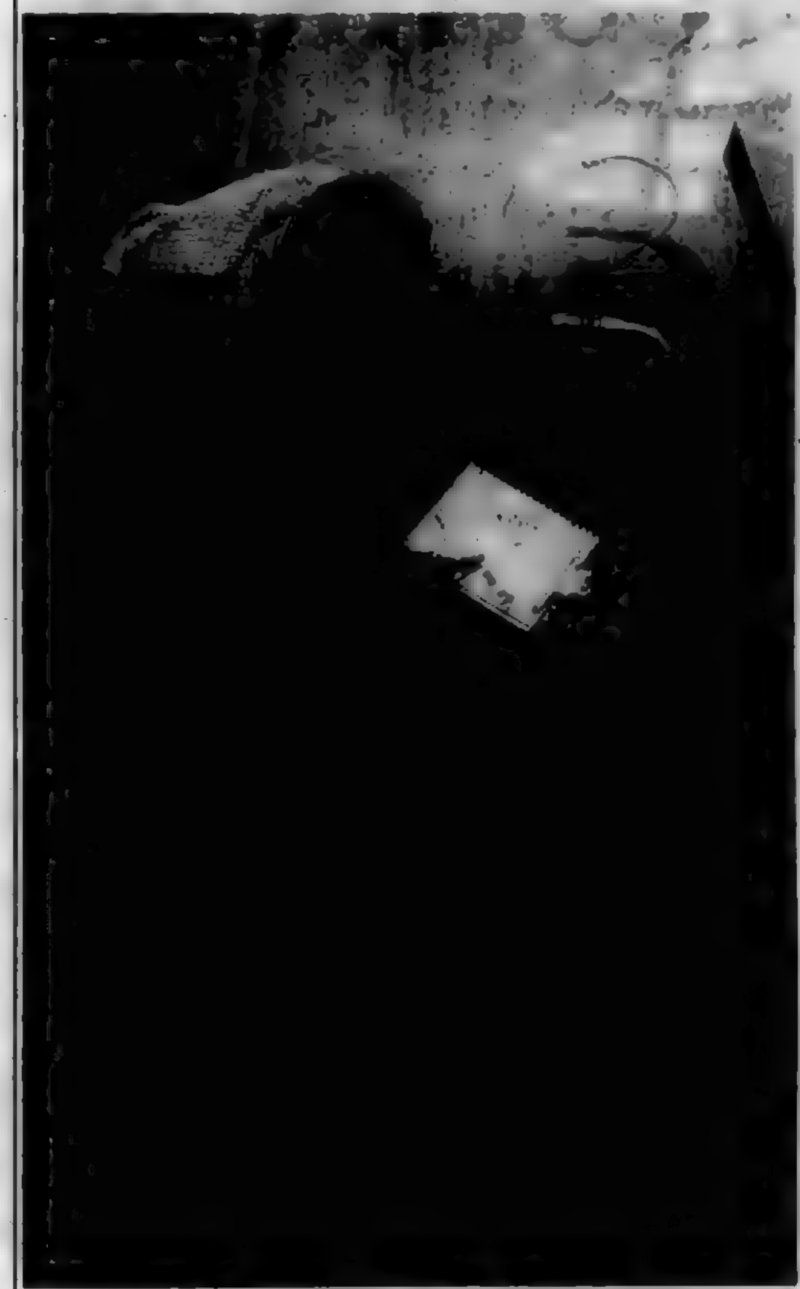
from page 49

the following:

- Expanded RACF/CICS security support.
- The ability to limit user and terminal access to systems by day of week and time of day.
- Real-time security violation notification.
- Tape data set protection and tape bypass label processing protection.
- Authorization checking, installation control and auditability improvements.
- Improved VM and JES2 and JES3 support.

RACF extends the security and auditing capabilities of MVS and VM and supplements security provided by other IBM products including CICS, IMS and DB2. RACF Version 1, Release 7 is slated for availability in December. It has a monthly charge of $841.

More information is available from IBM, White Plains, N.Y. 10604



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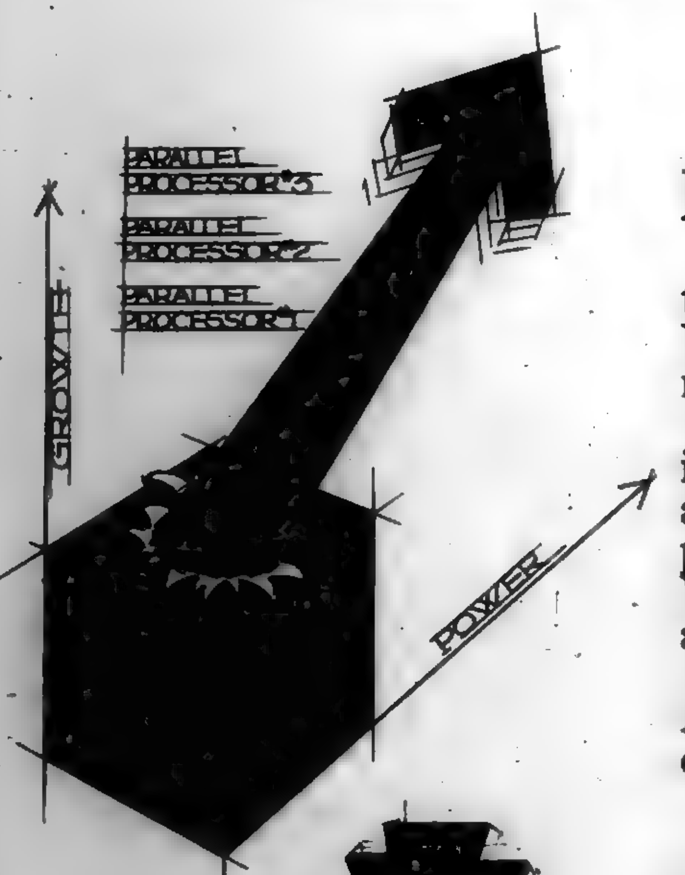

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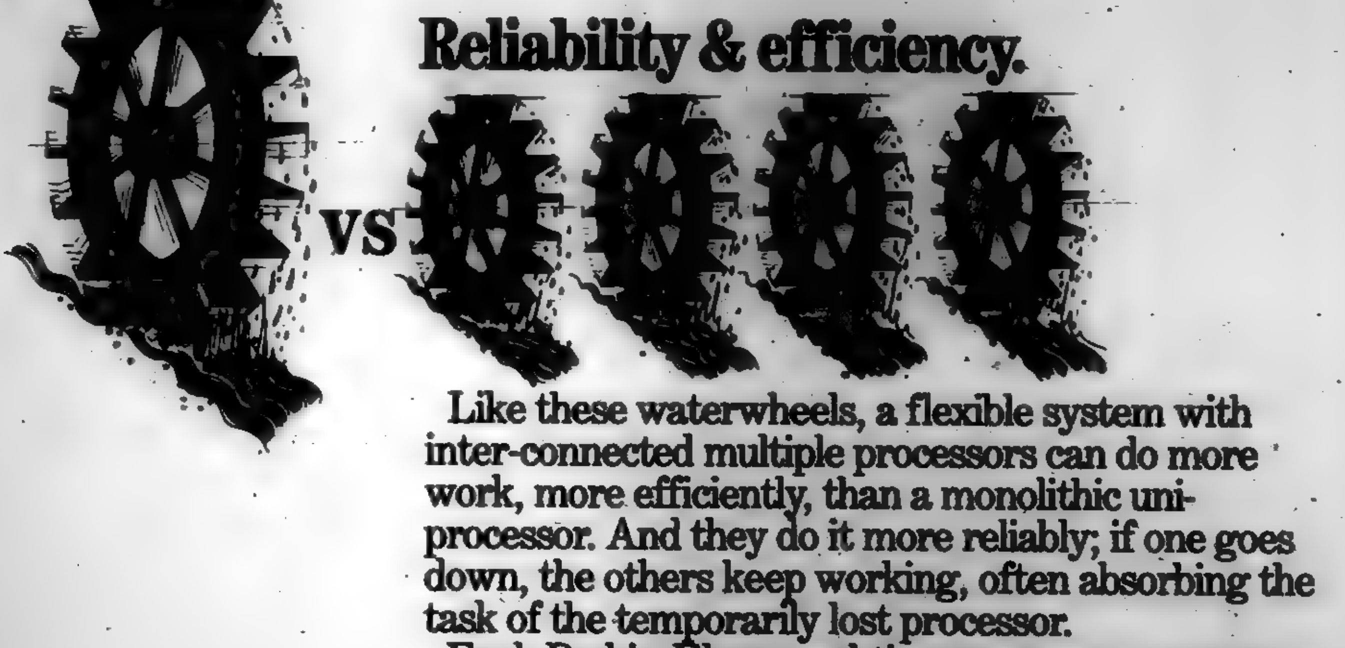

Like these waterwheels, a flexible system with inter-connected multiple processors can do more work, more efficiently, than a monolithic uniprocessor. And they do it more reliably; if one goes down, the others keep working, often absorbing the task of the temporarily lost processor.

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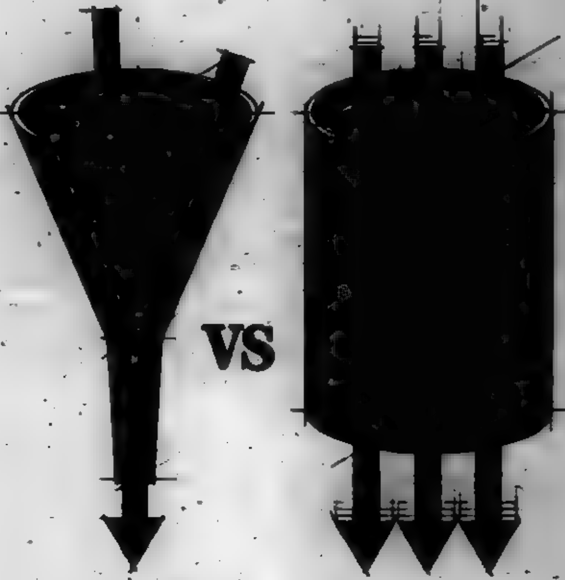

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When you've got many users on a system, all competing for the same limited resources, a uniprocessor can slow to a virtual standstill trying to accommodate all that I/O.

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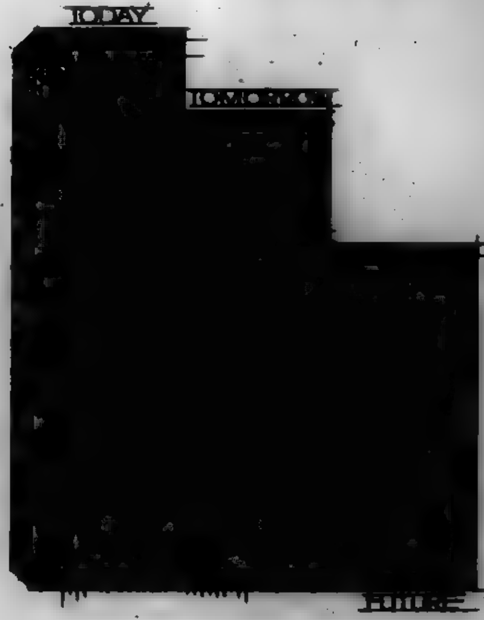

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SOFTWARE & SERVICES

SAS from page 40

batch and interactive processing, allows users to invoke the SAS System directly from the Primary Option Menu of the ISPF Program Development Facility.

First-year license fees cost $8,000 for base SAS software and $4,000 for SAS/DMI software.

More information can be obtained from SAS Institute, Box 8000, SAS Circle, Cary, N.C. 27511.

SYSTEMS SOFTWARE

■ Cosmic, Inc. has announced a set of vector plotting subroutines that runs on Digital Equipment Corp. VAX processors with DEC's VMS operating system.

Longlib consists of a graphics library, an on-line Help library, scan converter programs and command files for installing, creating and testing libraries. The package's features include viewport clipping, graphics input, gray-level and polar plots, three-dimensional plotting and support for hidden line removal.

Longlib produces plots on DEC's VT100, VT125 and VT240; Tektronix, Inc.'s 4010; and Ramtek Corp. 9400 terminals.

Longlib's source code is available for $2,600.

Cosmic, Computer Services Annex, University of Georgia, Athens, Ga. 30602.

■ Executive Technology Data Systems, Inc. has announced a disk management system for the IBM System/34 and 36.

The Disk Space Manager reportedly uses menu-driven operations to identify unused file space and initiate disk management functions. The system can be used to resize files individually or from a system-generated list of files.

The system provides file maintenance functions such as automatic backup of System/36 multiple files on multiple diskettes. It will also generate procedures to restore multiple files from sets of diskettes.

The Disk Space Manager is priced at $395 for a perpetual single-system license.

Executive Technology Data Systems, Suite 108, 28104 Orchard Lake Road, Farmington Hills, Mich. 48018.

■ CHI/COR Information Management, Inc. has announced enhancements to its Data Set Analysis System (Dsas) and its Resource Analysis System (RAS) for IBM mainframes under MVS, MVS/XA or VS-1.

The software defines critical data sets and computing resources required for processing when primary processing facilities are lost.

The highlights of Release 4 of the two products include support for Type 30 SMF records, which can now be used in addition to or in place of Type 4 and Type 5 SMF records to provide job and step data for RAS and Dsas reports. Also offered is support for 3375 Dasd under which the Job Detail Report and the Dasd reports from the RAS will now recognize and report on such devices.

The RAS and Dsas products cost $4,500 and $6,500 respectively.

CHI/COR Information Management, 10 S. Riverside Plaza, Chicago, Ill. 60606.

APPLICATION PACKAGES

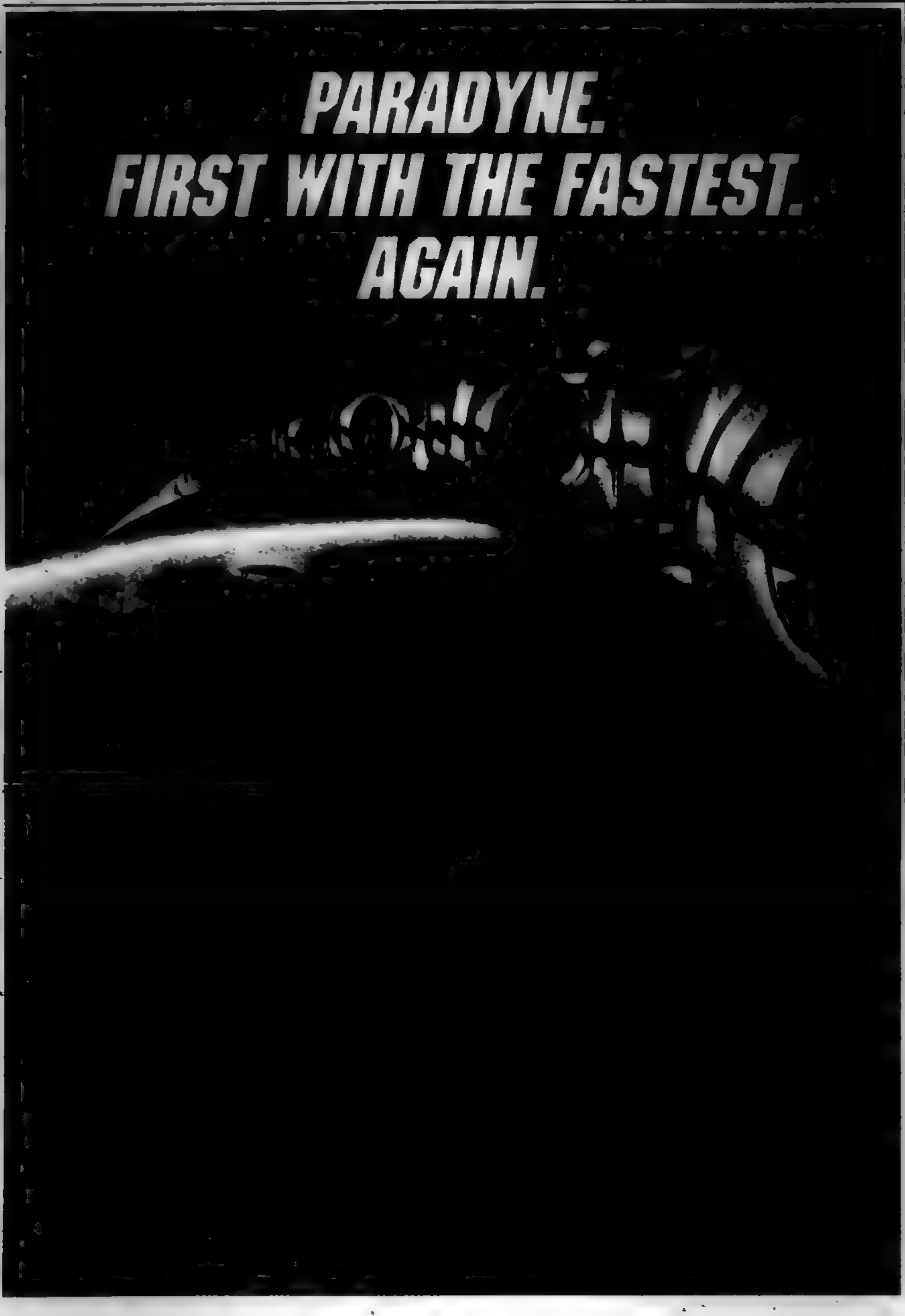
■ Financial reporting capabilities, Help facilities and on-line payroll and foreign currency calculation functions have been added to Sysgen, Inc.'s Release 3 of the 38/Accountant integrated accounting system for the IBM System/38.

The 38/Accountant's Flexlist function reportedly provides control over the horizontal columns on financial statements while retaining vertical control of sequencing and subtotaling. The payroll application has been rewritten to speed processing. A security feature allows managers to grant users access to specific options on selected menus of applications.

Accounts payable, accounts receivable, cash management and fixed assets applications can accept foreign currency transactions after input of currency definitions, a vendor spokesman said.

The entire 38/Accountant Release 3 includes 10 modules and costs $63,500. Modules can be purchased separately.

Sysgen, Suite 120, 3001 Academy Drive, Durham, N.C. 27707.



MICROCOMPUTERS

Lotus clones no bargain, analysts say

By Edward Warner
CW Staff

Two low-cost alternatives to Lotus Development Corp.'s 1-2-3 spreadsheet are being readied for market, but at least two analysts believe the packages will offer little to corporate users.

One of the alternatives, Paperback Software International's VP-Planner, reportedly includes two data base management systems, one of them compatible with Ashton-Tate's Dbase II and Dbase III. It also features a spreadsheet that, in the words of Paperback Software's marketing manager Michael Burdick, "will do the things that 1-2-3 does the same way that 1-2-3 does them."

The other, VIP Technologies Corp.'s VIP Professional, reportedly offers the same keystrokes, macro functions, commands and features as 1-2-3, plus an icon-based user interface.

While the two packages, both available in October, claim many similarities with 1-2-3, they differ in price. The Lotus product lists for $495. By contrast, VP-Planner is priced at $99.95 and VIP Professional at $249.95 for the IBM Personal Computer. A $149.95 version of VIP Professional for the Atari, Inc. Atari ST will be available by the end of August.

Will the corporate market for business software be attracted to new entries because of their price tags? "No," answered analyst Aaron Goldberg, director of microsystems services for market research firm International Data Corp. in Santa Clara, Calif. Goldberg characterized the pricing of the two entries as "a perfect example of consumer theory marketing run amok.

"If I'm an executive," he elaborated, "and my company uses 1-2-3, is it worth a couple hundred bucks [saved] to [fool] around [with a new product]?" To do so, he claimed, would be to risk spending hours fixing a spreadsheet if problems arose.

Analyst Amy Wohl, president of Wohl Associates in Bala-Cynwyd, Pa., agreed.

See CHOICE page 67

IBM offers drawing tool

Kit includes art library, multiple brushes, colors

An IBM Drawing Assistant screen

BOCA RATON, Fla. — IBM has boosted its line of Personal Computer Assistant series software with Drawing Assistant, a graphics package that may be used for drawings, floor plans, charts, diagrams and other illustrations.

The $169 package can produce separate drawings, enhance graphs created with IBM Graphing Assistant or produce graphics that can be merged within IBM Writing Assistant documents, IBM said.

Other features reportedly include an art library containing symbols, maps and patterns and a zoom function that allows any part of a picture to be magnified, retouched and then restored to original size.

Drawing Assistant permits users to select or create patterns, choose different brush styles and paint with two to 16 colors at a time, IBM said.

Simplified drawings of shapes such as circles and rectangles can be created by pointing to a function, selecting it and drawing the shape. The package also supports selective removal of a freshly painted drawing, leaving the original painting underneath untouched, according to the vendor.

The software runs on the IBM Personal Computer, Personal Computer XT, Personal Computer AT, Portable Personal Computer and PCjr. It requires 256K bytes of internal memory and either an IBM color graphics monitor adapter or an IBM enhanced graphics adapter. Use of a mouse and two disk drives is recommended.

More information is available from IBM Entry Systems Division, Boca Raton, Fla. 33432.

No leads in search for Unix PC

SMALL TALK
Edward Warner
CW Senior Writer

Call me the Personal Computer Private Eye. For the past month, I've been on the trail of the AT&T Unix PC. I've seen them on display at trade shows and in one computer store, but when I try to find one in somebody's office, no luck.

In May, I asked AT&T public relations people to give me the names of some users. Saying they were too removed from the actual sale, they sent me a list of three dealers instead. I called the dealers on the list, and with the third I hit pay dirt. Or so I thought.

That dealer was Glen Dardick, the owner of the two-store Computerland Corp. of Richmond, Va., chain. Both of his stores carried the Unix PC. Dardick, a straight-talking sort of guy, said he'd give me the names of Unix PC customers, if the customers agreed to it.

So I staked out Dardick's place via phone, checking in every so often. "Sold any yet?" I'd ask. Nope. Last week, I got the word from Dardick: He'd sent all of his Unix PCs back to AT&T. He hadn't sold one since he took delivery in April. "Multiuser software just [is] not out there," and without software a Unix machine won't sell, he lamented.

I'd reached a dead end. Unsure of

See SEARCH page 66

■ Micropro International formally introduced Easy, a word processing package for first-time users/60

■ A terminal emulation board compatible with three micro-to-mainframe standards was announced by Attachmate/61

■ A $480 2M-byte add-on board for the IBM Personal Computer debuted from Mega-Omega Systems/61

■ Index Technology upgraded its Excelerator automated system development software/62

INSIDE
Software/64

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IBM SQL/DS and DB2 relational DBMS now on PC

ORACLE, the relational DBMS compatible with IBM's SQL/DS and DB2, is now available on the IBM PC/XT and PC/AT. While SQL/DS and DB2 run only on IBM mainframes, ORACLE runs on IBM mainframes as well as on DEC, DG, HP and most other minis and micros. Any application written for SQL/DS or DB2 will run without modification on the complete range of systems supporting ORACLE, including PCs.

SQL/DS and DB2 are relational database management systems; ORACLE is a relational DBMS plus an integrated set of 4th generation software tools for application generation, report writing, color graphics and network communications.

Oracle Corporation introduced the first relational DBMS in 1979. Now, ORACLE provides the only complete implementation of the IBM-standard SQL language available for the PC.

Oracle Corporation cites three principal application areas for its product's capabilities:

■ The ORACLE Application Development Center provides a PC-based development center for the creation of DB2 and SQL/DS applications. The flexibility of the personal computing environment is made available to programmers creating applications for use with IBM's relational database products.

■ The ORACLE Personal Information Center extends the Information Center concept to the Personal Computer. ORACLE's application generator, graphics, spreadsheet and other end-user tools provide a SQL/DS and DB2 compatible Information Center on the desktop.

Users can become acquainted with the facilities and power of the Information Center in the personal computing environment, and transfer their knowledge and skills as the MIS Information Center facility evolves. The ORACLE Personal Information Center provides the facilities for MIS to develop the cooperative relationship with end users so vital to the success of the Information Center.

In addition, with ORACLE on departmental superminis, users can create identical Information Centers at the department level.

■ The ORACLE Distributed Information Center provides an intelligent set of communication links among multiple systems, with ORACLE running on IBM mainframes and various minis and PCs.

Using ORACLE's SQL*LINK networking facility, ORACLE on such diverse systems as MVS, VM/CMS, VAX/VMS, UNIX and PC/DOS can selectively exchange database information using the full capabilities of the SQL language. Applications, portable across all environments, can be run identically on any system, and data can be intelligently extracted for use at any site.

ORACLE is currently installed on over 1000 supermini and mainframe systems around the world, as well as on thousands of PCs and compatibles. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and many government agencies.

For further information, contact Oracle Corp., Dept. C, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350.

Micropro word processing package targets novice users

By Kathleen Sullivan
CW West Coast Bureau

SAN RAFAEL, Calif. — Setting its sights on the market for novice computer users, Micropro International Corp. recently announced Easy, a $150 word processing package designed for first-time users.

Developed for the IBM Personal Computer and compatible systems, Easy signals Micropro's intent to woo customers away from Software Publishing Corp.'s PFS:Write and IBM's Writing Assistant, which now dominate the market, said H. Glen Haney, Micropro's president.

Designed primarily for small business users, Easy is a menu-driven program that relies extensively on the use of pop-up menus. On-line Help is provided for every command, and Easy includes an Undo command that allows users to restore accidentally deleted text, according to Micropro.

Documents up to 240 columns wide

With Easy, users can create documents up to 240 columns wide. The program is said to provide seven type styles and to feature customized support for more than 120 printers. A 65,000-word spelling checker is included.

> 99
>
> *At its product debut, Micropro emphasized that Easy is not a 'cut-down version of Wordstar' but an entirely new product.*

According to Micropro, Easy users will be able to share files with the firm's two other word processing programs, Wordstar and Wordstar 2000.

Unlike competing products that limit the length of a document, Easy's documents are limited only by the amount of disk storage available. PFS:Write writes to random-access memory (RAM), so a document is limited to available memory.

At its product debut, the company emphasized that Easy is not a "cut-down version of Wordstar" but an entirely new product, written in the Modula-2 programming language.

User interface applauded

Analysts who had received early copies of the program applauded Easy's user interface, saying that the program's design gave it some advantages over products with which it competes.

In a report issued by Wohl Associates, a Bala Cynwd, Pa.-based consulting firm, analyst Amy Wohl and Joel Levy compared Easy and PFS:Write.

The analysts decided that while the products were "roughly comparable from a features point of view," Easy got higher marks in the ease-of-learning category.

"We found that the Easy product, because of its pop-up menu interface and its contextual Help, was particularly simple to learn," they wrote. Wohl and Levy estimated that a new user would be able to master the basic features of the program and begin producing simple documents within 30 to 60 minutes.

"While the functionality would not be adequate for every word processing job, it is more than adequate for new users and casual users," they wrote.

"Since the package is upwardly compatible with a range of more sophisticated Micropro word processing products, users whose needs grow should be able to upgrade without the need to convert their existing library of documents."

Easy also got high marks from International Data Corp.'s Yates Laboratories, a market research and software testing group based in Palo Alto, Calif., which brought three novice users together to compare Easy, PFS:Write and IBM's Writing Assistant.

A Yates report noted that all three programs are "quite simple to learn and use," but added that "an overriding advantage which Easy has over its two competitors is the high level of comfort which the users felt with the program.

"This feeling of comfort makes the new user's first impression of using a computer a rewarding one, rather than a frustration." Yates concluded that Easy has a shorter learning curve than the other products.

Although Micropro said Easy can run on a dual-floppy-drive system, Yates recommended the use of a hard disk with the program. "Easy, in certain functions, seems slow on a two-disk system," the report said. "There is considerable disk activity when moving from menu to menu, and a few editing operations, such as inserting text into a paragraph, lag slightly behind the user."

Easy, which requires 256K bytes of RAM, runs under PC-DOS 2, 2.1, 3 and 3.1.

It will be available late this month, the vendor said.

Additional information is available from Micropro, which is located at 33 San Pablo Ave., San Rafael, Calif. 94903.

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The Macworld Expo [illegible] designed to fit your busy s[illegible]. [illegible] distributor, a retailer, a business [illegible] cator, the three-day conference and [illegible] designed for you.

Day one is for dealers, distributors, retailers, and other third-party vendors to talk to Apple and the 100+ exhibiting companies about their products.

Days two and three are specifically geared for people interested in the Macintosh as a tool for business and anyone else interested in the Mac.

Attachmate introduces 3-N-1 adapter

BELLEVUE, Wash. — Attachmate Corp. has announced the Attachmate 3-N-1 3270 Coaxial Adapter, a $1,195 micro-to-mainframe board that offers compatibility with the Digital Communications Associates, Inc. (DCA) Irma board, the IBM 3278/3279 Emulation Adapter and the Multisession Adapter used in the IBM 3270 Personal Computer, according to the vendor.

A company spokesman predicted that IBM soon will offer a variety of software packages for its 3278/3279 Emulation Adapter and the 3270 Personal Computer AT, and emphasized that the Attachmate product is a commitment to the IBM interface standard embodied in those upcoming offerings.

As a single-board adapter for an IBM Personal Computer, Personal Computer XT, AT or compatible, the Attachmate 3-N-1 supports the IBM Type 2 coaxial protocol and the 3270 data stream commands in a CUT or DFT environment.

A range of software

The Attachmate 3-N-1 operates with software currently available for the Irma board and the 3278/3279 Adapter, and it comes with a range of its own software as well.

Features of the Attachmate Operational Software include IBM 3270-PC-compatible file transfer and concurrency.

Software compatible with the 3-N-1 includes DCA's E78 Terminal Emulator and File Transfer packages, Cullinet Software, Inc.'s Goldengate micro-mainframe link, Information Builders, Inc.'s PC/Focus, McCormack & Dodge Corp.'s PC Link and IBM's Professional Office System, PC Connection and 3270 Attachment.

The 3-N-1 fits into a single slot in the Personal Computer and attaches it to IBM 3274 and 3276 control units and 4300 mainframe processors.

The product offers IBM 3287 printer emulation and 3270-PC compatibility in IBM TSO, CMS and CICS environments.

Attachmate is located at 3241 118th S.E., Bellevue, Wash. 98005.

Mega-Omega board debuts

DALLAS — Another vendor cast its lot with the Lotus Development Corp./Intel Corp. Expanded Memory Specification (EMS) in July as Mega-Omega Systems, Inc. introduced its $177 Companion Card, an option board that can be configured to boost the IBM Personal Computer's memory up to 2M bytes, the vendor said.

A 2M-byte version of the Companion Card costs $480.

One main competitor in the EMS arena, Intel's Aboveboard/PC, cost $395 with 64K bytes of memory at its introduction in June. Aboveboard/PC is also said to be expandable to 2M bytes, using additional memory chips sold by Aboveboard dealers at the dealers' prices.

Allows [illegible] micros to address memory

The EMS permits Personal Computers to address memory beyond the 640K-byte limit imposed on the machine by its single-user operating system.

Companion Card reportedly also fills in the Personal Computer's memory below the 640K-byte limit, if required.

Like Aboveboard, the Companion Card will work with Lotus' 1-2-3 and Symphony packages, Ashton-Tate's Framework and other applications software, according to vendor.

With the use of an optional battery backup unit, the Companion Card reportedly can act as a nonvolatile random-access memory disk.

Memory from 0 to 2M bytes

Companion Card is available with zero to 2M bytes of memory and costs $177 to $480, depending on the amount of memory.

Companion Card Plus, a version of the Companion Card with serial, parallel and game ports and a real-time clock, was also introduced.

Companion Card Plus, which uses one option board slot, costs $297 to $600, depending on memory, and is available with zero to 2M bytes of memory.

Mega-Omega Systems is located at Suite 710, LB 122, 5217 Ross Ave., Dallas, Texas 75206.

TI micros get programs, kit

CULVER CITY, Calif. — Ashton-Tate has begun shipments of its Dbase III and Framework programs for the Texas Instruments, Inc. TI Professional line of personal computers, the two vendors have announced.

TI has also announced that it will market a $200 kit to allow users of the TI Professional version of Ashton-Tate's Dbase II to upgrade to Dbase III.

The kit will be available from TI and its authorized resellers, according to the vendors.

Dbase III and Framework for the TI Professional each cost $695.

Ashton-Tate is located at 10150 W. Jefferson Blvd., Culver City, Calif. 90230.

computer show
the Macintosh™

Here are some of the companies who will be showing Macintosh products:

Advanced Logic Systems.
Aegis Development
Ann Arbor Softworks
A+/Ziff-Davis Publishing Co.
Apple Computer, Inc.
Applied Logic Systems
Apropos Software, Inc.
Artline Industries
Assimilation, Inc.
Blue Chip Software
Boston Software
Brain Power, Inc.
Cadmus Computer Systems
The Cobb Group
Communications Packaging Corp.
Computer Additions
Computer Identics
Computer Learning Systems
Computer Shopper
Computer Software Designs, Inc.
The Computer Store
Corvus Systems, Inc.
Consulair Corporation/T/Maker
Creighton Development, Inc.
Diablo Valley Design
Diversions, Inc.
EDP Supply North
Enterset
Esoft Enterprises
ExperTelligence
Express Computer Supplies
First Byte, Inc.
Forethought, Inc.
Frontrunner Computer Industries
Future Design Software
General Computer Company
Haba Systems
Hayden Book Company
Hayden Software
Hayes Microcomputer Products
Hippopotamus Software
Icon Publishing
ICON Review/Mindwork
Infosphere, Inc.
InfoWorld
Innovative Technologies/Communications
Intermatrix, Inc.
Intersol
Iomega Corp.
The Kette Group
I/O Video
Kraft Systems
Layered, Inc.
Living Videotext, Inc.
Loki Engineering, Inc.
Lotus Development Corp.
Mac Packs, Inc.
MacTutor
MACWORLD
Micro Design
Micro Marketworld
Miles Computing, Inc.
Microsoft
MPH Computer Products
Mycroft Labs, Inc.
New Line 7
Odesta Corporation
Optimum Computer Luggage
Organizational Software Corp.
Palantir Software
Paradise Systems, Inc.
PBI, Inc.
Peripheral Computers & Supplies
Peripheral Systems
Personal Computer Peripherals
Prometheus Products, Inc.
ProVUE Development Corp.
Queue, Inc.
Scott, Foresman & Co.
Servidyne Micro Systems, Inc.
Sierra Information Systems
Silicon Beach Software
Small Business Computers of New England
SofTech Microsystems
Softidea
Software Arts, Inc.
SoftWeave
Softworks Limited
Stoneware
Sunol Systems
Systems Control
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Warner Software

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MACWORLD EXPOSITION
BOSTON

Index Technology enhances Excelerator development tool

CAMBRIDGE, Mass. — Index Technology Corp. has enhanced Excelerator, its automated system development methodology that runs on the IBM Personal Computer line.

The version supports Jackson structure diagrams, entity relationship data model diagrams and Yourdon data flow diagrams. Another capability is a dictionary interface facility that controls locking, unlocking, importing and exporting of project files.

The software's audit trail automatically tracks changes to every dictionary entry. Entity lists keep entity names and types that are logical subsets of a project.

The firm added two graphics enhancements to Excelerator. Level-to-Level Balancing report verifies the conversion of data flow by comparing a graph and all its lower levels. An Explosion report creates a hierarchical table of contents, listing up to nine levels to which objects in a graph can explode.

The release adds 78 ways in which a user can record relationships among entities in a project.

Excelerator costs $8,400.

Index Technology is located at Five Cambridge Center, Cambridge, Mass. 02142.

AST adds video adapter to hardware/software line

IRVINE, Calif. — AST Research, Inc. has announced the addition of the AST-5250/Display video adapter to its Model 11 line of hardware/software packages for communication between IBM Personal Computers and IBM Systems/34, 36 and 38.

The AST-5250/Display board reportedly makes it possible for a Personal Computer to support all IBM 5251 Model 11 terminal character and field display attributes on a standard IBM monochrome monitor.

The single-board AST-5250/Display also reportedly includes a parallel printer port and offers a Hercules Computer Technology, Inc.-compatible graphics display mode. The board is said to be compatible with such packages as Ashton-Tate's Framework and Lotus Development Corp.'s 1-2-3 and Symphony.

The product is said to include the ability to switch automatically from 5251/11 display to IBM PC-DOS display without operator interaction. Also supported are column separators as used in many IBM System/34, 36 and 38 applications.

The AST-5250/Display costs $495.

AST Research is located at 2121 Alton Ave., Irvine, Calif. 92714.

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Multimate products out

EAST HARTFORD, Conn. — Multimate International Corp. has introduced a word processing keyboard and a communications board that includes file conversion utilities to transfer documents between personal computers running its word processing software and Wang Laboratories, Inc. Office Information System, VS and Alliance systems.

The Multimate Business Advantage Keyboard is said to enhance the functionality of Multimate's Professional Word Processor software for IBM Personal Computers. The keyboard has 33 more keys than the IBM keyboard and includes reprogrammed function keys to offer up to four functions per key, the vendor said. It also provides color-coded key labels to remind users of Multimate commands.

Sixteen programmable function keys can be reassigned by the user for macro combinations of Multimate commands.

Sets of function key macros can be created, saved and loaded from the disk for use with different applications or other software.

The Business Advantage Keyboard will be available in October for $345.

Multimate's Business Advantage Communications Board is a dual-function communications board. Its word processing file conversion capabilities reportedly allow bisynchronous transfer of documents between microcomputers using Multimate and Wang dedicated word processors or asynchronous communication with printers, modems and other peripherals.

To transfer files, users can install the communications board in the personal computer and connect it to Wang's communications port directly or through bisynchronous modems and telephone links. File transfer is handled with error-checking capabilities and can conform to Wang's modifications to the IBM 2780 bisynchronous protocol, according to the vendor.

The Business Advantage Communications Board is priced at $995.

Multimate International is located at 52 Oakland Ave. N., East Hartford, Conn. 06108.

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Ashton-Tate utility tool debuts

INGLEWOOD, Calif. — Ashton-Tate has introduced a desktop utility program and a file encryption program for the IBM Personal Computer, Personal Computer XT, AT and compatible machines.

Timeframe is a collection of utilities designed to run with Ashton-Tate's Framework integrated software, the vendor said. Designed by Enabling Technologies in Chicago, Timeframe features an appointment book function, calendar, calculator and office assistant capabilities including a directory, letter writer, mail merge and mailing label function. The product is priced at $39.95.

Framelock is a stand-alone program that reportedly will encrypt files that can be read by the Personal Computer or compatibles. It includes two levels of security, password protection and a chain block cipher capability. Framelock requires a minimum memory of 320K bytes and costs $39.95.

Ashton-Tate is located at 8901 S. La Cienega Blvd., Inglewood, Calif. 90301.

Kit lets IBM micro users upgrade to 1-2-3

CAMBRIDGE, Mass. — IBM Personal Computer users of Lotus Development Corp.'s Visicalc spreadsheet package can upgrade to 1-2-3 under an exchange program announced in late July.

Lotus, which acquired the rights to Visicalc through its purchase of Software Arts, Inc., said it will sell $250 exchange kits through its authorized dealers. Visicalc users can buy the kits, complete the enclosed materials and then mail their Visicalc documentation and software to Lotus. They will receive a copy of 1-2-3 via an overnight delivery service, Lotus said.

The exchange program reportedly covers those versions of Visicalc for the Personal Computer marketed by IBM, Software Arts and Visicorp. The 1-2-3 software requires 256K bytes of internal memory, IBM's PC-DOS Version 2 or later and two double-sided, double-density diskette drives or one such drive and a hard-disk storage unit.

Lotus is located at 55 Cambridge Pkwy, Cambridge, Mass. 02142.

Reflex net version out

FREMONT, Calif. — Analytica Corp. has announced a network version of its Reflex data base management software package for the IBM Personal Computer.

The network version, which runs on 3Com Corp. Etherseries networks, is priced at $1,495 per server. Deliveries will begin in September, according to the vendor.

More information is available from Analytica at 3155 Kearney St., Fremont, Calif. 94538.

SOFTWARE

■ STSC, Inc. has enhanced Pocket APL, a version of the APL programming language that runs on the IBM Personal Computer line.

The enhancements include support for larger file sizes, which are now limited only by disk space. Pocket APL features report formatting, error trapping, native and APL shared file systems, online Help and more than 50 system functions, according to STSC.

The package also features an expanded reference guide that includes detailed descriptions and examples of system functions.

The programming language requires 128K bytes of random-access memory.

Pocket APL sells for $95.

STSC, 2115 E. Jefferson St., Rockville, Md. 20852.

See SOFTWARE page 66

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SOFTWARE from page 64

■ **Wiley Professional Software has announced a software training program for users of Computer Associates International, Inc.'s Microproducts Division Supercalc 3 Release 2 spreadsheet program on the IBM Personal Computer and Personal Computer XT or AT.**

"Supercalc, The Next Generation," reportedly explains the syntax of all commands and illustrates how to customize text and formulas, move information, manipulate data and print or save the work. The product includes a runtime version of Supercalc 3 that allows users to test its features but does not permit saving or printing data.

The Wiley product requires one 360K-byte disk drive, 128K bytes of memory and the IBM PC-DOS 2 or Microsoft Corp. MS-DOS 2 operating system. The package costs $46.95.

Wiley Professional Software, 605 Third Ave., New York, N.Y. 10158.

■ **Phoenix Computer Products Corp. has announced a macro assembler for microcomputers running Intel Corp.'s 8088, 80186 or 80286 processors and either Microsoft Corp.'s MS-DOS or IBM's PC-DOS operating system.**

Pasm86 is said to transform source code into object code in half the time of Microsoft's assembler. Pasm86 allows users to include local symbols within procedures, define symbols on the command line and obtain listings of error lines only, the vendor said. It can also assemble modules created by the Microsoft product and enables users to include files from any subdirectory by specifying the subdirectory on the command line.

Pasm86 defines relative offsets for each line of source in the first pass and can generate the listing, object and cross-reference file in the second pass. Listings can be generated on the first and second pass or on the second pass only.

Pasm86 is priced at $295.

Phoenix Computer Products, Suite 220, 1416 Providence Highway, Norwood, Mass. 02062.

■ **Texas Instruments, Inc. has announced an architectural design template package that runs on its Professional microcomputer.**

AE/Cadd is a set of template commands used with Autodesk, Inc.'s Autocad software. The template fits over an 11- by 11-in. digitizer tablet and contains common symbols and objects, the vendor said. Rather than continually redrawing a figure, architects can locate a desired shape and insert it into a drawing on their monitors.

AE/Cadd requires 512K bytes of random-access memory, an Intel Corp. 8087 coprocessor, a hard disk drive, color monitor, digitizer tablet and Microsoft Corp.'s MS-DOS operating system.

The package costs $1,000.

TI, Data Systems Group, Department H-802, P.O. Box 809063, Dallas, Texas 75380.

■ **Micrografx, Inc. has announced computer-aided design and drawing software that can run alone on the IBM Personal Computer, Personal Computer XT or AT or in conjunc-**

Continued on page 67

SEARCH from page 59

what to do next, I pulled the bottle of root beer out of my desk drawer and took a swig. As I was putting the bottle back, my eyes fell on an open *Wall Street Journal*. There I saw my next lead — an ad listing authorized AT&T PC dealers in New York and New England.

I called seven stores, in cities ranging from New York to Danbury, Conn., before I came upon one that was selling the Unix PC. That store, Computerland of Fort Lee, N.J., had sold only a few. Of those few, several had been sold to employees of AT&T itself, according to Paul Allessi, store manager. "People at AT&T have been buying the machines because they can't get them internally," Allessi speculated. But Allessi couldn't give me any names.

I made a few more calls. The score, when I gave up on the list, was seven "No" answers to three "Yes" answers; most AT&T dealers, it appeared, weren't carrying the machine.

In desperation, I called AT&T again. This time, a spokeswoman said she'd have no problem getting back to me with users. Could I give her until Wednesday?

Late on Wednesday, just as I was about to grab my hat and head for home, the phone rang.

"Sorry, but I don't have any users for you yet," she said, adding that she wasn't sure now whether she could ever get me some.

I hung up the phone and did some thinking. Can it be that after five months of selling Unix PCs, AT&T can't name one customer who is currently using the machine?

Sure, they've gotten big orders for Unix Personal Computers from such disparate groups as the Shearson Lehman Brothers, Inc. brokerage firm and the National Catholic Group Purchasing Association, but those orders won't be filled until this fall.

I wanted some users now, while people were still wondering about what impact the machine might have on U.S. business.

If I wanted Unix PC users, I decided, there was only one place left to go for answers. So, readers, do you know of anyone who is using the Unix PC in an office, or evaluating the machine for a possible large purchase? If you do, give me a call at 617 879-0700, extension 538). Please call soon; even the Personal Computer Private Eye can't stay on the case forever.

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INTRODUCING THE LDP-2000 SYSTEM VIDEO DISC PLAYERS.

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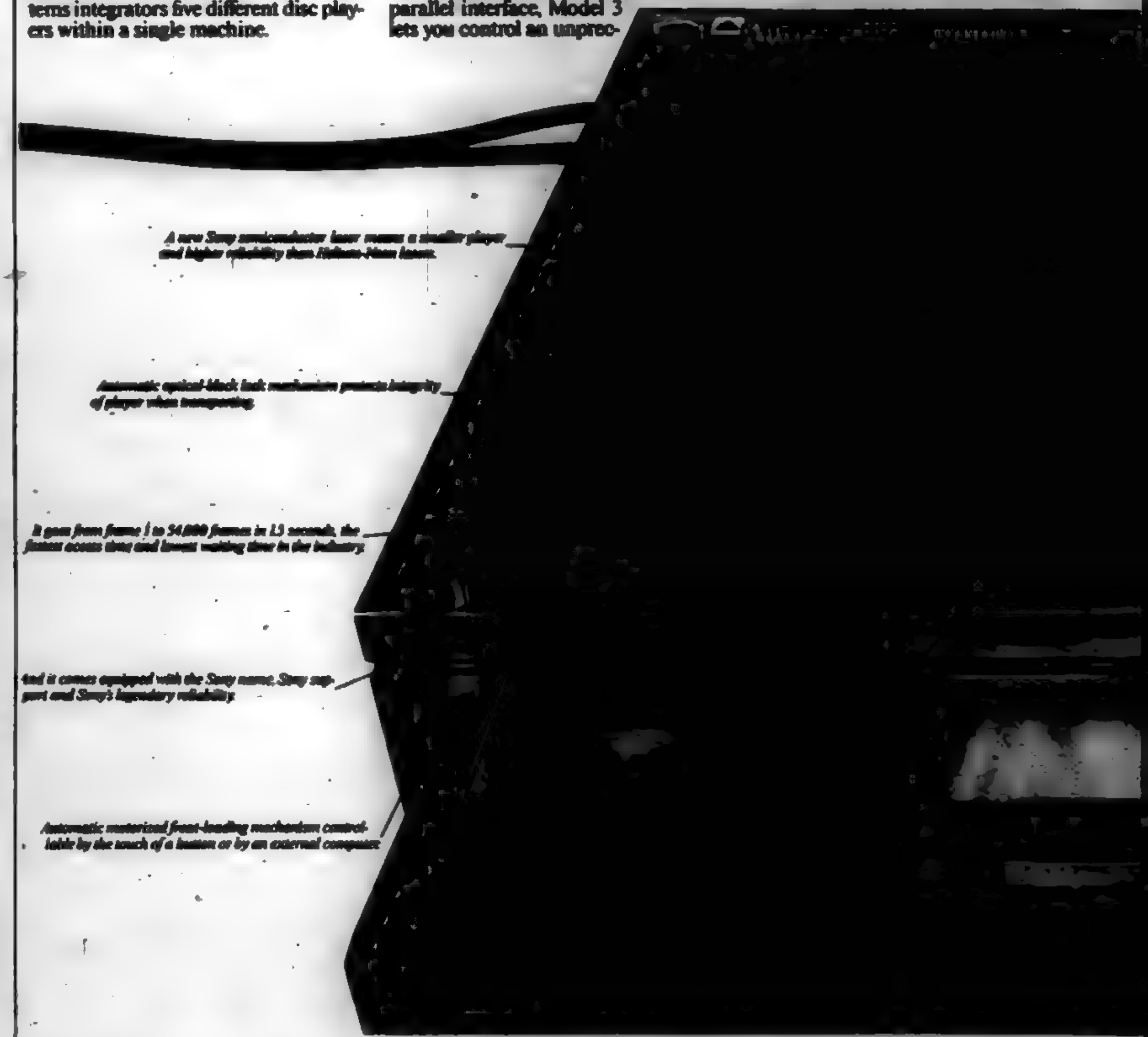
Model 1 provides random access audio/video with an RS-232C external computer interface. Add an expansion board, and Model 2 gives you the ability to play discs with audio-track control programs. While if you add a parallel interface, Model 3 lets you control an unprecedented 15 players through one communications bus.

With Model 4, you're equipped with the perfect educational tool: Still Frame Audio. It compresses digital audio so you can extend a program to an


A new Sony semiconductor laser means a smaller player and higher reliability than Helium-Neon lasers.
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It goes from frame 1 to 54,000 frames in 1.5 seconds, the fastest access time and lowest waiting time in the industry.
And it comes equipped with the Sony name, Sony support and Sony's legendary reliability.
Automatic motorized front-loading mechanism controllable by the touch of a button or by an external computer.

CHOICE

from page 59

"The whole problem with inexpensive software products is that they don't allow for proper support," Wohl said. Singling out VP-Planner, she said, "There are real questions about whether you can properly support a package for $99 and have any margin for dealers." No dealers means no local support, she said.

Wohl also expressed what she called mixed emotions about the ability of upstart software publishers to follow a trail blazed at some risk by Lotus. "Somebody did the work to [create] 1-2-3," she said. "If you know what the end result should look like, it's easier to do the programming."

The icon-based VIP Professional reportedly offers users the ability to interact with the software using either their keyboards or an optional mouse. It will interact with those programs that interface with 1-2-3. Versions of the package will eventually be marketed for Apple Computer, Inc. Apple II and Macintosh machines and for computers under the AT&T Unix multiuser operating system, VIP said.

> 'There are real questions about whether you can properly support a package for $99 and have any margin for dealers.'
>
> — Amy Wohl
> Wohl Associates

VP-Planner's templates, macros and worksheets reportedly are all compatible with 1-2-3. The product can work with files imported from the Lotus spreadsheet, Burdick explained, but it cannot export files for use in 1-2-3. That one-way file format compatibility is due, he said, to the fact that 1-2-3 is a subset of VP-Planner, and its compatibility is limited by the features that it offers beyond those of the Lotus product. These features include the ability to print a file in the background while the user works on another spreadsheet.

VP-Planner reportedly can create, read, write, update and join files that are compatible with Dbase II and III. The number of Dbase files that can be open at one time is limited only by disk capacity and the amount of memory available for the worksheet that is accessing those files.

A second data base system included in VP-Planner, the Multidimensional Database, reportedly stores information from worksheets in a data base format that can be used to calculate any combination of totals and subtotals, according to the vendor.

VP-Planner reportedly will be available next month and requires at least 256K bytes of memory, one diskette drive and an 80-col. monitor.

Paperback Software International is headquartered at 2612 Eighth St., Berkeley, Calif. 94710. VIP Technologies is located at 132 Aero Camino, Goleta, Calif. 93117.

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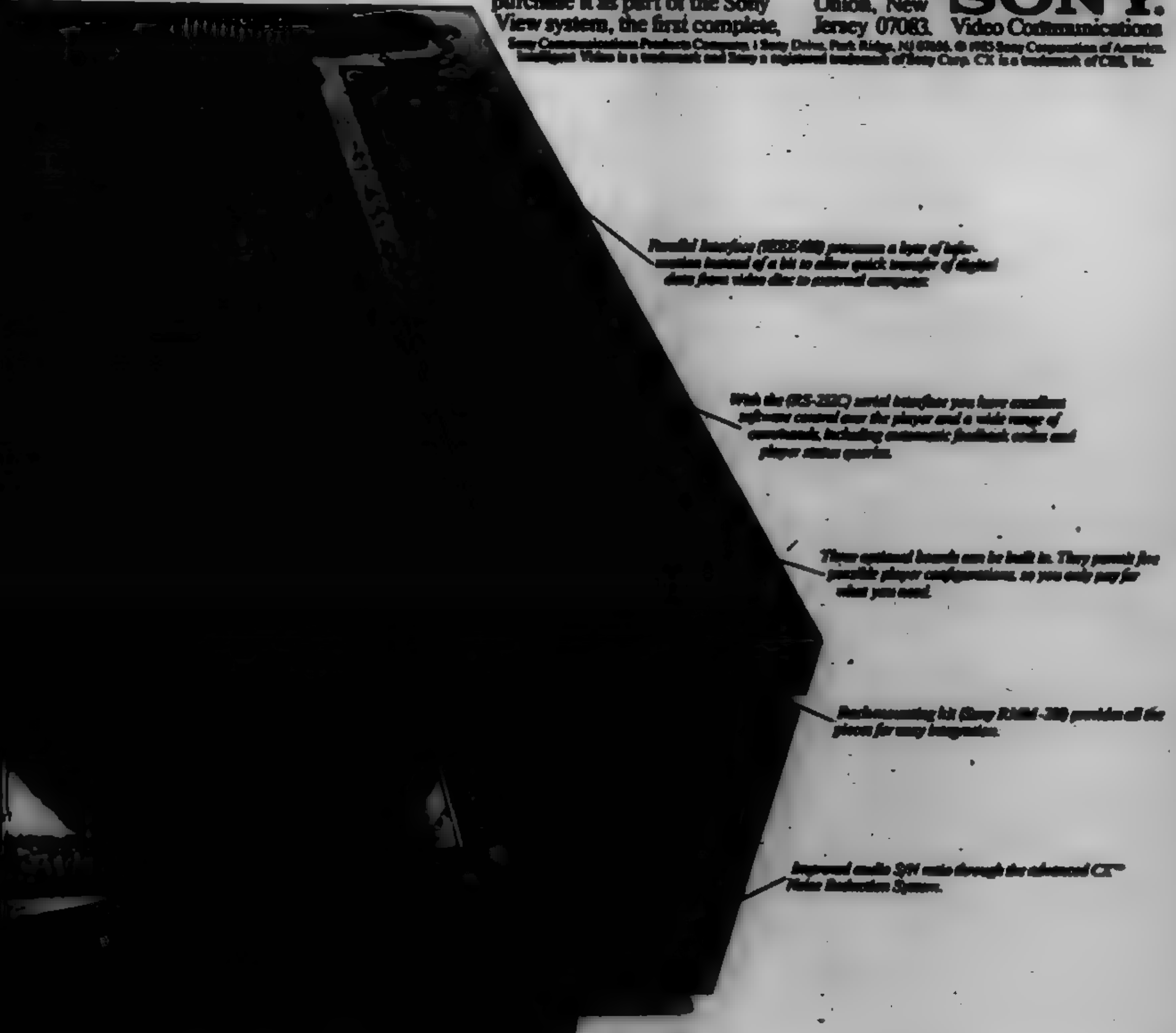
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Rackmounting kit (Sony RMM-30) provides all the pieces for easy integration.
Improved audio S/N ratio through the advanced CX™ Noise Reduction System.

Continued from page 66

tion with Microsoft Corp.'s Windows operating environment.

Inavision reportedly features optional mouse capability, allowing users to choose drawing and editing functions from pull-down menus with a mouse. The software incorporates the Windows capability for simultaneous viewing of multiple screens. Multitasking allows users to edit multiple documents or draw while printing hard copies.

Inavision includes zoom capability for close-up or faraway viewing of the design. Other CAD functions include rotation and scaling.

The software requires a minimum of 320K bytes of memory.

Inavision is priced at $495.

Micrografx, 1820 N. Greenville Ave., Richardson, Texas 75081.

■ **Analytics Communications Systems, Inc. has announced a Data Encryption Standard security package for the IBM Personal Computer line.**

Sherlock Personal Computer Security Module's security features reportedly include encryption and decryption of local files, secure local signon, key management, verification of communicated messages and approval for program change controls.

The package is available in two models: an asynchronous version that does not require an adapter and a bus-level peripheral.

The bus-level model sells for $1,065, and the asynchronous version costs $1,150.

Analytics Communications Systems, 1820 Michael Faraday Drive, Reston, Va. 22090.

■ **Ozz Networking Systems has introduced Ozzpoint/Management System, a sales support data base program for use with the IBM Personal Computer and machines under Datapoint Corp.'s DOS or Resource Management System.**

The software reportedly permits the sorting of the data base by Zip codes and includes statistical analysis capability for use in measuring the effectiveness of advertising campaigns.

Ozzpoint/Management System is priced at $99.95, according to the vendor.

Ozz Networking Systems, Suite 216, 6309 N. O'Connor Road, Irving, Texas 75039.

Matt's office has been winning a lot of new business lately. And it's really not much of a secret.

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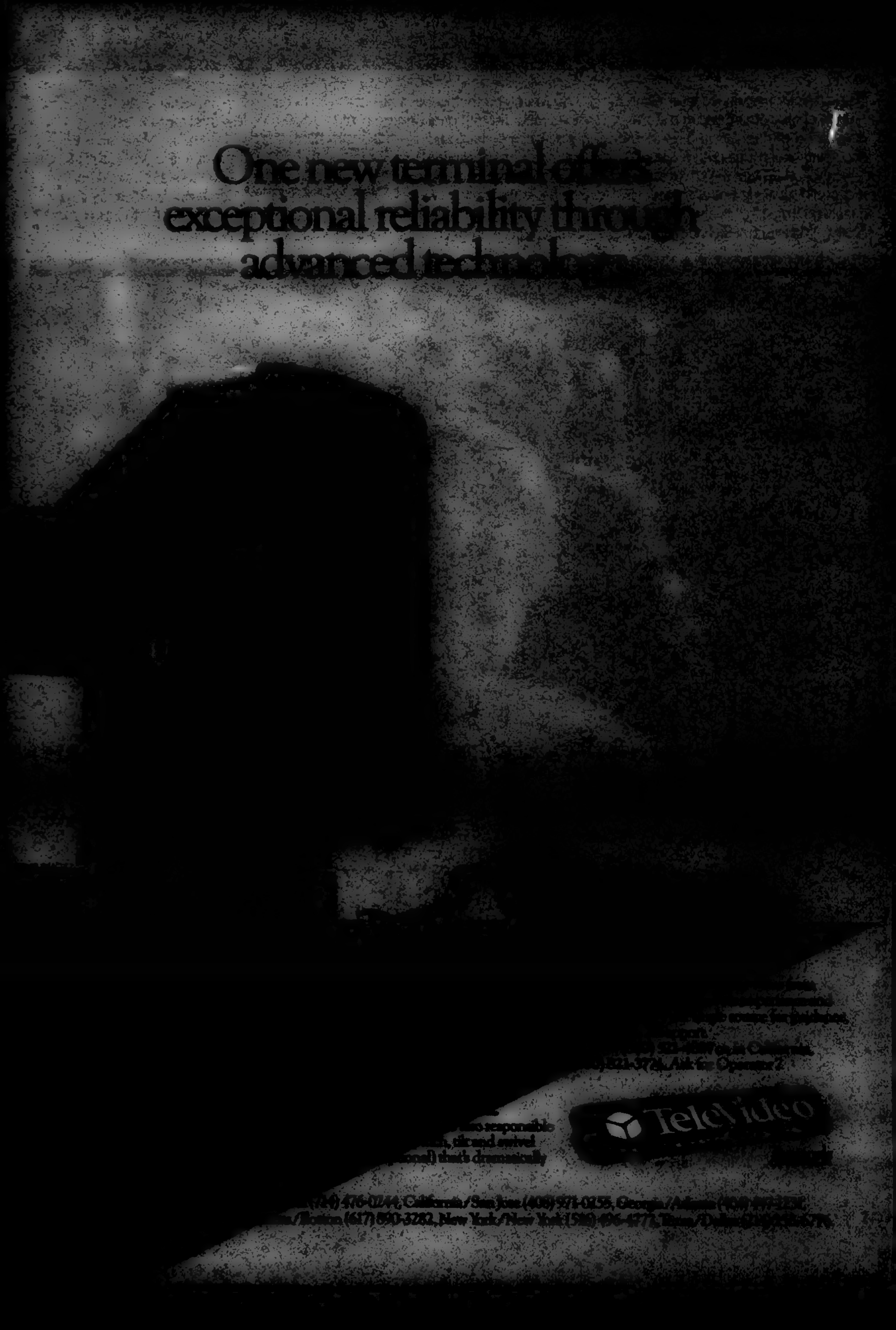
To make Matt's secret yours, call Team Xerox at 1-800-833-2323, ext. 42 or send your business card to Xerox Corp., Dept. 42013, P.O. Box 24, Rochester, NY 14292.



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COMMUNICATIONS

Net control offers opportunity

WIRE TAP
Paul Korzeniowski
CW Senior Writer

How does one spell opportunity? How about N-E-T-W-O-R-K-M-A-N-A-G-E-M-E-N-T?

The divestiture of AT&T and the growing importance of networks to businesses, large and small, have created a number of opportunities for corporations, individuals and vendors.

Corporations have the opportunity to reign in network control, which in many cases is running wild. Before divestiture, AT&T was responsible for locating glitches in a communications line. On Jan. 1, 1984, responsibility for a line became clouded as AT&T and its former operating companies began finger pointing rather than troubleshooting. Call one firm with a problem, and it will point to another as the source.

The easiest way for a corporation to stop this nonsense is by performing its own network management. Beside enabling network operators to right some problems themselves, the packages help pinpoint telephone company trouble spots, reducing the runaround.

When taking network management into their own hands, companies should carefully examine existing network designs. Divestiture, the growing number of personal computers accessing larger systems and technical advances may have rendered designs from a few years ago obsolete.

Some larger companies are starting all over again. McDonnell Douglas Corp. in St. Louis has replaced a Centrex and

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DATA STREAM

Network supports IBM 3270

By John Dix
CW Staff

Although most local networks do not provide the flexibility and availability associated with wiring systems like IBM's Cabling System, some networks can be used as viable alternatives to hardwiring terminals.

Ungermann-Bass, Inc.'s recently announced ability to support IBM 3270-type traffic, for example, makes its Net/One local network much more attractive. Companies that already have Net/Ones installed can add 3270 support for roughly $1,000 per terminal, a price that includes the cost of supporting the controller.

That price is reasonable given the high cost — often several hundred dollars — of rewiring point-to-point coaxial cables each time 3270-type terminals and printers are moved.

This Ungermann-Bass capability is made possible with two new interfaces, the Network Interface Unit Model 74 (NIU-74) and Network Interface Unit Model 78 (NIU-78). These units reportedly work with both the baseband and broadband implementations of Net/One

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Globenet enters pact with SBN

By John Dix
CW Staff

CHICAGO — Satellite Broadcast Network, Inc. (SBN) and Globenet have entered a joint marketing agreement to push a hybrid, two-way communications system that links SBN's satellite data transmission capability with Globenet's packet-switching network.

The digital service combines a point-to-multipoint, host-to-workstation satellite connection with a return terminal-to-host packet net connection. It is intended for companies that need to transmit the bulk of their traffic outbound, as in data distribution or the updating of remote data bases, and is said to cost half that of AT&T multidrop lines.

SBN is a 3-year-old company that markets a demodulator enabling consumers who have C-band receive-only satellite antennas to tap the company's Agribusiness or general business data bases. Both data bases are procured by SBN from Agridata Resources, Inc., a firm that specializes in agricultural news, market data and other information such as major U.S. Department of Agriculture reports, according to Frank Yurasek, vice-president of marketing.

Globenet was incorporated 1¼ years ago to resell the packet-switching services of GTE Telenet Communications Corp., Tymnet, Inc. and Uninet, Inc. According to Jacob Kuykendall, Globenet chief executive officer and president, having access to all three carriers enables Globenet to pick and choose the lowest costs and use the networks to back up each other.

As a reseller, Globenet can combine carrier facilities to realize savings, whereas

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■ Gandalf Data, Inc. has announced a software package that enables its Pacx 2000 family of data switches to be networked 74

■ Automatic dialing equipment and software for the IBM System/34, 36 and 38 minicomputers debuted from Orion Software, Inc./74

■ Complex Systems, Inc. announced a time division multiplexer that works with either the 56K bit/sec. Digital Dataphone Service or private lines/74

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Sytek system allows operators to monitor broadband activity

MOUNTAIN VIEW, Calif. — Sytek, Inc. has introduced a network management system that enables operators to monitor activity on moderate to large implementations of the firm's broadband local-area nets.

The Sytek 6101 Network Control Center, an upwardly compatible replacement for the Sytek 50/100 NCC, enables managers of the company's Localnet products to set parameters such as transmission speed and parity for each remote network device. The system is menu driven and can work with two to 1,000 devices.

Two optional software capabilities include the digital monitor option, which provides the means to collect data from up to five Sytek Statistical Monitors — used to gather information from the network — and sends the data to a hard disk or a printer port for analysis and report generation; and the queue server option, which queues users when network resources are busy.

The Sytek 6101 Network Control Center is based on an NCR Corp. Tower supermicro that uses a Motorola, Inc. 68010 microprocessor and AT&T's Unix System V operating system. A base unit includes 1M byte of random-access memory (RAM), a 46M-byte hard disk drive, 5¼-in. floppy disk drive with a 1M-byte capacity and a cartridge tape drive that can store 45M bytes of data.

In the event of a power failure, data is automatically stored in battery-supported RAM for up to four hours. The processing unit automatically restarts upon power restoration. The product's central call routing facility enables a user to be connected to a proper device automatically or by an operator.

An eight-port model sells for $28,950, and a 16-port device costs $31,750. The digital monitor option retails for $1,600, and the queue server option is priced at $2,500.

Sytek is located at 1225 Charleston Road, Mountain View, Calif. 94039.

Sun Microsystems unleashes gateway, software, connector

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. has announced communications products that connect Sun workstations to IBM mainframes and compatibles and enable Ethernet local nets to be linked over wide areas.

The Sunlink SNA 3270 is a gateway that enables Sun workstations on an Ethernet network to access IBM Systems Network Architecture (SNA) hosts.

The gateway supports up to 24 simultaneous sessions that can be dynamically allocated.

The product's windowing capability reportedly enables users to create a number of SNA windows and to run numerous sessions concurrently. With a mouse, users can switch between SNA and AT&T Unix applications, the company reported. Users can view data, capture the data to disk or print it anywhere on a Sun Ethernet using IBM 3287 printer emulation.

Sunlink Binary Synchronous Communications (BSC) RJE software is said to provide a bridge between Sun workstations and IBM RJE systems. A user can exchange files and execute remote programs with systems that use IBM's 2780, 3780 or Hasp protocols, according to the company.

Sunlink's Internetwork Router can be used to connect two or more Ethernet networks by lease line, dial-up or satellite connections. The Internetwork Router supports data rates up to 9.6K bit/sec. by itself; when supplemented with Sun's Sunlink Communication Processor, an optional board for the gateway processor, speeds up to 64K bit/sec. are possible, according to the vendor.

Sunlink SNA 3270 costs $2,000, Sunlink BSC RJE software sells for $1,500, and Sunlink Internetwork Router is priced at $2,000, the vendor said.

For additional information, Sun Microsystems is headquartered at 2550 Garcia Ave., Mountain View, Calif. 94043.

NET/ONE

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over any media. The system supports IBM's Systems Network Architecture (SNA) and Binary Synchronous Communications protocols.

IBM 3274 controllers are attached to a Net/One by wiring directly to a 16-port NIU-74. Eight-port terminal network interface units can be located anywhere on the network and support, through direct coaxial cable connections, IBM 3178, 3278, 3179, 3279, 3180, ITT Courier 1178 and Telex 078 display terminals.

Additionally, NIU-78s support the IBM 3270 Personal Computer in control unit terminal mode and personal computers when outfitted with the IBM Personal Computer 3278/3279 Emulation Adapter, Digital Communications Associates, Inc.'s Irma board or Forte Communications, Inc.'s Forte board.

The NIU-74s and NIU-78s are designed to support the 2.3M bit/sec. speeds associated with IBM's Type A coaxial-cable-attached 3270 devices. Because, however, both Net/One implementations use the carrier-sense multiple access method, network loading is critical to net performance and terminal response time.

Ungermann-Bass calculated the maximum number of devices that could be supported based on desired performance criteria, according to product manager Charles Feltman.

One such consideration was the permissible lag time between when a character was struck on the keyboard and when it appeared on the screen. The NIU-74's and NIU-78's response time was designed never to let the screen fall more than two characters behind the struck character, which is as good or better than IBM's response time, Feltman said.

Based on response time parameters, baseband implementations of Net/One, loaded to no more than 80% of capacity, can support 2,700 devices per net segment. Broadband implementations, loaded to a maximum of 50% capacity, can support 820 devices per channel, or a total of 4,100 devices on the network's five channels. The broadband version operates at 5M bit/sec. while all other implementations operate at 10M bit/sec. These figures presuppose that the 3270 devices are the only ones on the network. Users who already have partially loaded networks will not be able to support as many devices.

To support more terminal devices, networks can be bridged or, in the case of baseband versions, net segments can be interconnected with repeaters. With broadband implementations, the terminals or printers that are supported can be up to five cable miles away from the controller.

Both the local and remote versions of IBM's 3274 controllers are supported. But, more important, because terminals can be located so far from CPUs, users can pull remote controllers back to the machine room and locally attach them, thus vastly improving terminal response time.

Any peripheral device supported on a NIU-78 can access any NIU-74 port on the network. The system also reportedly offers a port rotoring capability that enables terminals to contend for controller ports. This is said to reduce the number of required controllers because terminal users can queue for ports.

Obviously, companies that don't have Net/Ones installed will be less inclined to purchase the system just to support IBM terminal gear. IBM's Cabling System provides greater availability — a data outlet in every office — and will be used as the foundation for the company's forthcoming token local-area network. For users with Net/Ones installed, the NIU-74 and NIU-78s do, however, provide workable options to hard-wiring IBM terminals.

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satellite communications system with a $58 million network driven by private branch exchanges. Electronic Data Systems Corp. has begun designing a $350 million network for its owner, General Motors Corp.

These sophisticated networks offer an opportunity to cut network costs. By carefully examining requirements and choosing suitable equipment, companies can increase the proverbial bang for the buck. McDonnell Douglas estimated that its network would save the company $15 million per year.

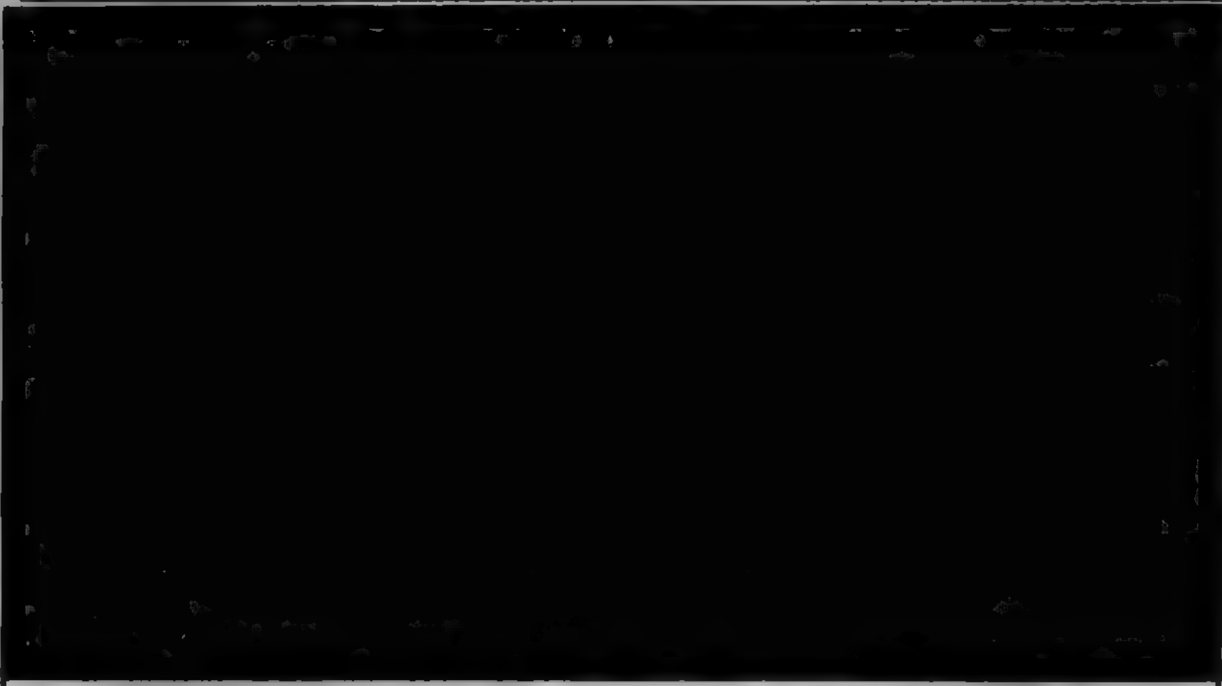
Senior management tends to notice such savings. MIS managers who save a company such large amounts of money are often rewarded financially and with career opportunities.

Network management can also present opportunities to network operators, who are becoming some of the most highly sought after data processing professionals. Network management staffs could mushroom just as microcomputer support centers did a few years ago.

Vendors are presented with an opportunity to turn a healthy profit. Corporations seem ready to invest in these packages but are not sure which system is best. For a few reasons, no network management package dominates the current market.

A great deal of flexibility exists in the manner in which a package could monitor transmissions. Certain firms have looked only to protect their existing markets and not to tap other markets, so their packages work well with only their equipment.

A more serious problem is that none of the systems provide comprehensive evaluation tools. Some are very good at monitoring the data that goes over the lines; others work well evaluating network connections. There doesn't seem to be one package that does both well. Such a package could do for network management what Lotus Development Corp.'s 1-2-3 did for personal computers.



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users that want to gateway one net to another will still pay the initial carrier's charges, Kuykendall said.

Combining one-way satellite distribution services with terrestrial packet nets gives the best of both worlds, Kuykendall said. Use of satellites for the heavy host-to-terminal traffic obviates the time and kilocharacter charges associated with packet nets, and the terminal-to-host packet return link enables the service to use error detection and retransmission. Unlike forward error checking, used with some one-way satellite services, this method provides more efficient use of the satellite resources and enables what Kuykendall called virtually error-free transmission — error rates in the 10 to the negative eighth range.

In practice, an insurance company, for example, would tie its headquarters to an SBN earth station with a private line. That facility will broadcast the traffic — via the Ku-band Hughes Galaxy One satellite — at 9.6K bit/sec. to all branch offices, which are outfitted with 1m to 1.2m receive-only antennae.

The antennae are part of a hybrid station management module that is an intelligent device providing error detection. It wakes up upon recognition of its address, autodials a packet net and logs itself on, establishing a return connection to the master earth station. The 1,200 bit/sec. packet link is used for retransmission and other transaction requests.

SBN will strategically locate master earth stations around the country.

Service prices include fixed hardware costs, recurring monthly charges and usage-sensitive rate elements.

On the host side, users can pick up the tab for installing their own master earth station or shoulder a roughly $20,000 charge for shared use of a master facility. The remote hybrid station management modules, which include the antennae, cost roughly $3,500.

Other charges include a $5,000/mo space segment fee for each full time, 24 hour/day, seven day/week 9.6K bit/sec. channel; and packet net charges that vary with use.

Kuykendall said the service is scheduled to be available in late September or early October.

SBN is located at 212 W. Superior St., Chicago, Ill. 60610. Globenet is located at Suite A 1715, 175 W. Jackson Blvd., Chicago, Ill. 60604.

VOICE/DATA COMMUNICATIONS

Gandalf Data, Inc. has announced a network software package for its Pacx 2000 family of private branch exchanges.

The software enables two to 32 data switches to be used as switching nodes in a network that supports up to 20,000 users. The software adds eight levels of security that limit unauthorized use of network resources. A network can reportedly be configured so various users are restricted from accessing specific devices.

Whenever a network map has been programmed into one node, it can be downloaded to other nodes in a system. If a route is not available, the system will automatically route it through an available device.

The software costs $1,000.

Gandalf Data, 1020 S. Noel, Wheeling, Ill. 60090.

SOFTWARE

Orion Software, Inc. has announced automatic dialing equipment and software for the IBM System/34, 36 and 38 minicomputers.

Auto Call Equipment (ACE) reportedly doubles the number of connections per host by using a single port for both data and autodialing. It requires a system that accommodates a bisynchronous protocol, including most IBM minis running Synchronous Data Link Control and the Nokia-Kinex Corp. 208AB or 201C modem or compatibles.

ACE supports Orion's ACE/3X software and Network Orion electronic mail system. ACE/3X is a utility program that allows users to issue programmed calls in an ACE-compatible format. It also enables ACE to return to the user program status codes in the event of call failure.

ACE is priced at $1,295 and ACE/3X software costs $625.

Orion Software, 222 Third St., Cambridge, Mass. 02142.

MULTIPLEXERS/MODEMS

Complex Systems, Inc. has announced a time-division multiplexer that works with 56K bit/sec. Digital Dataphone Service or private lines.

TDM 56, a synchronous multiplexer, has six ports that support data at speeds from 2,400 to 19.2K bit/sec. The ports can be configured in eight ways, two examples being five 9.6K bit/sec. ports and one 4.8K bit/sec. port or two 19.2K bit/sec. ports, two 9.6K bit/sec. ports and two 2,400 bit/sec. ports.

A user can select speeds and set up parameters by using a front-panel display. Configuration changes at one end of a link will be automatically made on the other end. Parameters are stored in nonvolatile random-access memory.

The product transmits EIA signals for support of tail circuits and end-to-end signaling. Local and remote loopback tests can be made for each channel and initiated either locally or remotely.

TDM 56K costs $1,395.

Complex Systems, 4930 Research Drive, Huntsville, Ala. 35805.

Not long ago, *PC Magazine* called MDBS III "The most complete and flexible data base management system available for microcomputers." That's a powerful statement. But then, MDBS III is an amazingly powerful software package. So powerful, in fact, that it lets you build mainframe-quality application systems on your micro or mini. MDBS III is not for beginners. It's for application developers with large data bases or complex data interrelationships who want to define data base structures in the most natural way—without resorting to redundancy or artificial constructs. It's for professionals who can appreciate its extensive data security and integrity features, transaction logging, ad hoc query and report writing capability and its ability to serve multiple simultaneous users. And if you want the power and the glory that only the world's most advanced data management system can provide, MDBS III is for you. For information on MDBS III and our professional consulting services, write or call Micro Data Base Systems, Inc., MDBS/Application Development Products, 85 West Algonquin Road, Suite 400, Arlington Heights, IL 60005. (800) 323-3629, or (312) 981-9200. **MDBS III. ABSOLUTE POWER.**

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SYSTEMS & PERIPHERALS

Prime to market plotters

NATICK, Mass. — Prime Computer, Inc. has announced that it will market three California Computer Products, Inc. plotters as enhancements to its line of computer-aided design and manufacturing workstations and terminals. The company also enhanced its PW150 graphics terminal.

The Calcomp plotters are integrated with Prime's Medusa two- and three-dimensional solid modeling software; Crown Software Systems, Inc.'s Sammie human factors 3-D interactive software system; and Ford Motor Co.'s Product Design Graphic System CAD system for curved body surfaces.

The Calcomp Model 1044 is a low-end plotter with eight pens and cut sheet and continuous roll plotting. The unit costs $13,800.

The four-pen Calcomp Model 1077 also allows for cut sheet and continuous roll plotting. It costs $29,900. The top-of-the-line Model 5744 is an electrostatic plotter capable of displaying 400 dot/in. plotting density. It costs $69,500.

Prime also announced its PW153 graphics terminal, an enhanced version of its PW150 graphics terminal. Added features include shaded viewing and an increase from four to 16 colors. The PW153 costs $18,750 singly, with additional terminals costing $15,000.

Prime is located in Prime Park, Natick, Mass. 01760.

Design system offers VAX link

ANAHEIM, Calif. — California Computer Products, Inc. has released an AT&T Unix-based computer-aided design system said to meet the design and drafting requirements of the architectural, engineering and construction markets. The distributed processing system can be connected directly to Digital Equipment Corp. VAX series computers.

The System 25 has a 32-bit applications processing unit and a picture processor that uses a series of separate microprocessors to perform all display processing.

Capabilities include Ethernet local-area networking ability and Multibus interface technology. A basic System 25 includes two displays, a 12-in. monitor and a graphics screen. Also included is a keyboard, a joystick, a digitizer table and stylus, a 30M-byte disk drive and a 1M-byte floppy-disk unit for data backup. The basic system costs $65,000.

Calcomp is located at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Wang desktop laser printer out

LOWELL, Mass. — Wang Laboratories, Inc. has released a desktop laser printer for its VS systems and Office Information System machines.

The LPS8 is said to provide letter-quality output at up to 8 page/min. It supports multiple font styles on a single page and can print on transparencies and 3- by 5-in. cards.

The desktop laser printer offers both landscape and portrait options for each of the 99 font styles it supports, according to the vendor.

The recommended duty cycle for the LPS8 is 150 page/day or 3,000 page/mo.

The unit costs $5,000.

Standard, signature and customized fonts cost $99; logo fonts cost $199, Wang said.

For additional information, Wang is located at One Industrial Ave., Lowell, Mass. 01851.

Graphics terminals introduced

ACTON, Mass. — CGX Corp. has released a pair of graphics workstations with IBM 5080 compatibility and local three-dimensional capabilities.

The 2033 and 2023 workstations use color raster and vector display technologies, respectively.

The workstations were designed to be used in IBM host-based computer-aided design and manufacturing installations, the vendor said.

The 2033 and 2023 reportedly support Cadam, Inc.'s Cadam and ICP; Dassault Systems' Catia; Structural Dynamics Research Corp.'s Caeds; Bell Northern Research Ltd.'s CBDS; Northrup Corp.'s Ncad; Mathematical Applications Group, Inc.'s Synthavision; and General Motors Corp.'s CGS CAD/CAM software packages running on IBM 370, 4300 and 30 series mainframes.

Features on the 2033 raster and 2023 vector workstations include a local 3-D graphics processor, valuator dials for manipulation of 3-D images and an interface to large-screen projection systems. The 2033 has additional features such as color hard-copy interface and selective pick windowing and visual overlay detection hardware.

The 2023 has 128K bytes of system memory, expandable to 1.1M bytes. The 2033 has 640K bytes of system memory, expandable to 1.1M bytes. Up to 16 workstations can be linked via a CGX 2010 channel unit that monitors the integrity of the system and provides an interface to the IBM mainframe.

The list price of a 2033 color raster workstation is $33,800; the 2023 vector workstation costs $29,700. The 2010 channel unit costs $14,500. Two-dimensional versions of the 2023 and 2033 cost $24,000 $24,500, respectively.

More information can be obtained from CGX at 43 Nagog Park, Acton, Mass. 01720.

■ Pericom, Inc. added two graphics terminals that are compatible with DEC and Tektronix, Inc. terminals/76

■ Raster Technologies enhanced its Model One/380 graphics system/76

■ CDC will begin marketing Digicon Geophysical Corp. seismic software for use on specially configured CDC Cyber 180 mainframes/80

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Parallel processing — An old idea with new uses, limits

HARD TALK
Tom Henkel
CW Senior Editor

Parallel processing systems seem to be the hot items of the summer. Encore Computer Corp. was touting its Multimax system, based on multiple National Semiconductor Corp. 32032 microprocessors, at last month's National Computer Conference; Intel Corp. just announced the first five recipients of its IPSC concurrent parallel machine; and two weeks ago, Perkin-Elmer Corp. added a mid-range parallel system to its product line with the promise of additional parallel systems in the next few weeks.

Why the sudden flood of parallel machines? Well, the flood really is not all that sudden. The ideas incorporated in parallel processing have been around for years. For example, PE noted it has essentially been in the parallel processing business for about 10 years, pointing to its 7/32 and 8/32 shared memory systems introduced in 1975.

So why are more vendors jumping on the parallel processing bandwagon lately? For one thing, the market for powerful, scientific processing systems seems to be the only bright spot in an otherwise gloomy year for computer vendors.

For a long time, scientific users have been moaning that they needed systems that would allow them to break up complex problems into smaller, more easily manageable pieces for processing. This sort of processing has worked well on multimillion-dollar supercomputers but has been cumbersome on traditional von Neumann architecture processing systems. Now, some clever systems designers have figured a way to develop processors with supercomputer-like qualities which, albeit slower than the Cray Research, Inc. Cray XMP, have a more palatable price tag — in the traditional superminicomputer range.

Economics is another advantage for the parallel machines. It is much less expensive to tie multiple small systems together in such a way that the combined processor complex offers an impressive throughput than it is to develop a powerful uniprocessor to do the same work. The economic advantages become even sweeter when the CPUs connected in a parallel architecture have been around for a while and computer vendors have been able to recoup much of their original R&D costs by selling them as uniprocessors. In fact, one of the big advantages of the Encore and Intel hypercube approach is they use off-the-shelf microprocessor technology. PE too is capitalizing on existing processors in its product lineup. The firm's top-end 3260MPS configuration was based on an existing PE processor, the 3250. Likewise, the company's newest parallel configuration, the 3232MPS, was designed around the 3230MPS.

If the latest round of parallel processors are faster, cheaper and easier to build than their uniprocessor counterparts, the new wave of machines sounds like the perfect deal. But the deal may contain some obstacles. Users switching from a uni-

See PARALLEL page 80

DATA STORAGE

■ **System Industries, Inc. has announced a quick-disconnect feature that has been incorporated into its 9722 and 9733 Winchester storage systems for all Digital Equipment Corp. computers, all Data General Corp. systems and the Hewlett-Packard Co. HP 3000.**

The quick-disconnect housing — for users who need secure sites but wish to use Winchester-type disks — contains the head disk assembly in a slide mount adaptation with a nonremoveable power supply permanently located to one side. One drive can be placed into each of these housings. An operating lever pops the head disk assembly forward so it can be grasped by its carrying handles and removed. A magnetic plunger automatically locks the head disk assembly in place when the drive is powered down and removed.

The quick-disconnect option adds $2,100 to the cost of the drive. The 9722 storage system costs $8,100, and the 9733 costs $11,000.

System Industries, 1855 Barber Lane, Milpitas, Calif. 95035.

TERMINALS

■ **Pericom, Inc. has added two graphics terminals and a screen printer to its product line.**

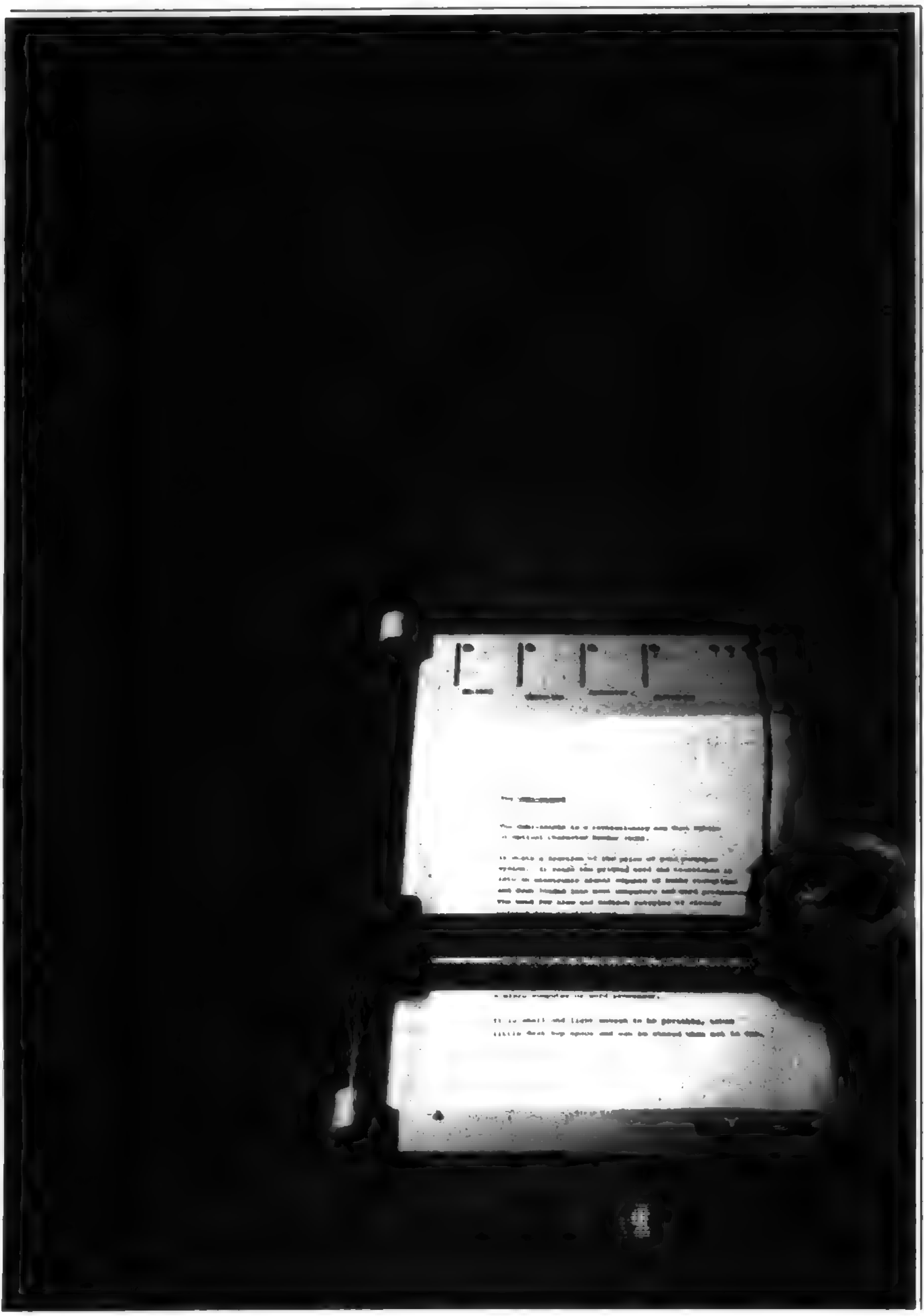
The company's MG-600, a monochrome terminal, includes 1,024- by 780-pixel resolution and in graphics mode is compatible with Digital Equipment Corp.'s VT220 and Tektronix, Inc.'s 4014 terminals. Other features are a 15-in. tilt-and-swivel antiglare monitor, support for a mouse or a digitized tablet, block-mode transmission, short persistence phosphor and support for multiple hosts.

The MD-420 is similar to the MG-600 but uses a 20-in. monitor.

By pressing a button, the Monterey Video Printer prints a screen of data in 12 seconds. The product supplies a resolution of 160 dot/in.

The MG-600 sells for $2,895, the MG-420 is priced at $4,995, and the Monterey Video Printer costs $3,395.

Pericom, Suite 100, 51 Digital Drive, Novato, Calif. 94947.



■ **Westward Technology, Inc. has introduced its Model 2215 desktop monochrome graphics terminal.**

The 15-in. terminal features 1024- by 784-pixel resolution, 57Hz noninterlaced flicker-free screen and an Ascii character set.

The Model 2215 costs $3,995.

Westward Technology, 90 Montvale Ave., Stoneham, Mass. 02180.

PRINTERS/ PLOTTERS

■ **Imagen Corp. has released its Imagestation series of text and graphics laser printers for workstations that run the AT&T Unix operating system, including those of Digital Equipment Corp., Sun Microsystems, Inc. and Apollo Computer, Inc.**

All Imagestation models include emulators for the Epson America, Inc. FX-80, the Diablo Systems, Inc. 630 ECS, the Qume Corp. Sprint 11, the IBM 5152 and the Tektronix, Inc. 4014 printers. The printers have a resolution of 90,000 dot/sq. in. and use dry toner and plain paper. The printers support a variety of document composition systems.

The Executive, intended for text and business graphics, costs $5,950. The Designer — for graphics support — is priced at $6,400. The Innovator, which costs $7,200, was designed for demanding graphics, including computer-aided design and engineering applications.

Imagen, 2674 N. First St., San Jose, Calif. 95134.

GRAPHICS SYSTEMS

■ **Raster Technologies, Inc. has announced an enhancement to its Model One/380 computer graphics system.**

The enhanced 64-bit Model One/380 three-dimensional system is said to provide an integrated rendering pipeline that brings 3-D visualization into a real-time mode. It will provide 64-bit planes of image memory that allow for 24-bit double-buffered true

Continued on page 80

So the
CEO said,
"If we could automate
all our key departments
and tie them into our
SNA network, we'd
knock the competition
off the map."

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“Ready for action.”

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Together, we can find the answers.

Honeywell

Continued from page 76

color display with 16 bits of depth buffering.

The Model One/380 is available in a desk-side tower enclosure with a 19-in. 60Hz monitor and keyboard. Prices start at $41,500.

Raster Technologies, 9 Executive Park Drive, N. Billerica, Mass. 01862.

POWER SUPPLIES

■ **American Power Conversion Corp. has announced the Model 750RM uninterruptible power source for multiuser processors, computer-aided design and manufacturing systems and communications systems.**

The 750RM provides up to 600W or 750VA of low-distortion power to ac loads of any power factor or wave form. During an extended outage a typical load of 60% can be powered for more than 40 minutes. At full load, the operating time is more than 20 minutes.

The 750RM provides protection from irregularities that account for more than 87% of all power-related problems. The 750RM protects against brownouts, under- and overvoltage, surges, spikes and conducted interference.

Additional features of the 750RM include fully automatic operation, phase-synchronized transfers, low distortion, 90db audible alarm, internal self test at turn on and overtemperature protection.

The 750RM weighs 70lb with battery and is priced at $3,000.

American Power Conversion, 89 Cambridge St., Burlington, Mass. 01803.

■ **Ulveco, Inc. has announced SIS 9310 system, an uninterruptible power supply featuring fault-tolerant parallel redundant power distribution.**

The SIS 9310 system delivers 640W with three redundant supplies of 320W each. The device is mounted in a box measuring 19 in. wide by 16.2 in. deep by 8.7 in. high, configured for mounting in a standard 19-in. rack cabinet. The system can deliver 320W with full redundancy using two modules, the vendor said.

Supervision and control circuitry for load management and current sharing is repeated in each power supply module. One module automatically assumes the master role. Should it fail, another module automatically takes over. Each module is independent and may be removed from the cabinet and replaced without disturbing the load.

The SIS 9310 system is available in the U.S., Japan, Europe and the UK. The product is aimed at voice/data communications applications, as well as broadcasting and civilian and military ground stations for communications and satellite links.

The SIS 9310 system costs $1,800 to $2,500 for a three-module system.

Ulveco, 323 Vintage Park Drive, Foster City, Calif. 94404.

CDC, Digicon ink marketing pact

HOUSTON — Control Data Corp. of Minneapolis and Digicon Geophysical Corp. here have signed a three-year value-added remarketing agreement whereby Digicon will enhance its Disco seismic software for use on CDC's specially configured Cyber 180 seismic processing system.

The Disco software is used by oil companies, geophysical contractors and universities, according to a spokesman.

Current configurations of the CDC seismic systems are said to have 4T bytes of virtual address space, up to 128M bytes of real memory and variable page sizes from 512 bytes to 65K bytes.

Additional information can be obtained from Digicom at Suite 112, 3701 Kirby Drive, Houston, Texas 77098.

PARALLEL

from page 75

processor to a parallel processor will probably run into some conversion problems because the two systems architectures — even if they are designed around the same operating system, that is, AT&T Unix — are not necessarily compatible. Users can look forward to the possibility of making alterations to applications designed for a uniprocessor to accommodate the parallel processing environment.

Many users will also have to learn to look at program development from a whole new angle.

Number of efficiently functioning units

Then there is the question of how many processors can efficiently function in parallel configurations. Most companies marketing parallel systems will boast of theoretical maximum configurations in excess of 100 processors. In some applications 100 processors may be able to work efficiently.

However in others, some experts said there could be memory contention problems. These problems would render some CPUs in the parallel configuration helpless while waiting for other CPUs to free needed memory.

Most industry experts agree parallel processing will play an important role in the marketplace for the rest of the decade. But like anything else, parallel processing is not a cure-all. There are trade-offs that have to be made and skills that have to be learned to use the systems efficiently.

You could win $1000 in the first international computer-generated art contest

CW Communications, Inc. — the world's leading publisher of computer-related newspapers and magazines — is proud to announce its sponsorship of the very first international computer-generated art contest.

All entries must be computer-generated, mounted, and suitable for display. Entries will be judged primarily on their artistic merit, but execution will also be taken into account. Two prizes will be awarded. The winning individual will receive $1,000 (U.S.). The winning organization will receive a trophy.

Winners will be announced during the First Pan Pacific Computer Conference (in Melbourne, Australia, this September 10-13). All entries will be put on display in a special exhibit at this conference.

Enter today. Send your entry to:
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Computer Art Competition
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Hampton, Victoria; Australia 3188.

Entries must be received by August 23rd

FIRST PAN PACIFIC COMPUTER CONFERENCE / CW COMMUNICATIONS

COMPUTER INDUSTRY

Korean firm testing U.S. micro mart

By Clinton Wilder
CW Staff

A $10 billion South Korean conglomerate has decided to dip its toe into the turbulent waters of the U.S. business microcomputer market.

Although several Korean manufacturers have OEM agreements to assemble U.S. vendors' computers in their offshore plants, the Samsung Group is the first to sell its own systems in the U.S. — but it may not be the last.

"Office automation and information technologies have been identified as the hot area by the Korean government," said Merit Janow, a New York-based Asian development and marketing consultant and a senior fellow at the Hudson Institute, which conducts foreign economic policy research. "Korean companies are very concerned about protectionism and unlikely to declare that they're targeting the U.S., but it goes without saying."

Samsung, already a strong presence in U.S. consumer electronics and CRT computer monitors, used the recent National Computer Conference to launch its first U.S.-marketed business microcomputers through its Samsung Semiconductor & Telecommunications Co. (SST) division. But the company readily admits that its first foray into the U.S. computer market is an experiment.

No intention of making money

"We really don't know what the market will be like, but we decided to try these systems," said Kwang-Hoi Koo, manager of Samsung's computer export section. "We have no intention to make money on them. You could say we're using them to pay our tuition in the U.S. market."

The exported products are an IBM Personal Computer AT-compatible called, simply, the Samsung and the SSM-16, a multiuser supermicro based on the Motorola, Inc. 68000 chip and the AT&T Unix operating system. Samsung has sold the SSM-16 in Korea for two years. Koo said that a recent slowing of demand there prompted the company to expand its horizons — notwithstanding the U.S. micro shakeout. "Even in a downturn, the U.S. market is much better than the Korean," Koo said.

The Korean personal computer market was closed to imports in 1982 and 1983 as the government tried to protect its embryonic market. Significant OA growth potential exists in Korea, but even as the market slowly opens to foreign vendors, it is a tough nut to crack.

"You see businesses side by side, one with a local-area network and one with a mimeograph machine," Janow said. "There are tremendous imbalances. That's a major difference between Korea and Japan. The Japanese economies of scale were first developed to serve their domestic market, while Korea is very much an export-led economy."

Like several other Korean conglomer-

See TEST page 92

- Datapoint last week said it agreed to a $22.5 million settlement to resolve class action stockholder litigation. The company did not admit to any wrongdoing, and the lion's share of the settlement will be paid by insurance companies/88
- Computer Automation recently agreed to sell off its Commercial Systems division, explaining that it could not provide enough resources to the supplier of distributed data systems/88
- Two top M&D executives recently jumped ship to take the top spots at a smaller company/91

Board decision seen boosting paper profits

STAMFORD, Conn. — In a long-awaited decision that is expected to boost paper profits for many software vendors, the Financial Accounting Standards Board (Fasb) recently announced it had resolved a 2¼-year-old debate over recording software development costs.

Fasb said it has issued Statement 86, "Accounting for the Costs of Computer Software to be Sold, Leased or Otherwise Marketed." However, copies of the full document were not immediately released.

The statement, which is expected to be adopted by the Securities and Exchange Commission (SEC), mandates that software vendors record development costs as expenses in the year incurred until technological feasibility of the product is established, according to a Fasb spokeswoman.

The statement differs from an earlier draft proposal [CW, Sept. 17] in that it clarifies the point at which feasibility is established. According to the revised version, feasibility "is established on completion of a detailed program design or, in its absence, on completion of a working model of the product."

After such feasibility is determined, companies are mandated to capitalize all software production costs, enabling them to spread out the reporting costs over a number of years, thus increasing reported net profits for those companies with substantial production costs.

The earlier draft version would have allowed, in some cases, the capitalization of coding and testing performed prior to completion of a detailed program design or working model.

In hearings before Fasb [CW, May 13], the draft version drew opposing reactions from trade associations representing hardware and software vendors, both of which expressed dissatisfaction with the wording of the draft. The American Electronics Association advocated straight expense

See FASB page 91

Watershed time drawing near

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Midway through the third calendar quarter, the major computer systems vendors should very soon have a handle on whether or not this year is going to go down as a watershed.

If the trend of the past two quarters continues or worsens, 1985 will not close on a happy note, reflecting at least a significant pause in the industry's breakneck growth pace.

With U.S. sales in a virtual no-growth holding pattern, most vendors have remained profitable from strong sales in Europe and other places. But the general consensus is that European sales tend to slack off in the summer. Also, there has been some early talk that the sales depression experienced over here may soon be duplicated over there.

IBM may be able to weather this quarter with its speeded up shipment schedule of 3090 mainframes and new disk drives, although there are a few skeptics among us who doubt that will be enough to erase the problems generated by slow mid-range systems sales.

Digital Equipment Corp. will probably experience its traditional fourth-quarter-to-first-quarter drop in revenue for the current reporting period, but the company claims it has costs under control. However, analysts have been saying the company has been too slow to cut manufacturing overhead, and a drop in international sales could be a problem.

See TREND page 91

AMD cost-cutting measures extended

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. (AMD) announced last week it will extend its program of reduced pay for executive, managerial and professional personnel and reduced workweeks for other employees to the end of this year.

The semiconductor manufacturer indicated there is no prospect of business improving through the remainder of the year.

In a prepared statement, W. J. Sanders III, AMD's president and chief executive officer, said, "It is clear that market conditions are not improving, and no general upturn in demand this year can be expected.

"There can be no return to a full pay program until sales growth resumes or while losses are increasing," Sanders said.

The company adopted a widespread cost-cutting program June 13 that was scheduled to expire at the end of September.

The company said the extended program will be restructured to ensure equitable distribution of the burden among employees.

Thoughtware bids for DSS company

COCONUT GROVE, Fla. — Exemplifying the current trend of consolidation in the microcomputer software industry, Thoughtware, Inc. announced last week that it is negotiating to acquire Lightyear, Inc. of Santa Clara, Calif.

Thoughtware, a developer of decision support system (DSS), expert system and computer-based training software for the IBM Personal Computer series, offered an undisclosed amount of stock for Lightyear, which also produces DSS.

Thoughtware, based here, also announced that Terry Garnett, Lightyear's president and founder, will join Thoughtware's executive staff with responsibility for product marketing and development.

Lightyear had previously agreed to turn over to Thoughtware the distribution and marketing of its one product line, also called Lightyear.

Thoughtware's product line includes the Thoughtware Management Training Library, Trigger, The Advantage Series and Sell! Sell! Sell! software packages.

Restructuring on horizon in rapidly changing chip mart

OUTSIDE LINES
Bohdan O. Szuprowicz

One of the worst slumps in history has hit the computer and semiconductor industries. What is puzzling to many, however, is the fact that this downturn is taking place during a time when the overall economy is relatively healthy and certainly not in a recession.

Japanese competition, IBM aggressiveness, the strong dollar affecting U.S. exports, excess manufacturing capacity, overcrowding of suppliers, a confusing proliferation of new products, overinvestment in the early 1980s and inability to manage torrid growth rates are all being cited as contributing factors.

We would add to this litany a few other factors that are often left unmentioned by the industry and the trade media. During the last few years a number of research organizations made numerous overoptimistic forecasts of growth in many high-technology sectors. These were often used as bases for launching ventures and products without sufficient market analysis.

There is no question that all the above factors are in some degree responsible for the current plight of the semiconductor and computer industries, but we feel that a major restructuring of these industries is also under way. It is the result, in large measure, of the rapid development of the very large-scale integration (VLSI) microcircuit, increasingly powerful computer-aided engineering (CAE) tools to design and use such complex components and the portability of such advanced technologies.

All this is beginning to happen at a time when the semiconductor industry is undergoing its first VLSI crossover period, switching from the widely used 64K-bit random-access memory (RAM) memory chip to the more powerful 256K-bit RAM devices. The prices for the larger chips are declining even faster than the 35% annual decline experienced with previous memory chip generations.

But this is only part of the story because, while the Japanese already control 92% of the 256K-bit RAM market, U.S., European and Asian competitors are accelerating their programs to introduce 1M-bit RAM microchips. South Korea's Samsung Semiconductor Co., for example, is already advertising 1M-bit RAM products for 1986 delivery and Texas Instruments, Inc. is expected to beat AT&T by bringing out its 1M-bit RAM microchip six months earlier than originally planned. As a result, the 256K-bit RAM chip may end up with a life cycle of only one year instead of the usual four years for a new memory chip generation.

What this means is that a massive "Osborne Computer Corp. syndrome" is overwhelming the industry and end users are reluctant to upgrade their equipment knowing full well that much more powerful and cost-effective devices and systems are just around the corner. This also plays havoc with manufacturers who embarked upon upgrading their products based on 256K-bit RAM microchips only to realize suddenly that their competitors who plan to go directly to 1M-bit microchip-based products will clobber them in the marketplace before they even get a chance to recoup their investments.

It now appears that a short-lived VLSI redesign revolution is leading directly into ultra-large-scale integration (Ulsi), which promises microchips in the 1M-bit-and-over density category. The initial 1M-bit RAM market, projected to be worth a few million dollars in 1986, is expected to skyrocket to about $7 billion in 1992.

As competition intensifies, the 1M-bit RAM chip may be superseded by 4M-bit microchips by 1990, again earlier than originally expected. If that happens 16M-bit products would normally follow about four years later. However, given the enhanced CAE development tools based on the more powerful custom-designed microchips, these may come to market much sooner. Toshiba Ltd. of Japan made it known that it expects to be producing 64M-bit RAM chips by the year 2000 and Tokyo University researchers have already proposed to develop a 100M-bit microchip. Other sources indicate that even 1G-bit memory chips may be possible before the end of the century.

Clearly the VLSI and Ulsi revolutions occurring so close together in an internationally competitive environment will create more, rather than less, stability in the electronics industries. Most high-technology market segments that depend on microchips are due for even more intensified and rapid change and an unprecedented multitude of shakeouts.

Szuprowicz is president of 21st Century Research of North Bergen, N.J., and publisher of Supergrowth Technology USA.

T S O users

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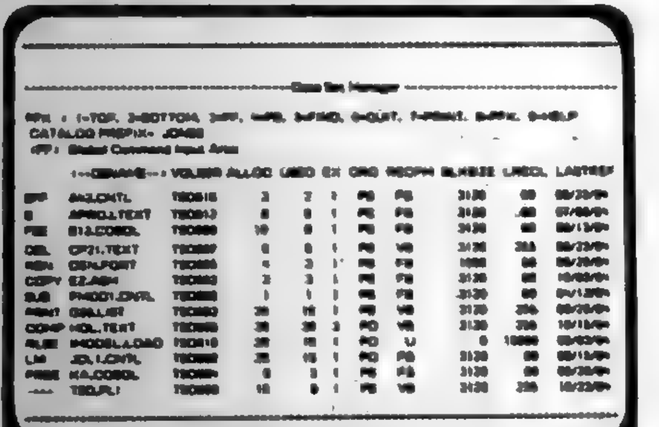

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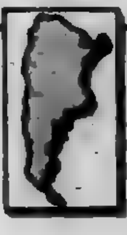

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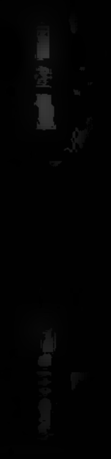

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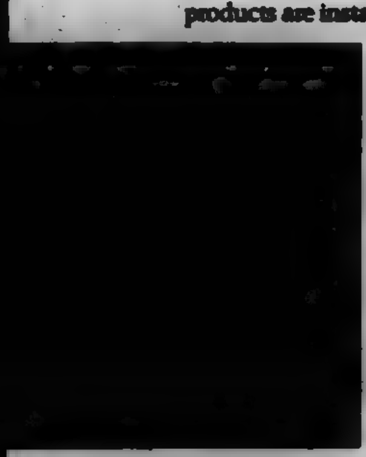

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WYSE

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AI specialist sees $5 billion expert systems mart by 1990

By Mitch Betts
CW Washington Bureau

ST. PAUL DE VENCE, France — Business and military applications of expert systems technology will be commercially available in about five years and may constitute a $5 billion market by 1990, according to Atle Fjeld, an artificial intelligence specialist at Sperry Corp.

At a recent press briefing here, Fjeld said Sperry, based in New York, is working on 22 different applications for expert systems, ranging from airline reservations and oil drilling to computer-aided design and battle management.

In the DP operation, expert systems could make large data bases more manageable through the use of smart data dictionaries, he said. Fjeld asserted that the bridge between traditional DP technology and expert systems is data base technology, because an expert system manipulates a knowledge base that is much like a data base.

In the public sector

In the public sector, Fjeld said, the Social Security Administration could reduce its administrative costs by capturing its Social Security eligibility rules in an expert system and then using the system to screen applicants.

In general, he said, expert systems can help business and government managers control information overload, because the system can refine the incoming data and suggest a course of action.

Fjeld said expert systems are most cost-effective when they are applied to management problems that meet the following conditions:

- A difficult problem that already has been solved by an expert.
- Knowledge that can be acquired and represented in the computer.
- A problem that needs to be solved regularly.
- Expertise that is scarce or unevenly distributed.

Sperry management is stressing the importance of this market, Fjeld said, and plans to spend $200 million during the next five years in hopes of capturing 15% to 20% of the world market.

Fjeld is the senior technical manager of Sperry's Knowledge Systems Center in Bloomington, Minn., which employs 150 people. The center, which reports directly to Sperry's chief executive officer, also has established artificial intelligence training centers in Princeton, N.J., and in McLean, Va., and in Birmingham, England.

Sperry's approach to the market is to develop commercially viable systems based on technology developed by other companies, Fjeld said. To this end, Sperry has cooperative agreements to develop systems using Explorer Lisp workstations from Texas Instruments, Inc. [CW, July 15] and expert systems development tools from Intellicorp of Palo Alto, Calif.

Datapoint to settle suits

SAN ANTONIO — Datapoint Corp. announced last week that it has agreed in principle to a $22.5 million settlement of stockholder litigation related to alleged company violations of securities laws.

The alleged violations occurred during a period from Aug. 1, 1980 to May 4, 1982 and resulted in a number of actions that were consolidated into a single class action suit in the U.S. District Court here. A separate derivative suit filed in Delaware was also settled, the company said.

In a prepared statement the company said it agreed to settle the litigation without admitting liability to avoid "the extensive commitment of management time and financial resources required to continue" with a trial.

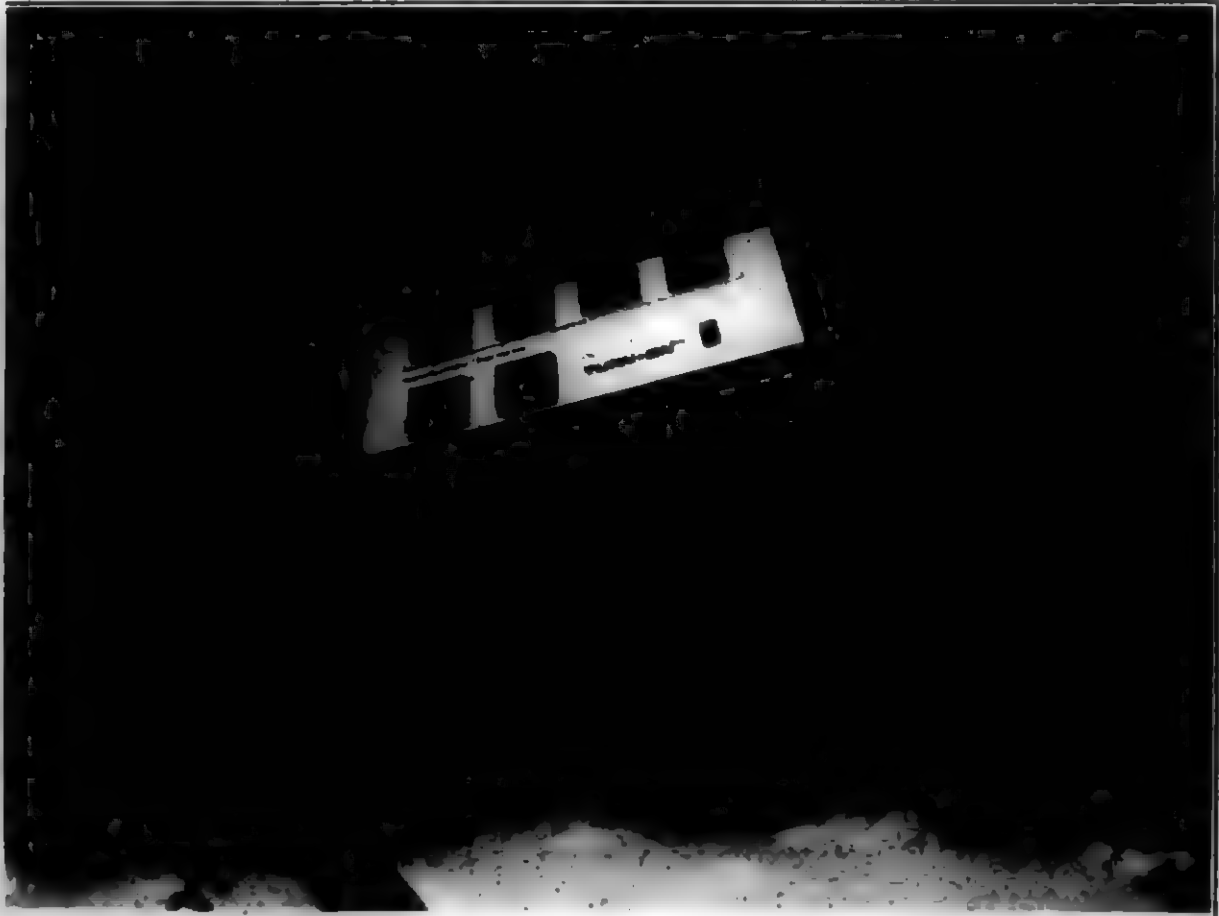
According to the company, its insurers will pay $16 million; $3 million will be paid from an indemnity trust fund established earlier in the year, and $3.5 million will be paid directly by the company.

Sorbus acquires service firm

FRAZER, Pa. — Sorbus, Inc., Bell Atlantic Corp.'s third-party computer maintenance subsidiary, recently acquired Computer Maintenance and Leasing Corp. (CMLC), a Minneapolis-based firm servicing IBM equipment. Terms were not disclosed.

Sorbus Senior Vice-President Michael B. Chamberlain said the acquisition strengthens Sorbus' presence in the IBM third-party maintenance market and adds 350 CMLC customers totaling an annual $3 million in revenue.

The agreement took effect Aug. 1. Sorbus said it will integrate CMLC's field engineering and management employees into its own national work force of 1,500.



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Computer Automation plans sale of division

IRVINE, Calif. — Computer Automation, Inc. recently announced it has agreed in principle to sell its Commercial Systems division to W. Norris Agee, a Santa Ana, Calif., businessman who is also chairman of Trendata Corp.

The agreement, which includes the sale of Computer Automation's UK subsidiary, is reportedly contingent upon execution of a definitive agreement. and approval by Computer Automation's board of directors and major lender.

The division manufactures Computer Automation's line of Syfa distributed data processing systems and employs 125 people in the U.S.

Computer Automation, which has posted losses in the past two years, was unable to devote adequate resources to the division, according to George Pratt, chairman and chief executive officer.

Financial terms of the agreement were not revealed, but Pratt said it would not result in a loss to the company.

Completion of the transaction is expected by Sept. 30.

Memorex bails out of two joint disk-drive ventures

SANTA CLARA, Calif. — Memorex Corp. recently announced the end of its participation in two four-year-old disk drive component joint ventures with Control Data Corp.

The companies said they will dissolve the operations of Disk Media, Inc. (DMI), a rigid-disk manufacturer in Westlake, Calif. DMI employs about 200 people.

In the same announcement, Memorex said it agreed to sell its share in Peripheral Components, Inc. (PCI) to Magnetic Peripherals, Inc. (MPI), CDC's loss-plagued thin-film recording head subsidiary. Minneapolis-based PCI, which also makes thin-film heads, will operate as a wholly owned subsidiary of MPI. Memorex said it will continue to buy thin-film heads for its IBM-compatible disk drives from PCI.

Memorex, a subsidiary of Burroughs Corp., will replace its supply of rigid disks from DMI by expanding its 3680 disk manufacturing operation here.

CDC said it will supply its rigid-disk requirements from a CDC facility in Omaha.

TRW unit to establish Calif. center

PARSIPPANY, N.J. — The Ultimate Computer Services, Inc. (UCS) operation of TRW, Inc.'s Customer Service Division recently announced that it will open a Baldwin Park, Calif., center for the reconditioning and refurbishing of computer equipment.

UCS, which operates similar centers in Rockaway, N.J., and Bensenville, Ill., said the West Coast equipment reconditioning operation will open Sept. 3.

The center will reportedly include staging and testing of water-chilled systems, a raised-floor area to simulate conditions in a data center environment and computerized work flow and inventory control.

Services provided by the company include relocation, features modification, sales, warehousing and refurbishing.

MERGERS AND ACQUISITIONS

United Technical Products, Inc. (UTP) of Canton, Mass., announced that the company has been acquired by a unit of **HMK Industries, Inc.** HMK is a manufacturing and distribution company headquartered in the Boston area. UTP will operate as an autonomous subsidiary of HMK.

■

Continental Telecom, Inc. (Contel) and **IPC Communications, Inc. (IPC)**, Atlanta, announced an agreement in principle under which Contel would acquire IPC in an exchange of stock valued at approximately $55 million.

It was reported that, under the agreement, Contel would issue an aggregate of 2.3 million shares of its common stock in exchange for all of the issued and outstanding shares of IPC.

The agreement would result in an exchange ratio of approximately one-half of a share of Contel common stock for each share of IPC stock.

■

Advance Circuits, Inc., Hopkins, Minn., and **Multaplex Corp.** announced they have executed an agreement whereby Advance Circuits will acquire the multilayer printed-circuit manufacturing operations of Multaplex for approximately $10.5 million in cash.

The transaction, which has an effective date of Sept. 3, is subject to the approval of Multaplex shareholders.

■

Hewlett-Packard Co., Palo Alto, Calif., has agreed in principle to acquire an equity interest of approximately 15% in Taiwan-based **Microelectronics Technology, Inc. (MTI)**

Final agreement is subject to approval by shareholders of MTI, the HP board of directors and the government of Taiwan.

■

Bishop Graphics, Inc. announced that **Perfectdata Corp.** has agreed in principal to be acquired by Bishop.

Under the terms of the proposed agreement, Bishop will acquire 100% of Perfectdata's stock in exchange for an undisclosed amount of Bishop shares.

The acquisition is subject to the approval of the board of directors and shareholders of both companies. The target date for completion of the acquisition is Sept. 1.

■

Sytek, Inc., Mountain View, Calif., announced that **General Instrument Corp.** has increased its interest in Sytek by exercising an option to acquire additional shares.

The option is for an equivalent 1.4 million shares of Sytek common stock, increasing General Instrument's ownership to 6.4 million shares, or 57% from 51%, prior to exercise of the option.

■

Control Data Corp., Minneapolis, announced the acquisition of **Computer Maintenance, Inc.**, a third-party computer maintenance vendor based in Denver.

Terms of the agreement were not disclosed.

■

The acquisition of Buffalo, New York-based **Software Distribution Services** by **Ingram Software, Inc.**, of Nashville has been completed. The combined companies will be known as Ingram Software Distribution Services, Inc. and will be a wholly owned subsidiary of the Ingram Distribution Group.

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Tandon posts quarterly loss

CHATSWORTH, Calif. — Tandon Corp. recently reported a loss of $14.9 million, or 29 cents per share, for the third quarter ended June 28. The results brought Tandon's losses for the first nine months of fiscal 1985 to $50.2 million.

Third-quarter revenue fell to $62.3 million, compared with $106.2 million in the year-earlier quarter. Tandon earned $10.4 million, or 21 cents per share, in the third quarter of 1984.

Tandon's pretax loss in the third quarter was posted at $21.3 million. A spokesman attributed the loss to inventory write-downs for older product lines and start-up costs associated with the development of products.

A spokesman cited "significant start-up and maturation costs" during the quarter from the development and production of 3½-in. Winchester hard disk drives, 5¼-in. high capacity Winchester drives and IBM-compatible computer systems.

SPECIAL REPORT

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September 30

The September 30th Special Report will take a close look at the minicomputer and small business systems market. We'll discuss the latest trends in minicomputer architectures and examine the evolving supermini market. And we'll cover what's happening in the supermicro market and how it's affecting the mini market. We'll include reports from users on the problems that they encounter in selecting and implementing minicomputer systems and the solutions they discovered.

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TREND

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For the rest of the computer industry, the continued depressed state of U.S. sales and dips in foreign sales could generate some very poor financial results for the current reporting period. If that turns out to be the case, the past few months of isolated layoffs and shutdowns could very quickly turn into a general trend in coming weeks as vendors move to balance costs against gross incomes.

■

After recently posting its first quarterly loss in two years [CW, Aug. 5], Applied Data Research, Inc. nonetheless expressed confidence that a traditionally strong second half would produce year-end profits of $2.10 per share. On Aug. 8, however, the company said it expects profits in the range of $1.50 per share for the year. The company said a continued slowdown in buying decisions in July leaves it less confident that it can make up the first-half shortfall.

■

The leading lights in the microcomputer software arena appear to be staying afloat quite nicely. Privately held Microsoft Corp. recently announced that it had sales of $140 million for the year just ended.

Microsoft founder Bill Gates said, "Our long history of success indicates a strong, viable, growing company in an industry that has seen its share of flash-in-the-pan ventures."

While the microcomputer software segment of the industry seems poised for a dramatic cycle of compression over the next year, it remains to be seen how long Microsoft can hold off from adopting the aggressive acquisition strategies adopted by the other companies in its league: Lotus Development Corp. and Ashton-Tate.

■

The Computer and Business Equipment Manufacturers Association (Cbema) recently offered a half-hearted apology for its March 6 comments criticizing Sentinel Bio-Tech Products' plan to market a screen to shield computer users from low-frequency emissions of VDTs.

According to a recent statement, "The Cbema March 6 press release was intended to reaffirm Cbema's longstanding position that there are no harmful emissions coming from VDTs. Cbema remains of that view, but withdraws its March 6 statements to the effect that Sentinel was acting in an unethical manner in announcing its marketing efforts."

Porter chosen to head Triad

SUNNYVALE, Calif. — Triad Systems Corp. has selected Informatics General Corp. executive James M. Porter to serve as president and chief executive officer.

The announcement was made by William W. Stevens, Triad's current chairman, president and CEO. Porter was executive vice-president of Informatics, which is currently in the process of being acquired by Sterling Software, Inc.

According to Stevens, who will remain as chairman at Triad, Porter will assume his duties Sept. 1. He said that Porter's skills will strengthen the company's top management.

FASB

from page 81

accounting as costs are incurred. The Association of Data Processing Service Organizations, Inc., representing software and services vendors, argued in favor of greater capitalization.

In the past, reporting procedures of companies had varied between straight expensing and capitalization.

In April 1983, the SEC essentially placed a moratorium on the situation by prohibiting companies from switching from the expensing method to the accounting method.

According to securities analysts, the revised standard will boost quarterly earnings of some software companies by as much as 10% to 15%. But the hikes only reflect paper profits, enabling companies involved in development to record as assets some of the costs they previously had to charge off against profits.

DMS appoints two top execs

LEXINGTON, Mass. — Two top-level McCormack & Dodge Corp. executives recently resigned to take the top jobs at Distribution Management Systems, Inc. (DMS), an applications software firm here.

John B. Landry III, who was executive vice-president of research and development at M&D, has been named chairman of the board of DMS, which develops and markets distribution packages, including order entry, inventory management and automated warehouse systems. Robert K. Weiler, M&D's former senior vice-president of marketing, has been appointed to serve as president of DMS.

Formed in 1976, DMS is a privately held company with $6 million to $7 million in annual revenue and approximately 100 employees, according to James L. Fox, the firm's vice-president of finance and administration. Fox said the pair has acquired equity interest in DMS.

A spokesman for M&D said the parting was on good terms, and the two will not be immediately replaced. Robert Kelley, M&D's vice-president of product directions and strategy, will take over some of Landry's responsibilities.

Beehive reorganization OK'd

SALT LAKE CITY — Beehive International, Inc., a maker of IBM- and Digital Equipment Corp.-compatible terminals based here, recently had its reorganization plan approved by a federal court. The decision means the company has exited the reorganization proceedings it entered in October 1984, under protection of Chapter 11 of the Federal Bankruptcy Act.

Beehive agreed to a debt-to-equity conversion that grants 45% of its common stock to its lead creditor, the Federal Deposit Insurance Corp.

Beehive President Joseph F. Carbone Jr. said the firm absorbed a $9 million write-down for closing its Fermoy, Ireland, manufacturing plant. According to Carbone, Beehive's reorganization plan cut the firm's expenses by an estimated $6 million by reducing its work force 50% and trimming discretionary expenses.

Beehive, which posted approximately $30 million in sales in 1984, recorded losses in the last three quarters of the year.

TEST

from page 81

ates (called chaebols in Korean), Samsung assembles an American computer, the Hewlett-Packard Co. 3000, in Korea. The U.S. Department of Commerce listed seven U.S. vendors that used Korean manufacturers as of January 1985, including Digital Equipment Corp. (Doosan Computer Ltd.) and Honeywell, Inc. (the Lucky-Goldstar Group).

One of the most recent such OEM assemblies is Leading Edge Products, Inc.'s low-priced Model D, an IBM Personal Computer-compatible micro made by Korea's Daewoo Group. "[The computer industry] has seen a lot of these [U.S.-Korean agreements] already, and we think it gives us the best product at the best price," said Michael Shane, chairman of Canton, Mass.-based Leading Edge.

Samsung will sell its two exported systems exclusively to OEMs, dealers and distributors in the U.S. through its distribution arm, the B. J. Davis Corp. of Akron, Ohio. The goal, Koo said, is for Samsung to break the American ice for higher ticket products still in the development stage back in Korea. "We're working on a 68000-based Unix workstation and a 32-bit Unix machine," Koo said. "We think our next systems will be able to compete very well."

According to Janow, Samsung and other Korean vendors will soon be in the U.S. to stay. "They have some problems in research and design, but I think they'll overcome those," she said. "The global competitors will come from Japan and Korea; I really can't see any other entrants. Five years down the road, they'll be right in there."

SST, founded in 1977 as a wholly owned government corporation called Korea Telecommunications Co., was denationalized in 1980 and taken over by the Samsung Group. Samsung, Korea's largest chaebol, has 26 subsidiary companies doing business in fields as diverse as shipbuilding, petrochemicals, sugar, insurance, hospital equipment, hotels and newspaper publishing.

Samsung's ties to the Korean government remain strong, with joint ventures such as codevelopment of the SSM-16 and the future 32-bit product. But unlike their well-known Asian counterparts in Japan, Samsung and other Korean companies do not receive direct government subsidies.

"The government would like to support us, but it spends a lot of money for defense, and the funds are not there," said Nahm-Wook Lee, executive managing director of SST's computer business group. "We pay a lot of taxes, too."

Lee believes Samsung's strength lies in mass-produced items that can best take advantage of Korea's low-cost labor and components. He acknowledged that Samsung's experimental tryout in the U.S. micro market poses a very different kind of challenge. "It will be very difficult to sell [computer] systems outside of Korea. The No. 1 problem is software support, because there is no one standard product," Lee said.

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Our Pico Rivera location is ideally situated midway between Los Angeles and Orange County in Southern California. And while our modern facilities are an ideal setting for your professional growth and development, our exceptional climate and nearby beaches, mountains and deserts offer you unlimited opportunities for recreational, cultural and personal fulfillment.

We have the following immediate opportunities:

Technical Services

IMS Systems Programmers
IBM Equipment Configuration Specialists
Database Specialists
Performance Specialists
Network Control Analysts
Network Equipment Technicians

Computer Security

Data Security Administrators
Senior Software Analysts
Security Programmers/Analysts

Scientific Programming

CAD Programmers
CAD/CAM Technical Support
Software Configuration Management
Technical Writer
Engineering Applications Programmers
Manufacturing Applications Programmers
Manufacturing Systems Technical Services
APT Systems Programmers
Manufacturing Programmers
(Quality Assurance Applications)

Business Systems Programming

Senior Programmers/Analysts
Programmers/Analysts

Administrative/Planning

Planning Specialists
Sr. Systems Analysts
(Advanced Planning)

Relocation assistance is available.

Northrop provides our employees a competitive, comprehensive benefits package. Please send your resume to: Dave Coffey, Computer Systems Employment Office, Dept. CW 722, P.O. Box 1138, Pico Rivera, CA 90660-0677.

PROOF OF U.S. CITIZENSHIP REQUIRED. Northrop is an Equal Opportunity Employer M/F/H/V.

NORTHROP
Advanced Systems Division
Aircraft Group

We're within your reach.

VM/SP Systems Programmer/ Systems Manager

A new position for a Systems Manager experienced in VM exists within LOTS, a division of Academic Computing and Information Systems. This person will report to the Director of the LOTS Computer Facility and lead our activities on the IBM/4381. Must work effectively with our academic users to establish operating procedures appropriate to their needs and function to keep the system running smoothly. Will supervise one professional programmer and assorted students in their activities in response to users' requirements. Perform or coordinate user training in VM/CMS.

Four year applicable degree or equivalent experience. Thorough knowledge of IBM 370 architecture and assembly language gained through actual work experience mandatory. Experience with working in and supporting an academic community is highly desirable: must enjoy the challenge of working with student and faculty clients and with student helpers. Knowledge of CP and VM/CMS internals. Experience in leading a major project and supervisory experience required.

You will be able to take advantage of the exceptional cultural and recreational facilities available on the Stanford campus. University employees enjoy an excellent benefits package and a vested, tax deferred retirement program. Liberal vacation allowances begin at 3 weeks per year, increasing to 4 weeks after one year of employment.

Send resume and a cover letter highlighting your qualifications to Kathy DeMoulin, Ref. #47257-CW, Stanford University Personnel Department, Old Pavilion, Stanford, CA 94305.

Stanford University has a strong commitment to the principle of diversity. In that spirit, we are particularly interested in receiving applications from a broad spectrum of individuals including women, members of ethnic minorities and disabled individuals.

STANFORD UNIVERSITY

COMPUTER CAPACITY ANALYST

Reno, Nevada

Tired of the commutes, crowds and smog? Consider the dynamic, exciting little city of Reno, Nevada, located at the base of the high Sierras. Reno means water skiing, snow skiing, Lake Tahoe and world famous stars in glittering 24 hour exciting downtown casinos.

Our environment features an IBM 3083 and two 3031s under operating systems MVS/CMS. This position is responsible for performing complex statistical analysis including trend analysis and application of multivariate techniques.

The ideal candidate must have experience in systems programming including software installation and maintenance, system tuning and understanding of operating systems and components. The successful candidate for this position must have considerable knowledge of mathematics, statistics and computer science. Excellent communications skills are essential in this position as the individual will interface with a wide range of areas.

In addition to moving expenses and present mortgage payment assistance, we're offering a top salary and benefit package. Please submit resume to:

DIRECTOR OF EMPLOYMENT

SIERRA PACIFIC POWER COMPANY
P.O. Box 10100 • Reno, Nevada 89520
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System Engineer: Design, develop and implement data base systems operating in "C" language on a UNIX™ operating system for the AT&T 3B20 Computer. Responsibilities include coordination with several software specialists to develop and implement data base systems to design specifications. [illegible] Master's Degree in Computer Science; two years experience in [illegible] This requirement may be satisfied by academic course work, related activities or work experience. Hours 7:45 a.m. to 4:20 p.m., 40 hours per week. [illegible] Ohio Bureau of Employment Services, Job Order No. [illegible], P.O. Box 24167, 3491 Cleveland Ave., Columbus, Ohio [illegible]

APL PROGRAMMER/ ANALYSTS

KARSTEN MFG. CORPORATION, a nationally known sports equipment manufacturer, is seeking APL Programmer/Analysts. Immediate positions available:

- Business Systems Applications
- Engineering & Parts Manufacture Applications

Familiarity with APL language required. Qualified candidates submit salary history and resume to Personnel Dept., at P.O. Box 9990, Phoenix, AZ 85068.

Director, Technical Services

Join our new management team

The Franklin Mint is a $300 million consumer products marketing company with 3000 employees worldwide. Our new, aggressive entrepreneurial management views information systems and communications as key elements in the future success of our company.

Working with our new VP of Information Systems, you will have an extraordinary opportunity to impact our company's growth by providing technical direction to our systems development and operations staff. You will also lead capacity planning, performance measurement, disaster/recovery planning and security projects. Our environment includes multiple IBM 30XX-Series mainframes which operate under MVS with IMS, CICS, TSO, COBOL, UFO, Easytrieve and RAMIS.

The person we seek for this high visibility position should have at least 5 years progressively responsible experience supporting large-scale IBM-based computing centers. Excellent communication skills and a Bachelor's degree are mandatory. A Master's degree is a definite plus.

If you seek a challenging opportunity that provides an excellent compensation package (including paid relocation), and recognition for top performance, send your resume, indicating salary history to: Executive Recruiter, JPC 819, The Franklin Mint, Franklin Center, PA. 19091. Equal opportunity employer m/f.

Principal Programmer

The University of California, Los Angeles, has an immediate opening for a Principal Programmer in its Laboratory of Nuclear Medicine. Primary duties include total responsibility in the research area of positron emission tomography for system programming, system management, application programming, supervision, consultation and training. Position requires: education and experience equivalent to a Bachelor of Science degree in Computer Science, Electrical Engineering or equivalent and six years of experience in computer programming including two years of experience which relates directly to positron emission tomography using state-of-the-art scanners and high level scientific programming languages. Also required is a detailed knowledge of: Assembly Language, FORTRAN, RATFOR and C; architecture of PDP systems; and operating systems structure of RSX 11M. Demonstrated skill in working with positron emission tomography and EG&G Ortec and CTI positron tomographs; demonstrated supervisory, system management, consultation and training skills. Salary range is $2808 to $4373 per month. Please send resumes to: University of California, Los Angeles, Laboratory of Biomedical & Environmental Sciences, Laboratory Personnel Officer — MR Job 09-3572, 900 Veteran Avenue, Los Angeles, CA 90024. An Affirmative Action Employer.

UCLA

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DATA BASE ANALYST

Major Twin Cities area firm seeks analyst to do logical/physical design and data base modifications. Requires IDMS or IMS experience. Salary to 40K. Call Mark David or Tim Smith at (612) 339-9001.

ROBERT HALF
OF MINNESOTA, INC.
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Minneapolis, MN 55402

Pioneering in any field demands inquiring technical minds — people capable of applying present technology to the future. Of looking forward. Pushing limits. Creating ways to apply new hardware and software. Central to our success is our ability to integrate new developments in the rapidly evolving science of communications. The following positions represent an opportunity to play a key role in the development of our services — ways you can become one of the bold pioneers creating new boundaries of networking technology.

TELECOMMUNICATIONS SPECIALISTS

Openings are available for this position throughout the United States to install and maintain sophisticated telecommunications equipment. You must have an AS degree or equivalent in Computer Technology or Electronics, a knowledge of earth stations and switching nodes (Tandem and/or Rockwell/Collins equipment preferred), and familiarity with communications protocols such as X.25 and HDLC. Practical knowledge of voice grade and DDS data circuits is also required.

SR. TELECOMMUNICATIONS ENGINEER

You will design programmable communications interfaces for various protocols (i.e. X.25, mobile satellite, SDLC/SNA, etc.). A Bachelor's degree or equivalent in Electrical Engineering or Computer Science and four years professional experience in communications or computer systems engineering and testing are required. You must have a thorough knowledge of microcomputer hardware and software and good communication skills. Experience in computer hardware, programming or data transmission is preferred.

SR. TECHNICAL ANALYST/NETWORK OPERATIONS

You will provide maintenance and diagnostic technical support to isolate and resolve component and system problems; formulate and document operational procedures. You must have a Bachelor's degree or equivalent in Computer Science or Electrical Engineering. Five years professional experience in field maintenance/repair/technical support of high technology computer, microprocessor, office products and/or telecommunications systems is required along with strong interpersonal skills.

CHIEF ENGINEER/NETWORK DEVELOPMENT

You will provide unique technical expertise in performing design and development of advanced telecommunications systems; develop telecommunications strategies to support corporate objectives; and ensure cost effective network systems. A Bachelor's degree or equivalent in Engineering, Computer Science or related field is required; Master's degree is preferred. You must have eight years professional data communications or computer systems experience, including five years experience in data communications planning, development or engineering. Knowledge of communications transport protocols and interfaces is required along with the demonstrated ability to work with broadly defined goals.

PROJECT ENGINEER/NETWORK DEVELOPMENT

You will design and develop advanced telecommunications systems and develop telecommunications strategies to support corporate objectives and to ensure cost-effective network systems. A Bachelor's degree in Engineering, Computer Science or a related field is required; Master's degree is preferred. You must have six years professional experience in data communications or computer systems, including three years in data communications planning, development or engineering. Knowledge of communications transport protocols and interfaces is required along with the demonstrated ability to work with broadly defined goals.

SR. ENGINEER/SATELLITE SYSTEMS DEVELOPMENT

You will participate in the design and development of spacecraft, earth stations and network control for the satellite communications network and provide the technical coordination with manufacturing contractors. You must have a BS in Engineering, MS preferred, and four years experience in the design and development of a space-based communications system which includes direct program experience from design to operation. Experience in aerospace industry manufacturing and contracting required.

SR. ENGINEER/SOFTWARE

You will plan, design, code, test and implement software and firmware for use in electronic mail applications. A Bachelor's degree or equivalent in Electrical Engineering, Computer Science, Math or Physics is required along with five years systems programming experience with microcomputers or microprocessors. A Master's degree is preferred. You must be proficient in real-time assembly language programming as well as high level (BASIC, PL-1, FORTRAN, PASCAL) language programming.

PROGRAMMER ANALYSTS

Requirements include experience using online systems, OS/MVS, IMS, large-scale IBM systems, and strong analysis and design skills. A minimum of three years experience using COBOL is also required.

Ours is a unique and creative environment for achievement. Technical resources are superior. Salaries are competitive. And our corporate benefit program is comprehensive. If you are eager to create new boundaries of networking technology, please call Toll Free, 1-800-[illegible]-2222, between 8:30 AM and 12:30 PM (CDT), Wednesday or Thursday, August 21 or 22, ONLY, or forward a letter or resume indicating your experience and salary history, in confidence, to the address below.

TO EXPEDITE CONSIDERATION, PLEASE INDICATE THE POSITION FOR WHICH YOU ARE APPLYING ON YOUR REPLY ENVELOPE.

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Create New Boundaries Of Networking Technology

ALASKA ALASKA ALASKA

DATA BASE SPECIALIST

If a 5,000-mile communications network linking 13 major sites with 6 computer systems sounds challenging, the University of Alaska Computer Network would like to hear from you. We have an opening for a Data Base Specialist to work under the general direction of the Data Base Administrator on an IBM 4381-2 running MVS/OS, ISPF, and PanValet. Our data base is Cullinet's IDMS/R release 10.0 and support software consisting of ADS On-Line, Automatic System Facility, On-Line Query, and Culprit.

MINIMUM QUALIFICATIONS:

Candidates for the Data Base Specialist position must have a demonstrated proficiency with IBM 4381 or equivalent mainframe running OS; OS JCL; IBM system utilities; performing in a data base environment and on-line applications.

Under the general direction of the Data Base Administrator, this individual performs the full range of data base requirements in support of user activities. These requirements include the data base management systems design, definition, organization, security, efficiency, documentation, generation, software installation, long-term requirements and operational guidelines. Minimum annual salary is $42,016.00.

Send letter of application, resume and three references to:

Statewide Office of Human Resource Development
University of Alaska
Room 1, Bunnell Building
Fairbanks, Alaska 99775

Closing date: August 24, 1985

The University is an AA/EEO employer and educational institution.

MANAGER
ADMINISTRATIVE PROGRAMMING

Excellent opportunity in growth environment. Responsible for systems & programming activities in the administrative support area where staff includes the director, professional programmers, and student assistants. Facilities include a VAX-11/750, two PDP-11 systems, 60 personal computers, and 110 terminals.

Bachelor's degree required. Prefer computer science or related discipline, and experience with administrative programming in an educational environment. Experience with RSTS/E and/or VMS is highly desirable. Good communications and interpersonal skills and the ability to direct the work of others is essential. Teaching in computer studies may be possible. Salary commensurate with qualifications.

Located in the cultural, financial and governmental center of the state, the College has a recognized standard of excellence, is financially sound, and has an enrollment of 1300, an all-time high. With a strong liberal arts and science program, strong pre-professional programs, and a School of Management, the College is a co-educational institution affiliated with the United Methodist Church.

Position available now. To be assured of consideration, send resume and names of three current references by September 2, 1985 to:

Fred L. Deckard, Jr.
Director of Computer Services
Millsaps College
Jackson, MS 39210

Millsaps College

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SAUDI ARABIA
DP CAREER OPPORTUNITIES

The Computer Department at the Ministry of Planning is seeking highly motivated individuals to play a major role in the definition, design, programming and implementation of business, planning and socio-economic systems.

The Ministry of Planning of the Kingdom of Saudi Arabia is responsible for the preparation of the national 5-year development plans and the monitoring of their implementations.

The mandate of the Computer Department in the Ministry of Planning is to provide computer support to its different departments by developing necessary models and systems, and maintaining existing ones.

These systems are being developed on an IBM 4341 VSAM/TSO/ISPF using mainly ADABAS/NATURAL but also COBOL, FORTRAN and SAS.

A number of immediate opportunities are available for DP professionals in the following areas:

OFFICE AUTOMATION MANAGER

MS required in Computer Engineering or Computer Science or equivalent. At least 8 years experience in Data Processing out of which at least 4 years must be in managing and implementing office automation technology. Must have the experience of using the microcomputer software (DBASE II, WP, Spread-sheet etc.). Ideal candidate will also be familiar with the Arabic language business systems and development software. Interpersonal skills and ability to train users.

SYSTEMS ANALYSTS

BS/BA required as a minimum. Must have at least six years experience in DP and a proven track in the following areas: Requirement analysis, project responsibilities from inception through completion, excellent written and verbal communication skills, familiarity with conventional languages, hands-on experience in ISPF, knowledge of data base concepts, experience in using systems development methodologies and in preparing documentation for all phases of the systems development life cycle, experience in statistical modelling is a plus.

PROGRAMMER/ANALYSTS

BS/BA required in CS or related discipline, must have at least four years experience analyzing, designing, programming, testing and maintaining business application systems on IBM mainframe, good knowledge of COBOL and/or PL/1 essential, familiarity with FORTRAN and NATURAL is a plus, good communication skills. Familiar with systems development methodologies and documentation of application systems.

COMPUTER PROGRAMMERS

BS/BA or equivalent diploma required. Must have at least three years experience in preparing program design and specifications, programming and testing business application systems on IBM mainframe, experience in using different access methods including VSAM and data base management systems, good communication skills.

TRAINING INSTRUCTOR

BS/BA required in CS or related discipline. Must have at least five years experience in DP two of which in computer teaching and preparing training materials, excellent written and verbal communications skills.

For all positions, bilingual applicants (Arabic, English) are preferred. All positions are offered on a 2-year contract basis. Excellent benefits package includes free medical care, housing and furniture allowances, education allowances for children, transportation and maintenance allowance, 45-day annual leave and a yearly round-trip ticket to the location of the present residency.

Applicants should immediately send resume including telephone numbers, references, recent passport-size picture, salary history and desired position to:

Computer Department, Ministry of Planning
P.O. Box 358
Riyadh 11411, Kingdom of Saudi Arabia

Telephone: (966) 01-401-[illegible]
Telex: 20[illegible] PLAN SJ

Last date for submission of applications is September 4, 1985.

ACP/TPF

CTG, is a twenty year old software consulting company with branch offices in 41 cities and annual revenues approaching $100 million.

The rapid expansion of our list of clients in the Southeast has created challenging assignments for software professionals with [illegible]/PL-1.

We currently have positions for Programmers, Analysts, or [illegible] with a minimum of one year of [illegible] experience. Candidates with at least six months of PL-1 experience are of particular interest. We are also interested in talking to growth-oriented professionals with any [illegible] DBMS experience who would be interested in learning [illegible] at our in-house educational facility.

Positions are available in: Atlanta, Baltimore, Charlotte, Ft. Lauderdale, Greenville, S.C., Miami, Nashville, Orlando, Raleigh, Tampa, Washington, D.C., Winston-Salem.

To find out for yourself about the unique career options, technical training, lifestyles and attractive compensation/benefits package that await you at CTG in the Southeast, write or call immediately to:

COMPUTER TASK GROUP • S.E. Regional Headquarters
100 Colony Square • Suite 2010 • Atlanta, GA 30361 • (404) [illegible] (COLLECT)

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CTG

[illegible]

Our top recruiters have technical backgrounds and understand our applicant and client needs. We have hundreds of openings in the SUNBELT and throughout the U.S. for:

Programmer/Analysts
Data Base Analyst
Systems Programmers
Software Engineers
EDP Auditors

Let us help you meet your career objectives. Call or send your resume to:

[illegible]

NEW
DATA CENTER

Outstanding opportunity for Systems/Tech. Support personnel by new North Carolina data center.

State-of-the-Art dual IBM 3081's MVS/XA database shop is currently searching for specialists in:

- MVS
- VTAM
- CICS
- IMS

Must be capable of rapid advancement into management level positions.

Call Camille Hankins at (704) 376-[illegible] or send resume to:

212 S. Tryon Street, Suite 1[illegible]
Charlotte, NC 28281

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(207) 773-4748

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EXXON

Exxon Production Research Company, located in Houston, Texas, has immediate openings for well-qualified individuals in the following area:

APPLICATIONS PROGRAMMERS

Qualified candidates must have an MS/MS Degree in Computer Science (with geophysical or geological experience) or an MS/MS Degree in Engineering or Science (with programming experience). A strong background in scientific programming using FORTRAN essential. Experience in IBM MVS environment and/or Data Management desirable.

These positions will develop and maintain a large software system for petroleum exploration in the areas of:

- Geological Mapping and Modeling
- Data Base Applications
- Graphics Applications

Exxon Production Research offers an outstanding employee benefits program and excellent opportunities for advancement. Salaries commensurate with education and experience. U.S. citizenship or Permanent Resident visa is required. Interested candidates please send resume (including grade point average) to:

EXXON PRODUCTION RESEARCH COMPANY
Recruitment & Employment
P.O. Box 2189, Dept. 215
Houston, Texas 77252-2189
An Equal Opportunity Employer M/F

DBA MANAGER - [illegible]

[illegible]

DP MANAGER - [illegible]
- [illegible], TN -

[illegible]

PROJECT LEADER - CENTRAL IL

[illegible]

CENTRAL [illegible] -
PROG/ANALYST

[illegible]

[illegible]

ROBERT HALF OF ST. LOUIS
77[illegible]
St. Louis, MO 63[illegible]
(314) [illegible]

ROBERT HALF

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212-307-0839

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for more information

Senior Programmer

The University of California, Los Angeles, has an immediate opening for a Senior Programmer in its Laboratory of Nuclear Medicine. Will work in the research area of positron emission tomography. Primary duties include systems design, system and application programming, documentation, maintenance, consultation and training for all projects involving positron emission tomography. Position requires: education and experience equivalent to a Bachelor of Science degree in Computer Science, Electrical Engineering or equivalent and four years of computer programming experience including one year of programming experience related to positron emission tomography. Masters degree in a related field preferred. Also required is a detailed knowledge of PDP 11 and RSX 11M computers, FORTRAN, RATFOR and PDP 11 macro assembly language and positron emission tomography; demonstrated skill in working with ECAT Ortec positron tomographs. Salary range is $2808 to $3791 per month. Please send resume to: University of California, Los Angeles, Laboratory of Biomedical & Environmental Sciences, Laboratory Personnel Officer — SR JOB [illegible], 900 Veteran Avenue, Los Angeles, CA 90024. An Affirmative Action Employer.

UCLA

SR. PROGRAMMER/ ANALYST $45,000

Proven capabilities in DOS/VSE COBOL & CICS are sought by this prestigious law firm. Get involved in applications design. Upward career path! FOCUS is a plus. FEE PAID.

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GERMANY

We are the leading software house in the field of OSI network software, UNIX-based system developments and artificial intelligence. As a subsidiary of the largest European service group (GSI) and the Deutsche Bundespost our company shows an outstanding growth history. Large vendors, the Deutsche Bundespost and major endusers are our client basis for future company growth. In our branch offices in MUNICH, STUTTGART and DARMSTADT we have openings in new and innovative telecommunication software projects for

Software Professionals

with a record of accomplishments in the areas UNIX-based systems software developments, communications protocols (eg OSI, DECNET, ICP/IP, SNA) and MVS System internals.

Qualified candidates must have several years experience in system software development: Design and implementation. Basic knowledge of the German language and experience in handling complex system developments are plusses.

6 weeks vacation, an attractive salary and a range of large company benefits including assistance with relocation expenses are offered.

US Representative OSI Software Products

More than 100 manyears development efforts lead to our UNIX-based OSI communication products and test systems. After having achieved a leading position in Europe with our UNITEL products we are now preparing to enter the US market. To start our US operation we have a challenging opening with high growth potential for

Manager — Sales & Marketing

The successful candidate should have several years experience in telecommunication software development such as TCP/IP or LAN protocols, SNA or DECNET components and complex system software preferrably UNIX-based. The candidate should have a successful track record in a sales position with either telecommunications products or software packages.

In order to introduce the successful candidate to DANET's products and business strategy a comprehensive training program will take place in Germany. Attractive salary, profit sharing and an incentive plan will be negotiated.

Interviews will be held in the US during September 23 to 27. Please call 00149-6151-86030 or send resumes, salary requirements and references to

danet
[illegible]

[illegible]
Otto-Röhm-Strasse 71
6100 Darmstadt
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Director of Administrative Systems

SUNY Stony Brook invites applications for the position of Director of Administrative Systems. This position is responsible for the planning, development and maintenance of all campus administrative software. [illegible] Send resume and cover letter with salary history by August 31, 1985 to: Mr. A. [illegible], Chairperson, Adm. Bldg. Rm. 254, SUNY Stony Brook, Stony Brook, NY 11794. SUNY Stony Brook is an affirmative action/equal opportunity educator and employer. AK# 185-45.

Computer Analysts
Automation

Amoco Production Company is a dynamic growth-oriented subsidiary of Amoco Corporation, and our achievements have made us a leader in the oil and gas industry. We are currently seeking Computer Analysts/Automation for our convenient West Houston facility.

You will have responsibility for designing, implementing and supporting software for field and plant automation applications. These duties will include project definition, development of software, installation of applications, documentation and training of system users.

The qualified candidates will possess a B.S. in Computer Science, Math, or Engineering with a minimum of three years in Real-time Applications. Experience in Perkin-Elmer OS/32, FORTRAN, Assembler and/or an understanding of Micro Hardware is desirable. These positions may require significant domestic and international travel.

Amoco Production Company offers an excellent starting salary and benefits package. For consideration, please submit resume which must include salary history to: Carole Shaull, Employment Coordinator, P.O. Box 3092, Houston, Texas 77253. Amoco is an equal opportunity employer, m/f. Principals Only, Please!

AMOCO

OFFICE OF THE ADMINISTRATOR FOR THE COURTS
STATE OF WASHINGTON

DIRECTOR - COURT INFORMATION SYSTEMS

The Office of the Administrator for the Courts, Olympia, Washington is seeking a Director to head its data processing organization.

Qualifications include: proven ability to effectively plan, organize, direct, and evaluate professional staff in the development, implementation, and operation of a major computerized system; And demonstrated success in developing/installing information systems in a complex environment. Excellent communication skills a must. Qualified applicant will have Bachelor's degree with major study in computer science, business administration, public administration or closely allied field and 8 years progressively responsible administrative, management or supervisory experience, 4 years of which must have been management of a large data processing organization. An allied Masters degree may be substituted for 2 years experience. Experience with IBM compatible and WANG computers desirable.

Salary $40,620-$51,996 and excellent benefits. Submit letter of application and resume by September 13, 1985. EOE.

Office of Administrator for the Courts
Personnel Department, Eastside Plaza Bldg. 8
1206 S. Quince, Olympia, WA 98504

SYSTEMS MANAGERS

Growing F 500 mfr. located in NY's Southern tier is expanding mgmt. staff. Has immediate need for Mfg. Systems Mgr. & Payroll/Human Resource Systems Mgr. Bkgrd. must incl. BA/BS degree, excellent track record, IBM mainframe knowl. Req. outstanding user skills. Great company & oppty. - rural living atmosphere. To $50,000.

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Personnel Agency

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You will work with advanced systems applications, providing support for Wyeth's operations, reporting and planning functions. Your work will impact on research, market analysis, capability assessment, product development, manufacturing, marketing, distribution, personnel. . .and more.

You'll be positioned in a large-scale IBM environment, and will use the latest system releases and software technology—e.g., high-level interactive system development.

Project Managers Operations Research

Responsible for development of computerized compliance validation of systems for drug safety evaluation, MIS, and manufacturing operations. Validation covers compliance with FDA standards. Must have experience in validation of computer systems to government standards. Position #GV5003C

Programmer/Analysts

Develop and code analysis and report programs for MIS functions. Requirements: at least 2 years of applications programming experience (systems analysis experience desirable). Basic knowledge of hardware functions and software methodology, including on-line database programming. Openings for senior and subordinate positions. There are various openings requiring varying amounts of experience (2, 4, etc. years) in applications and systems programming. Position #GV5002C

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- Mainframe background
- 2+ years of applications programming experience
- COBOL, PL/1 or ALC background
- Knowledge of MVS/JCL and IBM utilities

DATA COMMUNICATIONS ENGINEERS
- 2+ years experience in Local Area Network Communication
- Working knowledge of SNA, MAP, DECNET and programmable device communications such as Data Highway and Modbus
- Ability to architect LANs using computers and programmable devices

DEC PROGRAMMER/ANALYSTS
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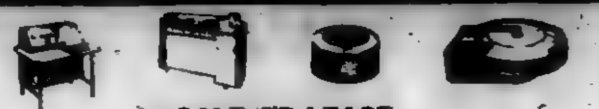

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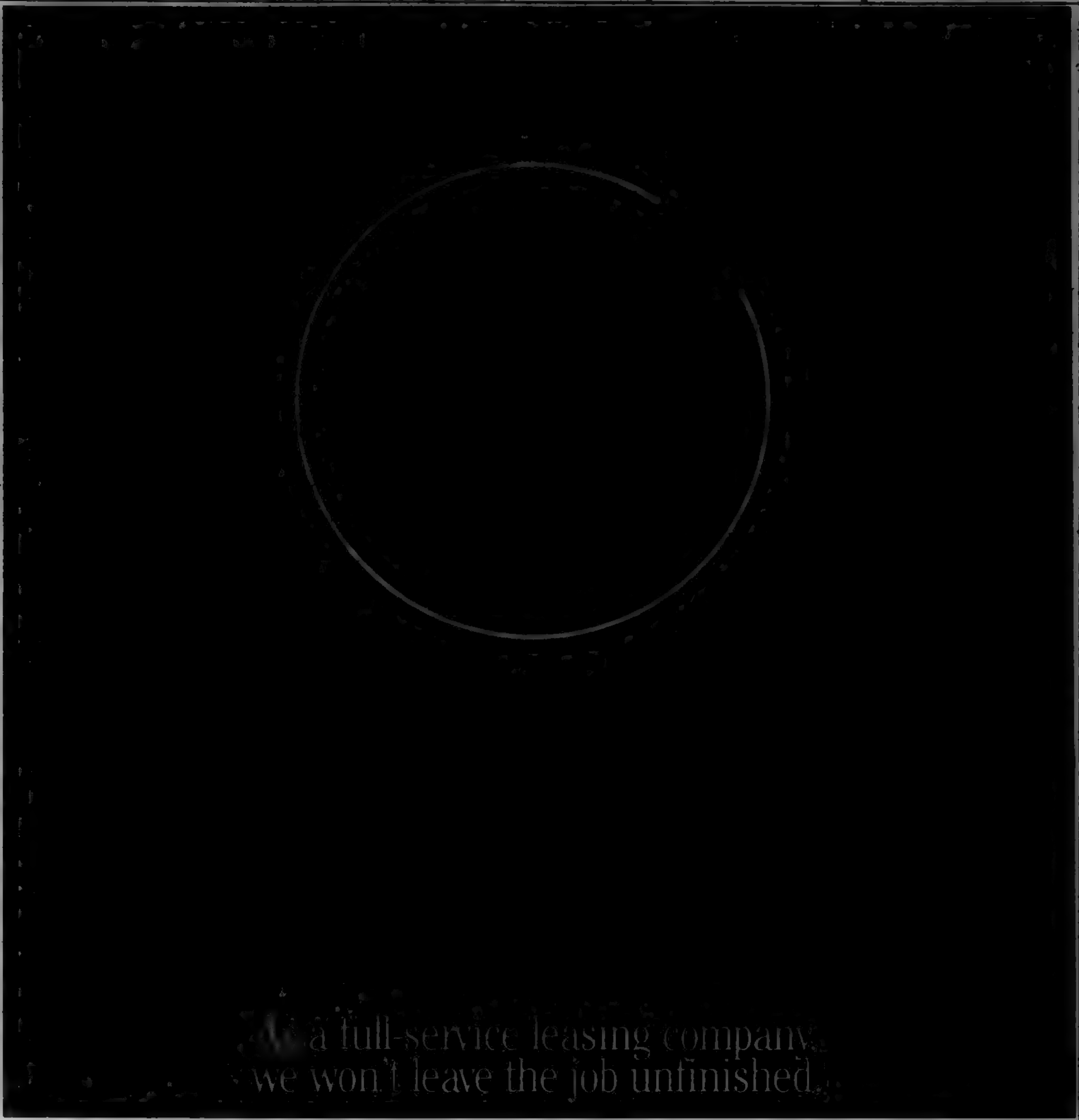
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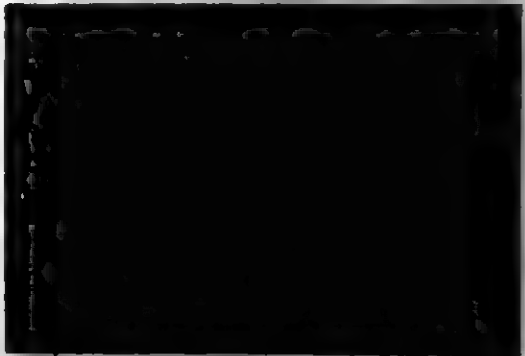

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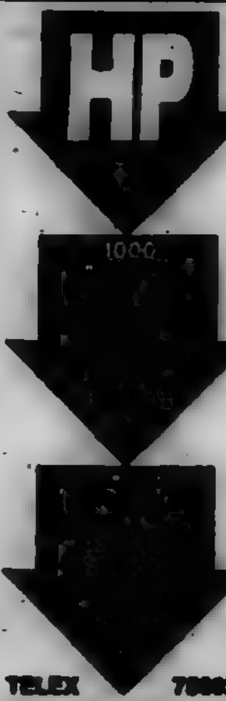

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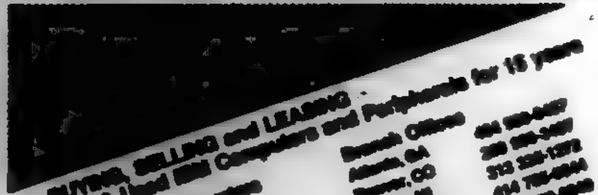

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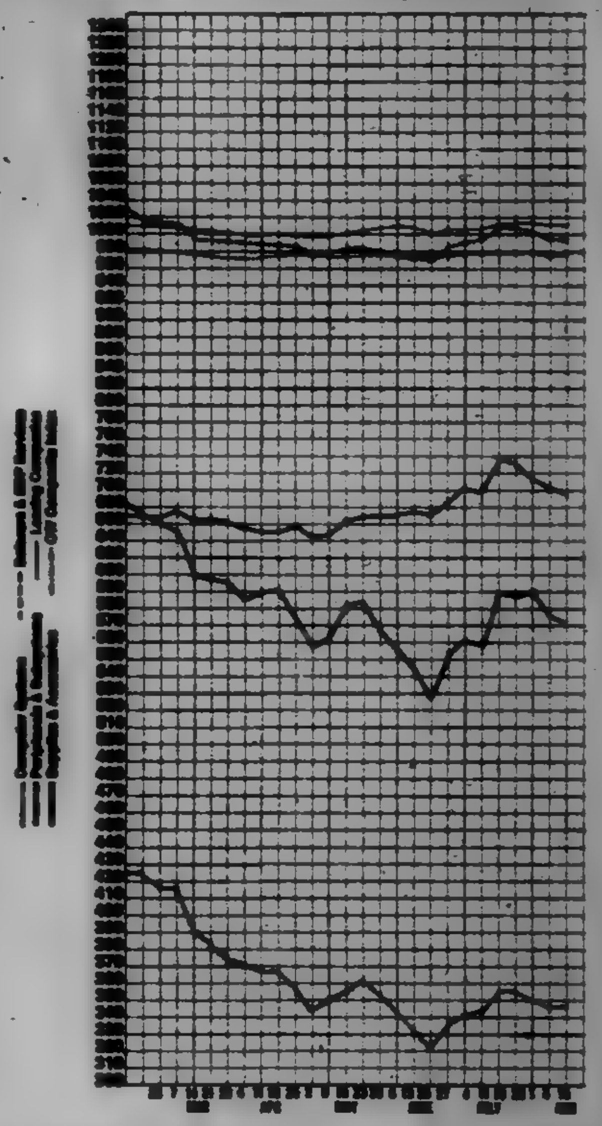

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Millennium gets a boost

M&D previews accounts receivable at World '85

By John Desmond
CW Staff

BOSTON — Applications developers are offered more power to edit screens, get help and issue commands with McCormack & Dodge Corp.'s enhanced Millennium on-line applications development system announced at the World '85 users conference here last week.

Also, users awaiting M&D's accounts receivable package were placated by the company's preview of AR:Millennium, its first major application developed using Millennium. The product is scheduled for controlled release in October and general release in December at a price of $95,000.

Several of the M&D users inter-

See M&D page 15

AT&T cuts 24,000 jobs

By Peter Bartolik
CW Staff

MORRISTOWN, N.J. — AT&T, in its largest consolidation since the divestiture of the regional operating companies, last Wednesday announced plans to eliminate 24,000 jobs from its Information Systems group. The company said its computer operations division will not be affected.

AT&T's move to slash the group's total work force by 20% was not unexpected [CW, Aug. 19] and was seen by analysts as part of an overall company strategy to improve profit margins on digital telephone switching equipment. This move, analysts said, would help AT&T blunt competitive pressures and counter a recent flattening of sales.

The cutbacks were announced by Information Systems Chairman and Chief Executive Officer Robert E. Allen in a nationwide telephone address to employee groups. He said the consolidation is only

See AT&T page 4

IBM turns to Microsoft on systems code

By Clinton Wilder
CW Staff

Formalizing a partnership that set the standard for business microcomputers, IBM and Microsoft Corp. last week signed an agreement to develop jointly future operating systems and systems software products. The pact ensures that Microsoft will play a major role in IBM's efforts to integrate the Personal Computer with its varied product lines.

Both companies declined to discuss specific products covered by the agreement, but analysts said they believe the firms will work together on Microsoft's anticipated Version 4 of MS-DOS and other future offerings. The announcement appeared to calm fears that IBM might adopt a proprietary operating system and thereby lock systems and applications software vendors out of its next microcomputer bonanza.

"The agreement puts to rest whatever questions remained about IBM moving away from DOS," said Michele Preston, an IBM analyst at L. F. Rothschild, Unterberg Towbin. "They have said it, but everyone kept [disbelieving] it. Anyone who still feels that way now has his head in the sand. It's very positive for the industry."

Although the deal does not involve the acquisition of Microsoft equity by IBM, it continues the recent pattern of IBM's joint arrangements with leaders in high-tech fields. Among these have been vendors of long-distance services (MCI Communications Corp.), communications switching equipment (Rolm Corp.) and semiconductors (Intel Corp.).

The financial terms and specific length of the agreement were not revealed, but it represents the largest contract ever signed by the Bellevue, Wash.-based company. Micro-

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TOP OF THE NEWS

Trouble abroad. HP's earnings dip, due largely to decreased European sales. Page 2.

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123V2. Lotus Development drops its key disk requirement in the next version of 1-2-3 and offers some support for IBM's PC Network. Page 6.

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Data General, competing with DEC, offers a product with hooks to IBM's Distributed Office Support System messaging architecture. Page 6.

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Is that the phone? IBM unwraps modems for its Personal Computer and jumps into the competition in another marketplace. Page 7.

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On the road again. *Computerworld* reports on last week's conferences — IJCAI, Info Center and World '85. Pages 10-16.

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Quick service. TRW bids for Datapoint's month-old maintenance spin-off, Intelogic Trace. Page 79.

■

Artificial intelligence: On the road to reality

By Eric Bender
CW Staff

ANALYSIS

LOS ANGELES — Last week's International Joint Conference on Artificial Intelligence, which drew roughly 6,000 attendees here, marked further milestones on AI's path from research and development to the marketplace.

Among these were the heightened presence of major computer industry players, price/performance boosts for dedicated AI workstations, further moves toward standards such as the Common Lisp dialect, an increased emphasis on linking AI software with traditional computing environments and signs of an upcoming deluge of AI-based software for the real world.

The conference sessions, with their traditional emphasis on highly technical advances in the art and science of AI, were well attended. IJCAI's commercial side had a much higher profile than in previous years, with the exhibit floor often too jammed for attendees to walk freely.

Fifty-seven vendors exhibited, all with professional-looking booths — a far cry in numbers and polish from last year's American Association for Artificial Intelligence show in Austin, Texas. However, as is usual for AI shows, many vendors continued development work until the last minute before the doors opened, and there were noticeably more software bugs than is typical in products demonstrated at mainstream computer conferences.

IBM's new offerings of Prolog and expert systems development tools for VM environments drew a great deal of attention, with showgoers noting that they expected Big Blue to fill its traditional role of blessing the technology and expanding the market. But many commented that the IBM products do not push the limits of AI technology and suggested that the introductions represent a holding pattern designed to keep IBM customers from straying, rather than an aggressive thrust into AI.

As one sign that AI-based software is being readied for widespread commercial use, IJCAI saw increased attention focused on the issue of what kinds of workstations will act as AI delivery vehicles.

Currently, companies that buy AI products "are hard pressed to find anything that meets their needs," according to Larry Geisel, president of Carnegie Group, Inc., an AI software firm. Dedicated Lisp machines are expensive and in scarce supply at customer sites, and they typically lack tight integration with mainstream computing environments, Geisel said. As corporations move toward actual deployment of AI-based systems, the lack of suitable delivery workstations is a growing worry, he maintained.

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NEWSPAPER

HP's European sales dip 20%

Foreign market slump might spell bad news for U.S. vendors

By Clinton Wilder
CW Staff

PALO ALTO, Calif. — For U.S. minicomputer vendors counting on continued growth in European markets to offset stalled demand at home, last week's quarterly financial results from Hewlett-Packard Co. could represent a troubling black cloud on the international horizon.

HP reported that its overseas sales unexpectedly fell 20% in the quarter ended July 31, with most of the decline coming in Europe. "While we began to see international order growth moderate several months ago, the sharp decline was greater than we anticipated," said John Young, HP's president and chief executive officer, in a prepared statement.

Young's observations echoed remarks made by corporate executives and analysts last fall, after HP's fourth quarter of fiscal 1984 showed a sudden softening of domestic orders [CW, Nov. 26, 1984]. Because HP's quarterly reporting schedule runs two months ahead of those of most companies, its results last year represented early indications of declining U.S. sales for other vendors and of the worst computer industry downturn ever.

"I don't think HP is the only company going through this; I think we'll see it across the board," said James Reynolds, a market analyst with Dataquest, Inc., a market research firm based in San Jose, Calif. "The European market tends to lag behind the U.S. [market], and the slump in the buying patterns of large corporations is just beginning to take hold there."

Dennis Rainey, the Geneva-based finance director for HP's European operations, said foreign buyers are more cautious about new computer technologies, creating a buying pause at an earlier point in the market's maturity cycle.

"Many of our customers have indicated a preference for waiting to see what the new technologies, particularly in networking, will do," Rainey said. "In the U.S., the prevailing cultural attitude is that we can do anything and it will turn out all right. [European buyers] look at things more skeptically, perhaps more hard nosed in a business sense. They're using more scrutiny a little earlier in the cycle."

Rainey declined to speculate on HP's European results as a bellwether for its competitors but said, "Looking at it from the outside, you'd have to say that the same economic and technical issues will affect others as well."

Overall, HP's third-quarter earnings fell 13% from the year-earlier period. The business and scientific computer maker posted profits of $117 million, or 45 cents per share, compared with $134 million, or 52 cents per share, a year ago. Revenue during the quarter slipped 3%, from $1.68 billion last year to $1.48 billion.

The plunge in HP's overseas sales comes at a time when the strong U.S. dollar's extreme pricing pressure on foreign buyers has begun to ease. But the dollar's recent weakening has only added to customer uncertainty, Rainey said. HP is adjusting European prices on a continuing basis with the unpredictable exchange rate situation, he added.

In addition to shrinking margins for U.S. vendors, the previously strong dollar helped European computer makers become increasingly competitive in continental markets outside their native countries. Firms such as West Germany's Nixdorf Computer AG, Italy's Ing C. Olivetti & Co. and Norway's upstart Norsk Data AS are fighting and winning more and more account battles in the lucrative French and British markets. "Local sourcing makes it easier for local vendors to gain market share," said Philip DeMarcillac, an analyst with market research firm International Data Corp.'s IDC Europa in London.

Rainey noted that the 1% to 1.5% growth of the overall European economy this year has been significantly less than the 2.2% to 2.5% rate anticipated. The sluggishness has been most acute in technology-oriented sectors such as the British and French defense industries.

IBM, too, looms as a major factor for U.S. mini vendors in Europe. "The [IBM] System/36 is part of the problem because it blocks the low end," DeMarcillac said. "Buyers believe IBM will come out with a good upgrade path for it, and its sales have boomed over the last 12 months. The $15,000 to $50,000 market is the key area at the moment."

That is where major players like HP, Data General Corp., Digital Equipment Corp. and Wang Laboratories, Inc. have sought to leverage European sales against the slumping demand on this side of the Atlantic. But if the European market follows the pattern foreshadowed by HP's dip in domestic orders last fall, the U.S. minicomputer industry may be in for a whole new round of tough times.

"In the mini field, HP has been an accurate gauge," said Dataquest's Reynolds. "I think we may see a whole different set of expectations now."

In a separate announcement last week, DG said it will shut down four manufacturing facilities this week. Company spokesman Ed Russell said manufacturing operations will be halted this week at Westbrook, Maine; Austin, Texas; Sunnyvale, Calif.; and the Clayton, N.C., assembly and test facilities.

Operations will continue at other facilities, but the Sunnyvale facility will be shut down for four additional days next week.

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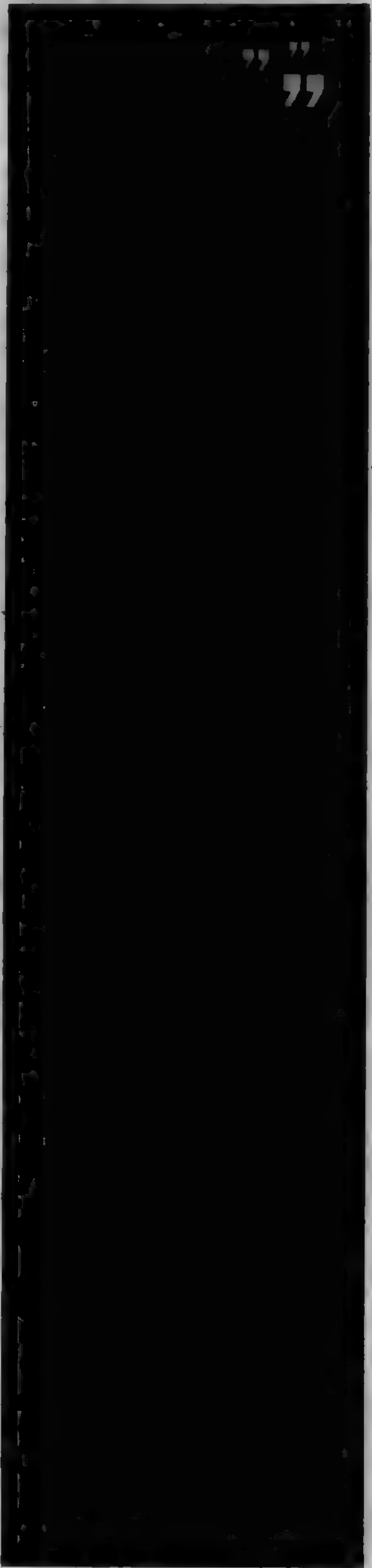

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AT&T from page 1

one of many actions that are being taken to improve profits. Allen also said that further consolidations are likely and market conditions could lead to further cutbacks.

According to Kenneth M. Leon, an industry analyst with the New York investment firm of L. F. Rothschild, Unterberg Towbin, Allen's remarks concerning more cuts reflect uncertainty about market conditions over the next 12 to 18 months and "indicate a worst-case scenario of a recession."

The company said it has already identified 7,400 surplus jobs and has notified those employees of options available to them. Other affected employees "will be notified by mid-September if they are in surplus jobs," spokesman Tom Holub said. Affected employees will have the option of accepting financial incentives, including enhanced pension programs, or seeking transfers to other jobs within the AT&T organization, he said.

According to Roland Pampel, vice-president of systems marketing and development for AT&T's computer systems division, the layoff is an attempt by AT&T to streamline the company and eliminate unnecessary positions. "It's part of becoming a commercial business," he said.

Holub said the company was not able to estimate how many of the affected employees could find jobs in other areas and how many will eventually be laid off or retired. The cutbacks will cost between $800 million and $900 million this year but will reduce expenses next year "by hundreds of millions of dollars," he said. Reserves established prior to divestiture will absorb the costs this year, according to Holub.

The consolidation follows a July 1984 cutback of 11,000 positions at AT&T Technologies, the operating arm — one of two — under which AT&T Information Systems falls, and the June 1985 announcement of the elimination of 1,600 positions at AT&T Information Systems.

L. F. Rothschild's Leon said AT&T's new digital phone switches are being well received, but sales of those products are not offsetting the impact of customer conversion from analog to digital systems and the added pressure of a declining lease base. AT&T's 3B minicomputer line "is a little pricey" compared with competing products, but a soon-to-be-released 3B20C — which won the company a $946 million contract with the National Security Agency recently — "will be a little more competitive," Leon said.

According to both Leon and Kathryn Korostoff, an analyst with Northern Business Information, a New York-based telecommunications market research firm, the move was important to boost AT&T's profit margins. "This should give AT&T more room to cut costs," Korostoff added. Both analysts agreed that the jobs being eliminated are surplus positions that will not impact the company's ability to compete in the telephone and computer equipment markets.

Leon said that second-quarter sales of phone switches targeted at the office market were flat compared with first-quarter sales. But AT&T's Holub claimed that sales of the company's System/75 mid-size private branch exchange doubled in the second quarter compared with the first. Holub also reported a 35% increase in System/85 sales and a 20% increase in Merlin sales. Additionally, sales of the PC 6300 personal computer were up 60%, Holub said.

The jobs already identified as surplus were in the following divisions: 1,100 in the large business systems organization and 2,300 in the general business systems organization, both of which supply PBXs; and 4,000 in the consumer product organization, which markets residential phone equipment. Some of the consumer product cuts had previously been announced when AT&T said earlier this month it was closing a Shreveport, La., facility and replacing that factory's output of consumer phones with off-shore manufacturing resources.

Of the 24,000 jobs to be eliminated, 30% are classified as management positions, Holub said. Cutbacks will affect about 15,000 sales and support positions nationwide, 4,000 installation, maintenance and other technical support jobs, 3,000 product distribution positions and the 2,000 hourly workers at the Shreveport factory.

Following the consolidation, AT&T Information Systems will have approximately 93,000 employees nationwide.

IBM ships 3090s in volume

RYE BROOK, N.Y. — IBM last week announced it has officially begun volume shipments of its 3090 Model 200 mainframes.

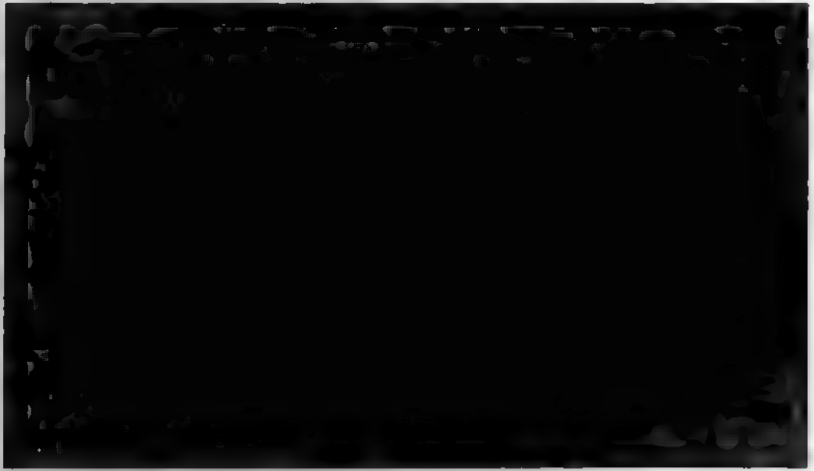
The first non-beta-site user of the system is Texaco. The 3090 will be installed at the the company's Bellaire Complex in Houston, IBM said.

First volume shipments of the 3090 Model 200, a two-CPU processor complex, are running about three months ahead of the schedule IBM originally announced when it unveiled the 3090 in February (CW, Feb. 18).

The improvement in the delivery schedule is believed to be an attempt by IBM to boost third- and fourth-quarter revenues in efforts to balance lower than expected earnings in the first and second quarters.

The 3090 is IBM's top-end mainframe series, the successor to its 3080 line. A second model of the 3090 line, a four-CPU Model 400, is not scheduled for availability until the second quarter of 1987. Many industry observers believe IBM will improve the delivery schedule on that processor as well. IBM is also expected to unveil a uniprocessor version of the 3090 within the next year.

The 3090 models use emitter-coupled logic circuit technology as opposed to the transistor-transistor logic circuits used in the 3080 series. The 3090 machines are the first IBM mainframes to use the company's 288K-bit memory chips. The 3090 Model 200 is said to offer roughly the same internal perfomance as the four-processor 3084 Model QX processor complex but at a much lower price. A 3084 Model QX costs roughly $6 million, while a 3090 Model 200 costs about $4.6 million.



AGREE from page 1

soft, the world's second largest micro software company behind Lotus Development Corp., is the developer of the MS-DOS operating system for the IBM Personal Computer, and Xenix, a Unix variant used on the Personal Computer AT and other systems. Microsoft said it is free to license products jointly developed with IBM to IBM-compatible and other manufacturers.

In anticipation of the agreement, Microsoft Vice-President of Systems Software Steve Ballmer said, the firm doubled the size of its systems software development group.

"This gives us a very clear opportunity inside IBM," Ballmer said. "It will enable us to hear openly about IBM's plans in some areas where it may have been difficult for us before."

Makers of IBM-compatible computers, or clones, welcomed the agreement as a boost to the overall industry. "If this means an advancement in technology, then we are all going to benefit," said Gail Soles, a spokeswoman for Corona Data Systems, Inc., a Westlake Village, Calif.-based maker of Personal Computer compatibles. "IBM comprises only about 10% of Microsoft's business, so Microsoft is going to continue to have to address the rest of us."

"I think IBM realizes there are other companies in the industry, like Microsoft and Lotus, that have quite a bit of talent and resources to offer," said Richard Levandov, vice-president of marketing at Phoenix Software Associates, Ltd. in Norwood, Mass., a manufacturer of compatibility tools. "IBM doesn't want to change the formula of working with an array of third-party companies."

Last week's announcement cemented a relationship that began in 1980, when IBM endorsed the MS-DOS operating system for what would become the world's standard microcomputer. That partnership will now continue on an even closer, more formalized basis.

"The agreement is really not surprising," said Frank Gens, an IBM analyst at the International Data Corp. in Framingham, Mass. "IBM can't afford to walk away from the DOS standard. In that sense, IBM is a slave to the industry standard that it has set."

CW Staff Writer Maura McEnaney contributed to this report.

CORRECTIONS

The Wang Laboratories, Inc. chart in the Aug. 19 Hardware Roundup incorrectly listed the VS85 cache memory capacity. The correct number is 32K bytes. Also, several prices in the IBM mainframe charts were inaccurate. The corrected figures are 3083 Model BX (16M), $1,155,000; 3083 Model JX (32M), $1,850,000; 3081 Model GX (16M), $2,190,000; 3081 Model KX (16M), $2,610,000; 4381 Model Group 3 (8M), $775,500; 4381 Model Group 2 (4M), $460,000; and 4381 Model Group 1 (4M), $340,400.

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Updated 1-2-3 drops key disk, supports PC Network

By Edward Warner
CW Staff

CAMBRIDGE, Mass. — The enhanced version of Lotus Development Corp.'s 1-2-3 spreadsheet, due to ship in September, will remove the "key-disk" requirement for operation with hard disk drives and will provide limited support for the IBM PC Network, Lotus said last week.

Currently, 1-2-3 users with hard disk drive systems must insert a system disk into the A drive of their personal computers each time they use the program. The new version avoids that requirement, allowing the machine to boot from the hard disk drive, Lotus said. Users will be able to install the software on one hard disk drive at a time and to deinstall the product for use on another machine if that becomes necessary. A backup system disk also will be provided with each package of 1-2-3 Release 2.

A version of Symphony 1.1 that avoids the key-disk requirement will be offered this fall, available free to current users, the company said. Future Lotus products also will support that capability, the company said.

For users of 1-2-3 Release 2, PC Network support will mean the ability to read and write to 1-2-3 files that are stored on the local-area network file server. It will not mean the ability to share 1-2-3 among network users, however. Network support was not one of the features originally announced by Lotus in April when the company said it would enhance 1-2-3. Lotus said local-area network support was added at the request of users in large corporations, the market segment to which two-thirds of Lotus' sales go.

Limited local-area net support meets half the demand

In reaction, Paul Cubbage, senior industry analyst at Dataquest, Inc., a market research firm in San Jose, Calif., said the inclusion of even limited local-area network support answers half of the demand from corporate microcomputer managers for a local-area-network-compatible version of 1-2-3.

Cubbage said the other half of the demand is a version of 1-2-3 that can be shared on the network, something that he said will require the establishment of a site licensing program by Lotus. Overall, he said the release of 1-2-3 is "a nice evolutionary step" for the product.

The top-selling Lotus spreadsheet will remain priced at $495 when Release 2 arrives. Users who purchased the current version of the software, Release 1A, after April 24 will be able to upgrade to Release 2 for free. Registered users who bought the version before April 24 will be charged $150 for the upgrade.

Included in the enhancement, the product's first in two years, are such features as the ability to access up to 1M byte of additional memory and support of the Intel Corp. 8087 coprocessor, which works with the IBM Personal Computer's standard microprocessor to speed calculations.

Another feature of Release 2 introduced by Lotus was the addition of string functions for use with both text and mathematical formulas. A string function would allow users to search the spreadsheet for a name rather than only for a number.

The string function was one of the few new features of Release 2 that interested Alan Gross, president of the New York-based Microcomputer Managers Association. Gross, microcomputer manager for a New York investment banking firm, said that access to expanded memory is "of some importance to 5% or 10% of our user body," and network compatibility will affect no more than about 5% of personal computer users in most firms.

To improve further 1-2-3's use in reports, Lotus said, it will exclusively market the $150 1-2-3 Report Writer, written by Concentric Data Systems, Inc., of Westboro, Mass. A Lotus spokeswoman said the marketing of Report Writer marks the first time that Lotus has sold another vendor's software.

Report Writer, demonstrated along with 1-2-3 Release 2, will ship at the same time as does 1-2-3 Release 2, Lotus said.

DG adds link to Disoss, giving weight to IBM standard

By John Dix
CW Staff

WESTBORO, Mass. — Following the lead of Digital Equipment Corp., Data General Corp. last week announced it will support IBM's messaging architecture, a move that further promotes that architecture as a de facto industry standard.

DG's CEO Document Exchange Architecture (DXA) is the company's link to IBM's Distributed Office Support System (Disoss).

DXA, being released in two phases, will eventually enable users within DG's Comprehensive Electronic Office (CEO) environments to take advantage of Disoss document distribution and library services, according to communications products manager Joe Clabby.

The first phase of DXA provides an interface to IBM's Document Content Architecture (DCA) and Document Interchange Architecture (DIA), Clabby said.

DCA and DIA dictate, respectively, how messages and documents are structured and exchanged between computers.

By providing a connection to DIA and DCA, DG's DXA will provide mail and document distribution capabilities, the manager said.

DXA does not yet provide the integrated method to store, search and retrieve documents from Disoss libraries available with DEC's recently announced External Document Exchange with Disoss software [CW, July 15].

The only way to do that with DXA today is through emulation of an IBM 3270 display station.

In its second release, scheduled for the first quarter of 1986, DXA will be enhanced with an integrated Disoss link that will make an MV system look like an IBM network node.

"In phase two, we will better integrate the [Disoss] library function into the product, add [IBM] Physical Unit 2.1 support, expand the [IBM] Logical Unit 6.2 to the optional verb set and add [IBM's] Systems Network Architecture Distribution System support," Clabby said.

Translated into application, this will enable users on MV systems to access Disoss as if it were an IBM node and use all Disoss library functions, analagous to using a real library.

To implement DXA, users need to add a DG Intelligent Broadband Controller (IBC) to their DG Eclipse MV system in addition to the CEO DXA software.

The IBC intelligent synchronous board, which is installed internally, provides the IBM link, but the necessary transmission code conversions are done by the MV processor, Clabby said.

The IBC costs $6,500. The CEO DXA for the Eclipse MV/4000 DC and MV/4000 SC computers and DS workstations costs $1,500. For Eclipse MV/4000, MV/8000 and MV/8000 II computers, the CEO DXA costs $5,000. For Eclipse MV/10000 and MV/10000 SX computers, the cost is $6,500.

The first phase of DXA is available 90 days after receipt of order.

DG is located at 4400 Computer Drive, Westboro, Mass. 01581.

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Bug found in Ultrix Microvax II

By Maura McEnaney
CW Staff

MAYNARD, Mass. — Just one month after its fanfare-filled introduction of the Microvax II, Digital Equipment Corp. stopped shipping versions of the machine running the Ultrix 32M operating system. The shipments were halted in June, after the company discovered problems with the machine's parity checking capabilities.

A spokesman for DEC said the company is currently working to find the source of the bug, which appears to be limited to Ultrix-based versions of the workstations. It is not known when shipments will resume. VMS-based Microvax shipments and the Ultrix-based Microvax I are not affected by the problem, the spokesman said.

John Forde, Microvax product manager in DEC's micro systems development group, told *Computerworld* that approximately 50 of the Ultrix Microvax II machines had been shipped when the company discovered the bug. The problem was present in five of the 50 machines and was occurring "every couple of days," he said.

According to Forde, "What appeared to be a failure in the operating system was a failure in the hardware but only under the Ultrix environment." The combination creates a memory parity bit error that requires users to reboot the machine and clear the system. "It appears that either the code sequence or the interaction of the code with the hardware creates a glitch in the machine." When that occurs, Forde said, the machine indicates that it will stop running.

DEC is working with users to pinpoint the problem, Forde said.

DEC's Ultrix operating system is based on the University of California at Berkeley's Unix 4.2.

IBM enters micro communications mart with modems

By Edward Warner
CW Staff

RYE BROOK, N.Y. — IBM introduced two low-speed modems last week that will put the computer giant in direct competition with companies such as Hayes Microcomputer Products, Inc. that have staked out the micro communications market.

Both IBM modems support full-duplex, asynchronous communications at speeds up to 1,200 bit/sec., and one also offers synchronous communications capability.

Although such products have been available from outside vendors since the IBM Personal Computer was introduced four years ago, this is the first time that IBM has offered its own modems for its machine.

IBM also announced discounts of 15% to 25% on high-volume Personal Computer maintenance agreements and a graphics-compatible version of the IBM Quietwriter printer.

Challenge to Hayes

IBM's belated entry into the Personal Computer modem market challenges longtime market leader Hayes of Norcross, Ga. An IBM spokesman said both modems are Hayes-compatible and can be used with Hayes Smartcom II communications software as well as with other non-IBM communications software packages, including Microstuf, Inc.'s Crosstalk XVI and Transporter and Dow Jones & Co.'s Dow Jones Market Analyzer, Dow Jones Market Manager and Dow Jones Spreadsheet link.

Although IBM introduced an internal modem for its PCjr when that ill-fated product debuted two years ago, the new modems, one external and one internal, mark Big Blue's first such offerings for its Personal Computer line.

In all, "the [IBM] strategy with Personal Computer modems is very similar to [its] strategy with mainframe modems," said John McCarthy, research manager for Forrester Research, Inc., a Cambridge, Mass., market research firm.

In both markets, he said, IBM was late to enter and offered a product that neither broke technological ground nor was priced less than the offerings of competitors. Prices of the IBM modems, he said, are nearly equal to those of the 2,400 bit/sec. modems for the Personal Computer being marketed by outside vendors.

IBM declined to comment regarding the products and prices of other modem makers.

The 5841, costing $800, is available immediately and reportedly supports both synchronous and asynchronous communications at either 600 or 1,200 bit/sec. A stand-alone unit, it interfaces with the Personal Computer and the IBM 3161 and 3163 Ascii display stations.

IBM said the 5841 has been tested for compatibility with the following IBM software for mainframe communications: Systems Network Architecture (SNA) 3270 Emulation, SNA Batch, Binary Synchronous 3270 Emulation and Display Communications Binary Synchronous Communications.

The other modem introduced, the IBM 1200, reportedly fits into an expansion slot inside the Personal Computer or the Personal Computer XT or AT. Priced at $495, the asynchronous modem will be out in September.

Both modems reportedly offer automatic speed detection — the ability to adjust to the speed of incoming data — as well as automatic detection of dial tones and busy signals and automatic line equalization, under which signal distortion is monitored and shared equally between transmitters and receivers as line conditions change. Self-diagnostics are built in, as are automatic redial and automatic dialing or manual dialing capabilities.

Also among the announcements were changes in the way that IBM will market service contracts for its Personal Computer and related hardware.

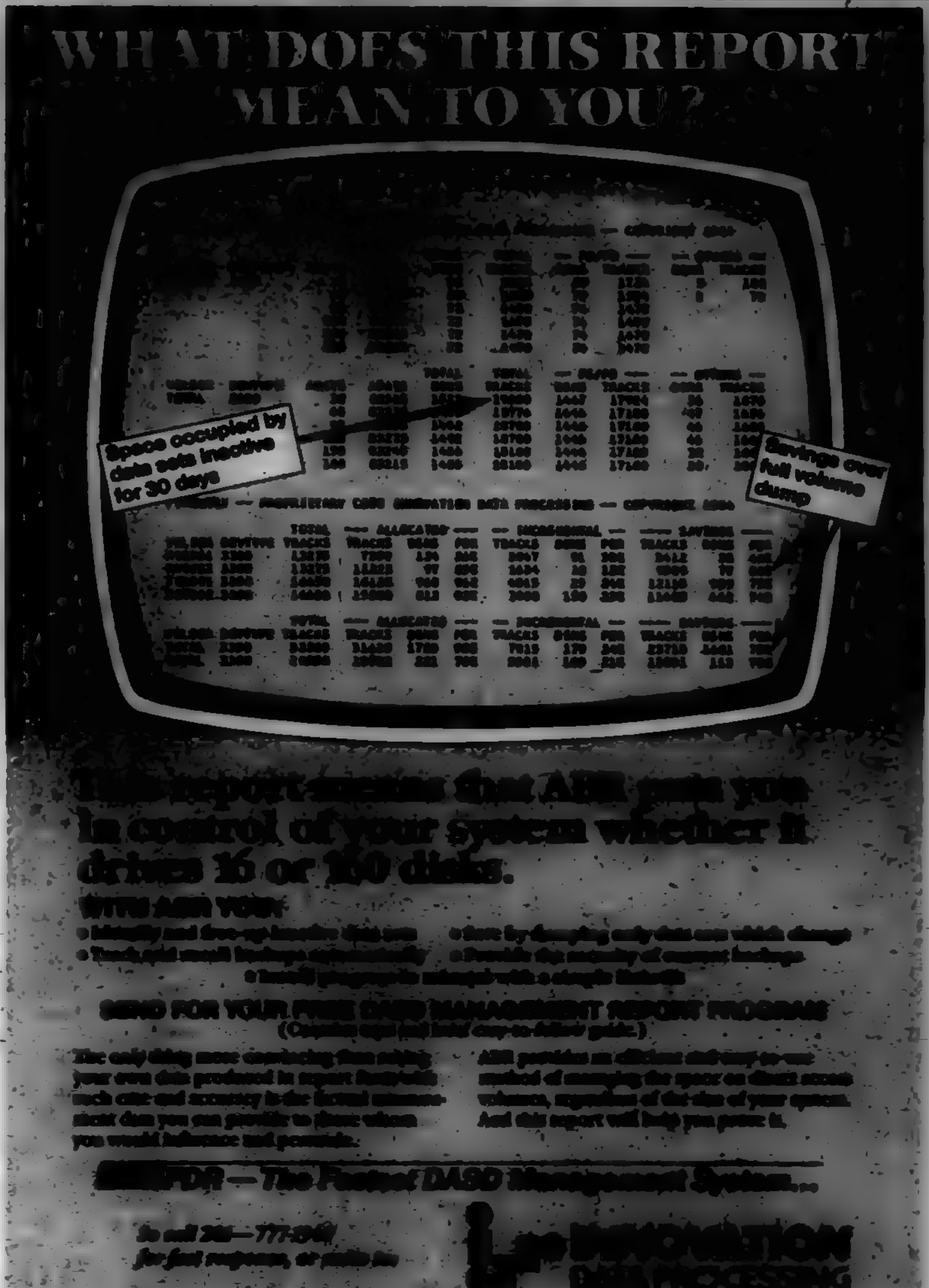
Foremost among these changes was the introduction of a Volume Maintenance Amendment, under which service contracts for 150 to 499 Personal Computers would receive a 15% discount. In addition, service contracts for 500 to 1,000 Personal Computers would get a 20% discount, and contracts for more than 1,000 Personal Computers would receive a 25% discount.

Among the other machines covered by the amendment are the Personal Computer XT, Personal Computer AT and the 3270 Personal Computer.

In another service-related move, IBM increased from nine to 32 the number of non-IBM personal computer hardware products that its national service organization will support, adding to the list such machines as Amdek Corp.'s Video 300 and 300A monitors and a variety of option boards from Tecmar, Inc.

The IBM Quietwriter Model 2 printer, meanwhile, reportedly offers the same features as the Quietwriter Model 1 but with all-points-addressable graphics capabilities. The printer, for use with the Personal Computer and other personal computers, prints graphics and text on standard paper. Priced at $1,595, it is available immediately.

IBM's Information Systems Group is located at 900 King St., Rye Brook, N.Y. 10573.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Seattle bank implements network overhaul

Upgrade eases switch in mainframe vendor

By John Dix
CW Staff

SEATTLE — The largest state bank here has completed testing communications products from start-up Doelz Networks, Inc. and is forging full steam ahead to install the technology throughout its network.

Seafirst Bank, the largest and one of the earliest customers of Doelz, is using the equipment in a major network overhaul to accommodate net growth and pave the way for new ventures, according to Timothy E. Turnpaugh, senior vice-president of Seafirst's operation technology division.

Besides playing a pivotal role in Seafirst's ambitious networking plans, Doelz's virtual circuit technology is providing an important ancillary benefit; it is greatly facilitating the bank's migration to a new mainframe vendor.

Seafirst will use Doelz's Elite One communications processors to upgrade its 167-branch statewide network. This is no menial task. The network supports processing minicomputers and terminals in each branch, 155 automatic teller machines and roughly 1,000 retail point-of-sale (POS) devices.

The overhaul is being made even more difficult by two other factors — Seafirst's central data center migration from Honeywell, Inc.'s processors to an IBM 3084 Model Q and the installation of Tandem Computers, Inc.'s processors to support ATM and POS terminals. The Tandem units will serve as front-end units to all ATM and POS devices and provide a gateway into the Northwest Electronic Network, a net consortium for POS and ATM terminals in which major Northwest banks are participating.

This was the design problem Seafirst faced: design a network that would facilitate future ventures and support disparate types of devices in the field, while providing access to three different processing systems in headquarters.

Each Seafirst office houses Honeywell branch control units that support teller and administrative terminals as well as one or two ATMs. Under its new master network plan, the bank decided to support each of these devices seperately. While the branch control units and ATMs could stand alone, the bank decided to install IBM 3274 controllers to support administrative devices.

Each of these device types uses different protocols. A proprietary protocol is used between the bank's host facilities and its branch processing units; the ATMs will use IBM Binary Synchronous Communications when they are detached from the branch control units; and the 3274s will use IBM's Synchronous Data Link Control protocol.

Instead of supporting these devices on separate networks — as the protocol hodgepodge would normally require — Seafirst wanted to support all of the devices on the same multidrop communications lines.

Additionally, the bank wanted to transform some of its branch offices into network hubs. The idea is to establish 70 key branches as network points of presence and build in enough reserve capacity to accommodate new services, Turnpaugh said. This will enable the bank to bring up services from remote hubs instead of having to reengineer circuits all the way back to headquarters. The savings in implementation time alone could be 25 days or more.

Doelz's Elite One offered many of the features needed to meet all of these requirements, according to Robert J. Bowman, vice-president and manager of network services. "The Doelz box provides all the protocol transparency approaching that of a time division multiplexer, with throughput approaching that of a statistical multiplexer," Bowman said.

In initial tests, Seafirst installed a master Doelz Elite One in its headquarters and two other Doelz boxes in remote branches (see diagram). The master Elite is connected to the older Honeywell processors, the new IBM hardware and the Tandem equipment. Each branch Doelz box supports a 3274, an ATM and two branch control units.

The branches are supported on a 9.6K bit/sec. multidrop link that stops first at a branch in Burien, Wash., and then hops over to the Renton, Wash., branch. Because the Doelz equipment provides throughput similar to a statistical multiplexer, the equipment on the 9.6K bit/sec. line is run as if it were a 14.4K bit/sec. link, Turnpaugh said.

The Doelz boxes provide multiple virtual circuits over this single line, fooling attached devices into thinking each has a dedicated link. The ATMs and 3274s have their own virtual circuits. All of the branch controllers in the test share one virtual circuit as if it were a dedicated multidrop line.

An appealing feature of the Doelz equipment, according to Turnpaugh, is limited fault bypass — what the bank calls self-healing. The Renton branch in the experiment — sitting at the end of the multidrop line — has a dedicated backup link to headquarters. In the event that the main link goes down, traffic is automatically reversed and routed over the alternate facility. Eventually that capability will be provided over dedicated or dial-up lines from the last Doelz box on most multidrop lines, Turnpaugh said.

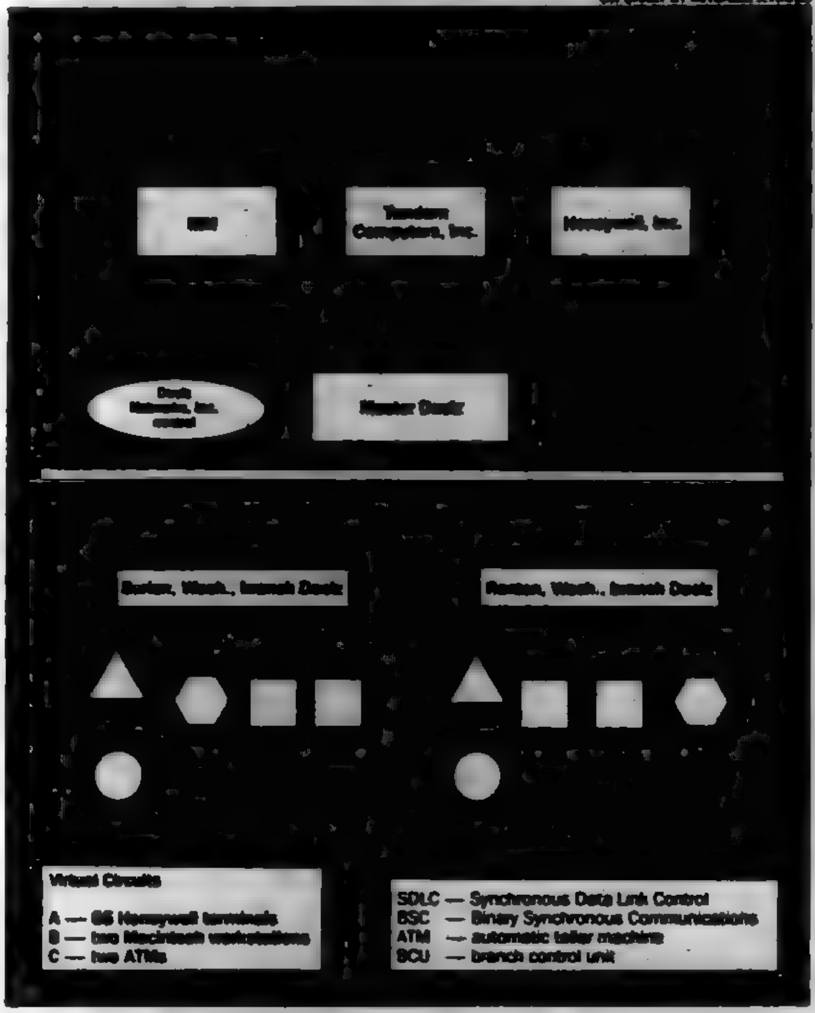
The Doelz experiment was meant to test the mainstream tasks that Seafirst's fully deployed network would be expected to handle. As such, the test supported 65 Honeywell terminals hung from four branch controllers; two Docutel/Olivetti Corp. ATMs; two IBM 3274 controllers; and two Apple Computer, Inc. Macintosh microcomputers.

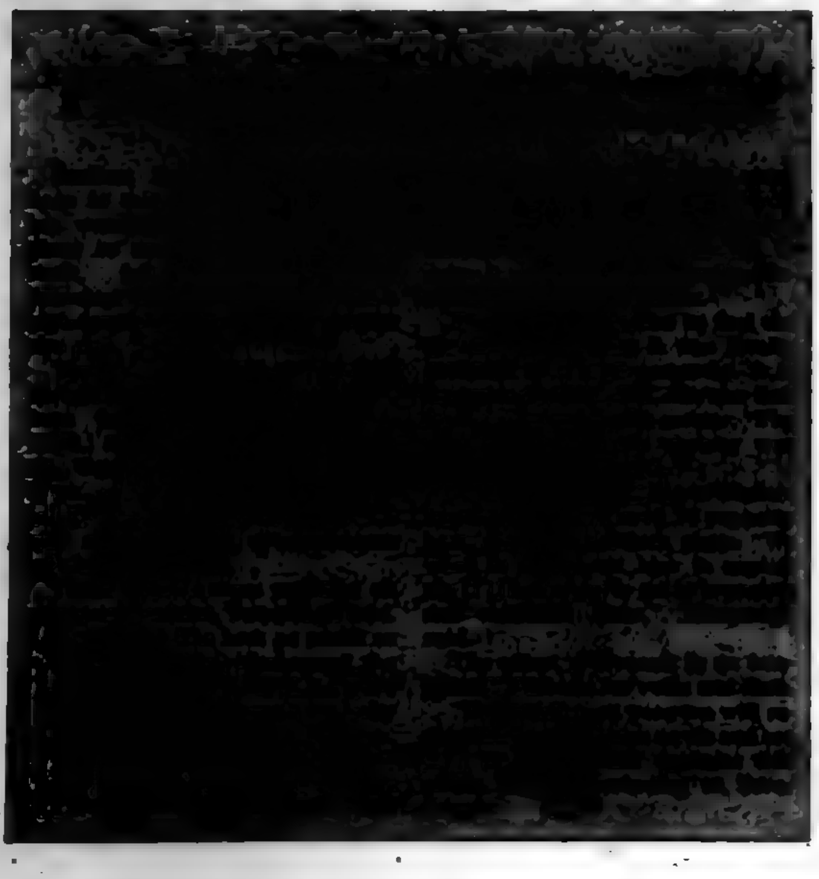
The Macintoshes emulate Digital Equipment Corp. VT100 terminals through a protocol converter, which appears to the IBM 3274 like an IBM 3178 display station. The Macintoshes will be used for administrative, nonteller functions, with the 3274s providing the gateway for such things as access to corporate electronic mail and access to an IBM DB2 4.5M-byte data base.

Of the roughly 180 Doelz communications processors to be installed, about 30 have been put in place, Turnpaugh said. The senior vice-president would not divulge the value of the contract but noted that the bank would realize a six-digit savings by engineering with the Doelz equipment instead of time division multiplexers.

While the Doelz hardware is enabling Seafirst to migrate gracefully from Honeywell to IBM processors, other features are perhaps more important. The Doelz network infrastructure — providing the ability to support multiple protocols and build in reserve capacity — will enable the bank to react and provide service on a marginal cost basis, Turnpaugh said. The self-healing feature will ensure uptime.

CW CHART BY MITCHELL J. HAYES


IBM
Tandem Computers, Inc.
Honeywell, Inc.
Doelz Networks, Inc. control
Master Doelz
Burien, Wash., branch Doelz
Renton, Wash., branch Doelz
Virtual Circuits
A — 65 Honeywell terminals
B — two Macintosh workstations
C — two ATMs
SDLC — Synchronous Data Link Control
BSC — Binary Synchronous Communications
ATM — automatic teller machine
BCU — branch control unit



AI

from page 1

Addressing this concern, Symbolics, Inc., the leading supplier of AI workstations, outlined a new and widely expanded delivery strategy at IJCAI. Options will include upcoming low-cost dedicated Lisp machines; multiuser setups for existing Lisp machines via direct connection or networking; use of dedicated systems as "back-end knowledge servers" on a net; and cross-compiling Common Lisp code to run on general-purpose machines.

Like others interviewed here, Geisel suggested several other likely alternatives for future AI delivery vehicles. One is Digital Equipment Corp.'s Microvax II, which could act as a single-user development machine and then be upgraded with several terminals for running applications. Another option, he said, will be "the fabled 32-bit IBM workstation," with a reduced instruction set computer design the most promising architecture, he remarked. The next generation of personal computers also will find a role. And to round things off, Geisel predicted, dedicated AI coprocessors will be widely available within three years.

"AI is much more exciting now than it's ever been," according to keynote speaker Woody Bledsoe, AAAI president and vice-president at Microelectronics & Computer Technology Corp., and IJCAI's overall mood was as sunny as its Southern California location would suggest. But notes of caution kept cropping up.

Many tasks now suggested for AI systems will prove extremely difficult to accomplish because they deal with what Hector Levesque of the University of Toronto described as "incomplete knowledge." Such problems require the computer to deal with "all those nasty things that you have to do when you take a logic course," Levesque said. "These limits exist, and it's easy to forget [them] among all the hysteria about knowledge-based systems."

May not find widespread business use

Even when the technology is appropriate, an AI-based system may not find widespread use in business, said Beau Sheil, manager of product development at the Artificial Intelligence Systems division of Xerox Corp. "In most Fortune 500 companies, there is an advanced development group doing the strangest things," Sheil said. "But in some of them it's just not going to work."

Successful adoption of AI technology requires a corporation to have "longtime horizons, real clear ideas about what [its] needs are and a long history of successfully applying technology to those problems," Sheil said. Petroleum services firm Schlumberger Ltd., one successful user of AI technology, "has been at it for five years now, and [it's] just now shipping in bulk to field operations," he pointed out.

As in other high-technology fields, there are also signs of growing friction in the AI community between academia and industry. One sore point is the continual movement of talent into industry, which may slow down emphasis on basic research and make in-depth training much more difficult, researchers said. "There's a tremendous wave of really bright kids coming into college but not that many good AI professors," Bledsoe said.

IBM, NYU join forces

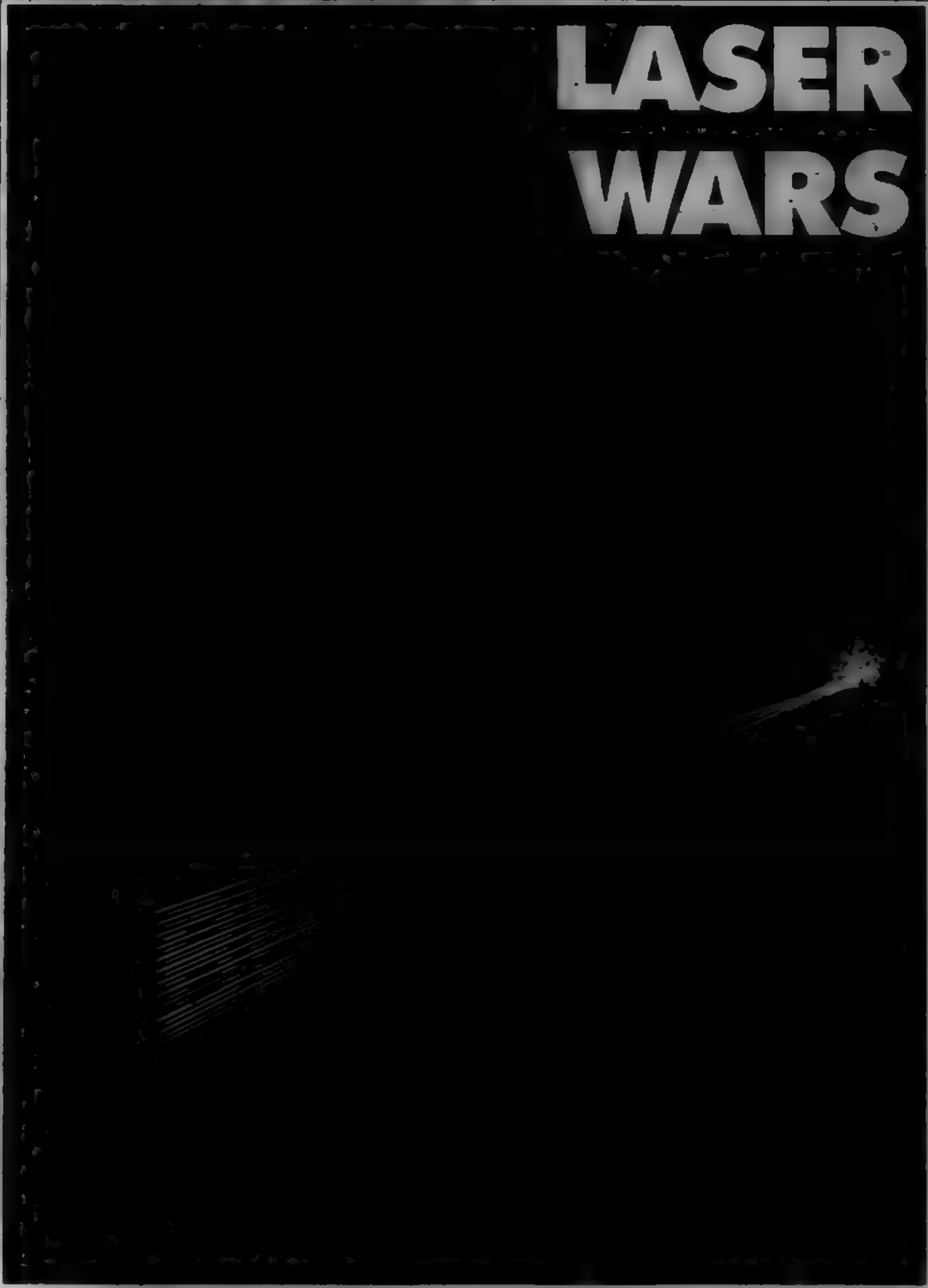
NEW YORK — IBM and New York University (NYU) have teamed up to pursue a two-year project to build a parallel processing computer, the experimental RP3.

The Research Parallel Processor Project will combine experimental 32-bit microprocessors into 64-processor units. When eight of the units are interconnected, they will become a 512-processor system with each processor linked to 2M or 4M bytes of memory, IBM spokesmen said.

An operating system devised at the Courant Institute of Mathematical Sciences at NYU has incorporated a synchronized fetch-and-add technique that bundles multiple requests for the same piece of data, retrieves it once and then broadcasts it to all requesting processors, IBM spokesmen said.

Coordination among the processors is to be handled by an interconnection network capable of moving packets of data at a maximum rate of 13 billion char./sec.

The system is being designed to address the need to work on a variety of complex problems, IBM said.



IJCAI sees HP, Intellicorp moves in AI programming

CW AT IJCAI

By Eric Bender
CW Staff

LOS ANGELES — The International Joint Conference on Artificial Intelligence (IJCAI), held here last week, saw a string of significant product introductions from existing AI suppliers, plus an announcement of strong commitment to AI development from one major industry player.

Hewlett-Packard Co. chose IJCAI to announce a major push into the AI programming arena.

HP's initial AI software offering, available by year's end, will be a Common Lisp development environment that runs on the HP 9000 Series 300 family of workstations announced last month. The software includes a compatible interpreter and compiler pair with an integrated debugger, Emacs editor and multiple user windows. It also provides a system interface called Browsers that is said to enable users to move freely from one part of the system to another and automatically have appropriate tools for the task at hand. Access to Fortran, Pascal and C programs also is supported.

A high-end development system based on the Model 320 workstation and running the HP-UX version 5.1 operating system will be priced in the $50,000 range. Costs for a delivery system based on the Model 310 will begin at under $20,000. More information is available from HP at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Xerox workstations

Releasing low-cost workstations (see story page 11), Xerox Artificial Intelligence Systems also climbed on board the Common Lisp bandwagon, with plans to offer Common Lisp software in second-quarter 1986. Other suppliers that announced Common Lisp product plans include Sun Microsystems, Inc. and Franz, Inc., whose Franz Lisp product is said to be the world's most widely distributed Lisp dialect.

Among other software introductions at IJCAI, Intellicorp unveiled a PC-Host system said to enable personal computers to act as delivery vehicles for expert systems developed with the firm's Knowledge Engineering Environment (KEE) software. In the distributed system, the micro handles KEE interface functions while the host computer runs a Common Lisp version of KEE core functions, the company said.

The initial version of PC-Host supports IBM Personal Computers and compatibles and the Apple Computer, Inc. Macintosh on the desktop side and Digital Equipment Corp. VAX systems as hosts. Scheduled for delivery in January, the software costs $15,000 for the host and $495 for the personal computer.

Intellicorp also unwrapped KEE Release 3.0, scheduled for January availability, and Simkit, a $15,000 graphics-oriented simulation tool that will be delivered in October. More information is available from Intellicorp at 1975 El Camino Real W., Mountain View, Calif. 94040.

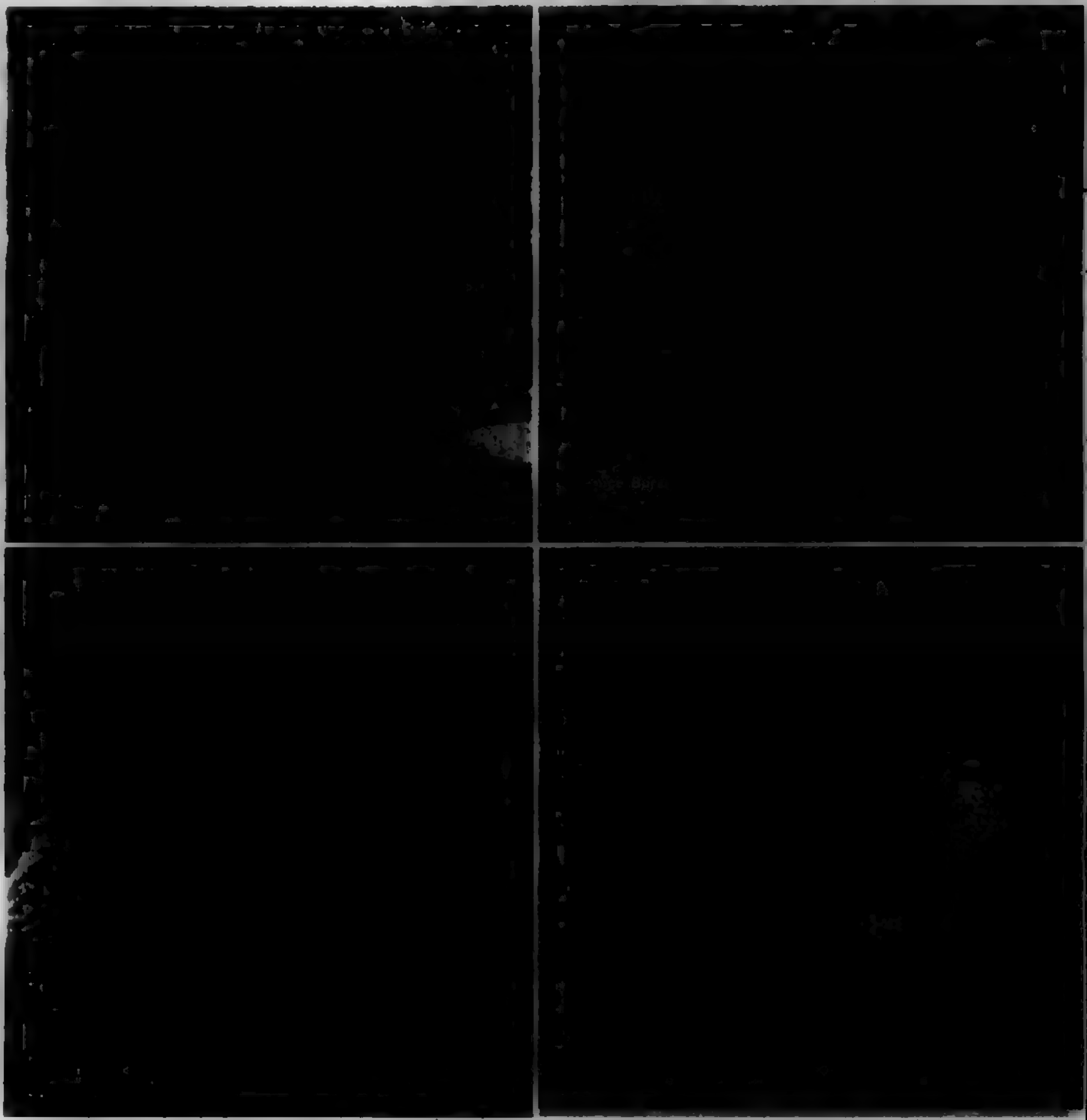
One AI-based application that grabbed the spotlight was Palladian Software, Inc.'s Financial Advisor package, which Chairman Philip Cooper described as "the first-ever commercial, large-scale expert system designed for general marketing to American corporations."

The Financial Advisor is targeted at assisting executives in planning, formulating, evaluating and monitoring capital-intensive projects and products. The package combines financial, economic, tax and accounting expertise with sophisticated mathematic techniques, Palladian said.

The Financial Advisor is designed for users without specialized financial or computer knowledge, Cooper said. During problem defini-

See IJCAI page 11

Announcing the first Satellite Symposium, leading AI experts.



NEWS

Symbolics, Xerox offer enhanced AI workstations

CW AT IJCAI

By Eric Bender
CW Staff

LOS ANGELES — Dedicated artificial intelligence workstations said to offer significant price/performance increases over their predecessors from Symbolics, Inc. and Xerox Artificial Intelligence Systems made their debuts at last week's International Joint Conference on Artificial Intelligence (IJCAI) here.

Symbolics, which claims about two-thirds of the dedicated AI machine market, enhanced its 3600 line with two systems offering performance improvements of up to 50% over their predecessors, said to Symbolics' marketing director Howard Cannon.

The new 3645 and 3675 models feature an Enhanced Performance Option, available as a $16,750 upgrade to the earlier 3640 and 3670 models.

With 4M bytes of internal memory and a 190M-byte disk drive, the 3645 costs $81,900. The 3675, with 4M bytes of memory and a 474M-byte hard disk drive, is priced at $113,000. Shipments of the machine and the upgrade are scheduled to begin in October.

Symbolics also disclosed plans to offer, within a year, low-end models, designed primarily as delivery vehicles and costing about half as much as current models. Most of the company's customers are currently developing rather than delivering AI applications, and the announcement was made to let them know that a relatively inexpensive delivery vehicle is on the way, President Russell Noftsker commented.

Along with its workstation debuts, Symbolics introduced Release 6.1 software, said to feature a technique for saving disk space, a lexically scoped debugger and other enhancements.

Additionally, the company announced a dot matrix printer with a base price of $2,995, a $9,995 laser printer, base-level support of Digital Equipment Corp.'s Decnet network standard and a slew of marketing agreements with software firms.

More information is available from Symbolics at 11 Cambridge Center, Cambridge, Mass. 02142.

Xerox Artificial Intelligence Systems rolled out two workstations that represent the lowest cost machines designed specifically to develop and run Lisp programs, according to general manager Gary Moskovitz.

He described the new Xerox 1185, which costs $9,995 with Xerox Interlisp-D run-time software, as "the first real Lisp delivery vehicle."

The 1185 comes with 1.1M bytes of internal memory and a 10M-byte hard disk drive. The Xerox 1186 development system, which can be expanded with up to 3.6M bytes of internal memory and 80M bytes of hard-disk storage, costs $15,965. Both systems are offered with an optional $750 coprocessor for IBM Personal Computer software and will be available next month.

More information is available from Xerox at Xerox Centre, 101 Continental Blvd., El Segundo, Calif. 90245.

IJCAI

from page 10

tion the software reportedly checks for errors, omissions and reasonableness of data.

The Financial Advisor comes in two modules — a data base management and communications portion that runs on large IBM and Digital Equipment Corp. systems and a workstation portion that runs on Symbolics, Inc. and Texas Instruments, Inc. Lisp machines.

A system for four workstations costs $95,000. The software is set for commercial delivery in December.

Palladian Software is located at 11th Floor, Four Cambridge Center, Cambridge, Mass. 02142.

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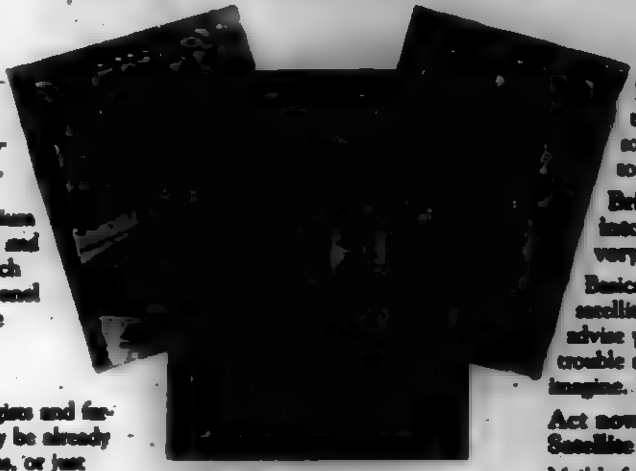

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Meet provides forum for software debuts, upgrades

CW AT INFO CENTER

By John Gallant
CW Staff

NASHVILLE — The scene was reminiscent of the old days on the computer industry conference circuit. Whether the driving force was the growing importance of information centers within many companies or the shift by marketers toward more narrowly focused trade shows, a variety of vendors used last week's Information Center Conference & Exposition here as a forum to announce products and enhancements to existing tools.

Among the software happenings, which included the debut of user training courses from at least three of the major educational products companies (see story page 13), was the introduction of an IBM mainframe-based word processing package from Group 1 Software. Group 1's EZ-Word, which operates under IBM's CICS, provides users with features such as insertion and deletion of copy, search and replace, movement of text within and between documents, full formatting capabilities and pagination.

The product can be used with list management or other programs — such as Group 1's EZ-List or EZ-Letter packages — to create letter-quality documents and form letters with variable inserts. EZ-Word enables users to share documents with other terminal users and is fully menu driven. The package is available now at a cost (perpetual lease) of $30,000 for IBM DOS environments and $40,000 for IBM OS environments. Group 1 Software is located at 6186 MacArthur Blvd., Washington, D.C. 20016.

Information Builders, Inc., whose Focus fourth-generation language is a mainstay in many information centers, gave users of that product an interface to IBM's DB2 relational data base management system.

The interface will allow Focus users under IBM's MVS/TSO to access DB2 tables. Users can execute Focus' reporting and data analysis functions, such as report writing, ad hoc queries, statistics and financial modeling, against DB2 data bases. The interface also allows users to join up to 16 different DB2 tables relationally as well as join the DB2 tables with other files, including Focus and IBM's Vsam, Qsam and IMS. Data from DB2 files can be downloaded to IBM Personal Computers with Information Builders' Foctalk link. The Focus/DB2 interface is scheduled for October availability. It will be priced at $8,500. Information Builders is located at 1250 Broadway, New York, N.Y. 10001.

Comshare, Inc., producer of the System W decision support system, also unveiled an interface to one of IBM's major products. The company introduced an interface — dubbed W/SQL Pipeline — between System W and IBM's SQL/DS data management system.

W/SQL Pipeline reportedly provides a data view from System W to SQL/DS data bases allowing either read-only virtual access or extraction of data from SQL/DS into System W. The interface features use of SQL/DS's security, concurrency and data dictionary capabilities and full screen facilities for viewing SQL/DS data using W/Datman, System W's relational data management facility. W/SQL Pipeline runs on IBM mainframes with SQL/DS Release 2 or 3 and a minimum System W configuration with W/Datman. The interface is available now for $7,500. Comshare is located at 3001 S. State St., Ann Arbor, Mich. 48106.

Gateway PC link

SCA Products & Services, Inc. chose the gala here to release an enhanced version of its Gateway PC micro-mainframe link. According to a spokeswoman, Gateway PC supports data transfer between additional mainframe and micro packages, including IBM's TSO and Lotus Development Corp.'s Symphony.

Gateway PC uses menus and screens to give users access to applications and data on the micro and mainframe. The link automatically builds 1-2-3 and Symphony spreadsheets from mainframe data and formulas. It runs on the IBM Personal Computer, XT and AT and includes a mainframe module that operates under IBM's CMS or TSO. The enhanced version is available now at a cost between $200 and $350 per micro and $18,000 for the mainframe module. SCA Products & Services is located at 353 Lexington Ave., New York, N.Y. 10016.

Chicago-Soft, Ltd. announced its 301 system, which consists of three products for micro-mainframe connection. ARX-Link allows IBM Personal Computer users to access mainframe data files selectively with automatic reformatting for micro packages. The second 301 component, ARX, provides for selective and incremental backup and restore of micro data files on a mainframe using a master IBM Vsam file. The package can run in unattended mode so backup can be done in off-peak periods. Control-PC, the final module, allows users to build a central repository of

See DEBUTS page 13

Announcements spotlight concern for user training

CW AT INFO CENTER

By John Gallant
CW Staff

NASHVILLE — Reflecting the increasing role of information center personnel in user training, at least three major vendors chose last week's Information Center Conference & Exposition as a springboard to launch educational products.

Advanced Systems, Inc. introduced four training courses employing a variety of instructional techniques. A microcomputer diskette- and videotape-based course called "Learning to Apply Symphony" helps users learn five basic functions, including spreadsheet and word processing, of Lotus Development Corp.'s Symphony integrated software. The course includes two videotapes, a data diskette and viewer's guide.

An eight-unit video course titled "IDMS Goldengate: Cullinet's PC Software" teaches users to master the information manager, edit, spreadsheet, graphics, profile and emulator tools of Cullinet Software, Inc.'s Goldengate micro software. Advanced System's "CMS (Xedit)" six-unit computer-based training (CBT) course offers instruction in IBM's CMS and Xedit mainframe software products.

Each of the training courses can be rented for $50 per month per module.

Advanced System's "Personal Consultant" interactive videodisk instruction course, which can be rented for $90 per month per module, is designed to teach novices to use microcomputers. Advanced Systems is located at 155 E. Algonquin Road, Arlington Heights, Ill. 60005.

Course hones writing skills

The Phoenix Courseware Group of Goal Systems International, Inc. unleashed two CBT tools at the conference. "Effective English for Business Writing" is a CBT course designed to help users hone their writing skills. It is priced at $4,900 for a permanent license fee.

"Ease/Instructor" is said to help instructors and training managers plan and administer CBT courses. "Ease/Instructor" costs $3,200 for a permanent license. Phoenix Courseware Group is located at 5455 N. High St., Columbus, Ohio 43214.

Deltak, Inc. offered four new training courses, including the following:

- "Symphony," a two-course video series with training exercises for users of Lotus' Symphony. The package costs approximately $125 a month.
- "Analyzing Sales Performance Using the Lotus 1-2-3 Program," a micro-based CBT course aimed at sales professionals and management. The course costs $70 per diskette.
- "Talk English to Computer with Intellect," a one-hour video course for users of Artificial Intelligence Corp.'s Intellect. The course carries a rental charge of approximately $125 a month.
- "Working Effectively with the Information Systems Department," a five-course video series for end users and MIS managers. The rental charge for the course is approximately $125 a month.

More information is available from Deltak, East-West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

DEBUTS

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micro software stored on the mainframe, allowing access to the packages only to authorized users. The package tracks software use by user.

ARX-Link uses IBM's CICS and supports most IBM 3278 emulator boards, 3274 emulators and protocol converters. Base pricing begins at $12,500 for DOS/VSE and at $30,000 for MVS.

Chicago-Soft is located at Suite 2, 738 N. LaSalle, Chicago, Ill. 60610.

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8:30 – 9:00 am Registration
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LOGICWARE

NEWS

Compatibility, integration key to info center tool choice

CW AT INFO CENTER

By John Gallant
CW Staff

NASHVILLE — What are the most important factors to consider in selecting software for an information center?

If you said price, functionality or vendor reputation, you are off the mark. But if compatibility and ease of integration with other software products topped your list, you are correct — at least according to the panel of top information center professionals who spoke at a forum on software selection at last week's Information Center Conference & Exposition here.

All the panelists, whose information centers support end-user populations ranging from approximately 200 to nearly 1,000, agreed that a product's ability to fit into an existing information architecture and to share data with other packages are the most important factors in their software selection decisions.

"We are not overly concerned with price," said Kenneth Barton, information center manager for the Vancouver, B.C.-based airline CP Air. "We have a big investment in hardware, and software is a relatively small component of the overall cost of workstations. Connectability and integration are the key issues."

Primary concern is integration

Kenneth Baker, manager of end-user computing and office automation for Lexington, Ky.-based Ashland Oil, Inc., echoed Barton's point. "Price is way down the list. Our primary concern is the integration of all the products we support. We have to have the ability to interchange data," Baker said.

Doug McGregor, senior information center specialist with London Life Insurance Co., London, Ont., said, "What we ask is 'How does this product relate to the rest of our product line? Can we move data around with it?' We don't have any more stand-alone personal computers. Integration, data transfer and compatibility are the vital issues involved here."

As a result, McGregor said, he would relish the opportunity to start from scratch.

"We would love to have a clean slate. We are using old, tired products that overlap functionally," he said. "If we could start over again, we would take a hard look at organizing our product line. I recommend that people just starting information centers think carefully about the products they want to have in place two years from now, especially considering the data communications aspects."

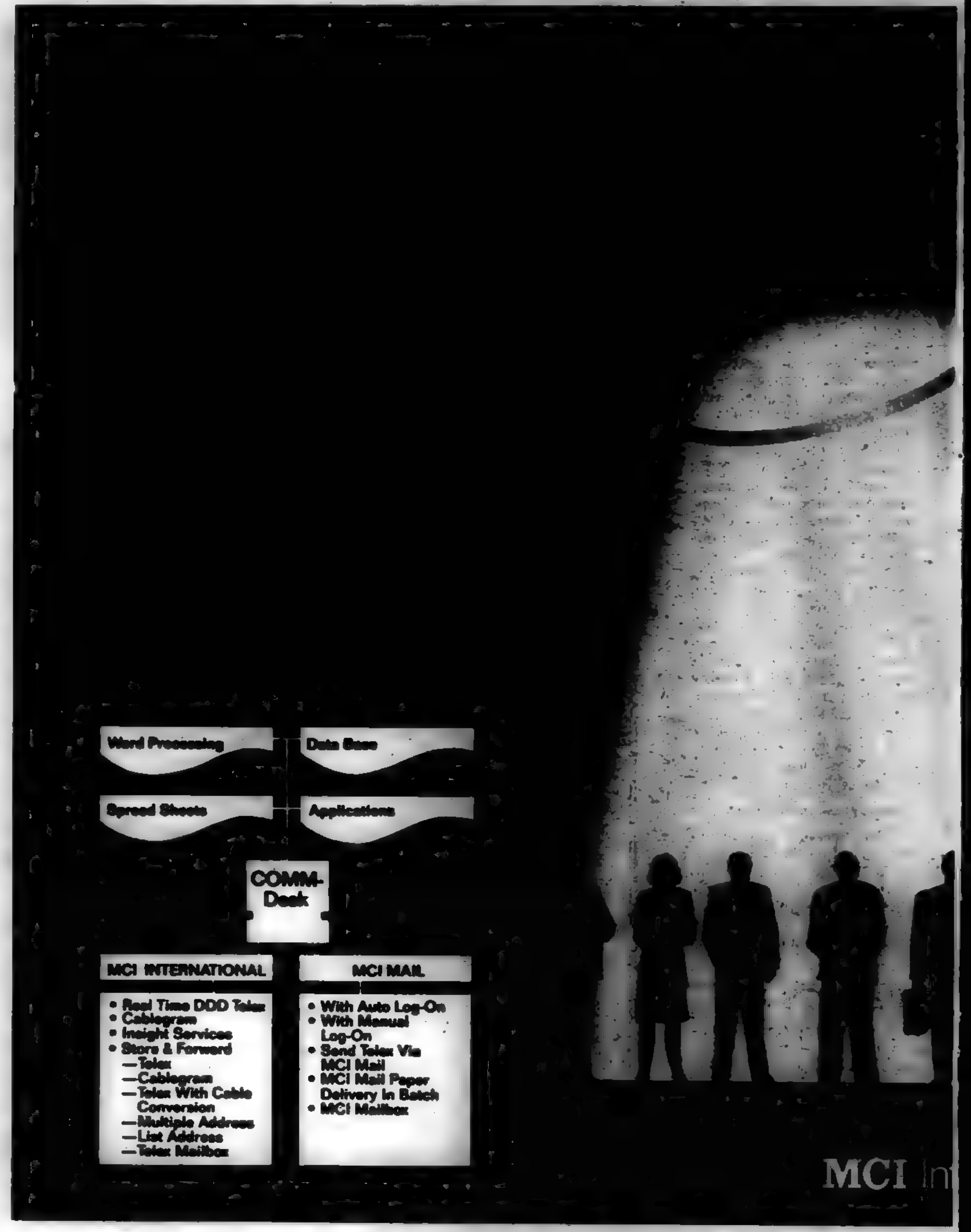
Barton said the quality of vendor-supplied documentation and other training materials has taken on a new importance. "As our users get more geographically diverse, documentation is becoming a more important factor in the selection process. As it becomes more difficult to support individual users, the training materials take on a new significance," Barton said.

Where the information center professionals differed was on how they select the standard products they offer to their end users.

McGregor said that while his technical staff stays up-to-date on new products, the evaluation and selection process is primarily user driven. "The users ask us for certain capabilities and products, and we do the research," he said.

That approach contrasted with CP Air's information center, which, Barton said, takes a leading role in seeking out new products.

"Everyone's information center is different," Barton said. "We are proactive. We try to lead our users to products that we think will boost their productivity. In a sense, we are dragging users to certain products."



M&D

from page 1

viewed at last week's conference were positive about the Millennium enhancements. Citing prior complaints that Millennium 1 has a seemingly voracious appetite for machine resources, the users were especially happy with promised improvements.

In opening remarks at the conference, attended by about 1,700 users, M&D President Frank H. Dodge called AR:M "the best product M&D has ever produced."

Mickey Clark, AR:M marketing manager, said eight people worked two years to develop the product. Many of the Millennium upgrades resulted from the AR:M development effort, he said.

To market in 1983

Millennium was brought to the market in 1983 as M&D's integrated system for developing on-line applications. Data input and query interfaces are consistent across Millennium applications. An M&D spokesman said 1,870 Millennium packages for on-line development have been shipped.

Enhancements in Millennium 2 include an interactive screen design feature that allows interactive building and modifying of screens, a spokesman said.

With the Quick Commands feature, users can now devise simple commands for use with any Millennium application. A Help Redirection feature lets users display actual values along with text.

A Data Macros feature allows calculations to be performed on specific fields for greater flexibility in executing queries and using M&D's Interactive PC Link micro-mainframe package.

The AR:M package will initially be available for IBM MVS and DOS operating systems and IBM's IMS data base management system.

AR:M requires Millennium 2 and will cost approximately $100,000, a spokesman said. An international version of the package will be available at a later date.

Dodge said the company is now working on Millennium 3, which, he said, "will be more integrated with data base management systems than prior versions." Robert D. Kelley, M&D's vice-president of product strategy, said Version 3 will be more relational in nature and will be compatible with IBM's DB2 and SQL.

In what a company spokesman said was an important feature for users with investments in their own or packaged non-M&D software, Millennium 2 offers an optional Batch Transaction Processor (BTP), said to translate automatically non-Millennium transaction records into Millennium-understood files.

For example, BTP could be used to reformat a company's in-house or non-M&D billing system into a format accessible by AR:M, Kelley said. The BTP option will cost $15,000.

William Fitzpatrick, M&D's new product development manager, said that with Millennium 2, "We've found things to make [Millennium 1] more convenient to work with. We've also speeded the system up," by recoding some Cobol into assembly language.

At the same time, M&D replaced IBM's macro-level CICS supported in Version 1 with the less-efficient command-level CICS in Version 2, because IBM announced it was discontinuing support for the macro level, Fitzpatrick said.

Broke even

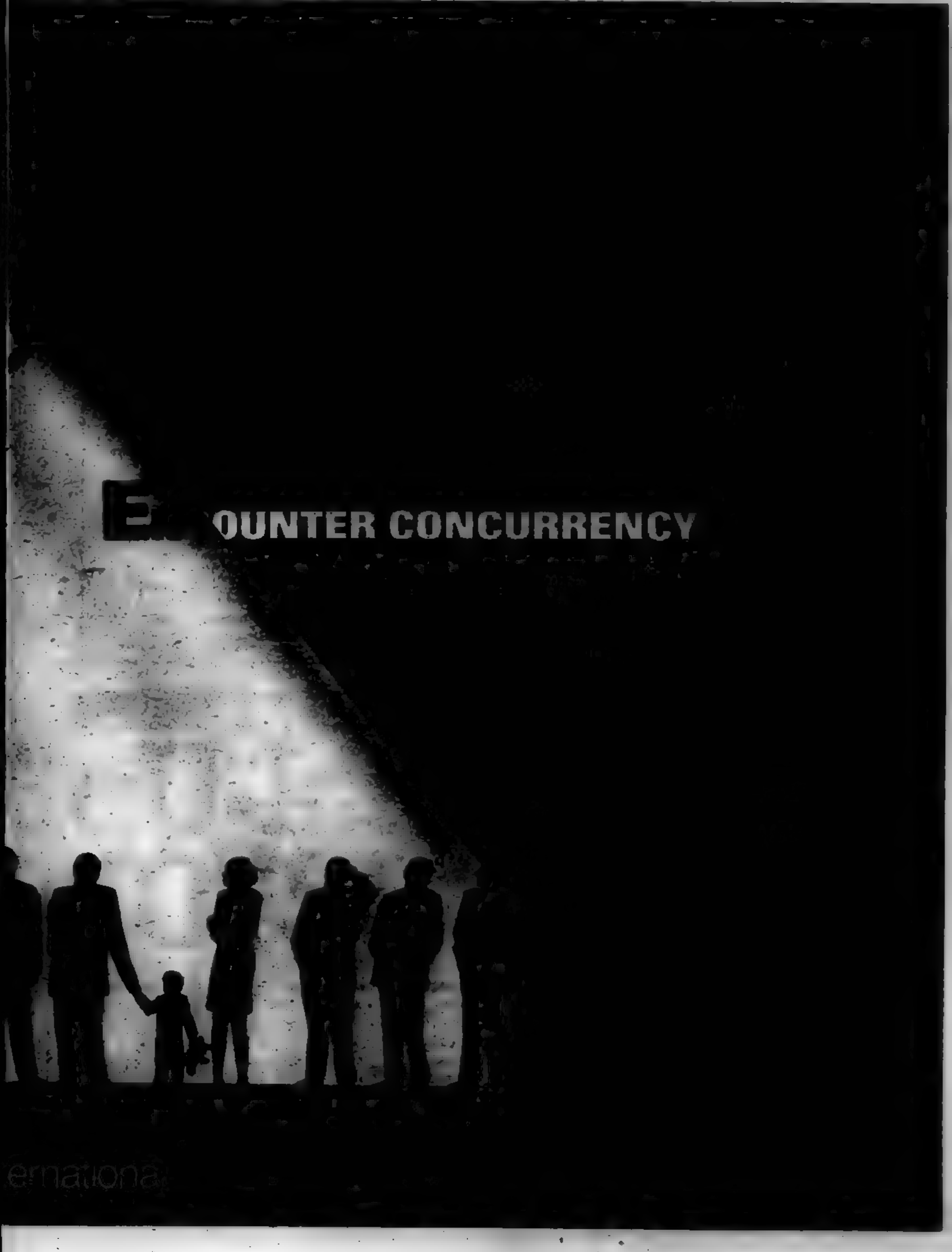
"What we gained in efficiencies we lost in going to command level, so we broke even," he said.

Kelley maintained performance did improve, with estimates that command-level CICS lessened performance 20%, while the recoding improved performance by 30% for a 10% net gain.

The Millennium enhancements will be well received by DP departments, users predicted. Bruce Pergament, vice-president of administration at the Melville, N.Y.-based Pergament Home Centers stores, said Millennium "does take up a lot of space on the mainframe. I know M&D has been deeply concerned about that."

Jerry Smith, senior systems analyst with the Albuquerque Federal Savings and Loan in Albuquerque, N.M., said, "I hear the DP people say that Millennium hogs the machine." But he said the DP people may not appreciate what the software is doing.

Millennium 2 is initially available for IBM CICS and Vsam environments. Version 1 will be supported for another 12 to 18 months, a spokesman said.



CW AT WORLD '85

Ramblings from the floor of World '85:

■ McCormack & Dodge Corp. used advanced presentation technology at its World '85 users conference in Boston last week. Most session leaders were linked directly to the company's mainframes in Natick, Mass.

In a preview of the company's AR:Millennium accounts receivable package, AR:Millennium marketing manager Mickey Clark tapped into a live version of the product to demonstrate how a credit representative would use it. The Personal Computer screens were projected in color onto larger screens. Graphics created with IBM's Storyboard micro software complemented the micro screens. A few session leaders resorted to the trusty overhead projector to convey the latest in software.

■ M&D President Frank Dodge said that the company has spent $2.3 million on equipment in the computer room of its Natick headquarters this year. Among installed products is IBM's DB2. M&D also spent $800,000 to enlarge the computer room. Dodge said his firm, a Dun & Bradstreet Corp. subsidiary, would top the $100 million mark in revenue this year.

■ Robert D. Kelley, M&D vice-president of product strategy, said the company is very interested in developing artificial intelligence applications. "But the AI we provide will be on the mainframe in the Millennium environment," he specified. Kelley said M&D will not program any expert systems in Prolog or Lisp. M&D has considered acquiring an AI software firm but so far has rejected all possibilities, Kelley said.

■ In describing the company's efforts to develop a more rigid systems development life cycle, Kelley said, "We are trying to better manage slippage of availability dates. Whether it will be faster we don't know, but at least we'll be able to predict better."

Development meet set

TOPEKA, Kan. — The 10th annual Data Structured Systems Development Users Conference, Feedback '85, will be held at the Holiday Inn West Holidome here Oct. 8-10.

Speakers for the conference will address object-oriented design and the Ada language, the application of structured requirements definition to knowledge engineering problems and pragmatic successes in data and systems architectural development.

Other topics to be addressed are computer-aided software engineering, using Pacific Bell's system to build data systems, the human aspects of technological society and the characteristics of a framework for information systems architecture.

Prize for info science excellence

Jean-Dominique Warnier will present the third annual Warnier Prize for excellence in the field of information science.

The registration fee is $600 before Sept. 6 and $650 after that date.

More information on Feedback '85 can be obtained from Ken Orr & Associates, Inc. at 1725 Gage Blvd., Topeka, Kan. 66604.

Cbema raps warranty legislation

WASHINGTON, D.C. — The head of the Computer and Business Equipment Manufacturers Association (Cbema) recently lashed out against computer warranty legislation pending in California, Pennsylvania and New York, arguing that it would raise prices.

Vico E. Henriques, Cbema's president, said in a statement that the bills are "unnecessary, heavy-handed and shortsighted."

In general, the bills seek to protect computer buyers from purchasing poor or unsuitable hardware and software. For example, the California bill (A.B. 1507) would require vendors to furnish an implied warranty of fitness for a specified application [CW, July 29].

"Someone who needs a computer for only a year, or someone who wants simply to experiment with the product, could use it free for a year and then claim a vague implied warranty and return it," Henriques said.

Henriques took specific exception to the bills' demands for one-year warranties, which he said would add the cost of a one-year service contract to each computer sold. He called that "an attack on the consumer's right to accept or reject a service contract."

The Cbema chief further argued that computer buyers already have protection, including the Universal Commercial Code, small claims court, the Federal Trade Commission, state consumer-protection officials and the Better Business Bureau.

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VCWA	VSAM in COBOL	Oct 28-30	NJ
BCWA	Assembler	Oct 7-10	NJ
CCWA	CICS(Command Level)	Oct 7-11	NJ
NCWA	Data Processing for the Non-DP Manager	Sept 25-27	NJ

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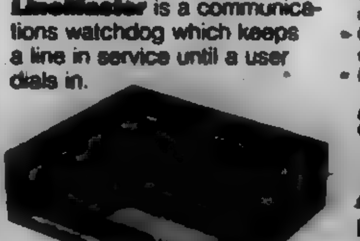

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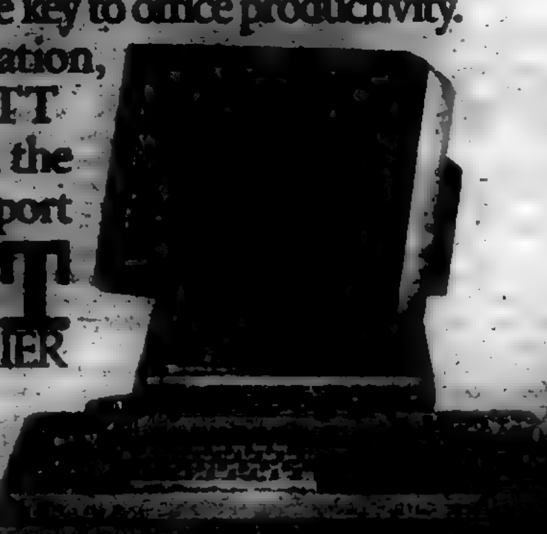


NEWS

WORLD DIGEST
CW International
News Network

CANBERRA, Australia — An angry row has broken out over allegations that corruption involving an Australian Customs Service computer is allowing criminals to enter and leave Australia undetected. The charges have been made by the Australian Federal Police Association, which has demanded an immediate government inquiry into information that downtime on the Customs Service computer coincided with the arrival and departure of some 60 criminal suspects during the last 12 weeks. The Federal Police, however, deny there is any such problem, while publicly admitting that the system sometimes suffers from the "hiccups."

MELBOURNE, Australia — The First Pan Pacific Computer Conference will be held here Sept. 10-13. Show sponsors at the Australian Computer Society and the International Federation of Information Processing expect more than 150 vendors at the conference, whose theme is "Software — The Driver." Some 126 technical sessions will be offered.

STOCKHOLM — The president of one of Sweden's largest software houses has called for government aid in developing and distributing software. "The Swedish state should help with the development costs through subsidization," said Magnus Larsson, president of a software company called Expander.

STOCKHOLM — The Swedish committee on copyright protection is preparing a report that is expected to advocate extending copyright coverage to computer software and semiconductors. The government will make the final decision concerning adoption of the committee's recommendations.

SINGAPORE — A joint venture set up here by Burroughs Corp. and Detroit-based Yojna, Inc. will be the first software company here to be granted a five-year tax holiday under a government incentive plan called Intec, established by the country's National Computer Board. The company, called Burroughs Cyberware Ltd., will conduct applied research and development into two existing product families — Global and Local-Area Communications Executive and Prototyping Environment Utility System — which Yojna has been developing for some years in Detroit.

MUNICH — The German Postal Telegraph and Telephone (PTT) authority has approved a test run of a voice/mail system, scheduled for April 1986. The voice/mail system would enable transmission of time-delayed messages from computer workstations. Three companies won contracts for the equipment involved in the project: Siemens AG, Standard Elektrik Lorenz AG and German Telephone Works and Cable Industry AG.

CANBERRA, Australia — The federal department responsible for providing policy advice on uranium-related and nuclear issues has publicly admitted that its computer system is vulnerable to sabotage by antinuclear extremists and that it has no formal backup plan. A strategic plan published by the Resource and Energy Department said that complete loss of this system due to sabotage is possible.

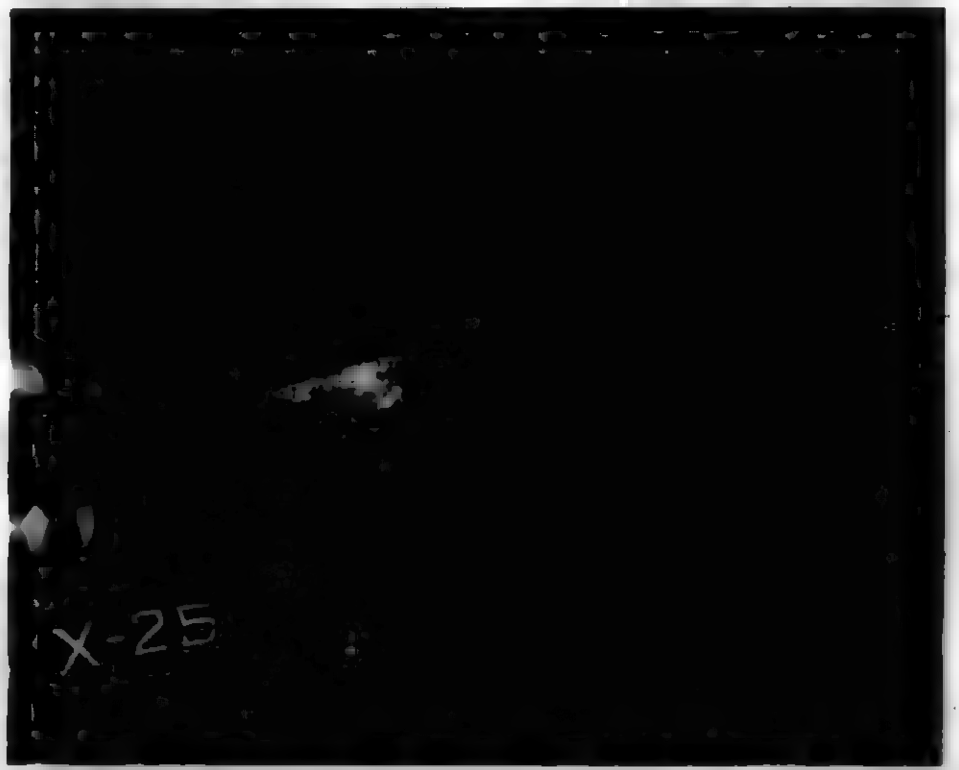
The department relies for emergency backup on Prime Computer, Inc., its computer supplier, and other government departments. Furthermore, the department felt that having two identical versions of its Prime minicomputer — both on the same site — served as partial backup.

COLOGNE, West Germany — Profits jumped 42% for fiscal year 1984 at Honeywell Bull AG. The German subsidiary of the French Groupe Bull earned $7.2 million, up from $5 million in 1983. The company predicted continued growth for 1985. Revenue for 1984 increased 10% to $138 million. Large systems accounted for an additional 29% of this revenue, while minicomputers, workstations and terminals amounted to 20%.

SYDNEY, Australia — Wicat Systems of Australia is claiming some of the credit for Wicat Systems, Inc.'s return to profitability during the June quarter. The U.S. parent company reached $110,000 in profits on $9.7 million revenue in that quarter, the first time it has made a profit since becoming a public organization two years ago. A spokeswoman here explained that the Pick operating system, ported to Wicat hardware by the Australian company in 1983, had been selling well since its U.S. release in March.

MUNICH — In a race to grab future customers, Siemens AG and AT&T have been crisscrossing the Atlantic recently to expand their businesses on each other's home turf. Siemens has created facilities in Boca Raton, Fla., while AT&T has launched Microelectronics GmbH here in Munich with a former Siemens executive at the helm. Seimens already has some 15,000 people at work in Boca Raton's Seimens Communications Co. Both companies are expected to concentrate on the telecommunications and office automation markets.

The LAN's IBM Mainframe Connection



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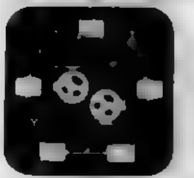

Auscom, the recognized leader in IBM mainframe channel interfacing, provides the capability of attaching the LAN of your choice directly to any IBM or Plug-Compatible mainframe. This allows you to access the host at your LAN technology speed instead of settling for slow-speed serial connections. Auscom offers a variety of field-tested solutions to meet your network-to-host requirements, including end-user interface units and board-level products for integration into OEM networking systems.

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NEWS

TURNAROUND TIME

Larry Long

***Q** I am responding to a letter in your column in which a disgruntled person was complaining about the treatment received from a headhunter. The complaint arose from the agent's lack of respect for the candidate's wish that the agent not contact a certain firm.*

It is unforgivable for any agent to disregard the wishes of the candidate he represents. A candidate should never work with an agent who will not respect a legitimate request. Tell the agent what you expect, and send the agent the demand in writing. If the agent does not acquiesce to this demand, turn him in to the governing state agency.

In the many years we have been placing computer professionals, we have never sent a resume until we first get in touch with our candidate and determine that we have a mutual agreement that the position is suitable. Technically, the resume belongs to the candidate, and we treat it as such.

Please inform your readers to demand that their agents inform them prior to sending any resumes and that they work as a team. If an agent will not agree to these terms, dump him.

It is unforgivable for many professionals — lawyers, computer specialists and a host of others — to do what they do, but they do it anyway. They will continue to do it as long as we let them get away with it.

I invite any readers who feel they have been treated in an unethical manner by a search firm to let it be known. Let's see what can be done to eradicate the unethical elements in this business.

***Q** I am a [U.S.] citizen, reside in Europe and work at the computer technician level for a U.S. multinational company on an expatriate basis. I have made a decision to leave my company but wish to remain in Europe. Could you advise me how to find other U.S. companies and interest them in offering me a job on expatriate terms?*

I wish I could be more encouraging, but you may have better luck if you seek employment with a European firm.

Virtually all multinational companies operating in developed countries prefer hiring foreign nationals at the operational levels.

Most European assignments are awarded to middle and upper management personnel whose future positions in the U.S. will require some international exposure.

Your best bet may be to conduct your search in Europe, just as you would conduct a similar search if you were in the U.S.

***Q** My husband is currently a systems manager at our company's headquarters. I work as an administrative assistant in the personnel department. My husband was recently offered a promotion, with a 50% increase in salary, but we would have to move to a regional office in the Midwest.*

Under normal circumstances, the company would be willing to transfer me as well, but since my husband will have authority over all departments that would hire secretaries and administrative people, they said that I would not be able to transfer to that office.

My husband wants to go, but I'm having second thoughts. If they can transfer other husband and wife teams, why not us?

Most companies will not permit a situation where one spouse can in any way influence the performance evaluation of the other. It may be a while before opportunity knocks a second time for your husband. If he turns down this position because you will not be retained, company executives will consider his decision to be poor judgment and will be reluctant to offer such a promotion in the future.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

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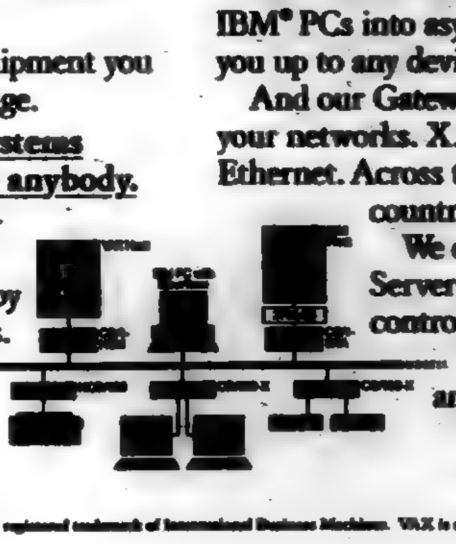

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CALENDAR

WEEK OF SEPT. 22

SEPTEMBER 22-26, BOULDER, COLO. — **Intelligent Building and Information Systems.** Contact: Tom Cross, Cross Information Co., Suite C, 934 Pearl, Boulder, Colo. 80302.

SEPTEMBER 23-24, CAMBRIDGE, MASS. — **Decision Support and Expert Systems: A Developer's Perspective.** Contact: Decision Support Technology, 51 Church St., Boston, Mass. 02116.

SEPTEMBER 23-24, NEW YORK — **TP and Network Fundamentals.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

SEPTEMBER 23-24, SAN FRANCISCO — **Financial Futures, Options and Swaps.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925. Also being held Sept. 30 to Oct. 1 in Chicago.

SEPTEMBER 23-27, HARTFORD, CONN. — **Advanced Systems Analysis.** Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

SEPTEMBER 23-27, KANSAS CITY, MO. — **Basic Systems Analysis.** Contact: Thomas J. Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Oct. 7-11 in Los Angeles.

SEPTEMBER 23-27, SAN FRANCISCO — **Project Management Control Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

SEPTEMBER 26-27, ATLANTA — **Information Centers: End-User Computing.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

SEPTEMBER 26-29, BOSTON — **The Eighth Northeast Computer Faire.** Contact: Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

WEEK OF SEPT. 29

SEPTEMBER 29-OCTOBER 2, CHICAGO — **American Bankers Association (ABA) National Bank Card Conference.** Contact: ABA, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

SEPTEMBER 30-OCTOBER 1, NEW YORK — **Sixth Annual Computer Law Institute.** Contact: Law & Business, Inc., Harcourt Brace Jovanovich, Inc., 855 Valley Road, Clifton, N.J. 07013.

SEPTEMPER 30-OCTOBER 2, BOSTON — **Index '85.** Contact: Independent Expositions, Inc., 786 Rockrimmon Road, Stamford, Conn. 06903.

SEPTEMBER 30-OCTOBER 2, BOSTON — **Information Systems Architecture.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

SEPTEMBER 30-OCTOBER 2, NEW YORK — **Comlease — The Computer Leasing Conference and Exposition.** Contact: Comlease, 3825-1 S. George Mason Drive, Falls Church, Va. 22041.

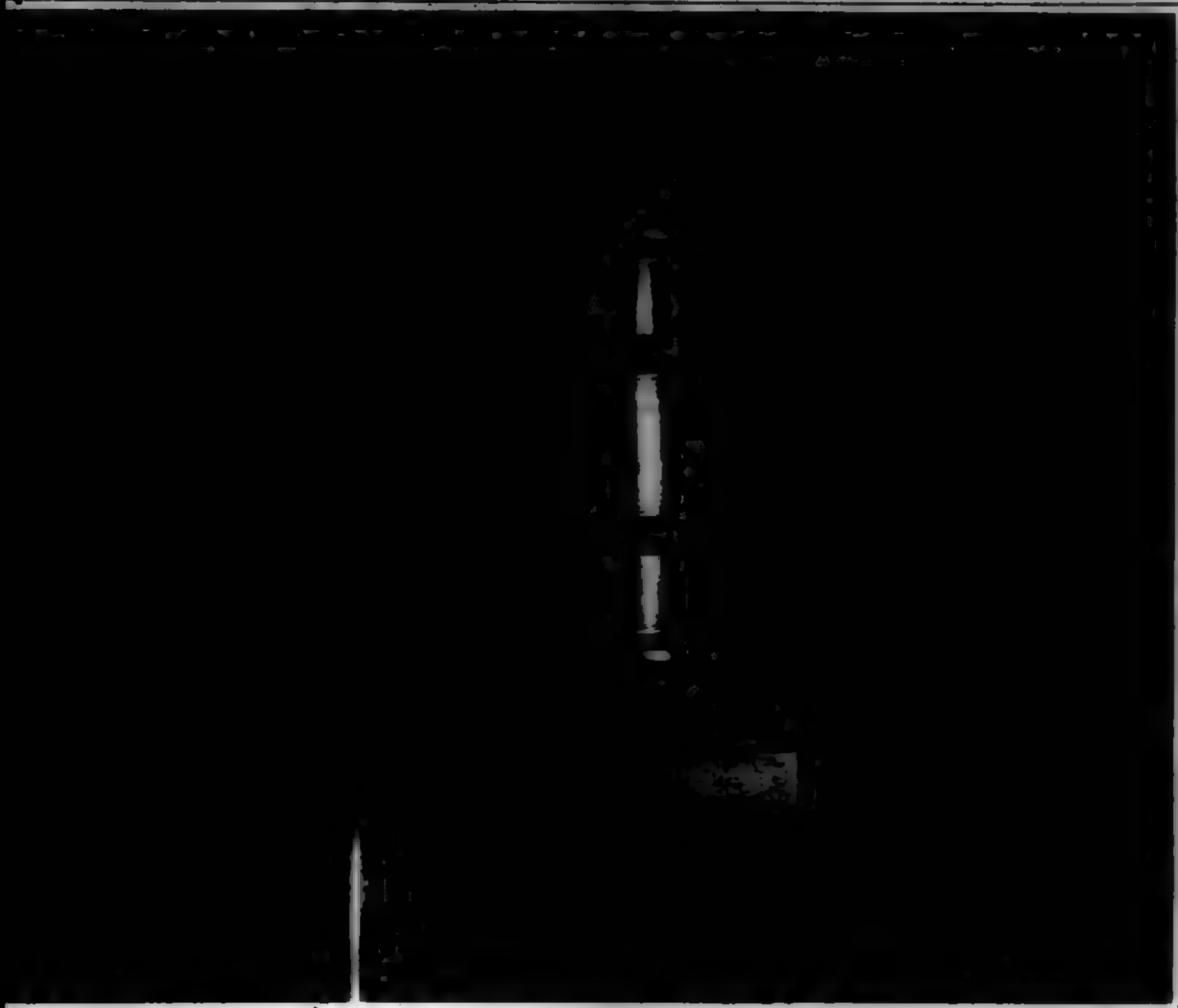
SEPTEMBER 30-OCTOBER 3, WASHINGTON, D.C. — **The Fifth Annual Conference on Control, Audit and Security of IBM Systems.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

SEPTEMBER 30-OCTOBER 3, WASHINGTON, D.C. — **Using Microcomputers in Government.** Contact: U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

SEPTEMBER 30-OCTOBER 4, HOUSTON — **Structured Analysis & Design Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 North Loop West, Houston, Texas 77092.

SEPTEMBER 30-OCTOBER 4, WASHINGTON, D.C. — **Computer Capacity Planning.** Contact: Compumetrics Training Institute, P.O. Box 58383, Houston, Texas 77258.

OCTOBER 3-4, ST. LOUIS — **Federal ADP and Telecommunications Procurement.** Contact: International Data Corp., Washington Division, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102. Also being held Oct. 17-18 in Denver.



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EDITORIAL

Hands off

The legislative busybodies are poking around computers again. Having raised alarms at such prospects as renegade hackers tapping sensitive data bases and foreign snoops using directional antennae to snatch unprotected data from terminal screens, the when-in-doubt-legislate boys are turning their attention to electronic bulletin boards. Their activities deserve keen attention and must be headed off lest the free flow of electronic information winds up outside the purview of basic First Amendment protection.

Bulletin boards are one of the most unique and fascinating phenomena of the microcomputer revolution, frequently providing useful new technical and application data to serious computer users. Alas, they are also used for considerably less noble purposes. Some broadcast obscene messages, others list purloined computer passwords and network access codes. Indeed, computer security experts estimate that there are at least 1,000 underground bulletin boards that traffic exclusively in illegal topics.

People *do* abuse freedoms. Always have, always will. They do it in newspapers, they do it on highways. Typically, those people are in the distinct minority and are best ignored unless and until they do serious injury to others.

Electronic bulletin boards, however, are not being ignored. *Computerworld*'s Washington, D.C., bureau has recently looked into this story and uncovered some unsettling developments.

At the federal level, Sen. Paul S. Trible Jr. (R.-Va.) recently introduced a bill (S. 1306) banning pornographic messages from computer bulletin boards. In particular, Trible wants to close down "sex talk" computer services and networks run by alleged child molesters who share information about their victims.

At the state level, California is leading the way. A bill introduced by Sen. John Doolittle (R-Calif.) would make it illegal for anyone to place a password, access code or financial account number on a computer bulletin board without authorization. It would also make the system operator liable for permitting the information to remain on the bulletin board after being notified that it was unauthorized.

These represent misguided attempts to harness change by putting it into a legislative straitjacket. Electronic bulletin boards — like newspapers and books — should have First Amendment protection. They are a legitimate medium for transmitting essential information that should have First Amendment protection. Efforts to regulate this form of electronic publishing could have a chilling effect on free speech, especially in its effect of prompting operators to censor their bulletin board offerings out of fear of legal prosecution.

A far better overall approach is the one taken by the computer crime committee of the Data Processing Management Association (DPMA) in its model computer crime bill. This proposal urges aggressive pursuit of those who use bulletin boards to engage in illegal activities and proposes to outlaw "aiding, abetting, conspiracy and/or solicitation of a computer crime," such as by posting a computer password or network access code on an electronic bulletin board.

The DPMA approach seems, by far, the most reasonable solution to an admittedly awkward problem. The label of illegality must never be applied to information in a free society. That is too easy and too dangerous a step to take, even when confronted with the threat of personal computers, modems and telephones in the hands of miscreants.

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OBVIOUSLY THEY'RE GONNA NEED OUR HELP!
THE "BIG BOYS"
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Computerworld

LETTERS

Users responsible for Unix survival

In the article, "AT&T's Unix: the formula for revolution?" [CW, July 8], few people view Unix as a replacement for MVS or anything else. Rarely do information systems replace something else. They migrate or coexist, depending on the type of processing.

Second, the statement in the article saying that manufacturers' "hardware would become a commodity" is one of the major reasons why Unix will survive. The other reason is also commodity-driven: well over half of today's computer science graduates are trained in C and wouldn't dream of working in traditional programming languages.

The Unix market is no different than any other save for two critical factors — users do not have to be manufacturer-dependent, and the already low supply of computer science graduates who are Unix-trained.

For once, the users may be in the driver's seat.

Paula J. Brooks
McLean, Va.

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VIEWPOINT

The future of mid-range systems

LECHT ON SCIENCE
Charles P. Lecht

In my last column, I suggested that there are still opportunities for small systems, especially if planners focus on creating easy-to-use, special-purpose tools rather than on general-purpose systems needing laborious applications programming. At a time when sales are sagging and manufacturers are failing, this may have seemed the witless remark of an unbridled optimist.

My latest prognostication may be every bit as hard to accept: Despite recent reports of dwindling profits in companies that manufacture mid-range systems, I forecast that this will change because of reasons similar to those I cited when discussing the small systems picture.

I never denied that small systems as we have conceived of them must face diminishing sales. I based my optimism on the fact that the technology influencing small systems product offerings is undergoing rapid change; the result is a new class of products that do less but do it with less fuss. I concluded that because of this, more people than ever before would purchase the powers such small systems provide.

So what about the future of mid-range systems? First, my definitions: A small system is one that can't do too much, or if it can, it can't do it too fast. A mid-range system — sometimes called a medium system — is one whose processing powers exceed those of small systems and are less than those that can be obtained in others of the same genre.

Until recently, medium systems technology was consigned, for the most part, to the role of providing bigger versions of small general-purpose computer systems — but not the biggest that could be had. In the good old days, the 1950s and '60s, no one could have misunderstood what bigger meant. Then, small, medium and large systems were defined by size considerations of a highly conventional nature.

In these times, defining a system as big or small is risky business; all kinds of conditional complexities have entered the picture. Nonetheless, if you accept the idea that mid-range systems exist, whatever criteria you use to identify them, I can argue that these offer the greatest potential in the data processing systems area.

Mid-range systems will see a vast improvement in sales when very basic premises that influenced past design are removed. Thus I suggest that designers who overcome their compulsion to view these as nothing more than bigger versions of small systems will likewise see vast improvements in the sale of their products. The reason: two recent events that have forever changed our DP world.

The first, distributed systems technology, was born within the computer industry as systems designers realized that the miles of cabling inside their computer inventions could be uncoiled. When the cabling was uncoiled, it allowed a system to be distributed over increasing areas and ultimately to be linked to other systems by preexisting, in-place networks of communications companies.

The second was the inevitable synthesis of the computer and communications industries as the latter continually increased the intelligence — a euphemism for computer technology — in their networks. Both events created the impetus for Integrated Services Digital Networks (ISDN) — small to large and everything in between.

From here on, the ISDN are the new family of general-purpose computer systems. The heretofore discrete but general-purpose systems technologies — desktop, small, mini, midi (mid-range), maxi and super will become ever more specialized. And it's my guess that the mid-range will, by dollar volume, exceed all others in its command of our collective data processing hardware expenditures.

Within the framework of the ISDN, these systems will play the vital role of mediation once found within the cabinet of a single CPU but now distributed all over the place. This includes the roles of net and device controllers, file servers, data base machines, concentrators, nodal processors, convertors, switching subsystems and so on.

By tending to flocks of terminal devices while servicing the needs of massive supercomputers as I/O data staging devices, the mid-range computer is destined to be the workhorse of the ISDN, whatever its size.

The new role of these systems is in some ways confounding to people inside and outside the computer industry. Having been bombarded with notices of astonishing change in small and large systems technologies, many seem to have concluded that there is no role for the mid-range in the scheme of things; therefore, it is on its way to becoming extinct.

Some seem to have adopted the belief that only bipolar data processing environments — massive machines servicing very small terminals — are in our future. I vigorously dispute this; there is no precedent for the bipolar theory. Even in telephone systems technology, local exchanges, or mid-range in this context, far exceeded in number the larger systems to which they were attached and, in dollar value, these and the sea of telephones that they served.

The role of mid-range systems technology is brighter than ever. We'll not be able to scale the ladder of data processing possibilities, bottom to top, with its middle rungs missing.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Microcomputer support: headache or gold mine?

MANAGEMENT MATRIX
Walter F. Cuirle

Microcomputers have been around for only about eight years as a consumer item. As an affliction in the day-to-day life of the MIS manager, they have an even shorter tenure — about five years. A great deal has happened in that time: vendors and services that seem to have been around forever but haven't, companies that seemed as if they would last forever and didn't.

MIS managers reacted in a variety of ways while all of this was going on. A few pulled the wagons in a circle and tried to fight off the onslaught. They were buried with their punch cards. Others disdained the new toys, retreated to their raised-floor temples and held fast to the attitude of the good old days when the data processing world was divided into the Initiates and the Rabble. The Rabble went on without them.

Nowadays, what seems to have evolved in most companies is an understanding that corporate MIS will handle corporate affairs and leave the various departments or divisions to make their own individual decisions on whether to implement microcomputers and how to do it. It's as if the MIS motto has become, "If it doesn't talk to the mainframe, don't talk to us."

That's a shame. The whole industry still has the fervor of a gold rush. And in a gold rush, it is not the miners who make the fortunes but the folks who sell support.

Take a look at the vendors of the popular microcomputer applications packages. They manufacture the pickaxes, lanterns and shovels in this gold rush. They would love it if their job was done when the package was delivered. Unfortunately, that's not the case — that new buyer may not be comfortable with the machine, is usually in a big hurry and probably didn't read the manual. So the vendor gets a telephone call. And then another. As the program's popularity grows, there are more and more calls.

Many vendors have been offering free support up until now, but that is likely to change. Aside from sheer volume, consider the problems that vendors have in handling customer support. Many calls describe problems having little or nothing to do with the applications package itself. For example, the caller may simply not understand subdirectories.

In cases where the problem does have to do with the package, the answer is often in the manual. In those cases where calls are free, there are inevitably users that overdo it and call about every little thing.

More sophisticated callers may have more interesting questions, but those calls may have to do with some arcane aspect of the caller's business that is unknown to the vendor's technical representative. The better the sales, the more calls there will be, but, because support represents a loss of revenue to the vendor, staffing is apt to lag demand. The result is a long queue of impatient customers.

No wonder vendors want to start charging for their trouble. Different fee structures are being considered. So far, there have been proposals for charges by the minute or by the call as well as for a yearly support contract. There will undoubtedly be other ideas. This is where corporate MIS comes in. If your financial organization allows it, there could be chargeback gold in them thar phone calls.

What can you offer that the vendor can't? Familiarity, for starters. Look at your experience in supporting users of your systems. The vendor's technical representative has to handle any kind of configuration that comes down the road and will necessarily have to start the call by getting basic information. Your organization has the advantage of knowing, or at least being able to find out, exactly who has what. As a result, you can be prepared to handle questions more effectively.

Unlike a vendor's ever-increasing volume, your novice users are likely to come in blocks — 20 this month as one department buys, 30 next month as another buys. You should be able to find out from the various departments what packages are being considered and when a decision will be made. In short, you have a more predictable user base; that potentially means better planning, closer margins and lower overhead.

Finally, you can probably offer single-source support, one call for any problem. Your own support people are already experienced in dealing with these users and their quirks. Because they now support the in-house systems, they also know what is available there.

Naturally, there is a lot of preparation to be done before you can make this idea work, but take a hard look at the situation. Suppose one of your own corporate departments is looking for a telephone support contract for its microcomputer users. Who really has the most to offer? Your own support group or a potpourri of vendor reps? Answer the telephone — that's opportunity calling.

Cuirle is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

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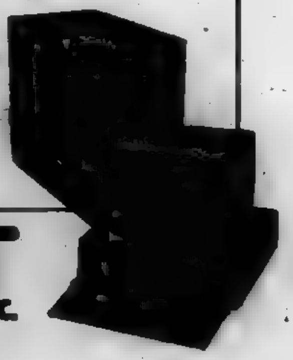

Hardware Roundup

By Donna Raimondi CW Staff

A look at 32 systems from 19 vendors

When Seymour Cray unveiled his Cray-1 supercomputer in 1976, many scoffed at its $7 million price tag, claiming that only a select few would ever be able to afford such an outrageous machine. Scientific computing was thought to be a profession reserved for ivory tower researchers and top secret government think tanks.

The times have changed. In the past three years, scientific — number-crunching-oriented — computing has found its way into many commercial DP shops.

A voracious demand for simulations and modeling, particularly among companies involved in designing highly technical products, has made scientific-oriented processors a staple.

Furthermore, the emerging artificial intelligence genre of applications is opening up marketplaces for parallel processing systems — series of CPUs that can either work on several problems at once or divide one big problem into several smaller parts for more efficient processing.

Users still balk at price

Users clearly still balk at the multimillion-dollar price tag of supercomputers, but more of the highly specialized systems are turning up in what are generally regarded as commercial applications.

Oil exploration firms are using the machines to analyze satellite data; auto manufacturers are using supercomputers to simulate auto crash tests; and the movie industry has discovered supercomputers as an ideal tool to produce highly sophisticated graphics.

Recent high-end mainframe announcements from IBM, Burroughs Corp. and Honeywell, Inc. — all of which have prices pushing the $10 million mark — have softened the sticker shock of supercomputers for some users. But for the many who still cannot justify or who cannot afford a supercomputer, a new niche market has developed.

Systems at a fraction of the speed, price

In recent months, there has been a rash of smaller, scientific-oriented computer systems announced that offer processing capabilities similar to supercomputers but at a fraction of the speed and price.

This week's Hardware Roundup focuses on an admittedly mixed bag of systems. For the first time, supercomputers have been added. The second part of this week's installment is devoted to superminicomputers that appear to have either a scientific bent or that appeal to a specialized audience.

It is in this second group where the distinctions among processor types can become sticky. For example, most vendors in this group claim their systems can be used for both scientific and commercial applications. Vendors of parallel processors, for example, would argue their systems are not so much special purpose but built with special architectures.

Computerworld agrees that the groupings as laid out are not perfect but are designed only to present the systems in some kind of order. The categorizations are not meant to be a buyer's guide but only to enable readers to look at similar systems all in one place.

> ”
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> *Scientific — number-crunching-oriented — computing has found its way into commercial DP shops. A demand for simulations and modeling has made scientific-oriented processors a staple.*

Four basic types of superminis

Included in this group are four basic types of superminicomputers: scientific oriented, machines with parallel architectures, transaction processing systems and reduced instruction set computer CPUs.

Supercomputers can be defined as machines that have efficient and fast vector processing, usually (but not always) using 64-bit precision. The million floating-point operations per second (Mflops) measurement that sets supercomputers apart from mainframes could arbitrarily be set at the 160 to 200 Mflops range. That definition, however, does not cover machines like Denelcor, Inc.'s Heterogeneous Element Processor, which is a scalar parallel processor that is less powerful than a traditional supercomputer but is significantly more powerful than the average parallel processor.

The past year has produced a crop of new supercomputers.

Cray Research, Inc. introduced its Cray-2, said to be 12 times faster than the Cray-1 machine. Amdahl Corp. unleashed both a low-end model, the 500, and its top-of-the-line 1400 model in one announcement.

Parallel processors

A number of parallel processing machines — including offerings from Encore Computer Corp. and Alliant Computer Systems Corp. — theoretically offer supercomputing power in their largest configurations.

Parallel processors may well be the fastest growing segment of the computer industry. They are used primarily for scientific purposes, as they make excellent number crunchers. Some manufacturers claim that they will be suitable for all kinds of applications once software is available to take advantage of their parallelism.

To that end, researchers are trying to work out methods of unleashing the inherent power in the systems.

Intel Corp., for example, has distributed a number of its ISPC concurrent processors to universities and supercomputer research agencies that will explore applications and algorithms in concurrent processing.

Fault-tolerant transaction processing systems include those manufactured by Tandem Computers, Inc., Stratus Computer, Inc. and Sequoia, Inc.

The past year has been a rough one for the transaction processing vendors. Auragen, Inc. and Synapse, Inc. both fell upon economic hard times. IBM got into the transaction processing act with its System/88, basically a renamed version of the Stratus/32 (hence not included in the Hardware Roundup). Other vendors, such as NCR Corp. and Digital Equipment Corp., also appear to be testing the fault-tolerant waters by developing methodologies for linking current systems in a fault-tolerant configuration.

Reduced instruction set computers — including Ridge Computers and Pyramid Technology Corp. machines — attempt to produce a more efficient system's architecture by streamlining the system instruction set in such a way that most internal operations can be carried out within one machine cycle. The architecture appears to have a bright future but may have some early limitations because of compatibility problems with existing systems using more cumbersome instruction sets.

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Supercomputers

Cray Research, Inc.

Flops¹	1.6G	1.4G
Purchase Price (In Millions)	$17.6	$5-$14
Channels (Minimum-Maximum)	4-40	7-42
Operating System	AT&T Unix System V	Cray COS
Bus Architecture	No	No

ETA Systems Inc.

Flops¹	50M-800M
Purchase Price (In Millions)	$6-$15
Channels (Minimum-Maximum)	8-16
Operating System	Control Data Corp. Vsos
Bus Architecture	No

National Advanced Systems Corp.

Flops¹	50M	50M
Purchase Price (In Millions)	$1.8-$2.5	$3.8-$4.7
Channels	8 or 16	16
Operating System	IBM MVS/XA, VM/370, MVS/SP	MVS/XA, VM/370, MVS/SP
Bus Architecture	No	No

Convex Computer Corp.

Flops¹	60M
Purchase Price	$495,000
Channels (Minimum-Maximum)	1-160
Price per 1M Byte of Main Memory	$6,000
Number of Processors	1

Denelcor, Inc.

Mips¹	16-256
Purchase Price (In Millions)	$1.4-$4.72
Channels (Minimum-Maximum)	1-128
Operating System	Denelcor HEP/UPX
Bus Architecture	No

Amdahl Corp.

Flops¹	133M	1.14G
Purchase Price (In Millions)	$4.9-$9.7	$12.5-$21.8
Channels	16 or 32	16 or 32
Operating System	Fujitsu Ltd. VSP	VSP
Bus Architecture	No	No

Specialized superminicomputers

Encore Computer Corp.

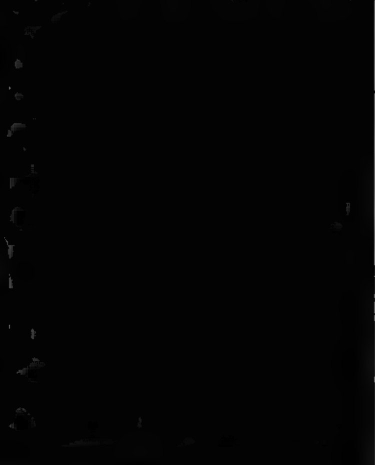
Characteristics \ System	Multimax
Mips[a]	1.5-15
Purchase Price	$125,000- $800,000
Channels (Minimum-Maximum)	1-10
Price per 1M Byte of Main Memory	Not available
Number of Processors	2-20

Tandem Computers, Inc.

Characteristics \ System	NonStop TXP	NonStop EXT	NonStop II	NonStop 1+
Mips[a]	4-32	1.6-3.2	1.6-12.8	1.4-11.2
Purchase Price (Memory Size)	$322,000 (4M)	$120,000 (2M)	$156,000 (2M)	$88,000 (1M)
Channels (Minimum-Maximum)	32-256	32-64	32-256	32-256
Price per 1M Byte of Main Memory	$4,800[b]	$7,800[c]	$7,800[c]	$7,800[c]
Number of Processors	2-16	2-4	2-16	2-16

Intel Corp.

Characteristics \ System	iPSC
Mips[a]	25-100
Purchase Price	$150,000- $520,000
Channels (Minimum-Maximum)	1-3
Price per 1M Byte of Main Memory	Not applicable
Number of Processors	32-128



Sequoia Systems, Inc.

Characteristics \ System	Sequoia
Mips[a]	2.5-50
Purchase Price (Memory Size)	$200,000 (4M)
Channels (Minimum-Maximum)	2-96
Price per 1M Byte of Main Memory	$8,500
Number of Processors	2-64

Sequent Computer Systems, Inc.

Characteristics \ System	Balance 8000
Mips[a]	1.4-7
Purchase Price	$50,000- $250,000
Channels	16
Price per 1M Byte of Main Memory[c]	$3,800
Number of Processors	2-12

Flexible Computer Corp.

Characteristics \ System	Flex/32
Mips[a]	1[b]
Purchase Price	$128,000
Channels (Minimum-Maximum)	1[b]-20
Price per 1M Byte of Main Memory	$6,000
Number of Processors	2-20

Norsk Data AS

Relative Performance[d]	408
Memory Size in Bytes (Minimum-Maximum)	1.5M-160M
Machine Cycle Time (Nsec)	120
Cache (Buffer) Size	64K
Operating System	Norsk Sintran or AT&T Unix 4.2
Bus Architecture	Yes

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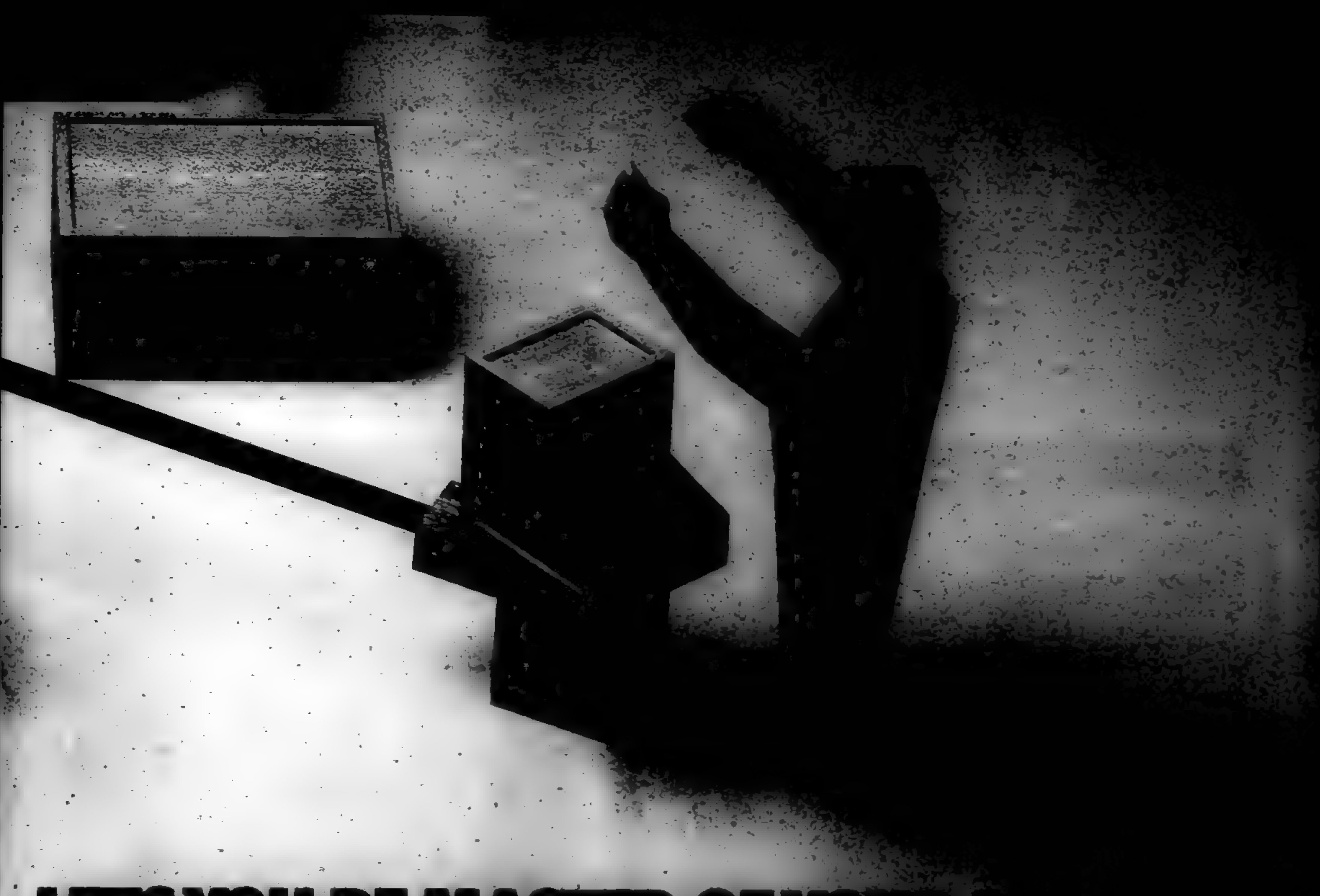

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Ridge Computers

Characteristics / System[1]	100 family	300 family
Mips[2]	0.7	0.7
Purchase Price	$39,000- $75,000	$56,000- $100,000
Channels	8	16
Price per 1M Byte of Main Memory	$3,250	$3,250
Number of Processors	1	1

[illegible]

Stratus Computer, Inc.

Characteristics / System	Stratus/32 FT 200	Stratus/32 XA 400	Stratus/32 XA 600
Mips[2]	0.9	2	3
Purchase Price (Memory Size)	$115,000 (4M)	$185,000 (4M)	$270,000 (4M)
Channels (Minimum-Maximum)	1-24	1-24	34
Price per 1M Byte of Main Memory	Not available	Not available	Not available
Number of Processors	2	4	6

[illegible]

Pyramid Technology Corp.

Characteristics / System	98X[1]
Mips[2]	5.4
Purchase Price	$260,000- $500,000
Channels	4
Price per 1M Byte of Main Memory[3]	$5,000
Number of Processors	2-4

[illegible]

Elxsi

Characteristics / System	System 6400
Mips[2]	6-60
Purchase Price	$389,000- $1.5 million
Channels	128
Price per 1M Byte of Main Memory[3]	$6,500
Number of Processors	1-10

[illegible]

Computer Designed Systems, Inc.

Characteristics / System	Advisor 32/60	Advisor 32/80	1400/32	1800/64
Mips[2]	4.2	14.6	2.6	3.5
Purchase Price[3] (Memory Size)	$290,000 (1M)	$290,000 (1M)	$263,000 (256K)	$326,000 (256K)
Machine Cycle Time (Nsec)	125[4]	125[4]	200	100
Cache (Buffer) Size	256K	256K	16K	32K
Price per 1M Byte of Main Memory	$62,000	$62,000	$24,800	$24,800

[illegible]

Alliant Computer Systems Corp.

Characteristics / System	FX/8	FX/1
Mips[2] (Flops[3])	4.45-35.6 peak (94M peak)	4.45 (11.8M)
Purchase Price	$270,000- $1 million	$132,000 base
Channels (Minimum-Maximum)	1-12	1-2
Price per 1M Byte of Main Memory	Not available	Not available
Number of Processors	1-8	1

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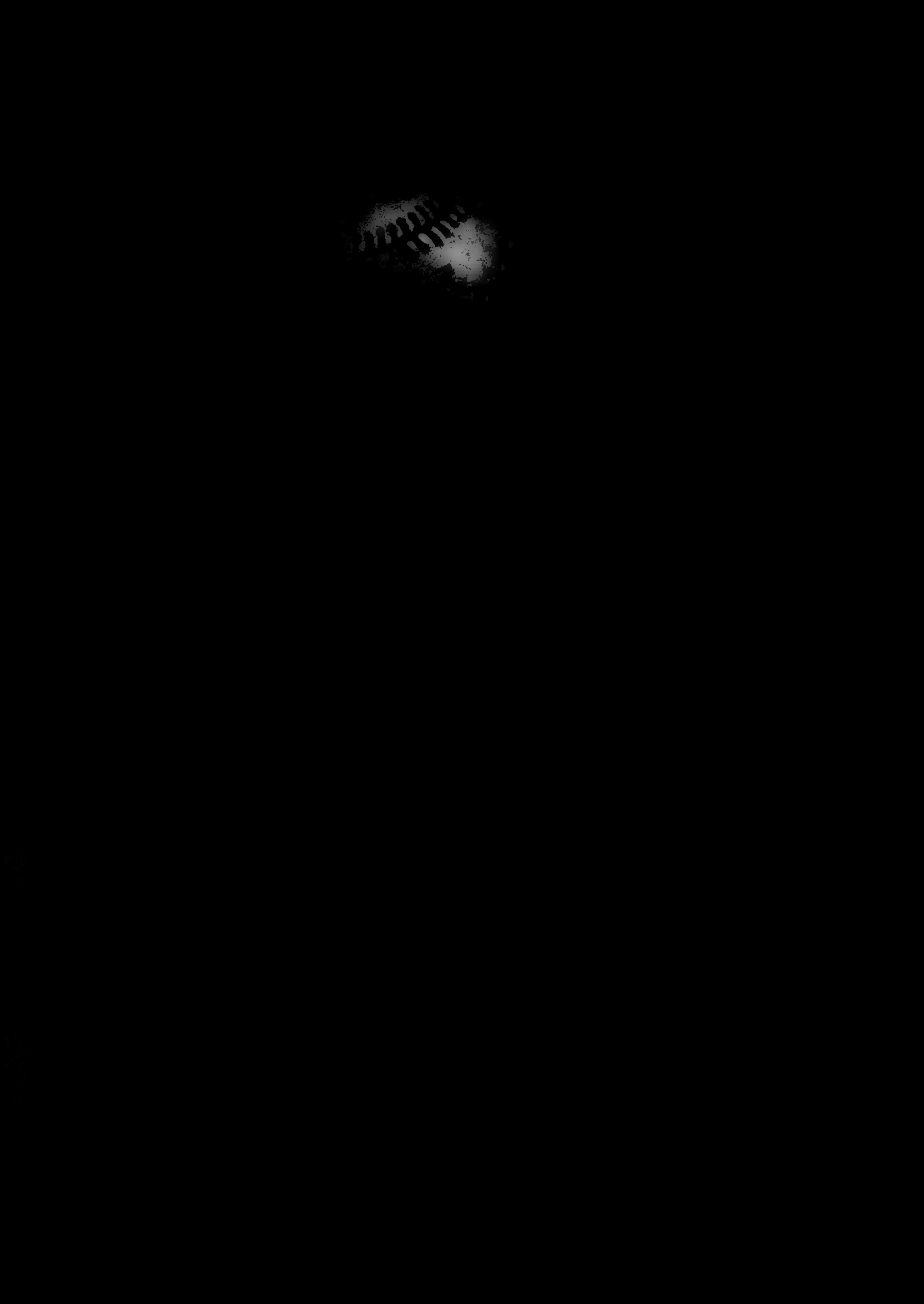

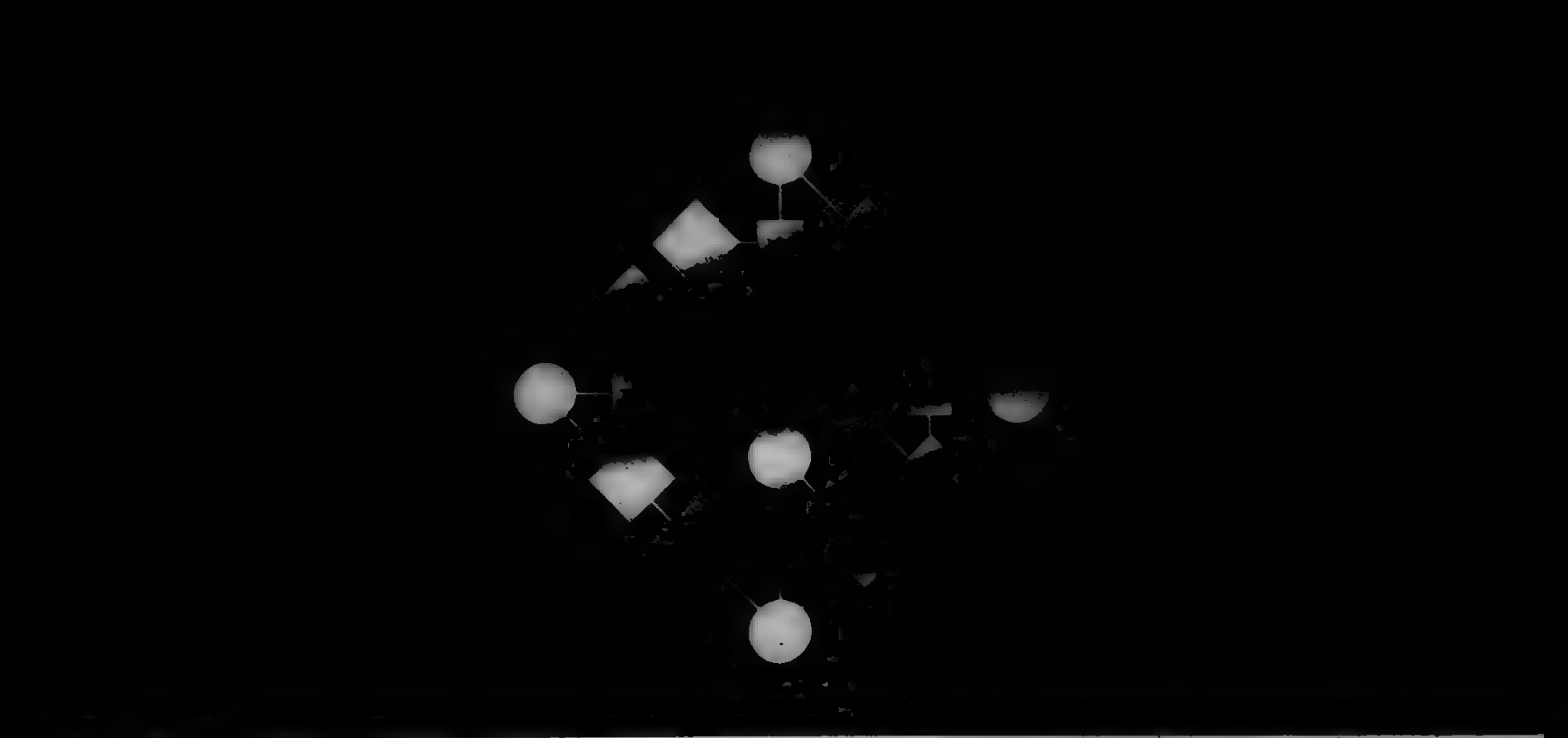

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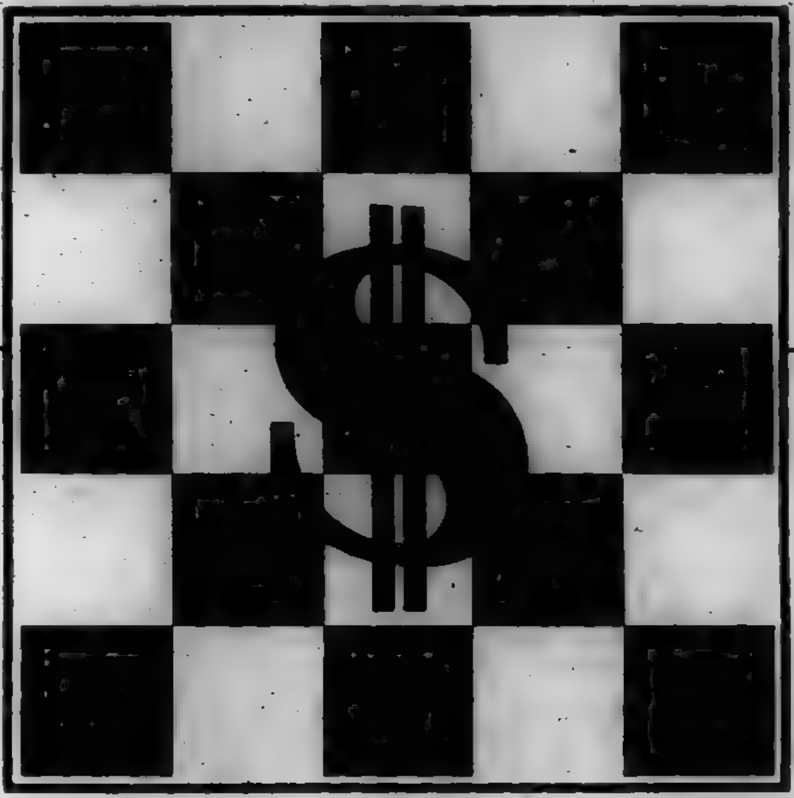


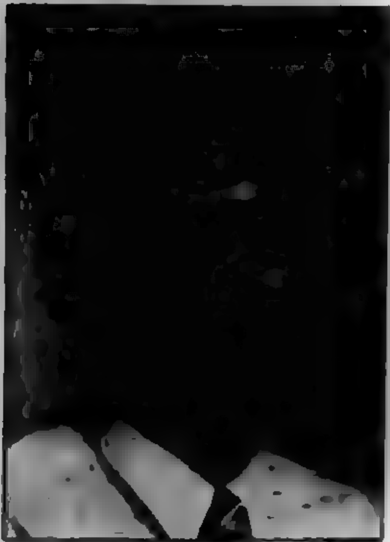
High-tech directorates: The Board Game

By James Connolly
Special Projects Editor

John Cullinane, where are you?

A suddenly successful, five-year-old minicomputer manufacturer that just went public needs help. The young company's chief executive officer is unsure how to manage 40% annual growth. Headhunters are recruiting his key technical people. His product is a star today but may be forgotten tomorrow, so he must envision new product lines into the 1990s.

The manufacturer and CEO here are fictitious, but if real they would need the guidance and advice of an executive who has survived start-up, boom and stabilization. The company would have a seat on its board of directors for a John Cullinane, chairman of Cullinet Software, Inc., or a similar executive who has practical



Foster

business experience and knows the high-technology marketplace.

"If I am going to add someone, I want someone who has faced the problems that I am going to be facing over the next few years," says Stratus Computer, Inc. President William Foster. "If now and then a person came along with very good experience, then we might take him on. We would look at a chief executive officer who has been through the rapid growth we are going through, which probably means it would be someone from the high-tech field."

Foster, whose Marlboro, Mass., company produces fault-tolerant superminicomputers, was the first of three computer company executives to cite "someone like John Cullinane" as the type of director who could help them manage their firms.

The demand for board members with experience in high-tech management is one trend emerging from computer company boardrooms, where decisions are made that affect not only each company but also the industry, the user-customer, the investor and the communities where the company operates.

A board of directors — an often unrecognized entity — faces decisions as outwardly simple as upgrading an employee benefit package or as complex as firing the CEO or withdrawing investments from South Africa.

Typically, a board meets every other month to perform such tasks as reviewing budgets, receiving briefings on new products and planning corporate expansion. In addition to regularly scheduled meetings, directors sit on specialized committees that focus on such topics as audits or compensation. These committees of three or four perform much of the preliminary work and fact-finding for the board as a whole.

A job as director can approach the status of volunteer work for wealthy executives. Directors typically receive stipends that may total $30,000 to $50,000 per year plus travel expenses. In some less successful companies, the pay consists only of risky stock options.

The composition and powers of boards of directors in the computer industry vary greatly, determined by factors such as company size, philosophy, age and recent business success.

"Today there is a trend toward much more activism and involvement [with their companies] on the part of the boards, a trend to awareness," observes David Francis, a partner in the New York executive recruiting firm Heidrick & Struggles, Inc.

Throughout American industry for at least two decades there was a well-publicized critical view of boards as the heart of the old-boy network, where company presidents filled paneled boardrooms with near-comatose, white-haired men-friends who blindly endorsed the CEO's actions.

Away from old-boy network

"Corporate governance is getting away from the old school ties. The criticism used to be that becoming a director depended upon how well you knew the CEO, not what you had to offer," says Northwestern University Professor of Management James Worthy, a director of Control Data Corp. Worthy is coauthor of *Emerging Issues In Corporate Governance* (1983, Northwestern University Press).

Francis notes that while many corporations are accepting a variety of people, that doesn't necessarily apply at computer companies.

He says, "It is certainly true that doors are opening for new board members such as professionals, women and minorities. But I think this is more a function of potential board liability than of social activity. Companies recognize that they no longer can have boards that just nod and rubber-stamp when the CEO acts. They want to be more representative of the community."

The liabilities Francis cites include not only societal pressures — such as those exerted by the news media, community groups or stockholders — but also financial liabilities if the company is sued.

"But it's the more traditional industries that may be more interested in maintaining a balance on the board, making sure that there are minorities or females or academicians on the board," he adds. "With technical product companies like computer companies, there is more interest in bringing in people who can contribute on the shorter term, technical people who, even if they can't design a supercomputer, have an appreciation of the market and what the technology business is all about. You have to remember that these companies are in a very dynamic market with short product life cycles."

Comparative youth and the dynamics of the market have left computer companies with boards of directors that are far different from those of banks and manufacturers

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founded at the turn of the century. Only the boards of the most established computer companies, such as IBM, resemble the directorates of more traditional industries.

A company may originally be little more than a founding engineer working on a handshake with seed money provided by a couple of friends, notes George McQuilken, founder of Spartacus Computers, Inc. and now CEO of Language Technologies, Inc., a Salem, Mass., software service firm. "For a start-up company, the time to get serious about your board of directors is when you get your first outside investment," he says.

McQuilken says Spartacus, which he left in 1984, was lucky in that no strings were attached to its first infusion of cash. "[Nixdorf Computer Corp.] was our first major source of capital. . . . What was interesting was that Nixdorf's role was to ask for no role in the company."

Money means seats

Unlike Nixdorf, subsequent investors in Spartacus wanted seats on the board of directors. When six venture capital firms posted a $3 million investment, they demanded three seats on the seven-member board.

McQuilken, another employee and another founder filled three others, and the remaining seat was filled by consensus among the first six.

McQuilken cautions that a start-up should ensure that it has an experienced outside computer industry executive on its board and that its agreements with venture capitalists specify who will represent the investors on the board. Such agreements can prevent the investors' seats from being filled by junior executives of the venture capital firms — executives who don't command the investment community respect accorded senior executives.

Stratus' Foster says, "Most of these companies get started with the help of venture capitalists, who usually want a place on the board. When the companies were private, they generally owned a certain percentage of the stock. After the companies went public, the venture capitalists could choose to stay on if the company continued to go well."

The investor viewpoint

Stratus director Paul Ferri, general partner of Matrix Partners of Boston and one of three venture capitalists on the Stratus board, says that the challenge for a director with a company like Stratus is in "maintaining the entrepreneurial spirit."

He notes, "Our role is an advisory one. It's one where we bring ideas to a company. We're not involved in the day-to-day operations, so we can be more detached in developing ideas."

While the boards of young companies are dominated by venture capitalists, those investors don't always leave four or five years down the road.

At Digital Equipment Corp., four members of the seven-person board — a small directorate for a 28-year-old, $5.5 billion company — have links to the company's venture capitalization in the years before DEC went public in 1966.

Employee input

DEC, like Stratus, is also exceptional in that only one company employee, President and CEO Kenneth Olsen, sits on the board. "He feels we can contribute to board discussions without being voting members. It's one less status symbol. Being a member of the board can turn into that," says Winston Hindle Jr., DEC's vice-president for corporate affairs.

Foster says that at Stratus, he excludes other employees from the board to prevent them from participating in decisions that directly affect themselves.

Of the 127 directors on the boards of 10 leading computer companies, only 38 are current or former company employees. Almost as many are executives with other corporations.

One director who differs with the idea of excluding employees is CDC's Worthy. He says, "I think it is important; in the computer industry in particular, it is very useful to have a strong representation of inside directors because of the technology involved.

"I assure you, as a management person myself, that it is very comforting to have an inside director who knows the technology. It's important that they work with you as a peer, not as

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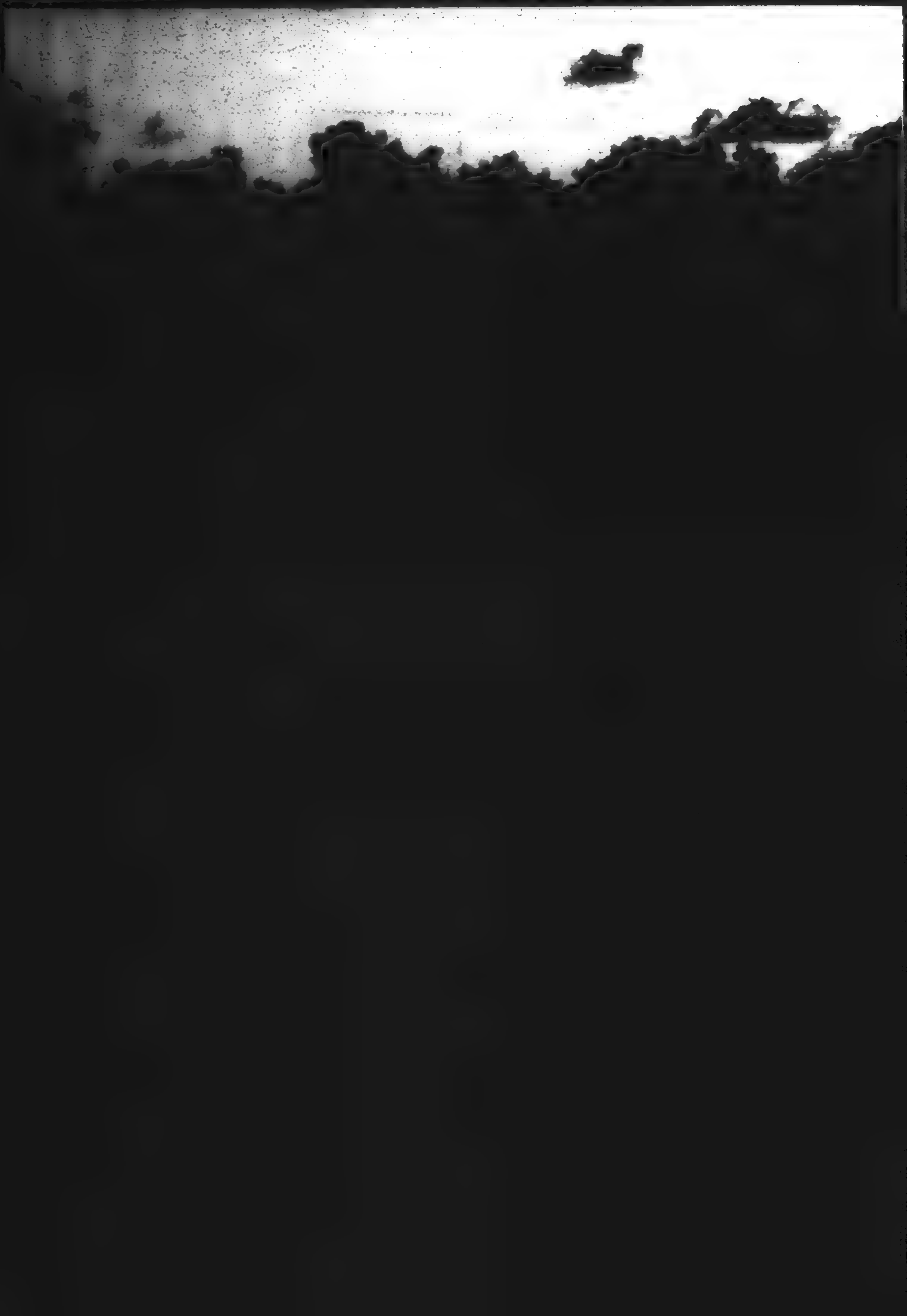

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someone who comes in to make a report and then goes out. They should sit with you and share the responsibility."

Just as directors and executives differ on who should sit on boards, the selection process differs from one company to the next, although the formal process usually has the CEO offering stockholders a slate of candidates for election at the annual meeting.

At some firms, directors are chosen because the CEO has worked with them before. In others, directors recommend directors, as when Ferri suggested that Foster take on Alexander d'Arbeloff, founder of Boston-based test equipment manufacturer Teradyne, Inc. Still others use executive search firms such as Francis' to find directors.

While lawmakers periodically file bills that would set guidelines for governing boards of directors, the primary restrictions remain a Securities and Exchange Commission ban on directors sitting on competitors' boards and a New York Stock Exchange requirement that firms listed on the exchange maintain an audit committee of outside directors.

Worthy notes that interlocking boards — the practice of executives sitting on each others' boards — may have once been popular but is now "very unimportant" — neither a positive nor a negative influence.

However, it is still common to see directors of a single company coming from the same colleges, belonging to the same clubs and working for the same social organizations. Some

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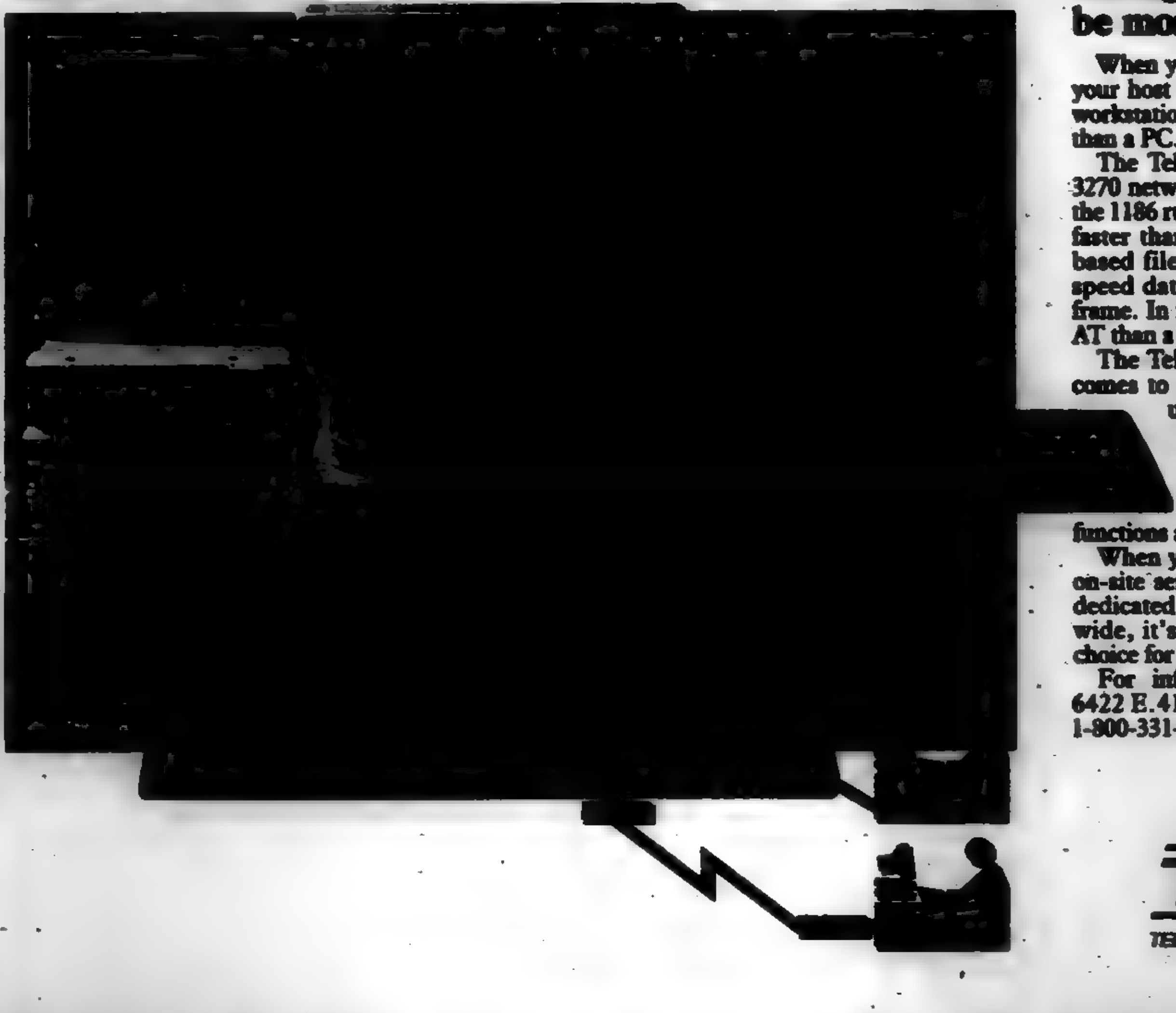

overlap is natural because of regional considerations. For example, California's Hewlett-Packard Co. board is dominated by alumni of a local college — Stanford University — and Boston-area boards are packed with Harvard University and MIT graduates.

Celebrity directors

Heidrick & Struggles' Francis notes that former government officials are added to boards in part for their public relations value and in part because of their familiarity with the government machinery. Two of the more sought-after personalities are former President Gerald Ford and former Secretary of State Henry Kissinger, he says.

Celebrities appear occasionally on the boards of high-tech firms. Cullinane added former hockey star Bobby Orr to the Cullinet board after meeting him during a golf tournament. Within months of U.S. Sen. Paul Tsongas' (D-Mass.) announcement of his retirement last year, he was named a director of Wang Laboratories, Inc.

At Sperry Corp., five out of 10 directors are executives with other corporations, with little apparent emphasis on government experience. But at IBM, six out of 21 directors listed in the 1984 annual report were former Cabinet-level officials.

CDC's 18 directors come from eight major backgrounds — CDC, other corporations, finance, law, education/research, medicine, consulting and government.

Board power

While most executives and directors won't publicly describe their boards as either weak or strong, boards should remain as advisory committees, Worthy observes.

"Typically, the chief executive officer pretty well calls the shots," he says. "He has a large influence on the composition of the board, and the way he relates to the board pretty much defines how the board is going to act. He should be the one who pretty much calls the shots because he is the one who is there every day and is most familiar with the company. But one thing happening in general with respect to power is a shift in the center of gravity to move some of that power toward the board but not to where the power actually rests with the board."

Worthy notes that areas where board power is increasing are in the selection of the chief executive's successor and in strategic planning, particularly in trying to balance long-term and short-term goals. He says that CEOs, who tend to reach the top a few years before retirement and feel pressured to leave their mark quickly, and outside directors lacking in technical skills may be too wary of innovative, risky, long-term ventures. He suggests both may sacrifice innovation in view of the stockholders' demand for near-term return on investment.

Part of planning long-term strategy is the director's assistance in choosing new directors — which Worthy says has happened more frequently in the past five years — and in choosing a successor to the CEO.

Burroughs Corp. director James Fletcher was involved in the 1979 hiring of former U.S. Treasury Secretary and Bendix Corp. executive W. Michael Blumenthal as Burroughs CEO. Fletcher notes, "The toughest decisions as a director are always who the officers of the company are going to be. In the case of Burroughs, we felt that we had to go outside the company to get a CEO.

> ❞
>
> *It is still common to see directors of a single company coming from the same colleges, belonging to the same clubs and working for the same social organizations.*

"Another tough question comes when the CEO can't do the job, which is something we haven't faced at Burroughs. Every time you hire a CEO, you raise the question of what direction the company is going in. Your responsibility is clear. You want to make sure the shareholders are getting their money's worth. That's the mandate. You do have to consider questions like social good, but that's secondary."

Even when fully staffed, the board can be expected to change. McQuilken advises that a board should evolve with the company as the firm moves from its entrepreneurial or start-up stage through its initial sales stage and into maturity.

Hindle says DEC is at that more mature stage, and its board is expanding to handle new challenges. "We feel that as we get larger we have more need for advice and counsel from people who have large-company experience," he says. Olsen took a step in that direction five years ago by adding Ford Motor Co. CEO Philip Caldwell.

However, finding an executive to take a board seat can be the challenge, McQuilken adds. He says that one good thing about venture capitalists is that they regularly attend their board meetings. Outside directors, particularly busy executives, may not have the time when dealing with their own companies, social organizations and other directorships. McQuilken, another who mentioned the name of Cullinane, says, "It's like town government. If you have something that has to be done, you have to ask a busy man."

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Join command bolsters CPF

The recently announced Release 7 of the CPF operating system for IBM's System/38 [CW, June 24] is notable for the addition of the Join operator command to the System/38's relational data base management system.

The Join command is one of three core requirements of a relational DBMS as outlined by Edgar F. Codd, an IBM Fellow of the San Jose Research Laboratory in California, who originated the relational model. When accepting the Association for Computing Machinery's Turing Award in 1981, Codd said relational DBMS technology provides a practical way for DP departments to attack two major problems.

One problem is the need to put corporate data stored in computers directly into the hands of end users. The other is to increase the productivity of DP professionals in the development of application programs. Only by achieving these goals will DP departments meet the rapidly growing demand for new applications, Codd stated.

Robert N. Goldman, president of Cullinet Software, Inc., the leading independent DBMS vendor, contends that while a true relational system requires a Join command, not all DBMS that claim to be relational have it. "Everyone wants to buy relational, so every DBMS has become relational," Goldman observed.

The Join command allows fields from separate records to be linked together as if they were one. Many IBM programmers worked long hours to bring this function to Release 7, according to David Anderson, IBM's System/38 product manager. For performance rea-

See IBM page 54

SOFTLINE/RICHARD FOX

Single vendor: Boon or bane?

Several months ago, an article appeared in this column extolling the virtues of a one-vendor software solution [CW, May 20].

Any software vendor offering more than a single product will naturally emphasize and extoll the virtues of installing all of its products. The justifications for doing this include the following: only one vendor will have to be dealt with when maintenance problems arise; and, of course, lease or rental agreements can be made more attractive when multiple products are installed.

The trend toward the installation of multiple, related offerings from one software vendor can only be expected to increase and intensify because of the current merger and acquisition fever in the software industry and because of the potential advantages offered by integrated packages.

What does this trend toward a one-vendor solution to the software needs of the data center mean for the DP manager or MIS director charged with acquiring and implementing such software? On the one hand, it would seem to make the selection, installation and use of software much simpler — the DP manager simply selects a vendor and then purchases whatever packages that vendor offers.

But the availability of such a "total solution" raises significant questions. The supposed increase in the ability of packages from the same vendor to work

See SINGLE page 48

Fox was recently laid off from his position as data center manager at the Bostitch Division of Textron, Inc. He is, in his own words, currently available.

- Softscope, a compendium of news from the software industry front/46
- The Guide users group reacts to IBM's release of an enhanced version of CICS/46
- SPSS unveiled the SPSS Tables data analysis and formatting package for IBM and Digital Equipment computers/46
- Tandem Computers strengthened the language support for its Nonstop processors/46

INSIDE

Systems Software/52
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IBM Profs users speak out

By John Desmond
CW Staff

BERKSHIRE, England — The major strength of IBM's Professional Office System (Profs) is its electronic mail features, and its primary weakness is that it is difficult to use.

That was the conclusion of a recent survey of 45 U.S. Profs users conducted by Xephon Technology Transfer, Ltd. Among the survey's other major findings were the following:

- The change to Profs most sought after by end users is improved word processing capabilities. Profs' document management facilities were given a low rating. Users said the DCF and the GML were overly complex. Several respondents commented that a word processing product based on IBM's Displaywriter would be a better solution.
- Users of the VM operating system were attracted to Profs because it works with the IBM 3270 terminals they already have in place, which makes unnecessary costly specialized office automation equipment for sending electronic mail.
- The system's electronic mail capabilities were given the highest marks by users, followed by the diary/calendar and conference scheduling tools and the proofreading aids, which include a spelling checker and a stylistic aid.
- Profs users ranged from managers to secretaries, and most were regular users as opposed to occasional users. By department, most Profs users were members of the DP staff. "VM has always been popular in DP circles and Profs appears to be following in this tradition," the survey stated.

In addition to enhancements to word processing, users sought improvements to the system's document storage and retrieval tools, specifically the ability to perform full text searches. Dead management was reported to be an operating problem

See PROFS page 54

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SOFTSCOPE

Notes from the software industry front

Digital Equipment Corp. has joined with **Coefficient Systems Corp.** to distribute New York-based Coefficient's Vterm II communications software through DEC's Digital Distributed Software program. Vterm II enables users of the IBM Personal Computer, Personal Computer XT and AT to communicate with DEC VAX and PDP minis.

■

Digital Equipment Corp. and **Signal Technology, Inc.** (STI) of Goleta, Calif., announced that DEC will co-sell STI's Smartstar applications development and data management system for the DEC VAX. Smartstar interfaces directly with DEC's Relational Database System and will be available through DEC's Digital Classified Software program.

■

Palo Alto, Calif.-based **Hewlett-Packard Co.** and **Relational Technology, Inc.** (RTI) of Alameda, Calif., inked an agreement to provide RTI's Ingres relational data base management system for HP's Series 9000/500. In cooperation with HP, RTI will directly market Ingres for the processors.

■

Apollo Computer, Inc. and **Lucid, Inc.** announced that Chelmsford, Mass.-based Apollo will sell and support Palo Alto, Calif.-based Lucid's implementation of Common Lisp. The agreement calls for Lucid to develop an implementation of Common Lisp for Apollo's Aegis and Domain/IX operating systems.

■

Apollo Computer, Inc. also unveiled details of its licensing agreement with **Verdix Corp.**, McLean, Va., which calls for Verdix to supply versions of its Verdix Ada Development System (Vads) for Apollo's family of Domain workstations. Apollo will market and support the systems. Verdix also penned a licensing agreement with **Harris Corp.'s Computer Systems Division** that will enable Harris to develop a version of Vads for its superminis and workstations.

■

TSR, Inc. of Hauppauge, N.Y., announced that it has completed the Honeywell Corp.-to-IBM conversion of **American Express Bank Ltd.**'s international banking software system. The software, which previously ran only on Honeywell processors, automates a range of functions for international banks and similar institutions.

Users group guides changes to IBM's CICS

CHICAGO — Guide, one of the largest IBM users groups, recently responded to IBM's introduction of an enhanced version of CICS — which was upgraded, in large measure, based on Guide's recommendations — by saying the product release "demonstrates Guide's positive influence on CICS development and direction."

Guide also said the impact of CICS Version 1, Release 7 [CW Aug. 12] will aid in the continuing development of its CICS Group.

The major revisions to CICS that stemmed from requirements from Guide and Share, another IBM users group, included enhancements to the Resource Definition Online facility to allow for on-line definition of terminals; improvements in the areas of installation and maintenance of Vtam terminals; security enhancements; added command-level programming facilities; and restart and installation enhancements.

SPSS analysis software out

CHICAGO — SPSS, Inc. has announced data analysis and formatting software for IBM CMS, OS, MVS and Digital Equipment Corp. VMS installations.

SPSS Tables reportedly produces camera-ready tables with data analyzed by the vendor's SPSS-X, a statistical analysis and reporting package. SPSS Tables can handle alphanumeric data with unlimited unique values, as well as multiple response and multiple dichotomy data.

The product computes frequency counts, means, percentiles and other statistics and can produce stub and banner tables. Users can control titling, labeling, footnoting, spacing and data display, or they can use the system defaults to produce tabular reports.

Integration with SPSS-X allows users to create and modify variables; select, sample and weight cases; process subgroups; and read complex files, including column binary data. SPSS Tables users have access to 40 different statistical and plotting procedures in SPSS-X.

SPSS Tables is initially available for SPSS-X 2.1 users and additional conversions are under way. The product costs $2,000 for an annual license, with a $1,000 renewal charge.

SPSS is located at 444 N. Michigan Ave., Chicago, Ill. 60611.

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Excelan also offers similar packages for DEC PDPs, UNIX supermicros, and the IBM PC, XT and AT.

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IBM

Tandem announces C, Pascal versions for Nonstop systems

CUPERTINO, Calif. — Tandem Computers, Inc. has unveiled versions of the C and Pascal programming languages for applications development on its Nonstop systems. The vendor also announced a version of Cobol 85, a proposed Ansi standard programming language that provides productivity extensions, and the Tandem Advanced Command Language, a command interpreter for Nonstop systems.

Tandem C, based on the Lattice, Inc. C compiler, has extensions that provide access to Tandem facilities and is compatible with the C compiler used for programming the Tandem Dynamite workstation and the IBM Personal Computer.

Tandem Pascal is based on the Ansi/IEEE 770 X3.97-1983 standard and Level 0 of the ISO 7185 standard. Tandem Cobol 85 supports all required modules specified in the Draft Proposed Revised Ansi Programming Language Cobol (X3.23-198X).

Both C and Pascal cost an initial $1,000, plus a monthly license fee of $225 for Nonstop II and Nonstop TXP systems, and $500 plus $115 per month for Nonstop EXT systems. Prices include runtime libraries. C will be available in the fourth quarter of 1985 and Pascal in the first quarter of 1986.

Cobol 85 costs $1,000 per Nonstop II or TXP system, with a monthly license fee of $300. The EXT costs $500 with a $150 monthly fee. The runtime library costs $500 per system for the Nonstop II and TXP and $250 for the EXT, with a monthly fee of $100 per system. First shipments of Cobol 85 will take place in the first quarter of 1986.

More information is available from Tandem at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

SINGLE

from page 45

together is a feature that must be considered in addressing a single-vendor solution. Will the security system from a particular vendor, for example, work better and offer more ease of use if it is combined with the vendor's Dbms management system, as opposed to a similar package from another vendor?

That question can only be answered through a detailed requirements definition and analysis by the user. One would certainly expect that if a vendor's products have been designed to work together — and, it must be remembered, not all have — then there would be increased efficiency and functionality from using them together. But that is not always the case.

Service, support sensitive issue

The issue of improved service and support is a somewhat sensitive one for most software vendors. Will buying five or six products automatically entitle a user to additional consideration when a problem is discovered? Most reputable vendors claim their support is outstanding even if a user has only one product.

The capable data center manager will keep in mind that it becomes much easier to assign responsibility for a problem between two products if both are from the same vendor.

If your shop is a major customer of the vendor, it seems reasonable to assume that a higher degree of attention will be brought to bear on a significant problem. A problem is also easier to locate and fix if the same service personnel can look at both products involved.

But, it must also be remembered that software maintenance people at vendor support locations are often willing and equipped to locate problems that turn out to be with another vendor's product. The question of additional service leverage is a subjective one and is open to change as the individuals involved change.

Additional disadvantages

In addition to the cautions noted above, there are some other potential disadvantages involved in the one-vendor approach. The most serious may be that such an approach often limits a user's choices to some less-than-optimal software packages.

If you have decided on a one-vendor solution, you may be forced to settle for an inferior product for any one particular function. The overall benefits of a single vendor may outweigh this disadvantage, but it is one that must be considered carefully.

A related danger inherent in tying your data center software fortunes to a single software vendor is that you have limited your data center to just one source for new products and enhancements and for support for new hardware and operating system introductions.

Of course, you can always obtain a new package from another vendor, but then the advantages of the one-vendor approach no longer operate. The vendor selected must have a proven research and development track record and a stable financial history.

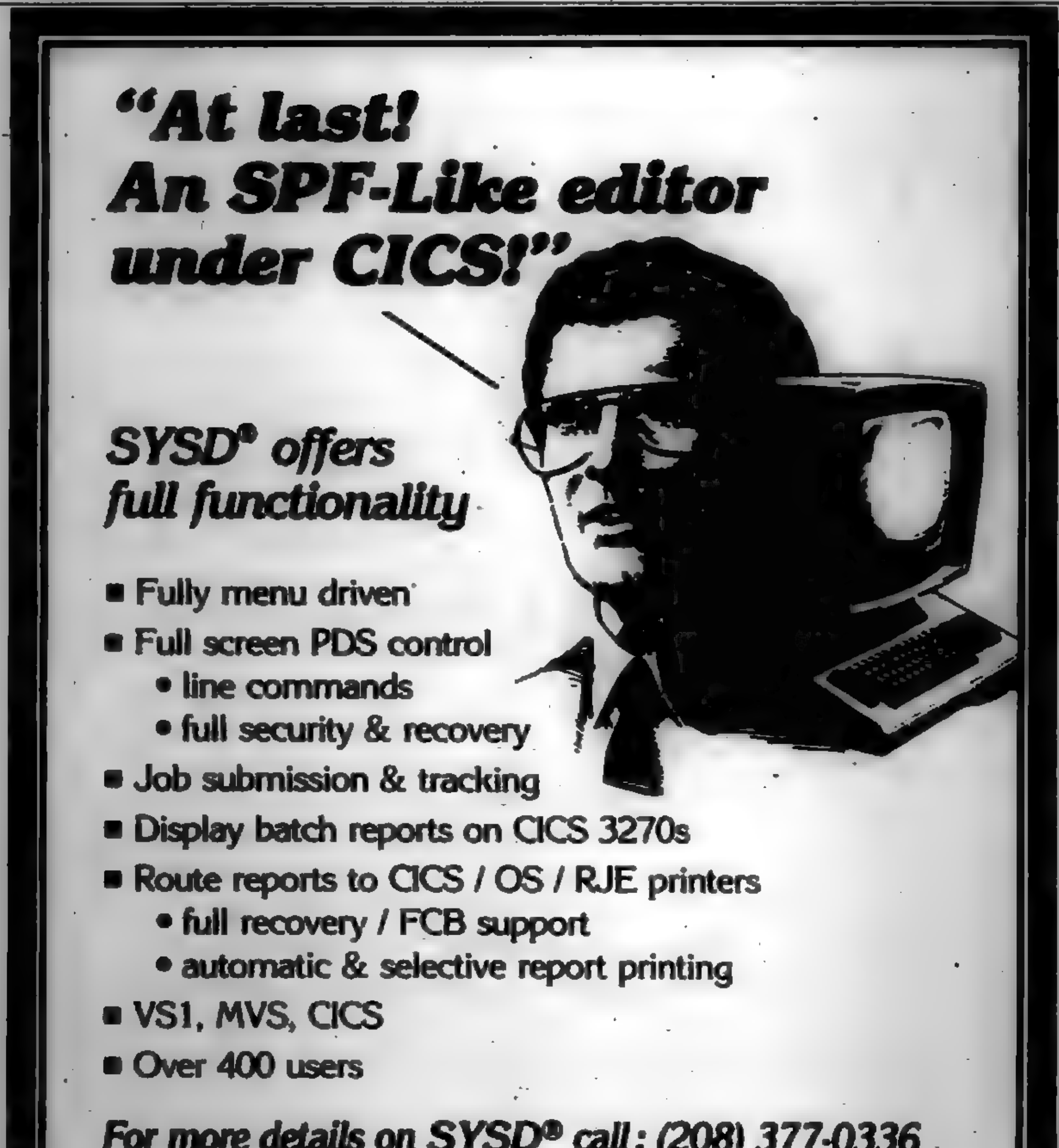
It is not the aim of this column to convince anyone that the one-vendor solution is or is not a proper strategy. With the trend toward development of integrated product portfolios will come increasing pressure on the data center manager to select a single vendor.

Instead, this column is intended to shed light on some of the trade-offs involved in the one-vendor approach. Exploration of the issues discussed here will have to go hand-in-hand with the detailed requirements and specifications analysis involved in any software purchase.

The selection of software packages can be a more critical issue since software is much more difficult to change than, for example, terminals or disk drives.

The choice of a one-vendor solution for software will make the life of a data center manager much simpler because it greatly reduces the work involved in selecting software. However, it may not be the best solution for the data center or for the organization.

Certainly, the management challenge of running a multivendor software environment is great, but there are many managers who possess the skills and business acumen necessary to accomplish the task.



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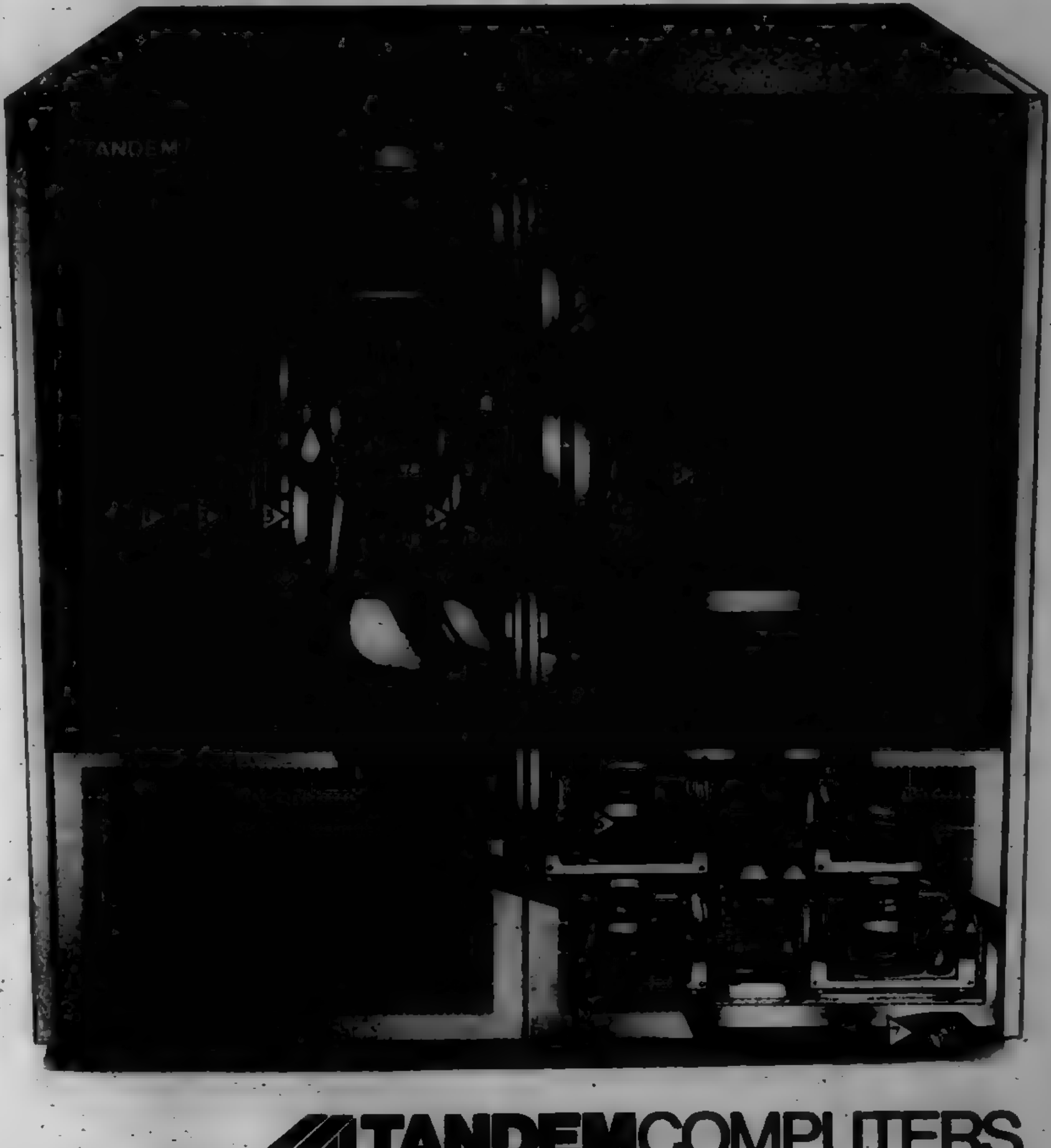

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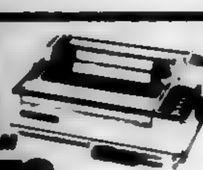

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SOFTWARE & SERVICES

Uniras announces data link

BURLINGTON, Mass. — Uniras, Inc. has announced the Unigraph Data Link, an option for its Unigraph business graphics software.

Unigraph Data Link consists of a full screen data editor and a user-definable file reading facility that allows users to read data sets and user labels selectively in a variety of formats, according to Uniras.

The product also includes data transformation capabilities that include arithmetic data set operations to minimize external modifications of data, the vendor said.

The Unigraph Data Link runs on IBM mainframes under MVS/TSO and VM/CMS and on Digital Equipment Corp.'s VAX minicomputers under VMS and Prime Computer, Inc. and Data General Corp. systems.

It is priced from $1,500 on the IBM Personal Computer AT to $7,000 for IBM mainframes.

Uniras also announced the Unipict Interpreter, an enhancement to Version 5 of its Raspak graphics and device handling software for IBM mainframes, DEC minicomputers and Cray Research, Inc. supercomputers. The Unipict Interpreter formats graphics files for transfer between computer systems for output or further processing, the vendor said.

Raspak Version 5 is priced from $12,000 to $24,000, depending on configuration.

An interactive system for schematic specification and simulation was also introduced. The ICPC-Simulator is designed for multiuser systems in a VAX or IBM environment.

Symbolic display

Simulation results can be processed graphically or by a symbolic display of numeric results of selected connection bundles.

Graphical post processing allows users to control how results are displayed, the vendor said.

The ICPC-Simulator is priced from $5,000 on the IBM Personal Computer AT to $28,000 on the IBM 3030, 3080 and 3090 series.

More information is available from Uniras located at Suite 212, 50 Mall Road, Burlington, Mass. 01803.

SYSTEMS SOFTWARE

■ BMC Software has introduced Local Copy Plus, systems software that allows users of IBM printers and 3270 terminals to generate and send exact screen images to other users in IBM's IMS/DC network.

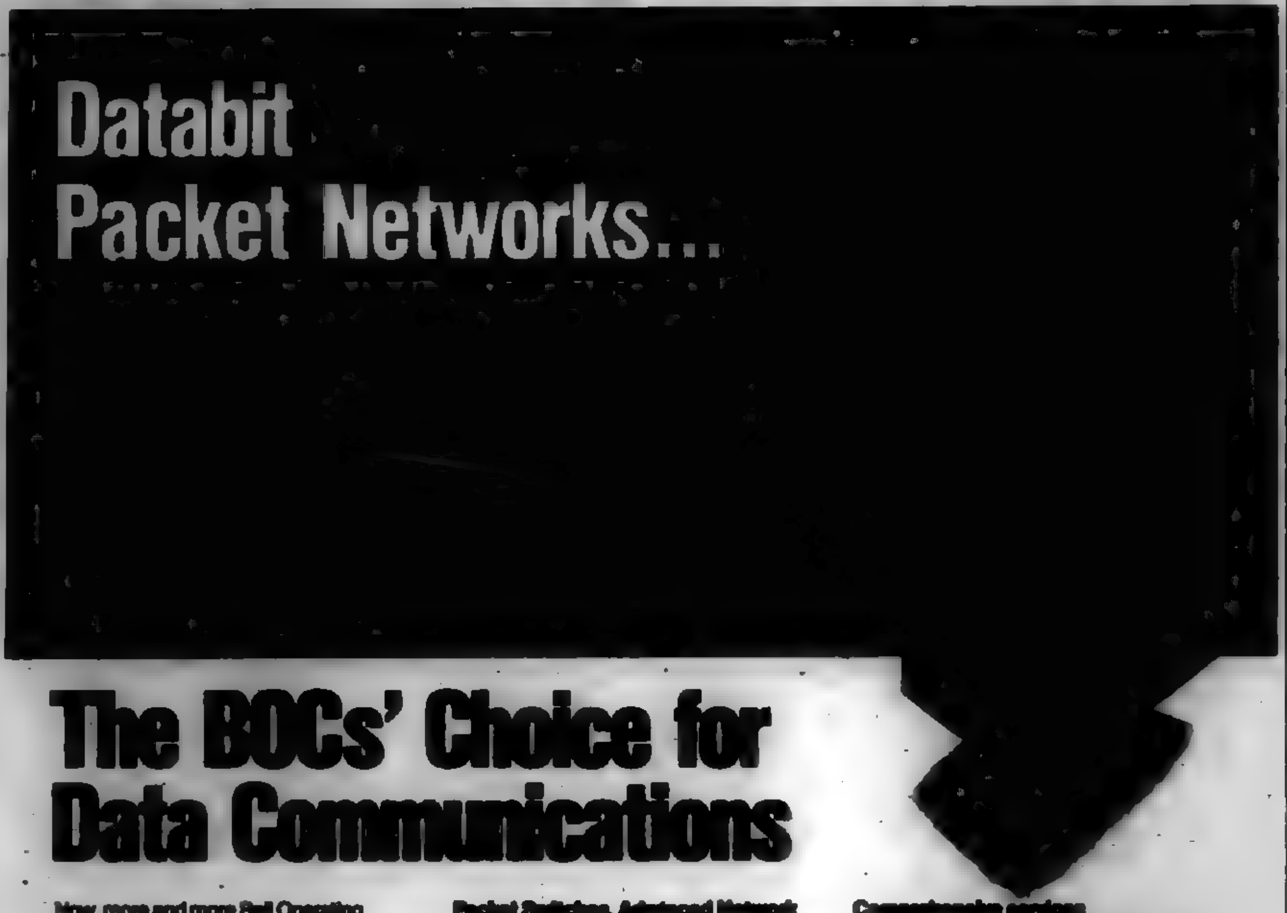
Local Copy Plus frees terminals immediately after initiation of print requests. Print traffic is routed through an IMS Message Queue and enables a single printer to be used for both the screen copy function and IMS-generated application output, including special forms. If a printer fails, unprinted screen messages can be stored in the IMS Message Queue until the printer is back on-line.

Local Copy Plus costs $12,950.

BMC Software, P.O. Box 2002, Sugar Land, Texas 77478.

■ Business Information Systems, Inc. has intro-

Continued on page 54



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Continued from page 62

duced E1CICS, which converts Cincom Systems, Inc. Environ/1 Cobol programs to IBM CICS command-level Cobol programs under IBM's MVS, OS/VS1 and DOS operating systems.

E1CICS produces necessary CICS control blocks for conversion. The base price of E1CICS is $25,000 for DOS.

Business Information Systems, 3442 Stellhorn Road, Fort Wayne, Ind. 46815.

APPLICATION PACKAGES

■ **Prime Computer, Inc. has announced enhancements to its Medusa two- and three-dimensional solid modeling software that runs on Prime's 50 series systems under the Primos operating system.**

Features include a text translator, a cross-reference system and a 3-D interface to Prime's Graphics Numerical Control software. Medusa costs $20,000 for use in an office environment to $35,000 for use in a computer room environment, the vendor said.

According to Prime, a revision to the AEC architectural design module of Medusa includes additional exchange menus for layout and symbol manipulation and more symbol menus.

The Medusa AEC costs $7,000 for office systems and $10,000 for computer room environments, according to the vendor.

Prime, Prime Park, Natick, Mass. 01760.

PROFS from page 45

for Profs users. According to one user, "Profs in general eats up disk space."

New users found Profs' text entry and editing facilities difficult to learn, the respondents observed. "The Profs system evolved in a DP environment, and it is not clear that as much attention was paid to the human interface of some aspects of the system as should have been," the report stated. One user commented that, in developing the product, IBM "appeared to have no consideration for the users."

Profs originated in a program development environment as an easy way for programmers familiar with VM to send electronic messages back and forth. One user commented that a weakness of its spelling checker, included among its text creation facilities, is that a user cannot proofread a document while it is on the screen, since the user must return to a menu of editing functions.

A significant weakness of Profs is its incompatibility with IBM's Systems Network Architecture (SNA) protocols, respondents said. "This means there are formidable difficulties in making Profs fully interwork with other IBM systems and architectures," the survey stated. However, IBM stated that its goal is to provide SNA support for VM, even though IBM is positioning the Distributed Office Support System as its strategic office product, the report noted.

To support Profs, most shops required an average of 2¼ people. The average organization requires one Profs support person for every 100 terminal users, according to the survey authors.

Most users surveyed indicated they would still be using Profs in five years, although more than half had plans to integrate Profs with other systems.

The survey, "Profs in Practice," can be obtained for $45 from the U.S. agent for Xephon, MJH Computer Services, 7113 Marvista Court, Orlando, Fla. 32811.

JOIN from page 45

sons, much of Release 7's enhanced functionality is contained in microcode, the "gut-level of the machine," Anderson said, according to a source who heard Anderson speak at a recent meeting of the Northeast System/38 Users Group.

Data independence

Anderson told the System/38 users that the Join function was a significant step in the direction of program data independence — the ability to hide the structure of the data base from the application program — and would have substantial impact in the System/38 community.

Here is an example of how the Join operator can be used on three files: File A lists order, customer number, item number and quantity. File B lists item number and description. File C lists customer number and name. The Join operator allows the creation of File ABC, listing customer number, name, order number, quantity, item number and description. If a value is missing, the system can be programmed to use a default value, and a file can still be created.

Although the release has impressive features, it does not appear to make the System/38 anything more than the niche machine it is now. Cullinet's president said he is not worried about the System/38 stealing away his mainframe-oriented business. Goldman observed that the System/38 uses a 40-bit address space, and its programs are written in RPG.

"It's a very nice architecture and a very good DBMS. The problem is it's not 370 architecture, and it has no tools," such as a fourth-generation language, data dictionary, query language or report writer, Goldman said.

All in all, Anderson said IBM made 216 programming enhancements in Release 7 involving the addition or change of 643,800 lines of code. That much code is likely to have an impact on users for years to come, Andersen said.

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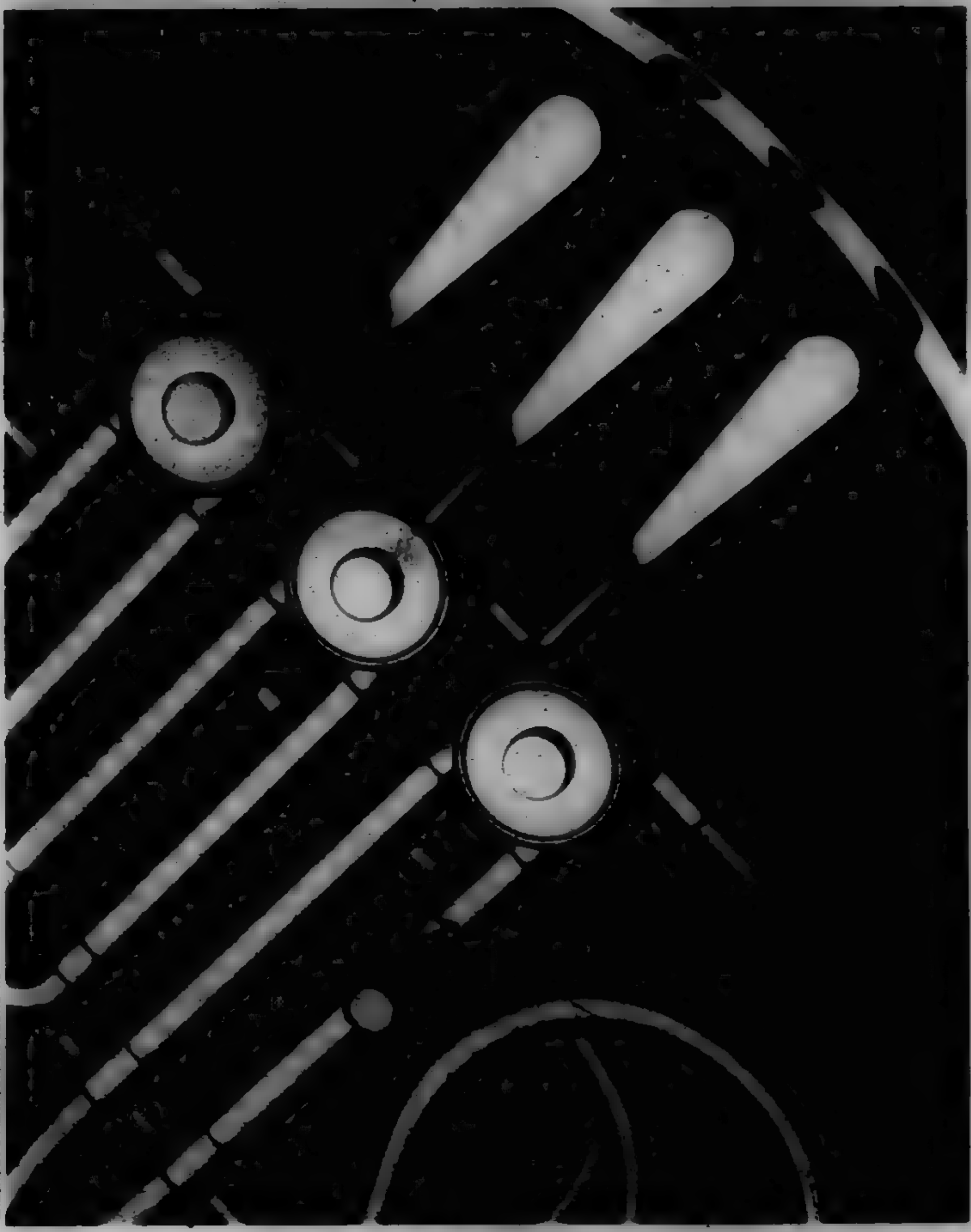
Special Report

Computerworld
August 26, 1985

Software Productivity
Creating harmony in the DP shop



CW PHOTO BY O'CONNELL/LADOUCEUR

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The keys to productive data processing: maintenance, management and development aids

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T. Capers Jones on reusable code

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Three tools for three tasks

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The 4GL debate: face-off on fourth-generation languages

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Negotiating software maintenance contracts

Balance key to productivity

Proper mix at issue

By John Desmond
CW Staff

The secret to making the DP shop most productive, analysts and experts in the field agree, is to balance use of development aids, planning for software maintenance and managing the people involved in the entire system development life cycle.

Just how these three issues should be balanced, however, is often disputed by the experts.

Maintenance aficionado, Nickolas Zvegintzov, editor of the "Software Maintenance News" newsletter complains that vendors are too oriented toward marketing products for software development even though the vendors of maintenance tools have found the market slow going. "It is much harder to use tools than vendors would like it to be. The way to push forward in this market is for the manager to look to the vendor [that] responds to a particular problem. Most companies don't have the resources to bring in the total solution," he said.

Naomi Lee Bloom, senior principal with American Management Systems, Inc. of Arlington, Va., warns that instant productivity will be an unlikely result of bringing in a maintenance tool or a fourth-generation language by itself. "This may sound like heresy coming from a technologist, but I think the real [productivity] issue is management — people management," said Bloom. "Unless staff members are organized and are motivated properly, you do not achieve the productivity improvement factors that the glossy literature promises," said Bloom, who specializes in productivity issues and human resource management.

In Bloom's view, sorting out how to use tools and what productivity gains should be expected are the first steps to implementing tools. She warns managers, however, not to create a "Tower of Babel" effect by introducing too many tools. "A sure way to lower productivity is to expect a person to manage too many tools," Bloom said. "Instead of having 47 different tools that no one becomes expert in, hone in on a set and say, 'That's what we're going to use.' Give your people a chance to become expert, facile with the product."

Bloom also warned that managers should beware of the promise of integration. The integration buzzword is often a misnomer, in part because tools in the same family often require use of different command languages and terminology. She recommends companies pick the best report writer, the best screen painter, the best data dictionary and so on, not necessarily all from the same vendor.

[illegible]

Her approach to the difficult issue of productivity measurement is to compare the known time it takes to execute a specific task with the time it takes to execute the same task using a productivity tool, such as a fourth-generation language.

T. Capers Jones, an expert in evaluating what factors are known to affect development productivity, maintained that the measuring of productivity gains or losses is still the No. 1 DP issue. Jones, chairman of Software Productivity Research, Inc. of Acton, Mass., said, "Lines of code metrics always conceal real productivity. When more power languages like fourth-generation languages are used, [lines of code measurements] are almost totally worthless.

"Once you understand how to measure productivity, you need to identify what factors can be addressed to improve it. Most people think fourth-

See QUALITY SR/10

Tale of two DP shops

Once upon a time in the dream world of DP there were two DP managers, Perfect Perry and Failing Frank, who were at opposite ends of the scale when it came to achieving maximum productivity in their shops.

Perry used a fourth-generation language to increase each programmer's yield of source code. His programmers prepared prototypes to give end users a view of the end product before a full commitment was made to implement. Perry maintained a library of reusable code, which saved time in writing programs with similar functions.

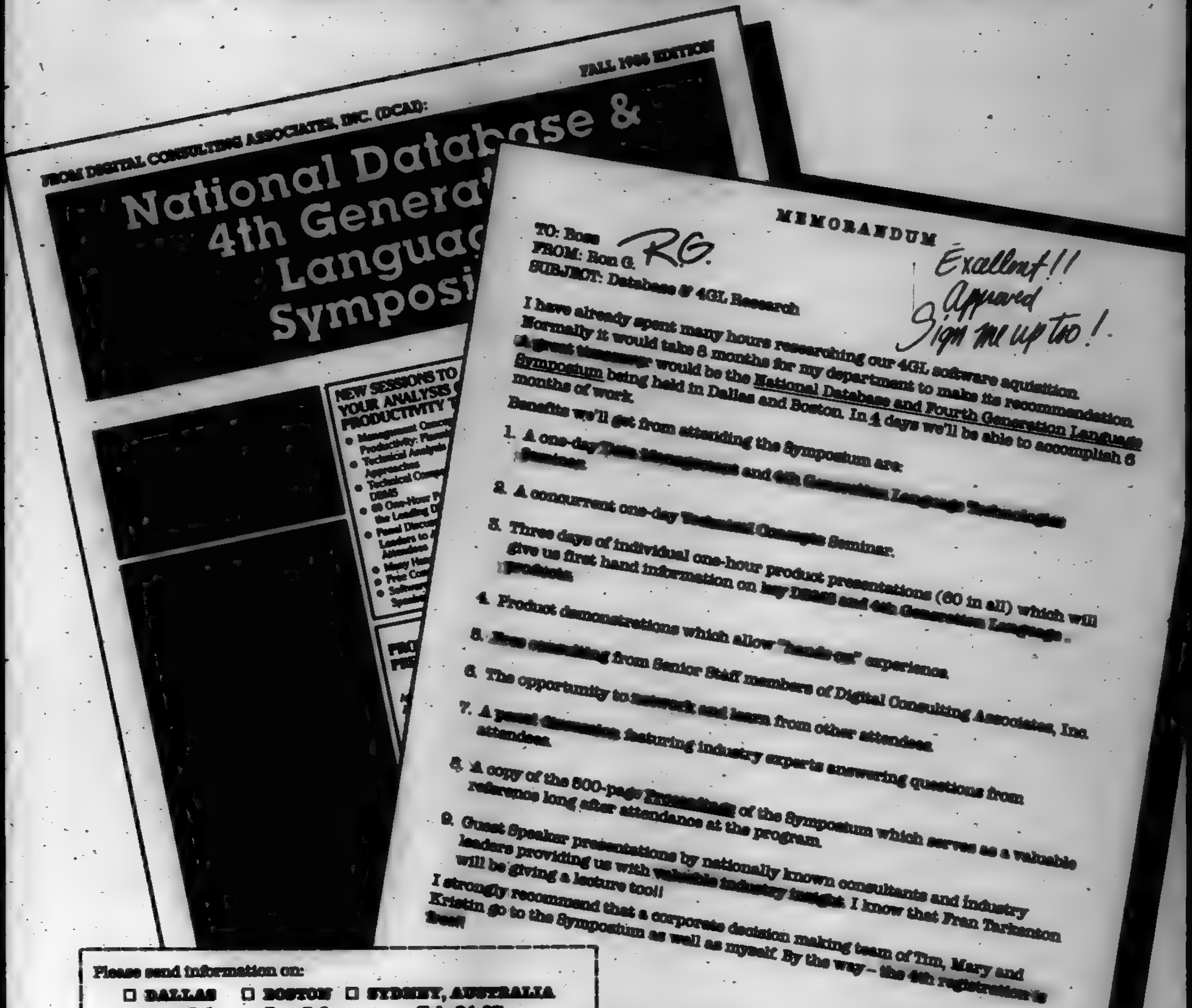
Frank was a Cobol stalwart. His programmers wrote source code in Cobol. He used the classic system development life cycle of requirements definition, specification, design, implementation and maintenance. His programmers kept often-used blocks of code on stacks of index cards in their desks.

Perry catered to his end users, providing them with automated tools that enabled them to solve business problems. Frank required end users to submit requests for applications to the DP shop and then wait in line for their turn. His programmers produced the industry average of 10 to 20 debugged lines of Cobol per day. Frank maintained that his users always wanted more than they could get. Users waited years to get served, then asked for the sun, moon and stars when it was their turn.

In his shop, Perry focused on fundamental issues of productivity, not on the symptoms. He had a management system that tracked requests, assessed projects and reported on accomplishments. Frank kept track of projects in his head. He tried to remember the accomplishments of his staff at salary review time.

As characters, Perfect Perry and Failing Frank are extreme. In reality, most companies are not ready to implement the total solution that Perry displayed, which is usually the most expensive one. And most Cobol users, similar to Frank and despite the wishes of fourth-generation language vendors, seem unwilling to give up on the third-generation mainstay. The real secret to achieving a productive DP shop lies somewhere between these methods.

National Database & 4th Generation Language Symposium



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FROM: Ron G. R.G.
SUBJECT: Database & 4GL Research

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Special Report

Users find problems with fourth-generation tools

Cite programming, performance snags in complex applications

By Paul C. Tinnirello
Special to CW

The tide of popularity for fourth-generation languages is beginning to wash ashore the harsh realities of programming in these new language systems.

Users, especially those who are developing moderately complex production systems, are discovering some significant problems, especially with programming and performance. These problems affect both the application development and the software maintenance processes.

Programming. Many fourth-generation products cannot compete with traditional languages in solving complex application problems. One reason for this lies in the structure of fourth-generation language products; the other emanates from the products' limited range of programming features.

Many fourth-generation products are built on a multicomponent concept, which often includes a reporting tool and an executive language. The reporting tool offers simple and quick solutions to the bulk of many organizations' reporting needs. The executive language offers end users the power to solve traditional programming problems.

Both components are more or less nonprocedural. They will, in other words, allow for the construction of logic without a formal procedure. This nonprocedural environment leaves much of the control to the product and not the user.

In many programming applications, however, user control of logic — even the most subtle control — is essential. Some fourth-generation languages, for example, will not allow for the simple, byte-by-byte editing of an input field. Editing must be done through a mask procedure that may require excessive coding. The cumbersome code that the procedure creates may not be practical for larger systems.

Fourth-generation languages also fall short under another consideration, that of programming strength. Although many fourth-generation languages have eliminated much of the overhead associated with data and file manipulation, they have sacrificed programmability.

Restricted to simple applications

Third-generation languages give programmers strong assets like arrays, functions, string manipulations, looping and block structures. Many fourth-generation languages, however, do not incorporate the full range of necessary logic constructs. By leaving out these features, some vendors have restricted use of their fourth-generation language systems to applications that are simple by comparison.

A programmer who uses a fourth-generation language in production system applications often finds the lack of advanced programming logic frustrating. As a result, his code may be tricky. This has a serious impact on the future maintenance of the system.

It also raises some serious questions about the situations in which a fourth-generation system should be used as a replacement for a traditional language.

These questions may be best answered only after an organization invests in program development under a specific fourth-generation system. By then, one hopes, the organization's staff will have an understanding of the restrictions and limitations of the system.

Performance. Compounding the problem of programmability is the issue of fourth-generation performance, which can be measured in a language's affect on both human and hardware resources.

Organizations have had great success with rapid development under fourth-generation systems. In many applications, human effort has been reduced from several months to a few weeks. This is largely because of the advanced reporting language features that have been the trademark of fourth-generation languages. Integrated application environments, which guide developers through preformatted menus, have also aided programmers.

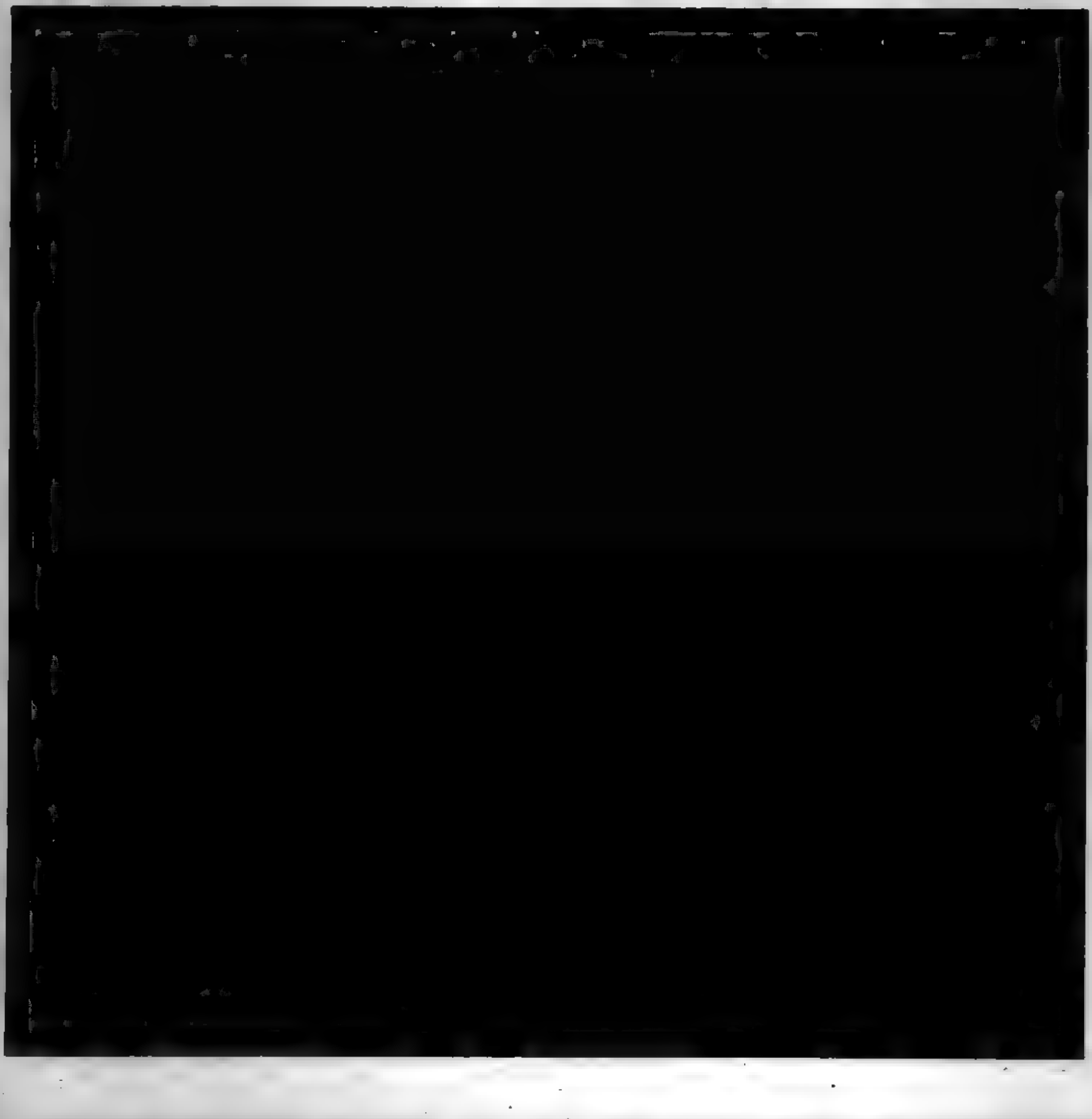
Even though human resource performance has improved, however, hardware resources have been degraded. Perhaps this is because of the overhead required to support the different automatic facilities that make fourth-generation languages so attractive. More then likely, though, hardware performance suffers because of the manner in which high-level languages execute.

Many fourth-generation systems use interpretive code rather than compiled code. This means that execution times will be relatively long. In production systems, lengthy execution time may be prohibitive.

The advantages of compiled traditional languages should come as no surprise; one need only recall the reason why Basic was infrequently used as a major production system language.

Fourth-generation languages can work in a variety of applications, but their scope is limited. Users must work to recognize what fourth-generation systems do best — then apply them to those specific uses.

Tinnirello is manager of programming for the data services department of A. M. Best Co., an insurance publishing firm based in Oldwick, N.J.



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As data processing professionals weigh the advantages and disadvantages of the new fourth-generation programming languages, one point becomes clear: The fourth-generation language market is one that is rapidly growing and still evolving.

Currently, no standard exists for these development aids, and it is not yet clear exactly what their impact will be in traditional data processing environments that use third-generation languages.

The *Computerworld* fourth-generation language debate presents two opposing views of these languages. The debate, highlighted below, begins on SR/22.

> *'Automated fourth-generation languages have progressed to the point that they can be used to replace Cobol and Fortran for all but the most complex or time-critical applications.'*
>
> **— Pieter Mimno**
> **See SR/22**

> *'Fourth-generation language vendors will survive by moving away from inventing languages and toward supplying support functions that are compatible with existing languages.'*
>
> **— Nicholas Zvegintzov and Ray [illegible]**
> **See SR/23**

Cobol remains a mainstay as new languages spread

By Arnold Leak
Special to CW

Amid the echoing proclamations of fourth-generation language enthusiasts insisting that Cobol is dead, companies using the venerable language may get the feeling that they're driving Studebaker Larks while surrounded by new sports cars.

With the advent of fourth-generation languages and the associated marketing hype, MIS managers face a dilemma. The urge to use state-of-the-art techniques often conflicts with business realities.

For example, is it feasible for a Cobol shop to adopt a fourth-generation language? Can an MIS manager afford to retrain the data processing staff in the new language? What about converting existing Cobol systems? What about maintenance — can fourth-generation languages be adjusted as easily as Cobol? Must Cobol be abandoned to take advantage of fourth-generation techniques?

After all, Cobol has been around for more than 25 years. It is the most widely used procedural language in the world and is recognized by the American Standards Institute. It provides readability, machine independence and a common base of communications via groups like Codasyl.

In addition, Cobol-literate personnel are easily found, and properly written Cobol code is easier to maintain than most of the cryptic proprietary fourth-generation languages.

Good reason for hoopla

This is not to say, however, that shops using Cobol should become complacent. There is good reason for all of the fourth-generation language hoopla. Until recently, programming methods have barely changed, while hardware has improved drastically. Although computer hardware costs have dropped, the application development effort is still as labor intensive as ever. Thus, software development costs continue to rise.

Even though DP departments are hard at work producing applications to make the rest of the organization more productive, the computer's power has not been fully harnessed to enhance the development and maintenance of those applications.

With the need for efficient applications growing at better than 45% annually, coupled with existing backlogs, MIS managers are behind the eight ball trying to improve programming productivity in terms of both quantity and quality.

Considering the tedium and labor intensity of hand coding, testing, debugging, maintaining and upgrading applications, it is inevitable that, using traditional application development methods, the application backlog will increase rather than decrease. And, to compound this problem, each year a larger piece of the MIS budget is absorbed maintaining existing applications rather than focusing programmers' talents on the production of new applications.

Applications development productivity must increase exponentially to establish and maintain a workable programming environment. Therefore, it is logical that productivity tools are gaining widespread acceptance among those who realize the critical importance of application development productivity.

To reduce realistically the application backlogs and offset expected programmer shortages, hand-coded Cobol must be minimized.

There is no justification, in general, for retaining this labor-intensive method of application creation in a marketplace flooded with high-powered productivity tools. There is, however, reason for MIS managers to be reluctant to change over to fourth-generation language application development from Cobol.

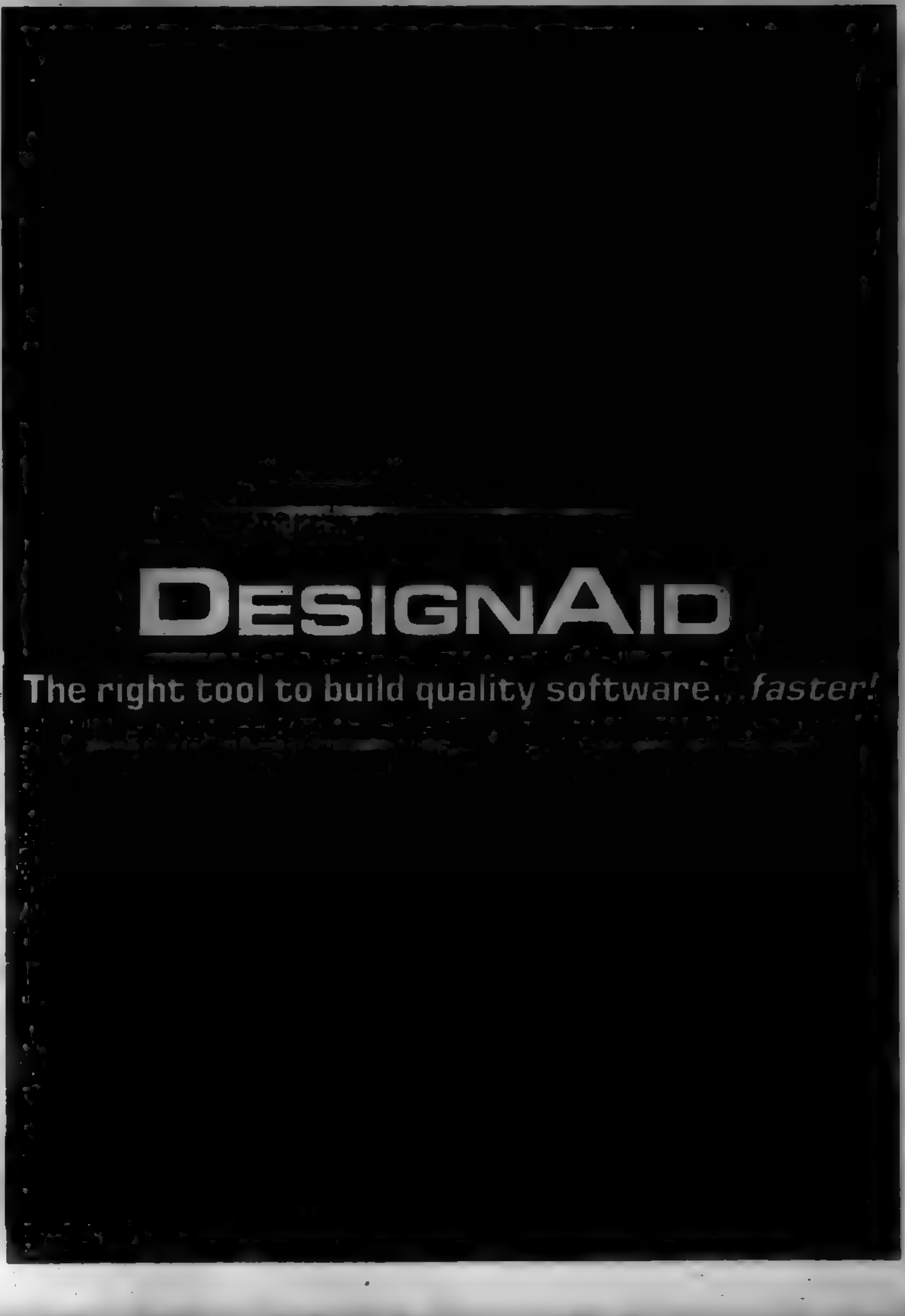
What MIS managers should be looking for are products that support their current operations while taking advantage of new technology.

Although current publicity implies that fourth-generation languages are required to be progressive, what is important are the techniques behind fourth-generation languages. It is not necessary that fourth-generation languages be used but that the gains promised by these methods be applied to the creation of applications.

In the case of Cobol shops, an application development system using fourth-generation language techniques can produce Cobol code at rates that rival many of the fourth-generation languages available.

MIS management can take advantage of productivity tools that use fourth-generation approaches to gain the most from fourth-generation languages. This can be done by understanding what these languages are all about (see story SR/30) and by shopping for tools that provide a compromise between fourth-generation languages and realistic constraints such as Cobol. What MIS managers have is a practical choice, not an either-or situation.

Leak is vice-president of technology for Commercial Systems Laboratories, Inc. in Auburn, Ala., the producers of C/Script II, a fourth-generation Cobol application development system.



Reusable code paying off in variety of applications

Effective in systems doing similar tasks

By T. Capers Jones
Special to CW

For really large systems — those with more than 100,000 source statements — third-generation languages hold all the world records in productivity.

In this top class, moreover, every record holder depends on a variation of one particular technology — the construction of programs and systems from standard, reusable modules and the reliance on standard, reusable designs.

Not every system, or even every industry, can make use of this technology at the present time.

Reusability has been most successful for programs and systems that have similar or identical processing and data requirements, in fields such as banking and insurance, where even competitive companies perform more or less the same kind of processing.

In government and industry

The following is a brief survey of the current status and future prognosis for reusability in selected industrial and government sectors:

Aerospace. The space shuttle — not its software but the aircraft itself — is the most prominent aerospace example of reusability. The National Aeronautics and Space Administration, however, is also making effective use of reusable software. A recent study that Nasa commissioned cited more than 60% reusability among sampled applications in several operating groups.

In the civilian aerospace sector, airline reservation systems are a classic example of the kinds of systems that are natural for reusability. These systems require high transaction volumes and are found in an industry where one finds essentially identical processing requirements among direct competitors.

On the whole, aerospace has an effective history of reusability and a good prognosis for the future.

Banking. Many banking and financial applications are essentially identical, even among competitive enterprises. This phenomenon has been demonstrated in New Zealand, where banks use standard software under government control.

Large banks — those with more than 500 programmers and analysts — typically develop standard reusable code and designs for their own use. Small- and medium-size banks, which employ fewer software professionals, are able to buy standard banking packages in modular, reusable form; they then add minor additional features as needed.

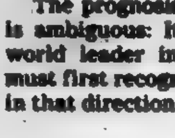
Banking is one of the primary domains where reusable designs and reusable code have been valuable, and this should remain so in the future.

Department of Defense. As the world's largest user of computers and software, the DOD might be expected to have established itself as the world's leader in software innovation and effectiveness as well. This, unfortunately, is not the case.

Unlike the Japanese Ministry of International Trade and Industry, which is playing a dynamic part in both computing and software, the DOD is relatively inert in leading-edge issues.

While the Ada language and its supporting environment are mildly innovative and can eventually give some support for reusability, the fact remains that the DOD has no serious program in place to create, stock or supply standard reusable designs or reusable code to the defense community.

The prognosis for the department is ambiguous: It may yet become a world leader in reusability, but it must first recognize the need to move in that direction.



Federal government. With an ever-growing bureaucracy and ever-mounting expenses, the civilian agencies of the federal government could find substantial economies in lateral coordination, use of reusable designs and use of standard reusable

See REUSE SR/7

Jones is chairman of Software Productivity Research, Inc., a consulting and expert systems development firm based in Acton, Mass.

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REUSE

from SR/6

code from agency to agency.

This fact is certainly known by the General Accounting Office and the General Services Administration. Both agencies have had partial and intermittent successes in their efforts to introduce standardization and shared technologies across various federal agencies. As those who have worked within the federal government recognize, however, it is not easy to achieve lateral coordination across such a vast and essentially feudal type of enterprise.

The prognosis for the federal civilian government is not overly favorable: Reusability is recognized as desirable, but the mechanisms for actually putting it into practice are probably insufficient.

Health care. The 1984 rate of increase in hospitalization costs was only 4.5%, compared with 10.2% in 1983. A major factor in the reduction was increasing recognition by health care professionals that shared technologies and reusability are highly effective.

More than 75% of American hospitals currently participate in various technology sharing programs. Blood banks, laboratories, nuclear medical facilities and data processing shops are examples.

The general prognosis for reusability in the health care industry is quite good: A long history of technological sharing and the need to lower costs are making the use of common designs and reusable code very active concerns for professionals in the health domain.

Insurance. The insurance industry has been one of the leading users of computers and software since these first became available. Today, large insurance companies are among the most software-intensive enterprises in the world. Programming staffs of between 1,000 and 3,000 professionals are not uncommon.

Standard reusable designs and reusable code are perhaps further along in the insurance industry than in any other.

The prognosis for reusability within individual insurance companies is not at the same level. Overall, however, insurance reuse is quite respectable.

Municipal governments. All municipal governments share a good number of similar data processing problems — for example, how to process taxation, land zoning, building permits, police business and school records.

Theoretically, then, standard municipal software designs and libraries of reusable code should be quite effective.

Sometimes they are, such as in the area of shared data processing services among police agencies. But governments, by nature, tend to be parochial, which somewhat lowers their abilities to cooperate laterally and share software.

The overall prognosis for reusability within municipal governments is ambiguous but positive: In the long run, we are likely to see as much as 40% commonality in basic applications.

Public utilities. The ever-increasing spiral of rates for natural gas, electricity, water and telephone services highlights an important point — public utilities need to do all they can to lower their costs.

Because the public utility sector deals with common application types, its member utility companies should be able to share common designs and common code with each other, yet they have not done so as fully as they might.

The utility companies in the past — under full regulation — were not always particularly innovative or cost conscious.

Recent trends toward deregulation and the introduction of cost consciousness within the segment, however, have made exploratory use of standard software a significant topic.

The overall prognosis for reusability within the public utility sector is quite favorable: The climate is right, and the companies have strong motivation.

State governments. State governments share many common problems, require substantial DP and computing support and are relatively sensitive to voter feelings. These three factors may catapult U.S. states governments ahead of the U.S. federal government.

Already, state governments have an effective common data base of drivers license and motor vehicle information. With the success of such data bases in mind, larger efforts to hold data in common may occur.

The overall prognosis for reusability at the state government level is fairly good: The early steps have been visibly useful and may serve as models for more extensive reuse.

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Rapid prototyping matches system to user needs

By Linda Brice
Special to CW

Rapid prototyping has yet to transform software development, as its staunch supporters expected, or to prove itself a disaster, as its strong detractors predicted.

The technique simply has not been around long enough for all of its strengths and weaknesses to have evolved. No one has the time and money to conduct a controlled study where a large system is developed in duplicate — once with prototyping, once with traditional methods — holding all human and machine conditions constant to weigh the two approaches against each other.

Rapid prototyping has, however, already emerged as a solid technique to improve one aspect of productivity: that of delivering the right system for a user's present environment, a system that will evolve as the user's needs change.

Under this technique, developers bring up a physical representation of key parts of a system before the system gets implemented. Users then have the option of canceling their development requests, looking to packaged software for a better solution or allowing the DP department to continue its work.

If the users cancel their requests or seek packaged software, the DP backlog shrinks, and it shrinks more quickly than it would if users had to wait for lengthy specifications to be written and approved. The discarded prototype does not represent wasted effort. Rather, DP will have wasted less effort on the rapid prototype than it would have on a full system that worked but did not meet users' needs.

If the users like the model and decide to continue with development, the prototype improves programming productivity.

Prototyping saves the DP department time because communications between users and software developers are stronger than they would have been had the developers used traditional paper models.

In some cases, the prototype can even evolve into a final production system. Rarely, and in only the most simple of systems, however, can a prototype become an implemented system.

Because prototyping can help users quickly define their needs and because it can shorten the tuning phase of system development and reduce enhancements, the technique can reduce DP applications backlogs and help users decide not only what they want but also what they need and what they can afford. To bring on these benefits, however, prototyping must be done correctly and with the proper tools.

Methodology. Under most circumstances, a prototyping methodology should include most or all of the following phases:

- Planning — in which developers and users lay out rough, flexible schedules.
- Rapid analysis — in which developers draw up a very brief, high-level paper model, usually using a visual aid such as a data flow diagram.
- First-cut prototyping — in which developers produce a working model.
- Prototype iteration — in which developers seek users' suggestions and incorporate them into the working model until the users accept the model.
- Benchmarking — in which developers test performance to determine how the sytstem will respond in production.
- Training — in which the developers teach the organization's software maintenance staff any prototyping methods and tools that have been retained in the implemented system.

Tools. In his book, *Applications Prototyping: A Requirements Definition Strategy for the '80s* (John Wiley & Sons, Inc., 1984), Bernard H. Boar suggests that DP would benefit from having a prototyping center, a tool kit that contains a number of productivity aids. Following are the tools he indicates a prototyping center should include:

- A text editor.
- A data base manager.
- A procedural language/program generator.
- A teleprocessing monitor.
- A screen generator.
- Dictionary maintenance tools.
- A nonprocedural report writer.
- An interactive query language.
- A documentation reporter.

A number of data base management systems on the market feature all or most of these components in one package. Because it is important to be able to modify data storage structures quickly and easily during rapid prototyping, users will benefit most from a DBMS with a relational structure.

Brice is a staff member in the administrative data processing division at Los Alamos National Laboratory in Los Alamos, N.M. She is cowriting a book, The Professional User's Guide to Buying Software, *with John Connell, a computer systems engineer at Martin Marietta Corp. Denver Aerospace. Van Nostrand Reinhold Co. expects to publish the book in September 1986.*

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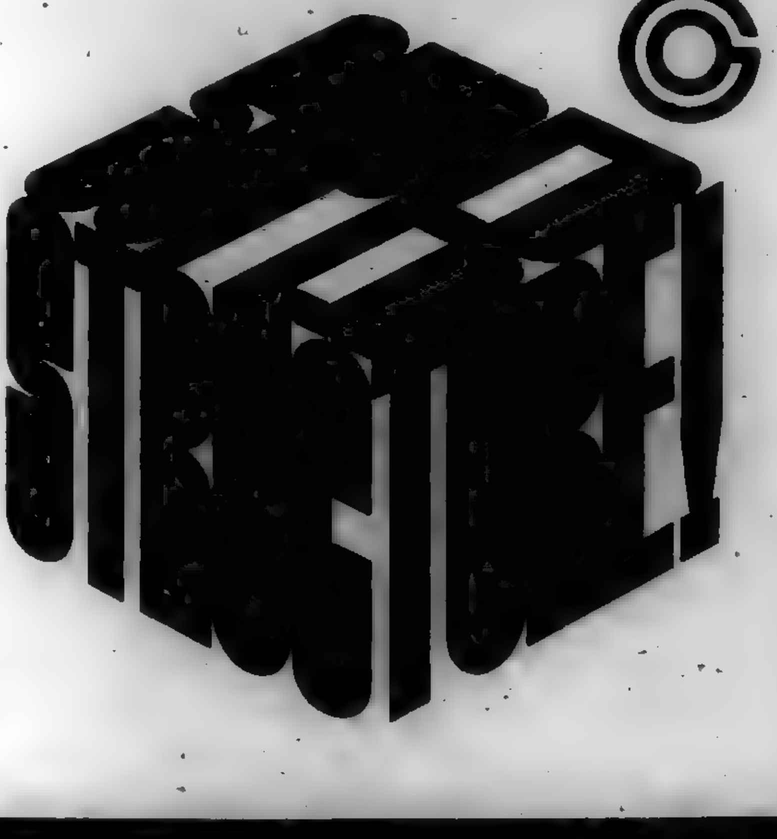

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generation languages will be sufficient, when in reality, they are not and probably never will be," Jones said. The largest programs ever developed in a fourth-generation language are relatively small, the equivalent of approximately 50,000 lines of Cobol.

"You can't do big systems in fourth-generation languages because of the performance penalty you have to pay," Jones asserted. "The rule of thumb is that it takes five or six times as much machine time to run an application written in a fourth-generation language."

The first step toward improving productivity is to understand how much is being spent on software or the total cost of developing and running a package. "The biggest expense element over the life of the package is getting rid of bugs. One of the most effective ways to cut costs is to minimize defects.

'Aim for quality'

"Aim for quality, and productivity is a natural by-product," he said. "If you forget quality, it's technically impossible to make really substantial productivity gains."

Capers agreed that management is crucial to better development productivity.

A skeptical outlook on the productivity improvement promise of fourth-generation languages is that of Tom O'Flaherty, principal of Information Service Strategies of Woodridge, N.J. Allowing end users to use complex systems is a primary way to improve productivity, but "really critical end users don't have time to learn computer languages," O'Flaherty said.

O'Flaherty disputes estimates that fourth-generation languages improve development productivity by a factor of nine or 10. Actual coding is 10% to 20% of the cost of a development project. If development is one-third of lifetime software costs, that is a 3% to 6% savings over the entire life cycle, he said.

Companies can improve productivity by being heartless with end users, O'Flaherty suggested. "You can be productive, or you can do what the end users want," he said.

"Managers have to tell the end users they will be heard but will not be central [to decision making]. Otherwise, DP will not be efficient."

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Development tools market on the rise

The market for development aids such as fourth-generation languages, which are seen alternately as a replacement for Cobol or as merely a productive way for end users to request corporate data, is a growing one.

International Data Corp. (IDC), a Framingham, Mass., market research firm, is projecting the market for fourth-generation languages based on data base management systems to grow an average of 40% each year until 1989.

IDC estimated the total market for fourth-generation languages, including those for personal computer, mid-range and large systems, is $265 million this year. IDC projects an increase to $993 million by 1989.

The maintenance tools market is a harder one to quantify, according to the guru of the maintenance market, Nicholas Zvegintzov, editor of the "Software Maintenance News" newsletter.

No good figures exist on the sales of maintenance tools, according to Zvegintzov. He has approximately 15 advertisers in his newsletter marketing maintenance tools for Cobol — products such as a source code file compare. No maintenance tools exist yet for fourth-generation languages, but some will eventually be needed, he noted.

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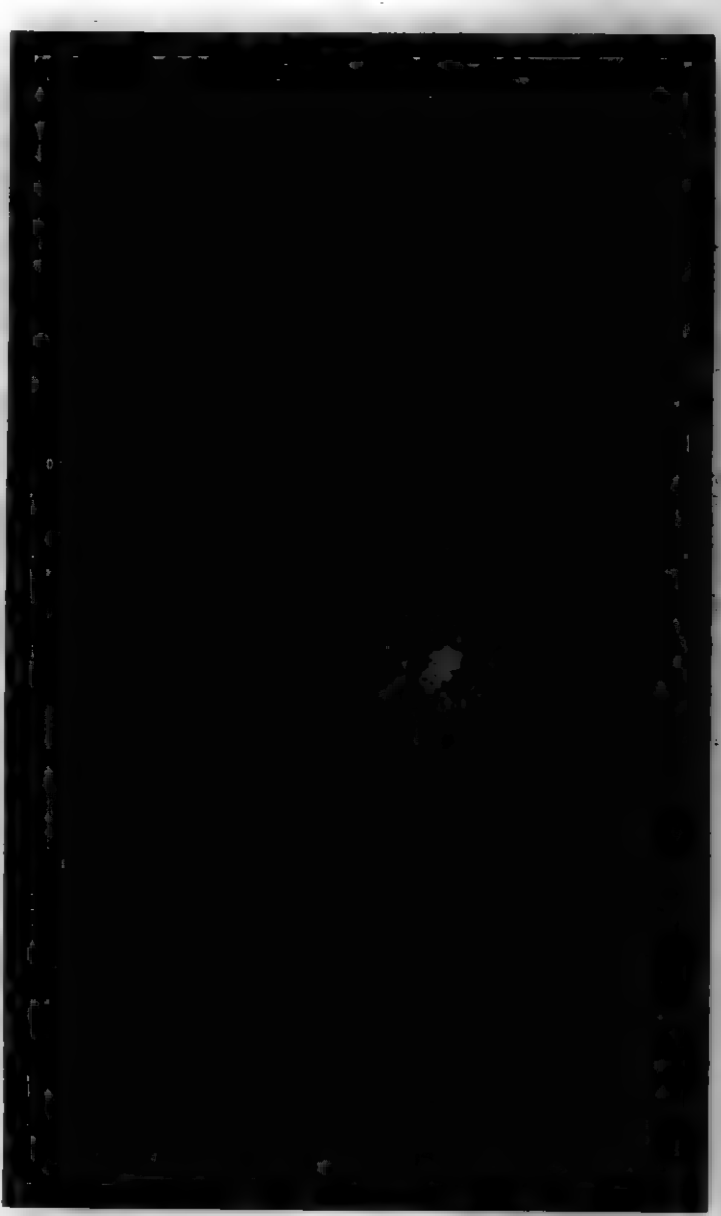
The time has come for straight talk about database management systems.

"The only reason to buy a database management system is to build better applications."



Throughout the history of the software industry, proponents of one database architecture after another have promoted their respective systems as the sole solution to a company's application backlog problem.

The early debate centered on hierarchical versus network architecture. Advocates of inverted file entered the argument in the 70's. And today, relational is the architecture of choice.

While this discussion about architecture is interesting, it's just not the issue.

Database management systems, beginning with the very first, were created to do one thing and one thing only—they were created to build better applications. *Building applications—efficient, online applications, faster, with fewer people—is the only real issue.*

Today corporations have a huge backlog to contend with. And the applications they need to develop have different characteristics. Some may be retrieval only. Some may be heavy on update. Some will run the company, and will require professional development. Some can be created by end users to satisfy their own needs.

It is extremely important to have a database management system that can handle all applications. *It is essential* that a database include tools rich and comprehensive enough to accommodate both the professional developer and the end user. It's the richness and power of these tools that's critical to the successful implementation of highly responsive fourth generation applications. What's demanded, in fact, is software that goes a *step beyond* today's conventional relational database systems.

With a comprehensive database management system and the appropriate tools like the kind I'm talking about, you'll make the data processing department a *strategic asset* instead of corporate overhead. You will make your company succeed in a highly competitive world.

In Cullinet's new Annual Report, Presidents and CEO's of major corporations speak about the positive impact Cullinet has had on their operations. For a copy that you might like to read and pass along to your company president, write to me. I'll see that you get one.

J. J. Cullinane

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The only database management system worth buying is one that meets these six requirements.

Stated simply, IDMS/R is a step beyond today's conventional relational DBMS because it meets these key requirements for building successful applications.

1. MIS Application Development Facilities

The application development system required to build high performance production applications requires more than a fourth generation language. Cullinet's ADS/OnLine is a comprehensive application development environment for the MIS professional combining fourth generation language with a menu-driven modular development approach. Integrated with the data dictionary, this minimizes not just the programming but the entire design, development and documentation of an application. Furthermore, this approach produces a dramatic reduction in maintenance and support.

2. End-User Application Development Facilities

Because Cullinet recognizes the difference between production and end-user applications, as well as the need for both to share common data, we provide an easy to use end-user oriented development and inquiry system. The Automatic System Facility of IDMS/R is a non-procedural, menu-driven tool designed for end-users. Once data tables are defined, an application is automatically generated. The query facility of IDMS/R provides menu-driven query capability and full online help, so end-users can build working applications in minutes and get reports easily and efficiently.

3. Relational Architecture

IDMS/R allows for the definition of databases using the relational data model. Data tables and associated user views are easily defined online. Additionally, any number of key fields may be defined. IDMS/R also supports advanced relational features including referential integrity and domain definition. This architecture provides the capability to address all application requirements.

4. High Performance Database and Application Tuning Facilities

IDMS/R is a full multi-tasking, multi-threaded system providing for concurrent processing of online and batch, update and retrieval applications. Additionally, tuning facilities provide efficient indexing techniques, space management, page management, and buffer management. No conventional relational DBMS has these capabilities.

5. Dictionary Driven DBMS

Data integrity and data independence are essential in a DBMS environment. The dictionary actively controls the source and use of all data. Data definitions, data validation criteria, data formats and security are all defined within the dictionary and exist only once, eliminating redundancy and ensuring integrity. This information is then automatically used throughout the system. Examples of the functionality of this facility include never needing to define output formats for query; never needing to define field attributes for screens; never needing to code validation and editing criteria when using ADS/OnLine. Only IDMS/R provides this level of dictionary integration.

6. Open System Architecture

With the unique Open System Architecture of IDMS/R you can maximize your investment in existing software. IDMS/R accepts data from outside the database environment with direct access to VSAM files. In addition, applications written to access other databases like IMS, DL/1, TOTAL, or VSAM can directly access IDMS/R without modification. IDMS/R is designed to work in virtually all IBM mainframe operating systems and teleprocessing monitor environments.

IDMS/R: More than a relational DBMS

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Special Report

Software tools improve firms' performance, conserve time

USER REPORT

COMMERCIAL UNION INSURANCE CO.

Problem:
Too many runtime abends.

Solution:
Tool that identifies JCL errors.

Benefits:
Decrease in demand on CPU and personnel.

BOSTON — The operations support staff at an insurance firm here cut its number of runtime abends in half and saved related CPU and staff time after it installed a software utility that flags errors in job control language (JCL) modifications.

Commercial Union, a worldwide property, casualty and life insurance company, once logged approximately 35 abends in the more than 300 production jobs it ran each night, according to Ed Swartz, manager of operations support services for the firm. Since the firm installed the software tool, he said, about 17 jobs have abended each night.

Because fewer jobs need to be rerun, the firm has decreased demands both on its mainframe hosts, a 24M-byte IBM 3081 and a 16M-byte 3083, and on its operations staff. "In the past, we had people in production who did nothing but fix abends," Swartz said. Commercial Union dedicated one operations staff member on each of four shifts to that job. Since the firm installed the utility, every staff member has been able to perform a number of duties.

Commercial Union installed the tool, Triangle Software Co.'s JCLcheck, in March 1982, as part of an effort to manage production. "We needed to integrate or centralize all our job documentation and get control of our entire operations," Swartz said.

Since then, the firm has used the product in a number of projects, including a large storage conversion Commercial Union completed in February. For this project, Swartz's staff had to migrate thousands of data sets from mass storage to disk and tape.

The job entailed making modifications to block sizes, finding locations where data sets were used and determining whether data migrations were valid. In an effort to keep track of the JCL changes and make sure they did what they were designed to do, Swartz's staff invoked JCLcheck both before and after it ran JCL modifications.

Before a job ran, the software flagged errors in proposed JCL modifications; afterward, it validated all changes (it checked, for example, to see that data sets indicated in JCL statements actually existed).

The software tool ran under MVS/XA on both the firm's mainframes. To start the tool's error-checking process, staff members ran JCLcheck and JCL modifications against each other in batch mode. Whenever the utility detected an error, it notified the users on-line. As output, JCLcheck printed all faulty JCL statements along with a description of the problems in those statements. Users then corrected the errors, ran the modifications against JCLcheck again and repeated the process until no errors surfaced.

With the help of the utility, Swartz's staff completed the conversion less than one month after the firm layed out detailed plans for the job. He estimated that the project would have required approximately six months if programmers had to do manual reviews of each JCL modification and validate its relation to other changes. "With the JCLcheck product's cross-referencing capabilities, we have absolute confidence in making across-the-board changes," Swartz said.

Commercial Union's staff uses the utility to clear every change they make to their system's JCL. This is especially important to the firm, Swartz said, because its DP shop is in a constant state of flux and needs to keep abreast of all JCL modifications.

"Our shop has been involved in upgrading one of our mainframes, getting rid of a mass storage unit, adding new software [and] undergoing a disk conversion, pretty much simultaneously," he said. "With the JCLcheck utility, necessary changes in JCL can be made swiftly and efficiently."

The utility has eliminated visual reviews of JCL modifications at Commercial Union, allowing analysts to spend time on less tedious tasks, according to Swartz.

USER REPORT

MANUFACTURERS HANOVER TRUST CO.

Problem:
Applications testing forces staff to work overtime.

Solution:
Automated testing tool.

Benefits:
Workers have weekends off; backlog gets cut.

NEW YORK — A financial firm here reduced the number of weekend hours its employees had to work and increased the number of days its DP staff could devote to CICS applications testing after it installed a tool that automated the testing procedure.

Until this spring, Manufacturers Hanover Trust Co. did most of its testing on weekends, according to Kenneth A. Hamilton, senior vice-president of global wholesale systems. The firm's interactive transaction processing applications — funds transfer, letters of credit and the like — had been integrated around IBM's IMS on a 32M-byte IBM 3081 and were too complex to test during normal working hours.

"Because of the interactive nature of our systems, we could not bring up a complete production parallel system in the 9-to-5 environment," Hamilton said. "So, we typically came in on weekends."

The schedule had the following two drawbacks:

- Because changes to one module affected others, employees from many different departments had to participate in the tests. On any given weekend, clerks and managers from different user departments had to join data center staff members and applications programmers in the shop.
- Because every year had a finite number of weekends, the DP shop developed backlogs and delays. Manufacturers Hanover had only 52 weekends in which to test between 18,000 and 20,000 annual changes and additions to program modules.

The testing procedure relied heavily on manual labor. After programmers added or changed a module, employees from the firm's user departments ran tests of related modules that the change would affect. The users then checked output from the original system against output from the changed system to make sure the results matched.

User acceptance and environmental testing for a major change (a product offering, for example) often required between 10 and 13 weekends of work, Hamilton said. Manufacturers Hanover installed the automated testing tool, On-Line Software International, Inc.'s Verify, to streamline the process and speed up system delivery.

To test a modification, a programmer now calls on the tool to run regression analyses of system output. The tests compare results obtained from the original system against results from the modified system, and the tool generates output that flags any discrepancies. Because the tool checks for errors systemwide, employees do not have to initiate and run a test over and over, once for each of an application's modules.

After system operators at Manufacturers Hanover became familiar with the tool, they could run an automatic test stream in about one-tenth of the time they had needed for manual transaction entry, according to Hamilton.

"What Verify does for us is to collapse the time necessary to introduce changes to our systems," he said. "It allows us to test new systems and enhancements automatically during the normal workday and reduces the need to bring people in on the weekends." The firm still tests some of its new systems on weekends, but fewer people have to show up for the trials.

Because the firm has only used the tool for a few months, Hamilton said he is cautious about predicting its impact. He estimated, however, that Verify will cut applications testing time in half for most applications and will pay for itself in less than one year.

USER REPORT

LIBERTY MUTUAL INSURANCE CO.

Problem:
Spaghetti code imposes maintenance problems.

Solution:
Tool for structuring Cobol code.

Benefits:
More free time for development.

PORTSMOUTH, N.H. — A conversion program that imposes structure on spaghetti code has given an insurance company's DP shop here a firm grip on maintenance and a chance to extend the lifespans of some old but good programs.

The DP staff of Liberty Mutual Insurance Co., headquartered in Boston, installed the software in 1984 to solve some problems associated with a group of unstructured Cobol applications.

The firm had instituted a structured methodology and had brought most of its programs into line. Some of its central operations, however, still depended on unstructured applications — programs that performed well despite their unwieldy designs.

"We had identified about 50 real spaghetti programs," systems manager Paul Mooney said. "They ran well in production, but when we had to change them, we had problems."

Mooney said the programs, some written as long ago as 20 years, confused new programmers who had to maintain them. The problem was especially pronounced because Liberty Mutual had lost programmer continuity when it moved its DP operations here from Boston in 1980. Most of the people who had to maintain the firm's code had not

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> ”
> *Technical solutions to productivity problems address symptoms, not fundamental issues. To improve productivity, MIS managers must employ well-defined systems of management.*

Increasing productivity does not depend on tools or gadgets — it's not that easy. True productivity gains come from identifying and developing systems that are critical to a company's business and ensuring that staff activities are directed to this end.

Technical solutions to productivity problems address symptoms, not fundamental issues. The thrust of most productivity tools, for example, is to produce operational code faster, but only a modest portion of systems development is devoted to producing programs.

To improve productivity, MIS managers must employ well-defined systems of management that allow them to direct and control MIS resources.

Once an organization has a system in place, it can bring in productivity tools and do some fine-tuning. Tools are valuable for speeding up the development process, but speed is an asset only if one is headed in the right direction.

A good system of management will let the MIS manager do the following:

- Track requests for services.
- Classify projects.
- Oversee project approval.
- Organize the MIS staff to complete assigned work.
- Report on accomplishments.

Tracking requests. Many organizations allow informal work to filter into MIS, and this is unacceptable. A systems and programming department is like a machine job shop: Both manufacture one-of-a-kind products.

The manager of a well-run machine shop always knows what jobs are to be done and when. An MIS organization requires the same discipline. To gain this control, MIS must have a formal project request procedure.

Classifying projects. Classification establishes a structure that is consistent with resource commitment. Once the structure is in place, it directs how project approval and reporting will proceed.

A structure that works particularly well is one that classifies projects as either discretionary or nondiscretionary.

Nondiscretionary projects are those in which staff members support production systems by solving operational problems or making minor improvements; these activities are part of the cost of having systems. All other projects are discretionary.

Duration is a handy guideline for

Marks is president of Poc-It Management Services, Inc., a Santa Monica, Calif.-based management consulting firm that specializes in information services. Strowbridge is vice-president of MIS for Dataproducts Corp., a printer manufacturer based in Woodland Hills, Calif.

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to data processing center productivity

classifying projects. With few exceptions, any project that consumes more than one staff-month of effort is discretionary. MIS managers can benefit further by classifying discretionary projects as either major — requiring more than one staff-year — or intermediate — requiring between one and 12 staff-months — and approaching the two somewhat differently.

In medium-size and large organizations, MIS staffs tend to be more productive if they are divided into two groups: one that handles discretionary projects (software development, for the most part) and another that takes responsibility for nondiscretionary projects (mainly maintenance work).

Managers who so divide their staffs, however, must take special precautions to make work satisfying for maintenance workers who are assigned to nondiscretionary projects (see story SR/45).

Overseeing project approval. Projects must be approved at the proper level:

■ Because nondiscretionary projects usually cost between $5,000 and $6,000 apiece, the approval level for them need not be high.

■ Discretionary projects, both intermediate and major, require approval by users' high-level managers. Intermediate projects generally require the approval of decision-level managers from the users who request the service.

Major projects typically should get approval from an executive committee that includes senior managers from each of a company's user departments. The approval of both major and intermediate discretionary projects should be based on documentation similar to that used for capital appropriation requests.

A good approach is to have users and representatives from MIS prepare a formal document that includes a statement of need, alternatives considered, cost, benefits and recommended approach. The appropriate management group can then use the document to decide whether or not to proceed with the project.

Project approvals are financial decisions, requiring a commitment of resources, and users should be charged for the projects they request. Chargeback focuses management attention on the business value of each request.

Organizing to complete work. Once a project gets the go-ahead, MIS must develop a plan that describes what will be done, who will do it and when it will be completed. The MIS department will also need a tracking process to monitor its progress against the plan. Without formal schedules and tracking, a manager cannot measure performance or determine how productive the staff is.

A formal systems development methodology is important for large systems development. The methodology need not be complex or procedural. It must, however, define project phases and deliverables in enough detail that management and the project team can communicate clearly about activities and status.

Reporting accomplishments. MIS managers should require weekly project reports from their staff members that account for staff time, show progress toward goals and highlight events that are overdue. In addition, MIS managers should provide to the company's executive managers comprehensive monthly documents that report on MIS activities.

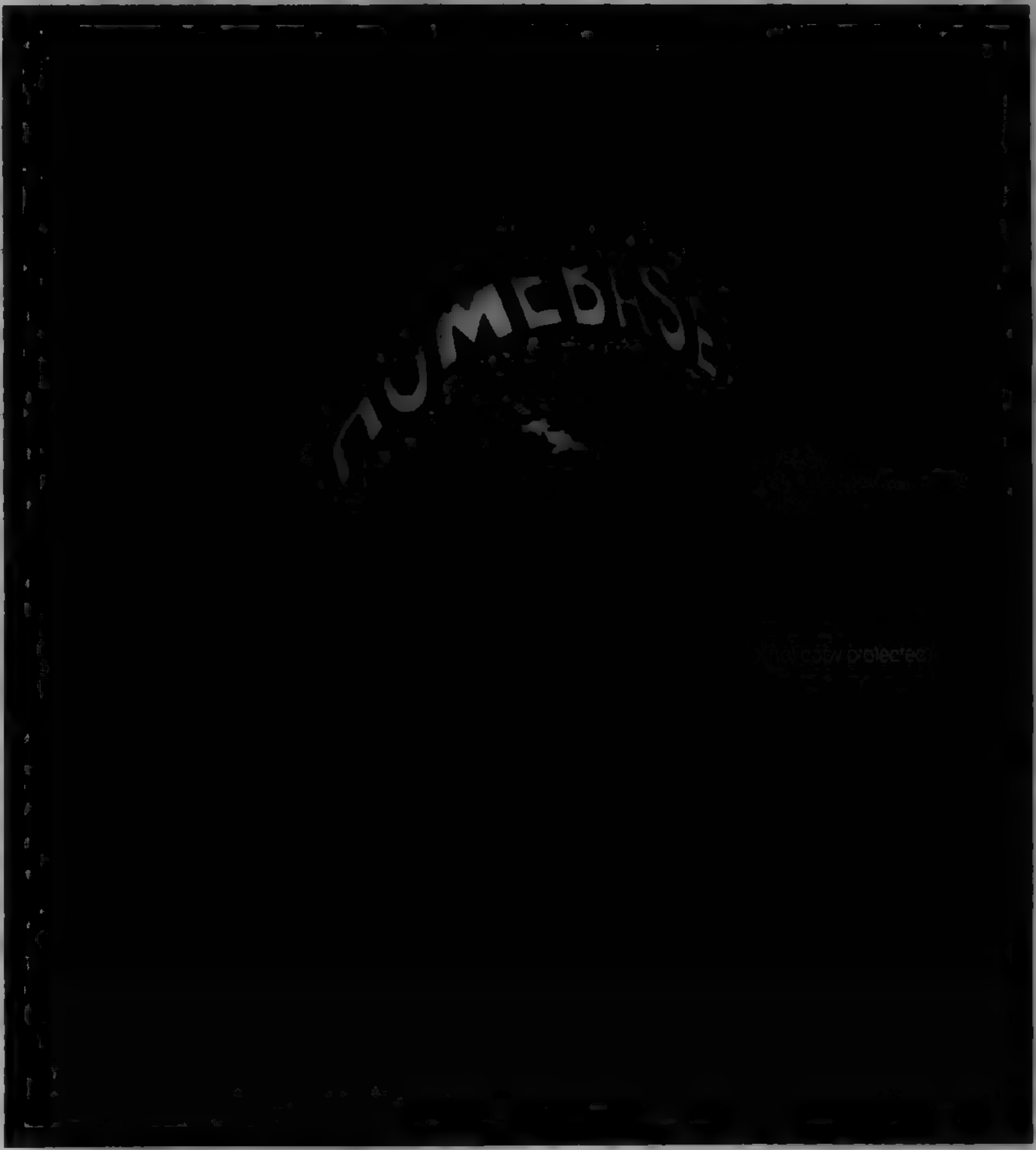
To exercise control over MIS project work — the most vital part of a program to improve productivity — executive managers need information about service delivery, resource commitments and progress. MIS should provide monthly reports on all projects; the type of report, however, will depend on a given project's size:

■ For nondiscretionary projects, reporting should focus on the quantity of work and on service delivery. MIS should give executive management statistical reports that show the number of requests received, completed and backlogged; the average duration of projects; and the percentage of jobs completed on schedule.

■ For intermediate systems development, MIS should provide executive management with a monthly report that shows a one- or two-line summary of each project. Intermediate projects are large enough to warrant individual scrutiny, but they require little more than a report of progress and cost against plan.

■ For major projects, monthly reporting should be more detailed, as these projects tend to have the most problems.

A desirable way to tackle large projects is to break them down into phases and report on that basis. If project plans are well structured and task assignments are measurable, MIS management can maintain control and keep users abreast of progress.



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Manager's role critical to keeping staff productive

By James Huling
Special to CW

After a recent study by the Public Agenda Foundation of New York, researchers Daniel Yankelovich and John Immerwahr reported that only 23% of American workers were working as hard as they could. The reason, they said, was ineffective management.

MIS managers may argue over the exact percentage of unproductive workers in their industry. They will agree, however, both on the presence of untapped potential and on the premise that management is the greatest single influence on employees' ability to reach their potential.

True gains in productivity can only be accomplished when managers motivate individuals to reach their potential. To motivate a professional staff, MIS managers must recognize — and develop in themselves — those qualities that characterize the truly effective manager. The following are among the most important:

Demandingness and ability to praise. Managers' expectations strongly influence employees' work. If a manager expects less-than-average performance from a particular employee, that employee's productivity will be poor; if the manager's expectations are high, the employee's performance will rise to meet them.

Because managers communicate constantly, both verbally and nonverbally, it is almost impossible for them to mask their expectations. Everything managers say and do serves either to reinforce employees' confidence or to destroy their self-esteem. Effective managers are aware of the influence of expectations and monitor their own expectations to keep them high.

Effective managers also recognize employees' achievements and reward excellence. The reward need not be an increase in salary; MIS professionals show equal or greater response to new technical challenges, increased responsibility, better training and management opportunities. Managers who want to maintain a high level of productivity must understand what rewards motivate a particular employee and must look for opportunities to grant them.

Professional competence. Professional competence for MIS managers embody two skills: management prowess and technical expertise.

■ Management skills are a necessity. Without them, MIS managers cannot effectively organize their staffs' work or use their employees' talents.

Often, MIS managers have been promoted to their positions because of a series of accomplishments as technicians. Although each level of technical work has prepared them for the next level, none provided training for the role of manager. Managers who find themselvs in this position should seek other sources of information and training.

> ”
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> *True gains in productivity can only be accomplished when managers motivate individuals to reach their potential.*

Individual classes, or the more involved pursuit of a management degree, are ideal. Most universities recognize professionals' needs and offer classes scheduled and paced for people who hold full-time jobs. Organizations like the National Management Association also offer excellent management training that can be conducted at the office.

■ Technical skills are equally important. Without them, MIS managers will have no ability to make intelligent, informed decisions.

Some managers come to MIS with plenty of management skills but little understanding of the technical problems that MIS employees face on the job. MIS managers must make decisions daily on hardware acquisition, software development, systems schedules and other issues. Each decision requires knowledge of different technical subjects.

Managers who lack specific technical knowledge find themselves in a difficult situation; to get out of this position, there are three moves:

■ First, when managers do not understand some aspect of a problem, they should ask for an explanation. Employees will quickly detect any attempt to mask a lack of understanding, and their perceptions will harm the manager's credibility.

■ Second, managers should use

See GAINS SR/30

Huling is a systems analyst and project leader with Vulcan Materials Co., a Birmingham, Ala.-based chemical and materials company. He is a frequent contributor to Computerworld's *Special Reports.*

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Function Points helps managers assess applications,

By A. J. Albrecht
Special to CW

Almost five years ago, in October 1979, the Function Points productivity measure was presented to Guide and Share, IBM's users groups, and at the IBM Application Development Symposium in Monterey, Calif.

The original objective of the Function Points work was to define a measure for applications development and maintenance functions that avoided the problems inherent in productivity measures in use at that time.

In effect, the measure was intended to help managers analyze applications development and maintenance work and to highlight productivity improvement opportunities.

The original intent of the measure has not changed over the years. As originally designed, the measure will help to focus management attention sharply and objectively on the vastly different levels of applications development productivity being achieved within a DP facility. This is done by establishing a single common measure of an application's I/O products, inquiries, master files and interfaces to other systems.

The method is dependent on the three following elements:

- **The measure must be technology independent.** The measure gives the same number for equivalent applications functions that are based on the external design document regardless of the programming languages or technologies used to deliver the applications.
- **It must measure all the applications functions delivered to the end user.** The measure gives the same number for equivalent applications functions even if large portions of an application were delivered with labor-saving techniques, including the extreme case of avoiding the programming altogether by buying an off-the-shelf application.
- **It must measure only the applications functions delivered.** The measure gives the same number for equivalent applications functions, regardless of the obstacles to productivity, such as a bad development environment, an indecisive application user/owner or inexperienced programmers.

In effect, the Function Points method measures the equivalent functions of end-user applications regardless of the language, technology, technique or development environment used to create the applications. This common measure of applications' functions can then be divided by the amount of time expended on the product to estimate the applications' productivity value.

The productivity value of various similar applications can then be analysed and compared to determine the languages, technologies, techniques and development environments with the greatest effect on productivity. With this information in hand, managers can objectively and systematically change the things under their control to promote higher productivity.

The resulting improvement trends would be demonstrated by tracking the trends with the same measure, namely, Function Points delivered per work month.

The Function Points future

Since that first presentation, a number of conferences and articles and a lot of activity have demonstrated that wide interest in the measure exists both inside and outside of IBM.

Outside IBM, I have participated in over 25 Function Points conferences involving more than 400 companies worldwide. There have been Guide and Share projects to develop the use of Function Points. At least two users groups have been formed to exchange data about Function Points measurements.

Inside IBM, the Function Points idea is evolving into a major measure of applications development and maintenance productivity. For example, a 1984 IBM study of applications development and maintenance productivity reported the following:

- The delivery of 241,000 Function Points for internal IBM use with a work effort of 11,200 work months; an average productivity of 21.5 delivered Function Points per work month.
- The support of 1,115,000 installed Function Points with an annual work effort of 6,200 work months; an average unit work effort of .72 annual maintenance work hours per installed Function Point for internal IBM use.

Futher analysis of this data, and of another set of Function Points data from a cooperative industry study, confirmed that vastly different levels of applications development productivity existed.

The projects reported on by 23 individual IBM sites showed a site-pro-

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Albrecht is an IBM senior technical staff member based in Purchase, N.Y. He first proposed and defined the Function Points productivity measure in 1979 and has spent a portion of the intervening years in its practical definition and use.

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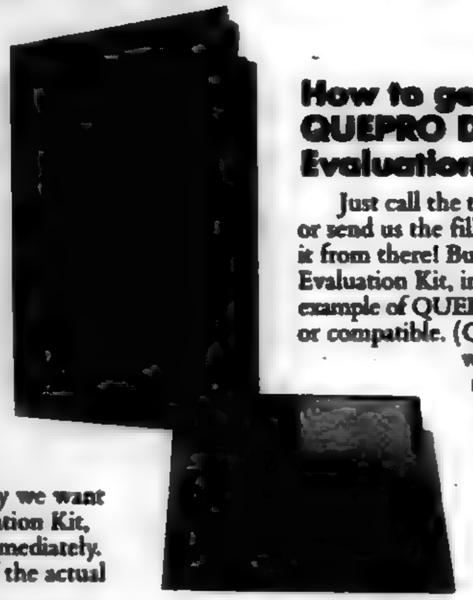

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maintenance values

ductivity range from 11 to 65 Function Points delivered per work month.

The cooperative industry study, coordinated by J. Edward Kunkler of Xerox Corp., reported that 19 companies averaged a productivity range of four to 65 Function Points per work month. Since these are site and/or company averages, the individual projects vary over an even wider range.

There are valid reasons for this wide range of productivity ratings as follows:

- Generally, sites near the top of the scale are installing a high percentage of applications acquired from other sites.
- These sites are also using high-productivity tools on applications well suited to the tools.
- In the middle of the productivity curve are those sites that use a broad mix of techniques and whose projects range from small to large.
- Near the bottom are sites that have central development responsibility for large applications supporting many diverse users.

The productivity of each of these levels is, in turn, influenced by the effectiveness of the project management, the maturity of the applications users and owners and the training and experience of the project personnel with the languages, technologies and techniques being used.

Improvement possibilities

Clearly, there are significant improvement possibilities to be considered when weighing the results of these studies.

More precise statements about the attributes associated with the levels of this productivity spectrum must be developed.

Companies could analyze these attributes and identify those that might offer potential productivity improvements.

Further, those attributes that affect productivity significantly could be considered when designing a project.

Management concerns

The frequent management response to this wide range of productivity results is a request for additional adjustments to the Function Points measure. Managers often ask that normalization factors be added to neutralize the effects of productivity obstacles that are outside of their control or responsibility. Their arguments include the following:

- Since they are not responsible for the work lost by an indecisive applications owner, they should be allowed to include the rework in the output product.
- Programmer inexperience is a result of departmental turnover, and there should be an adjustment to neutralize the effect of inexperience.
- They did not select the programming language; they are stuck with it.

The inescapable problem with making such adjustments is that the resulting measure does not portray the real output product. Two consequences can result, both of them bad in the long term:

- Management's view of the obstacles to productivity can become blurred. Instead of a sharp and objective focus on the true cost of low productivity, the effects of the obstacles to productivity are masked. Obstacles are much more likely to be identified, analyzed and overcome if their true effects on productivity are measured and portrayed.
- The ability to track and portray improvement trends is lost.

For these reasons IBM is continuing its Function Points measurement work with its original objectives: to be technologically independent; to measure all the applications functions delivered to the end user; and to measure only the applications functions delivered to the end user.

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Fourth-generation languages prompt productivity boost

By Pieter Mimno
Special to CW

The rapid proliferation of computers to a wide variety of end users has caused a serious productivity crisis. The demand for new applications is clearly outstripping the ability of professional programmers to supply these applications using conventional development techniques.

In many organizations, the imbalance between demand and supply has resulted in a growing application backlog, increased end-user frustration and a deterioration in the support provided to the organization by information services. New, much more powerful development techniques, accessible to end users, are required to solve the productivity crisis.

One significant trend that developed recently addresses the productivity needs of both end users and professional DP personnel. This trend is the growing movement away from the use of inefficient, manually oriented third-generation programming tools such as Fortran, Cobol and PL/I and toward much more productive, automated fourth-generation language tools.

This new technology enables organizations to use computers and information more effectively and to obtain major increases in development productivity. These products sidestep the process of hand coding applications.

The programming of applications one line at a time using third-generation, hand-coding techniques is a hopelessly inefficient process that must be replaced by more automated techniques. Few organizations can afford the expense, low productivity and unreliability of hand-coded applications.

Hand-coding techniques are incapable of coping with the avalanche of new applications that are already overwhelming data processing centers. In his book, *Application Development Without Programming* (Prentice-Hall, Inc., 1982), James Martin estimates that the number of applications per data processing center is growing at a rate of 45% per year. Over a 10-year period, this rate of growth will result in 40 times as many applications as we now have.

Most development centers currently need a productivity improvement of 10:1 to cope with the rapidly growing backlog of new and pending applications. Over the next 10 years, productivity in the applications development process must increase by a factor of 100.

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> *Organizations that have made a commitment to fourth-generation languages . . . have found they can develop applications much faster.*

In order to achieve major improvements in development productivity, it is necessary to do the following:

- Eliminate hand coding.
- Use automated applications development-tools.
- Provide end users with automated tools that enable them to access and process information directly to solve business problems.
- Use new prototyping and development methodologies that are tied to automation.

Automated fourth-generation languages have progressed to the point that they can be used to replace Cobol and Fortran for all but the most complex or time-critical applications.

These languages provide a wide range of integrated functions, includ-

See BOOST SR/36

Mimno

Mimno is president of Technology Insight, Inc. of Marblehead, Mass.

He is also the editor and coauthor of the "James Martin Report on High Productivity Languages."

What IBM can't tell you about MVS, CICS, & VM.

Marketing clouds language issues

By Roy Bengen
and Nicholas Zvegintzov
Special to CW

Fourth-generation languages are a marketing skin wrapped around a mix of products. The aim of the vendors is to persuade data processing professionals to buy everything that the vendors have to sell — everything inside the marketing skin. The aim of DP professionals is to buy only what they need.

The "language" in fourth-generation language strictly refers to query and report-generating tools, but vendors want DP customers to think that when they buy the language, they buy all the tools the vendors have in the closet. Some of the tools in the closet are useful and needed. These include the following:

- Tools for specifying the most visible functions of a data processing system — reports, inquiries, screen formats, graphics and so on.
- The building blocks of a data processing system — data base, data dictionary, communications, development support tools and the like.
- Applications packages — payroll, accounting, manufacturing support and others.

The challenge for DP professionals is to do the following:

- Buy tools that they need.
- Buy the tools at the time that they need them.
- Fit the tools to the systems and people that the professionals already have.
- Not lock themselves into proprietary straitjackets.

Fourth-generation language products can be bought separately when a customer persists. Try out a vendor by asking for something specific. If the system is so general that it will match every need, but not specific enough to match your shop, avoid it.

The fourth-generation language marketing approach is designed to convince DP management that they need an entirely new system for creating applications and that they need to replace everything in their shop with it. Some of the arguments promoting fourth-generation languages make the following claims:

- Most shops have an application backlog.
- There are not enough programmers.
- Users should do their own programming.
- Systems must be integrated.
- Most DP systems are old and worn out, and, therefore, fourth-generation languages are needed.

This approach lacks substance for the following reasons:

- Backlog is not the central issue in most shops. Users always want more than they can get, but that is human nature.
- Programmers are in fairly good supply; in fact, there is a surplus of entry-level programmers.
- Users do not want to do their own programming. If they did, they would be in data processing.
- Integrated systems are not essential, and they bring their own problems. The more integrated the system, the more difficult to adapt to existing constraints and the harder to maintain.
- Most currently installed systems are old but not worn out. Most systems managers would like to keep the old systems and build new features on top.

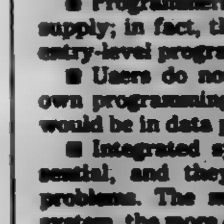
Given these weaknesses, the future of the fourth-generation language marketing approach is dim.

The fourth-generation shakeout

DP professionals should also note that within the fourth-generation marketplace there has been a ferocious shakeout. Most fourth-generation language start-ups have faded away, and there is heavy competition among the larger and older vendors.

Martin Marietta Data Systems now owns both Ramis II by purchase of Mathematica Products Group, Inc.

See FOURTH SR/36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Zvegintzov is the editor of "Software Maintenance News" in Staten Island, N.Y. Bengen is a Philadelphia-based consultant.

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Subsecond TSO response times cultivate productivity

SYRACUSE, N.Y. — By a conservative estimate, a large farm cooperative here has gotten between 53 and 55 programmers' worth of work out of its 50 programmers since it installed applications development hardware and software in June 1984.

The estimate is that of Dennis LaHood, director of systems development for Agway, Inc. And the numbers bear him out: Agway's IBM TSO transactions have increased from approximately 55,000 to approximately 75,000 per day, and the firm has not added to its programming staff.

Agway, a $4 billion concern owned by 104,000 farmers in 12 Northeastern states, oversees farm supplies and food marketing for its members. LaHood's staff develops between 300 and 400 programs a year and maintains a stock of software that handles corporatewide and divisional data.

The cooperative brought in its application development aids last year shortly after it upgraded from two 8M-byte IBM 370/158s to two 12M-byte 3033s — one for development and one for production — in an attempt to end a response time problem that had stalled programmers' work.

Before it upgraded the mainframes, Agway logged an average response time of 6 seconds for trivial TSO transactions on its development mainframe. The upgrade brought the average lag down to between 2¼ and 3 seconds and let Agway process 65% of its trivial transactions in less than 1 second. It left room for improvement, however, according to Andy Catts, the firm's manager of technical assistance.

AGWAY

"When we upgraded the CPUs, we had to ask if the new IBM gear solved everything for us," Catts said. "The answer was obviously no." Agway still had two issues to address: consistent reponse time and individual productivity.

Consistent response time. Although response times dropped after Agway installed the IBM equipment, they were still inconsistent: They varied according to the number of other demands on the mainframes.

Individual productivity. Programmers still had to wait for the mainframe to process nontrivial transactions. Their keyboards froze, and the programmers could work on nothing else.

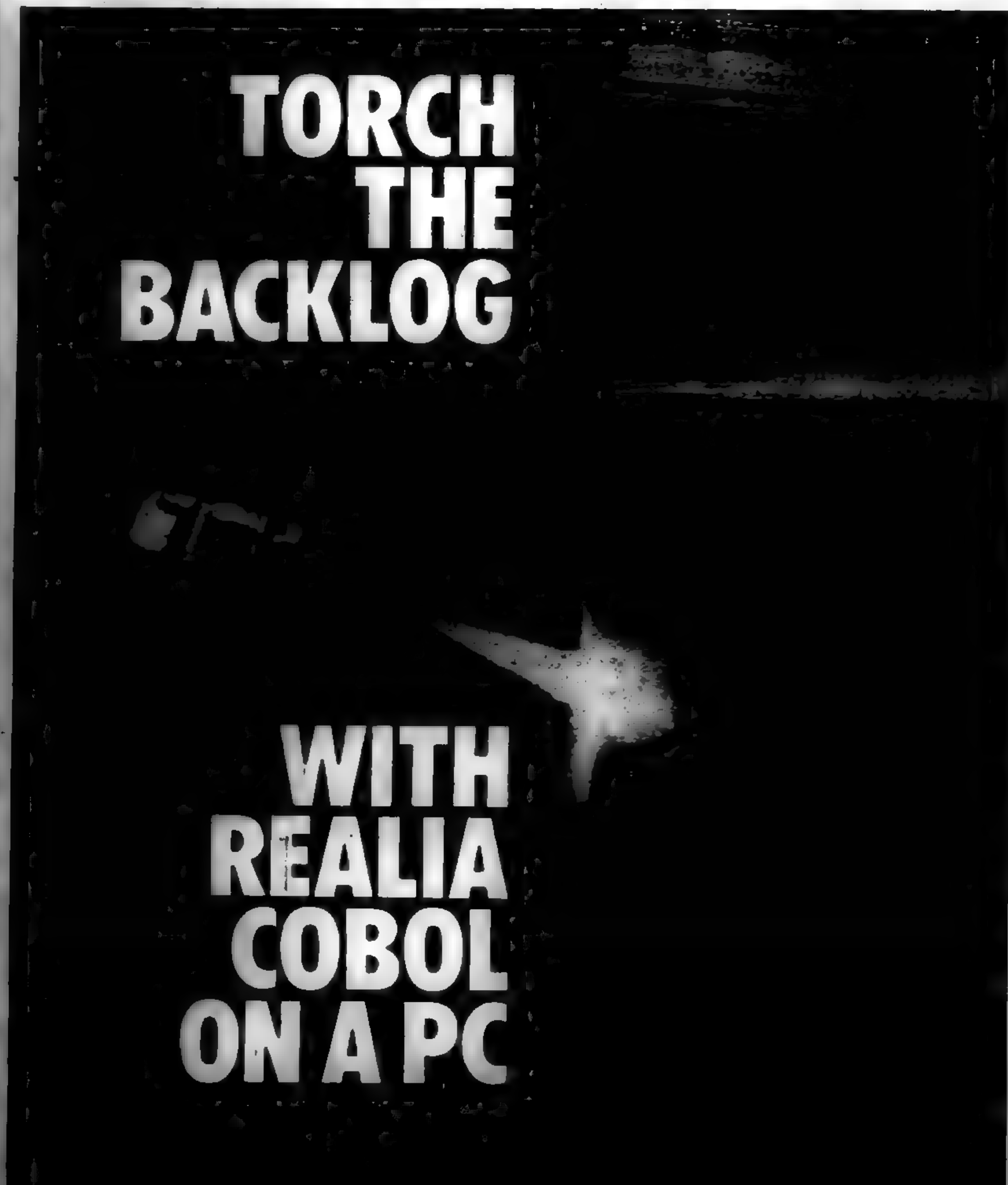
First commercial user

Agway agreed to serve as the first commercial user for an integrated applications development system (see story SR/27). The system, Dialogic/One from Dialogic Systems Corp., consists of a parallel processor, made up of four Motorola, Inc. 86010 chips, that runs program development application software and a series of editors. The hardware sits physically and functionally between programmers' terminals and their host mainframe, which runs software that enables communications (see chart).

Since it began using the system, Agway has consistently off-loaded approximately 40% of its total TSO transactions from the mainframe to the parallel processor, according to LaHood. Overall programmer transactions have increased by approximately 26%, but the number being run on the mainframe has dropped by approximately 20%.

The setup has resulted in average response time of less than 1 second, LaHood said. He calculated that the decreased response time accounted for an increase of at least 5% in programmer productivity, based on a study in "The IBM Systems Journal" that related the two factors.

Because developers have access to their own processor, their response times no longer vary according to other users' demands on mainframe resources; the processor ensures consistent response times regardless of



in farm co-op's DP shop

other users' patterns of consumption. LaHood said the setup also shields development from the inevitable rise in demand for mainframe power and the performance degradation that accompanies it.

The Dialogic/One's software components, especially programs that give developers split-screen and Cobol editing capabilities, have also contributed to improvements in productivity, especially for individual programmers.

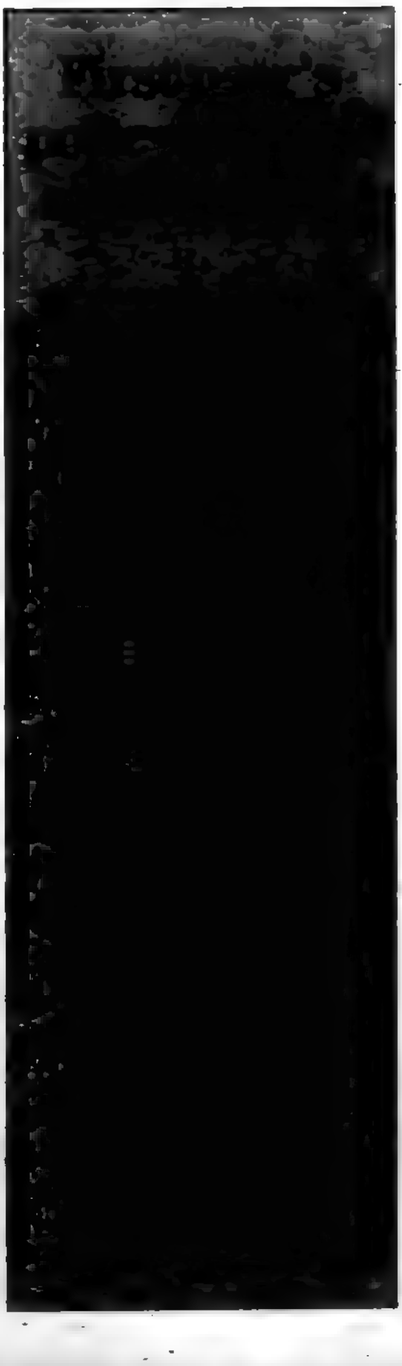
The split-screen capability allows a programmer to perform up to four concurrent tasks. While the programmer waits for one transaction to run, he can work on another one.

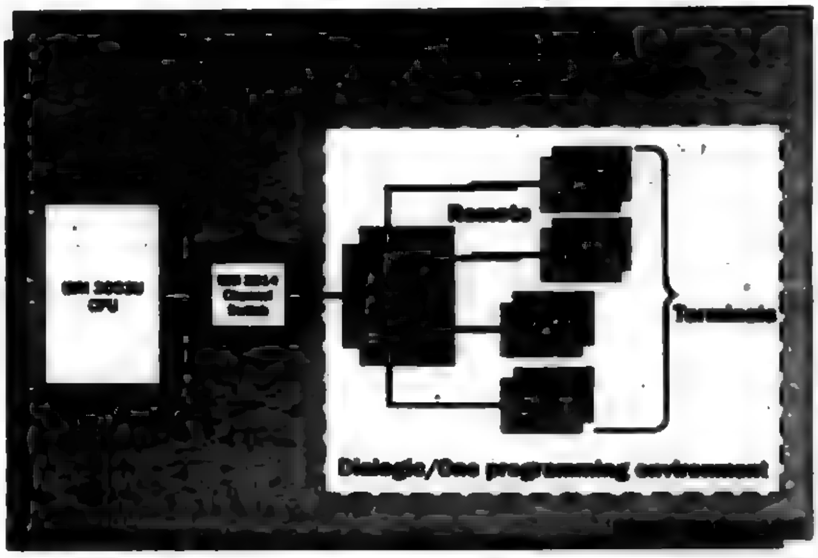
Catts said the advantages of this approach over traditional TSO processing have impressed Agway's programmers.

"In the standard TSO environment, you can only perform one task at a time," he explained. "With the Dialogic system, a programmer can sit down at a terminal, split the screen up and do multiple tasks concurrently. It's been great for the productivity of the application development group here."

LaHood said the system's Cobol editor, which allows programmers to check and edit their syntax before they compile a program on the mainframe, has also contributed to improvements in productivity. Without the editor, Agway's programmers had compiled their programs an average of three times before they cleaned up errors in syntax; with the editor, they compile programs just once, on the average.

Besides freeing programmers from the chore of recompiling their work, the editor has allowed Agway to cut costs by reducing the amount of expensive mainframe time devoted to compiling code, according to LaHood. He said logic errors still hamper development, but he knows of no quick solution to that problem.





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informatics general corporation

application development report: MARK V

MARK V® HELPS AIRCRAFT MANUFACTURER ENTER ONLINE PROGRAM DEVELOPMENT WORLD

Use of MARK V at Beech Aircraft Corporation has not only increased the productivity of the firm's programmers and analysts — it has given them a whole new capability for online program development.

Prior to acquisition of MARK V, an Implementation System from Informatics General Corporation for generating online applications, Beech had largely limited itself to purchasing ready-made packages for its online systems. "Until we acquired MARK V, greater levels of technical expertise and manpower were required to develop online systems," explained Craig Young, MARK V Coordinator in the Beech Computer Services Department.

"We're an IMS/DC shop, and in this environment a COBOL programmer has to be thoroughly versed in IMS and DL/I in order to write online programs," he added. "We're talking about months and months before you develop enough expertise to be productive. But a programmer using MARK V doesn't have to learn IMS or DL/I, and this shortens the learning curve tremendously. We can take recent hires, or people who for one reason or another have not been involved with IMS, and almost immediately put them to work developing online systems."

Beech, a leading manufacturer of business and commuter aircraft, employs about 40 programmers and analysts, nearly three-quarters of whom have learned to use MARK V, Young noted. Total employee count for the firm is approximately 7,500. The company uses an IBM 3084 mainframe, running under the OS/VS MVS operating system.

Their pilot MARK V project — the first online system ever developed by the firm in-house, Young noted — was an interactive Industrial Relations System linking the functions of Personnel and Payroll with a common online data base.

This system allows Personnel to load information on new hires into the data base from their online terminals, with control of employee data being automatically transferred to the Payroll Department after employment begins.

Coding for the Industrial Relations System was performed by two Beech programmers who attended the MARK V training class but had no prior experience in data communications or online system development.

In addition to MARK V, Beech also uses MARK IV®, an Informatics Implementation System for generation of batch application, and SHRINK, an Informatics data compression system.

"The online data base for the Industrial Relations System has to interface with our existing batch payroll system," Young explained. "To facilitate this we're using MARK IV on the front end, to load the online data base from the existing batch personnel files — and we're also using MARK IV to read the online data base and update existing personnel files that are used in writing paychecks. In effect, we've got MARK V in the middle and MARK IV on both sides of it."

Beech has implemented a number of additional online systems since completion of the pilot Industrial Relations System, Young pointed out. "MARK V has made us a lot more responsive to user requests than we used to be," he noted. "For example, we recently put up an online Telemarketing System for our marketing people that has met with enthusiastic approval from the users."

"We had not had a Telemarketing System in the company before, and when we began developing this online system the user was making his best guess at what he wanted, but really wasn't sure," Young explained. "Here, the flexibility MARK V provides in prototyping a system really came to our rescue. It was a tremendous asset to be able to quickly change or add the things the user wanted."

Other online systems recently developed using MARK V include:

- An Inventory Management System used by Procurement to maintain information on manufacturing inventory. This system was originally purchased from an outside vendor, and was written in COBOL; Beech programmers have added a number of sections and screens to it using MARK V.
- A Production Inventory Control pick list system.
- A Tool Control System to track location of tools.
- A Quality Assurance System that keeps track of periodic calibration of tools and certification of personnel as required by FAA.
- A system to cross-reference vendor part numbers with the company's in-house material code numbers.
- A report distribution control system for the Computer Services Department.
- A system to track reliability of target missiles manufactured by Beech for the military services.

"There's a lot of enthusiasm among our programmers to use MARK V," he said, "because it's a way for them to get into the world of interactive programming quickly, without having to learn all the ins and outs of IMS data communications. They consider it a real break from the humdrum of batch systems, to be able to work on an online application."

"The advantages to the company of having information available online are obvious — and now that we know how easy it is to get an online system up, we're much more inclined to look at writing an application in MARK V and putting it online," he added.

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The future of prototyping as a user-friendly DP strategy

By Bernard H. Boar
Special to CW

In the past year there has been a tremendous growth and acceptance of prototyping as a requirements definition strategy. This is not at all a surprising fact, as more and more corporations have realized that alternative definition techniques are feasible with integrated fourth-generation software.

Many data processing professionals are interested in learning how they can successfully implement prototyping as well as learning what the future of prototyping will hold.

Predicting the long-range future of prototyping is simple if its future is viewed as part of the natural trend toward friendly, more user-oriented data processing approaches.

The future

What, however, will happen with prototyping during the next few years?

When I gaze into my crystal ball to see the future, I see the following:

Controversy. As is the case with most new ideas and techniques, controversy will surround prototyping. Conservatism, vested interests and skepticism will all contribute to the debate. Many users will be hesitant to experiment fearing that "the leading edge is the bleeding edge."

Though concern is understandable and prudent, the controversy will eventually give way to enthusiasm for this approach.

After all, nothing is radical about an approach that promotes the following:

- Interacting with the users.
- Quickly building a model solution.
- Demonstrating the solution.
- Refining the model based on the user reaction.

> ”
>
> *Predicting the future of prototyping is simple if it is viewed as part of the natural trend toward user-oriented DP approaches*

In the long run, nothing can remain controversial about such a simple, yet elegant, approach to solving the communication problem and finally enabling meaningful user participation.

Every consultant will be a prototyping expert. As the interest and market for prototyping grows, so will the consultant bandwagon of products and services. The information center, data base management system and structured techniques all created huge consulting industries.

There is nothing wrong with this, and, to the contrary, the availability of qualified consulting support can expedite the introduction of prototyping.

Prospective clients, however, should be selective when they go about hiring a consultant.

Prototyping products. Today actual prototyping tools cannot be bought. Rather, one buys a superior product to support conventional development that can be used to support rapid prototyping.

As the prototyping discipline develops, specific prototyping products will be developed.

Such products will be designed around a central integrated dictionary and will optimize the productivity/flexibility of the prototype without regard to production system constraints. The influx of this technology will be especially evident in the personal computer world as multiuser systems with shared data bases become available.

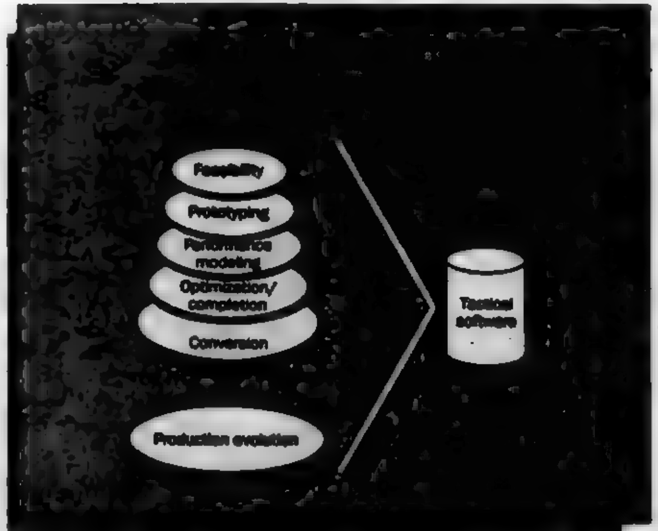

Figure 1. Prototyping is a key stage in fourth-generation development.

Prototyping will displace prespecification. By the early 1990s prototyping will be

See MODEL SR/35

Boar is national director of advanced technology for Software Resources, Inc. He is the author of Application Prototyping: A Requirements Definition for the '80s *and is a frequent contributor to* Computerworld.

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Prototyping system halves insurance firm's backlog

MILWAUKEE — An insurance firm here cut its backlog in half and brought up a valuable strategic system after it switched from a standard development methodology to one based on prototyping.

Before June 1983, when Capitol Bankers Life Insurance Co. installed a fourth-generation applications development system, the firm did most of its programming in Cobol. Capitol Bankers had grown 225% annually for three years, and programmers could not keep pace using a third-generation language. They faced a six- to eight-month backlog.

Today the firm has a three-month backlog, according to DP manager Dan Johnson, and much of the time lag has resulted from increased demand rather than from development problems in the DP shop.

Capitol Bankers Life

"By dramatically reducing our application development backlog, we have found that we can go back to our users and tell them that they can have more features, instead of fewer," Johnson said. "This made our data processing department very popular."

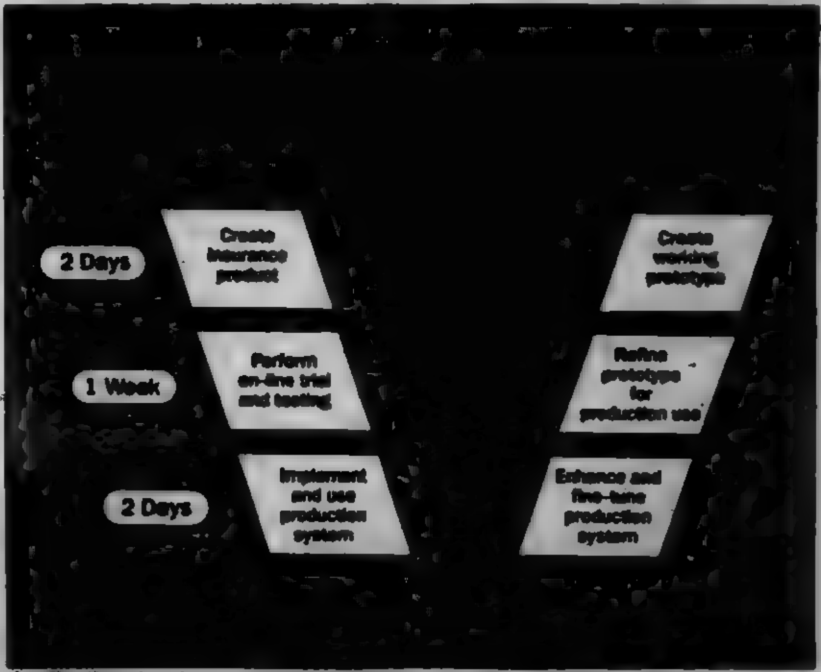
Johnson's staff works with users to design prototypes with Rexcom, a fourth-generation language and relational data base management system (DBMS) from Rexcom Systems Corp. The software runs on two 6M-byte Prime Computer, Inc. 9950s linked in a ring network.

Working with the users

At the start of any development project, programmers meet with users to define basic functional requirements. When these are set, the programmers build interface screens and data bases with Rexcom. They add some simple edits and data manipulations and release the prototype. Users then work with the prototype system, entering test data and generating reports.

Next, the programmers build the system into a production application. At this stage, they add edits and tie in Fortran or Cobol subroutines that can handle heavy calculations better than the fourth-generation language can. When they finish, they release the production system to the users.

For typical applications, those that support new insurance policy types, development takes two weeks from planning to implementation, according to Systems Analyst Tom Ehlen. When Capitol Bankers programmed in Cobol, the development cycle consumed two months or more.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Perform on-line trial and testing
2 Days
Implement and use production system
Create working prototype
Refine prototype for production use
Enhance and fine-tune production system

Application development normally takes about two weeks.

Johnson said the prototyping life cycle gives his shop an edge over organizations that use traditional techniques. "In many DP shops I know of, it takes six months before a new application even enters the development queue," he said. "Here, we are able to sit down with the users, sketch out their functional requirements and present them with a prototype system in just a few days."

Capitol Bankers has taken advantage of its development tools to create new policy applications, ad hoc reports and strategic systems, most notably an application that allows independent insurance agents in the field to enter policy data to the Prime hosts on-line and print out policies in their offices.

Field agents use a variety of terminals and microcomputers to dial into the hosts via Tymnet, Inc.'s Tymnet. As agents enter policy data, Rexcom applications capture, edit and validate the information. Cobol and Fortran routines then access the data in batch mode.

These routines calculate clients' insurance premiums. Within 20 to 30 minutes, agents can print out a client's policy record.

See PROTOTYPE SR/35

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Fourth-generation languages: What they are and are not

By Arnold Leak
Special to CW

Fourth-generation language is a term that has been applied somewhat ambiguously to a number of productivity tools. The ambiguity inherent in the definition is characteristic of the differences found within the set of productivity aids being sold as fourth-generation languages today.

The fourth-generation term was coined to describe tools that were designed to be more productive than third-generation languages for creating applications.

One common objective of fourth-generation languages is to eliminate programmers from the software creation cycle.

Programmerless development

The systems analyst can use the new products to generate prototype programs quickly to show the user. This process is completed without detailed hand coding by a third party; it is in essence, programmerless software development.

To be defined as a fourth-generation language, a product must have the following features: nonprocedural operation (does not require a programmer); natural language (English-like) keywords; links to a centralized data base and data dictionary; efficient code creation; and the capability of creating applications in one-tenth the time (or less) required to hand code Cobol.

The speed of applications creation and the absence of procedural code enable prototyping to be done by nonprogrammers.

Fourth-generation languages must be differentiated from other software with which users or systems analysts can create applications. Products that can be grouped into the non-fourth-generation-language category include query languages, report generators, graphics languages, applications generators, high-level programming languages and parameterized application packages.

Leak is vice-president of technology for Commercial Systems Laboratories, Inc. in Auburn, Ala.

GAINS

from SR/19

each such instance as an opportunity to increase their understanding.

They will soon learn which employees are willing to share their knowledge and which are most skilled at explaining technical issues.

■ Third, MIS managers who lack technical expertise can find help outside their shops. There are excellent textbooks and university classes directed toward managers who have little or no technical background.

Managers who have both management and technical skills will be able to lead employees to reach their full potential as effective, productive professionals.

Concern for individuals. Effective MIS managers are concerned with their employees as individuals. They respect their differences and attempt to provide the environment most conducive to each one's productivity. Managers must recognize, for example, that some people work best when they have considerable freedom, while others need structure and guidance.

Recognizing and understanding employees' perceptions of their roles in the organization are also critical. Conflicts arise when employees sees themselves differently from the way their manager sees them. To reconcile the two perspectives, managers must talk and listen.

Most MIS professionals have definite feelings about their needs and their roles, and they will discuss these with the manager who has learned to listen.

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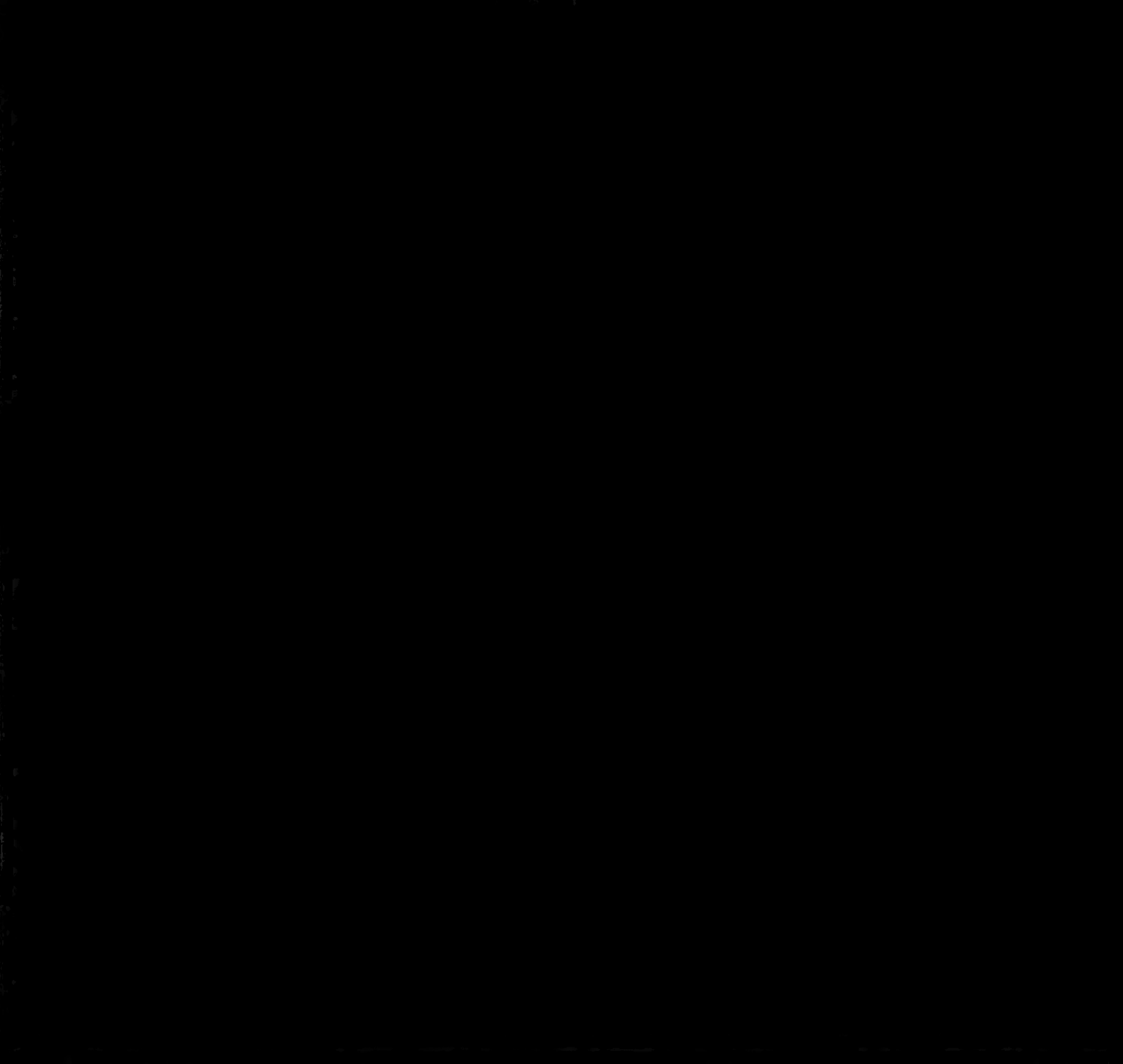

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Special Report

AT&T subsidiary undertakes two-part effort to boost

JACKSONVILLE, Fla. — A two-pronged approach to software productivity is helping an AT&T subsidiary here meet the challenges of the competitive postdivestiture world.

American Transtech, Inc., established by AT&T in 1983 to provide shareowner services during the divestiture, branched out after the Bell system officially split in January 1984. Today, it offers record keeping, direct marketing and other information services to outside clients.

The expansion required massive software development efforts. In the past year, American Transtech has doubled its programming staff from 100 members to 200 and has developed just under one million lines of Cobol code, according to David Adler, the firm's director of information systems development.

Growth, however, was not a sufficient condition for survival in the market American Transtech had entered. "We have a mission to be a responsive provider of quality, innovative information systems to our clients," according to Adler. To prosper, he added, the company had to speed up its software development efforts and keep costs competitively low.

The firm targeted software development as an area that needed improvement. Programming was central to the creation of any service offerings, yet it lagged behind other efforts such as hiring personnel and installing hardware.

American Transtech attacked the problem on the following two fronts:

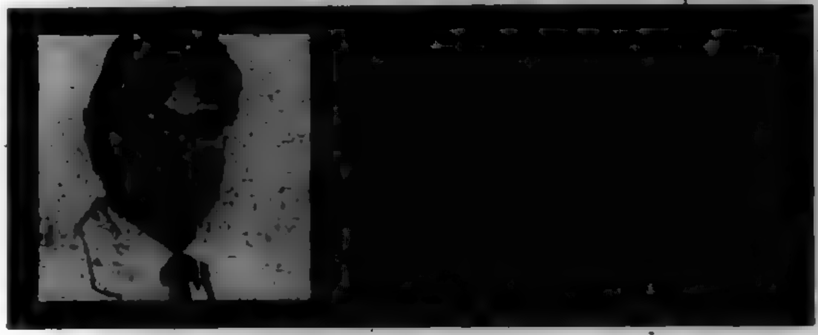
- In the DP shop, it brought up a Cobol code generator to give programmers the ability to develop and maintain applications more efficiently.
- In user departments, it installed a mini-based relational data base management system (DBMS) to allow users to create some of their own applications.

Code generation. American Transtech runs Master Software, Inc.'s Programaster Cobol generator on a 32M-byte IBM 3081. To develop code, programmers work through a set of menus then call on the generator to compile prewritten modules into a working application.

They begin by selecting one of six functions: edit, update, report, sort, merge or explode. Screens within each function guide programmers through the development process. According to the choices a programmer makes at each stage, the generator pulls prewritten modules of code from a library and inserts them into the application.

If a programmer needs to modify the prestructured logic to perform specific functions, the code generator indicates where he should insert new statements. Adler said programmers can store any logic-specific modules they write in the code library, from which they can call for the module in future applications.

On average, he said, the programs American Transtech has developed with the code generator — a group of about 60 programs — consist of about 72% generated code. Programmers developed most of these programs during a five-week trial, after which the firm deinstalled the code generator until the firm signed contracts with the vendor. American Transtech installed the generator in production mode early in July and is currently working on a 50-program application scheduled for completion next month.



Because the firm still has relatively little experience with the product, Adler said, no one has calculated exact savings in time or money. During the trial period, however, programmer productivity (measured as performance against schedule) increased by 28%.

Adler said that in about 10% of all programs, development with the code generator actually took longer than without the tool. This set of programs — mainly those for scientific processing — did not conform well to the generator's set program structure and required extra manipulation by American Transtech's DP staff members.

Because between 80% and 90% of the firm's programs target more mundane applications (financial record keeping and mass mailings, for example), Adler said he expects most development to proceed as fast or faster than it did when the shop used traditional coding techniques.

The firm's main savings, however, have come in the program testing cy-

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its software development

cle, which now takes less than half the time it once did, regardless of application type. Testing is faster, Adler said, because a substantial part of each new program is prewritten code that does not require testers' attention.

Although programmers initially hesitated to accept the code generator, time savings have helped win them over. Adler estimated the average programmer has chopped between 10 and 15 overtime hours from his workweek.

Programmers' biggest qualm, he said, had been that the generator would make their job an assembly line process, with little creativity involved. Most of them came around, however, when they accepted coding as a routine task and learned to devote their creativity to initial project analysis.

Regina Alai, manager of the firm's development team, said the code generator eventually helped form a strong sense of teamwork among programmers. "We now spend more time communicating and designing instead of coding and testing," Alai said.

"Our software products are of higher quality, and the programmers feel better about their jobs," she said.

In addition, Adler said, programmers have been able to spend less time at their desks and more in meetings with user groups. Through their involvement, they have come up with ideas that help save the company money.

End-user computing. To promote software development in end-user departments, American Transtech recently installed a relational DBMS, Oracle Corp.'s Oracle, on four AT&T 3B2 minicomputers.

In preparation for the software, the firm sent one representative from each of its user departments to a five-day vendor training session. Each representative is currently instructing employees in his department on the use of the product.

Some DP staff members are also helping the user departments, but these systems people are trying to keep their hands off as much as possible, Adler said. "We continue to work closely with our users but have assumed a coach role, rather than a developer role."

Users are still experimenting with the DBMS and its query language, and they have not produced any working applications. But when these users come up to speed, they plan to develop applications for management reporting, manpower scheduling and similar tasks, according to Adler.

He said applications written by end users will not decrease DP's work load or backlog because the department never devoted much time to developing such programs. The DBMS will, however, allow end users to bring up applications they had little chance of ever getting from the systems staff.

Cobol still going strong, despite grim predictions

By Steven Pfrenzinger
Special to CW

Cobol's future is not as bleak as many would have you believe, especially in IBM's IMS DB/DC, CICS/IMS and DB2 environments. It's alive and well as a procedural language embedded within a group of powerful new IMS application generators used within or under the influence of the development center..

The reasons behind why Cobol did not fade away as predicted by the experts are simple.

- No performance-oriented procedural language has been able to replace Cobol adequately.
- IBM has added significant improvements in VS Cobol II.
- Cobol is not really the problem when developing on-line applications.

First, the fact that no programming languages have come along to replace Cobol adequately is nothing new. The shortcomings of other procedural languages are substantial and have included performance penalties, reduced functionality and restrictive architectures. These and other shortcomings have meant no one language can be used in all situations.

Second, VS Cobol II has significant improvements, probably not enough to quiet the ardent anti-Cobol group but enough to show that Cobol can be enhanced to improve productivity during both development and maintenance.

These enhancements include a PERFORM statement variation for in-line looping without GOTOs, the new EVALUATE/WHEN statement combination for complex conditional tests in a case structure, the INITIALIZE and SET statements to assign values to data items and conditional variables, nested COPY statements, a batch debugging tool, formatted dumps and improved compiler listings.

Add to this the command or macro-like feature of some Cobol-based application generators, and Cobol's future looks even better. This feature allows blocks of reusable Cobol code to be built, modified and inserted into generated Cobol programs. These blocks of reusable code can be built by senior developers to blueprint common functions within a system or installation, which provides major opportunities for productivity.

Third, Cobol is not the problem. It is only the language used for procedural logic requirements, and that is not the real challenge in developing on-line applications. The real challenges come from screen definitions (for example, message format service and basic mapping support), data communications interfaces (for example IMS, DC and CICS), data base access (for example DL/1 and SQL), testing, prototyping to validate user requirements and others that have nothing to do with Cobol's merits as a procedural language. Cobol is continually blamed for low productivity in on-line applications development while the items listed above are the real culprits.

Simplifying these challenges is what most of the Cobol-based application generators are attempting to do.

The debate over Cobol's future will likely continue. However, the fact remains that there is a huge base of trained Cobol programmers and plenty of existing and newly developed Cobol systems on which they can work.

Given that we can get substantial improvements in productivity from these Cobol programmers, IMS and CICS installations can follow a more evolutionary, rather than a revolutionary, path to increased productivity.

Pfrenzinger is president of IMS Consulting, Inc., an Encino, Calif.-based consulting firm.

[illegible]

Documentation boosts systems development effort

By Gary Laneman
Special to CW

Systems developers toil to produce documentation for business users but direct little effort toward meeting their own needs. This lapse hinders systems development productivity.

Documentation can improve productivity in systems development, as it does in business applications, by providing efficient means to record and share information. But to take advantage of these efficiencies, systems developers must identify their needs and meet them.

Identifying documentation needs. Documentation should span all phases of the systems development life cycle. To do so, it must encompass three broad categories — strategy, management and technology.

■ **Strategic documentation.** In order for significant change to occur, managers must make an accurate articulation of the change; strategic documentation accomplishes this.

The strategic documentation process begins with the statement of a company's business strategy. At a high level, business strategy documentation sets an organization's direction for products, services and support. At the systems level, it indicates a company's best bets for using emerging technology to exploit market opportunities.

■ **Management documentation.** Broadly, this category includes all documents used to manage systems development activities. Management documents include performance objectives, project schedules, status reports and performance reviews. This category also includes guidelines for systems standards and methodologies and for documentation and investment.

> ”
>
> *Every organization needs an integrated framework of documentation that will promote productivity by helping systems developers reference, share and manage their documentation.*

Management documentation supports strategic documentation by giving feedback about a firm's advancement toward strategic goals. It provides the tools for managers to assess and improve their organization's systems development productivity.

■ **Technical documentation.** Historically, this category has received most of the attention given to documentation. Despite the effort expended at this level, however, problems continue to occur. Run books, for example, do not contain meaningful solutions to unusual system problems.

Meeting documentation needs. Every organization needs an integrated framework of documentation that will promote productivity by helping systems developers reference, share and manage their documentation. For each of the above categories, the framework must provide developers with the following five key functions:

■ First and foremost, it must support easy, reliable and accessible means of referencing development documentation. Developers must be able to use the three classic references found in libraries: author, title and subject. In addition, systems developers should be able to use keyword searches.

Multiple, on-line indexes provide the ability to locate documentation quickly, but not all documentation resides on-line. Any reference scheme, then, must address both on-line and off-line documentation.

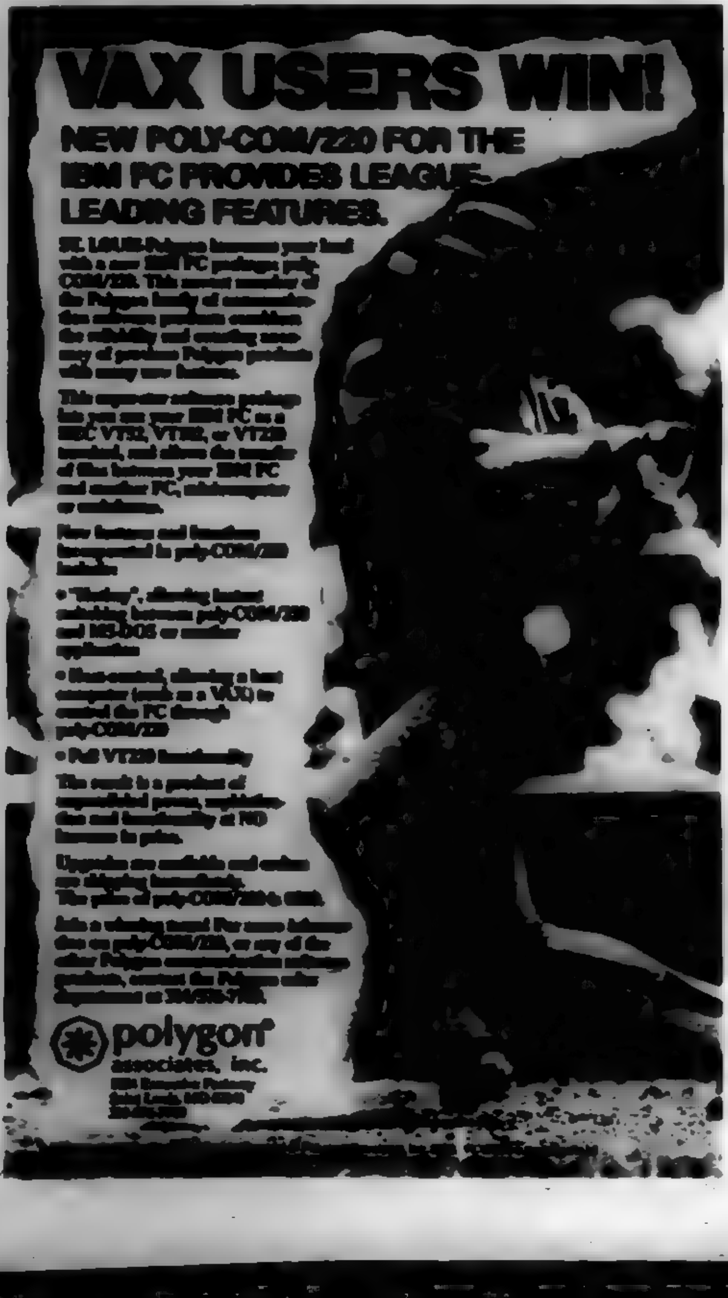
■ Second (because, over time, more and more documentation will reside on-line), the documentation framework must provide developers with a means to print some or all of a document on demand.

■ Third, the framework must provide on-line development facilities. Such facilities alleviate many of the problems associated with keeping documentation up to date. They provide change control, for example, which protects users while developers change the system.

■ Fourth, the documentation framework should give developers an opportunity to share some of the unique or interesting ways in which they have used different tools. An electronic bulletin board, for example, lets systems developers improve their productivity by using other people's experiences as a springboard.

■ Fifth, the framework must provide a monitor that collects information on the successful and unsuccessful use of documentation. A monitor provides information that helps answer questions such as: "What documentation is used most frequently?" and "What documentation is sought unsuccessfully?"

Laneman is a senior systems consultant for Bank of America, which is based in San Francisco.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PROTOTYPE from SR/29

With the system in place, Johnson said, "we can now offer our independent agents an industry leader — instant policy turnaround — . . . an incredible competitive-advantage that no one else I know of currently offers."

Capitol Bankers would not have attempted instant turnaround, either, if it still relied on Cobol programming, he said.

According to Johnson, "We did not even envision such a system until we had Rexcom in-house."

> 'We can now offer our independent agents an industry leader — instant policy turnaround.'
>
> — Don Johnson
> Capitol Bankers Life Insurance Co.

System up quickly

Using the fourth-generation language, programmers brought up the Rexcom system in less than four weeks.

Since Capitol Bankers installed Rexcom, it has used the language and DBMS in about 75% of its new applications.

Programmers, however, rarely write a complete fourth-generation program; rather, they develop data bases and screens in Rexcom and create computational subroutines in Fortran. Johnson said this approach — using the most appropriate language for a given task — has been the reason for his staff's success.

According to Ehlen, Capitol Bankers' users have had few problems with response time, even though the system normally supports between 35 and 55 concurrent users and includes several data bases with up to 100,000 records.

Users sometimes have to wait for their initial system inquiry, but subsequent inquiries generally take less than three seconds, he added.

Ehlen, left, and Johnson

MODEL from SR/28

established as the preferred definition strategy. Prototyping will be used as the cutting-edge definition technique to get a verified agreement on the user's needs quickly. Prespecification methods will then be used to complete those parts of the application that do not lend themselves to model building.

The rationale for this is simple: Prototyping fits naturally the way people normally decide on what they want.

Fourth-generation development methodology. Prototyping will lead the way to a modern fourth-generation development life cycle (see figure 1). The attributes of such a life cycle would be as follows:

- Prototyping will reduce application development risk. The strategy is straightforward: Invest neither substantive human nor machine resources in developing an application until a working model has been experienced, critiqued and agreed to by all affected users.
- Performance modeling will assure operational feasibility. The results of the functional prototype will provide the necessary metrics to permit meaningful performance modeling to assure and define operational feasibility.
- Rapid and responsive application development. More then anything else, users want applications rapidly. By leveraging the prototype into production by optimizing it, the life cycle will be compressed.
- Fully leverage tactical software. The powerful software that enables the rapid prototyping will be extended to the entire life of an application. From feasibility through system evolution, an integrated set of software will track, build and maintain the system.
- The system life cycle will trade conjecture for confirmation. Rather than proceeding solely on paper specifications, the system life cycle will be punctuated by numerous small, rapid experiments to confirm the wisdom of an approach.

In conclusion, fourth-generation system development will bring together many of the best current ideas on software development and package them into a responsive but orderly process.

The trend toward a user-friendly DP style is becoming evident. Whether the subject is languages or the user/machine relationship, the trend is clear.

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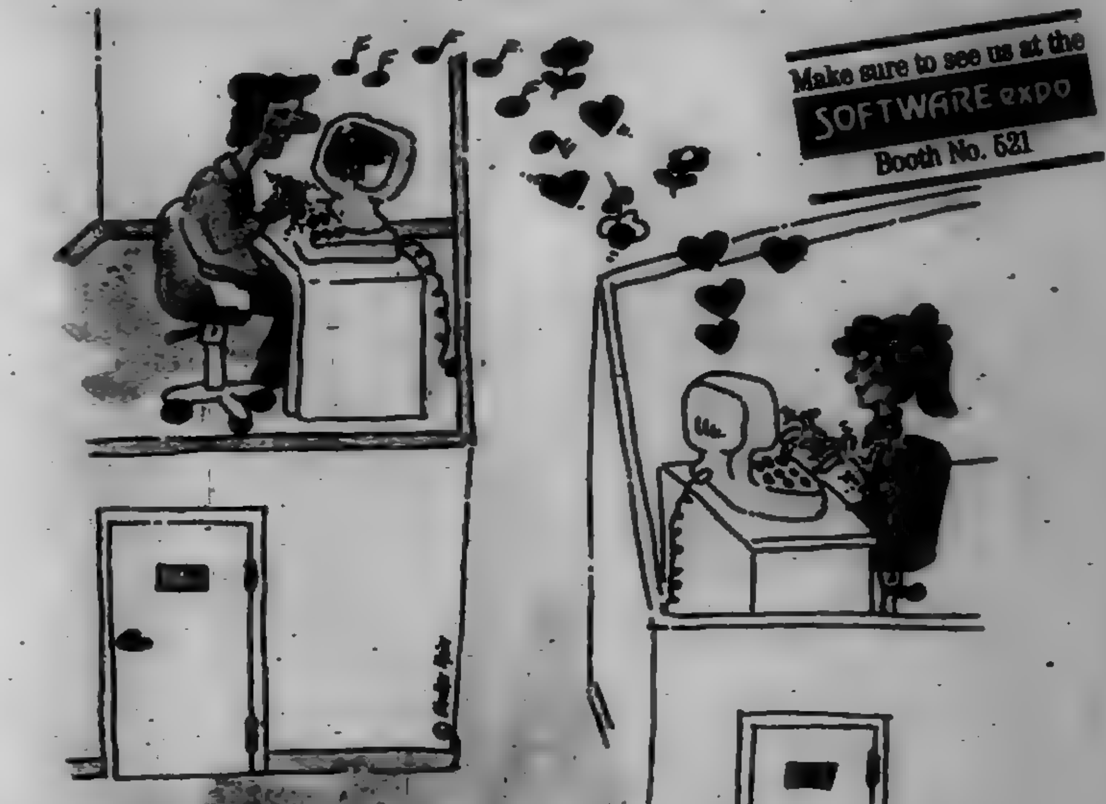

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FOURTH

from SR/23

and UFO by purchase of Oxford Software Corp. Dun & Bradstreet Corp. now owns both Nomad2 by purchase of National CSS, Inc. and the Millenium development harness through its purchase of McCormack & Dodge Corp.

SAS Institute, Inc. bought the System 2000 data base system. The Canadian conglomerate Crowax bought the Model 204 data base via purchase of Computer Corp. of America.

The software tool conglomerate Sterling Software, Inc. acquired Mark IV by taking over much larger Informatics General Corp.

Standard unlikely

Under these circumstances, it is unlikely that any fourth-generation language standard will emerge.

Instead, existing languages will continue to evolve and extend. IBM VS Cobol II is already available, and Ansi Cobol 85 is due in November.

> *Under these circumstances, it is unlikely that any fourth-generation language standard will emerge.*

As if anticipating this trend, the fourth-generation language vendors are hedging their bets. Applied Data Research, Inc. offers ADR/DL, which is an enhanced Cobol, and Martin Marietta Data Systems announced in June both a Cobol/XE and a PL/I-like System Building Executive.

Supporting existing languages key

Fourth-generation language vendors will survive by moving away from inventing languages and moving toward supplying support functions that are compatible with existing languages.

With this service, they can promise to assist the data processing professional in the arduous task of keeping current systems targeted on current needs.

This is a less magical promise than that of the fourth-generation language, but it is one more likely to be fulfilled.

BOOST

from SR/22

ing data query, report generation, graphics generation, decision support, applications generation, micro-to-mainframe links and, in some cases, a fully integrated micro version of the mainframe product. The languages are appropriate for use both by non-DP end users and DP professionals.

Most fourth-generation languages provide a user-friendly front end that may be learned easily by end users to support data base query operations and the generation of screens, reports, graphics and application prototypes.

In many organizations, DP professionals use these tools to create complex applications requiring extensive functionality and large amounts of procedural logic.

Most fourth-generation language tools routinely demonstrate about a 10:1 improvement in productivity relative to Cobol for business applications of moderate complexity. Improvements of 3:1 relative to Cobol are typical for complex applications requiring extensive procedural logic.

These productivity gains are achieved primarily by the nonprocedural components of the tools, that is, the ability to support very rapid specification of data dictionary entries, data views, edit criteria, display screens, menus, reports, graphics and simple prototypes. Numerous users report productivity gains in the range of 10:1 or 20:1 relative to Cobol for on-line transaction processing applications involving large numbers of screens, transactions and reports.

Significantly lower productivity gains, in the range of 3:1 relative to Cobol, are reported for applications that require an extensive amount of procedural logic.

Advantages

Organizations that have made a commitment to fourth-generation languages and to an appropriate development methodology have found that they can develop applications much faster and at lower cost than with Cobol. They are able to develop time-critical applications rapidly and to reduce the backlog of pending applications.

One of the most important advantages of the use of fourth-generation languages is the ability to solve critical business problems quickly and to react immediately to business or market changes through the development of applications and products. Fourth-generation languages may be used very effectively to gain a competitive edge in a rapidly changing environment.

The advantages of fourth-generation languages will become even more pronounced in the future as information services moves away from a mainframe-oriented environment toward an end-user environment dominated by networks of personal computers.

Highly integrated fourth-generation language micro-mainframe tools, such as Focus and PC/Focus from Information Builders, Inc., enable users of IBM Personal Computers to query data on a mainframe, download the extracted data transparently to the micro and automatically format the data for use by standard Personal Computer tools such as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase III.

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Insurance firm secures DSS with statistical tool

GRAND RAPIDS, Mich. — A statistical analysis software package helped bring together end users and the MIS department at an insurance firm here in a project to develop a decision support system (DSS) during a pressing DP backlog.

Users from the marketing department at Foremost Insurance Co. wanted a system that would help them target new customers and retain old ones by reporting information such as customers' demographics, the time periods during which they held their policies, the number of claims they made and the amount of money the firm paid to them.

Until January 1984, the department channeled requests for such reports through the firm's MIS department. But, according to Ben Salzman, marketing manager at Foremost, MIS was so busy processing information for other departments that it could not turn around marketing's requests in time. "Sometimes, we simply completed report requests on our own, using hand-held calculators and typewritten formats," Salzmann said. "It was not efficient."

Marketing DSS to the rescue

Salzmann and his supervisor Jim Malnight felt that a marketing DSS would help solve the problem. "We needed a DSS to extract data easily, format that data in reports customized by the end users and allow us to bypass that MIS backlog," Malnight said. Because MIS was busy developing a comprehensive billing program for the firm, Foremost contracted a team of outside Cobol programmers to develop the data base for the DSS, which was to be called the Customer Retention Decision Analysis (RDA) system.

Once the data base for the RDA had been established, Salzmann and Cathy Bandt, a customer retention development specialist from the marketing department, planned to format reports using SPSS-X statistical software from SPSS, Inc. "I said, 'Give us a friendly data base, and we'll do everything else with SPSS-X,' " Salzmann said.

Salzmann and Bandt directed the project from the marketing end, and Dave Herbert, Foremost's systems development manager, provided help from the MIS department.

When the Cobol programmers delivered a less than satisfactory data base, Salzmann, Bandt and Herbert used SPSS-X to pinpoint problems and correct them (see story right). After the bugs had been ironed out, they put the software to its intended use — formatting marketing reports.

Pleased with marketing's role in project

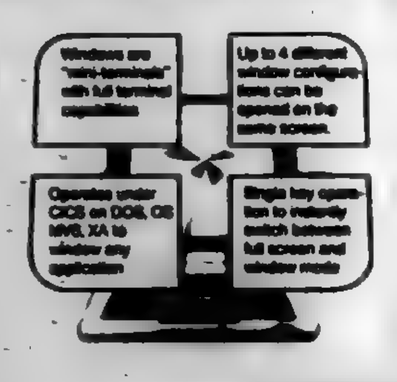
Herbert said he was pleased with the marketing department's role in the development project. "RDA was designed, tested and implemented with very few programming resources from the Foremost MIS staff. This is the first time we used this approach, and it's been very successful."

The department is made up of professional staff members familiar with reporting tools, he said, and they had the knowledge to take responsibility for some of the development. The firm had used SPSS software for seven years.

Now that the marketing department's data base system is in place, Salzmann said, the department uses SPSS sorts and aggregates to break the more than 4½ million records in the data base into smaller groups determined by information in the records' fields and to consolidate them into categories for reporting. In 1984, the department ran more than 60,000 SPSS-X jobs on a 16M-byte IBM 3033.

Bandt estimated that SPSS-X and RDA give the marketing department a report output more than 10 times greater than that of the former reporting setup. Staff members now control the format and turnaround time of their reports.

Herbert said the software processes data from the data base efficiently. "SPSS-X doesn't use up a lot of CPU cycles. I would have expected a lot more cycles given what it's doing."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Overhead concerns will keep systems analysis in vogue

By Barbara F. Medina
Special to CW

Recent articles have suggested that structured systems analysis techniques are obsolete and, by inference, not needed if programmers would only switch from Cobol and Fortran to fourth-generation languages [CW, April 8].

Predictions have been made for 10 to one increases in programmer productivity with the use of data base management systems and query language software. User satisfaction is guaranteed and annoying backlogs in meeting user demand for processing will be cleared up by simply building prototype systems using fourth-generation languages, proponents claim.

Impatient, action-minded American managers, who have always resisted allocating the time and resources needed for planning and systems analyses, are being tempted by these claims. After all, DBMS and query languages do make it possible to get a system up quickly. What many managers do not recognize, however, is that these systems have a high permanent overhead and are a drain on computer resources.

Minicomputers with their single-channel I/O buses are prone to processing problems when I/O demands increase, and a variety of different software packages are used simultaneously. DBMS and query languages increase I/O demands on the system. Although minis are prone to failure from poor application design, even mainframes can get overloaded.

Well-designed data bases and efficiently designed applications can limit problems, and systems analysis is the very tool that uncovers duplication of data in records and redundancies in processing. It is because DBMS and query languages require such a large overhead that systems analysis and planning are a necessity before new applications are implemented.

As languages are developed that make applications easier and faster to implement, the well-trained analyst will be the key to successful use of computers by organizations of all sizes. What data processing managers should advocate is better theories and materials for use in training more proficient systems analysts.

In addition, nontechnical managers have to be educated to understand the long-term benefits of systems analysis and planning. Data processing managers who cave in to the immediate demands of users who want terminals or micros on their desks when they know that they are building inefficient, redundant systems are asking for trouble.

Medina is a consultant and the author of numerous articles and two books. She has also directed computer service bureaus for 12 years.

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Self-interest motivates development

By Roger E. Booker
Special to CW

DHAHRAN, Saudi Arabia — The goal for setting up a data dictionary might be described by the following Marxist doctrine: "From each according to his ability; to each according to his need." Experts from different areas provide their input so that all users can access whatever information they desire.

The best way to ensure success in a data dictionary project, however, is to satisfy the capitalist question "What's in it for me?"

During a large data base conversion project that centered on the development of a data dictionary, an international oil firm here used the maxim of self-interest to its advantage.

In 1984, the Arabian American Oil Co. (Aramco) decided to centralize its oil exploration and production information into an integrated business data base. A feasibility study, management approval, conversion planning and data base management system selection of Model 204 from Computer Corp. of America [CCA] had all been completed. The remaining tasks involved design of the new data structure and the conversion of applications software.

But the volume and nature of the interpersonal communication necessary to complete these tasks posed special difficulties for the conversion team:

- The project would cross the boundaries of two technical disciplines, engineering and geophysics, with inherent differences in terminology and data conceptualization.
- The data processing staff came from different backgrounds with training in different data base design methodologies and varying exposure to relational concepts.
- The conversion team was drawn from many nationalities: Saudi Arabian, American, British, East Indian and Norwegian, with the attendant cultural and language differences.
- By many standards, the conversion was large. It would span a user community of 600 people, with as many as 60 active participants in the conversion process. Nearly 2,000 data elements would be reviewed and more than 250 applications converted.

Early in the conversion process, the firm recognized that a comprehensive and well-maintained data dictionary system could provide the communications mechanism necessary for a successful conversion project. It also recognized the inherent pitfalls of using a data dictionary.

To overcome any disadvantages, the Aramco conversion team took several important steps:

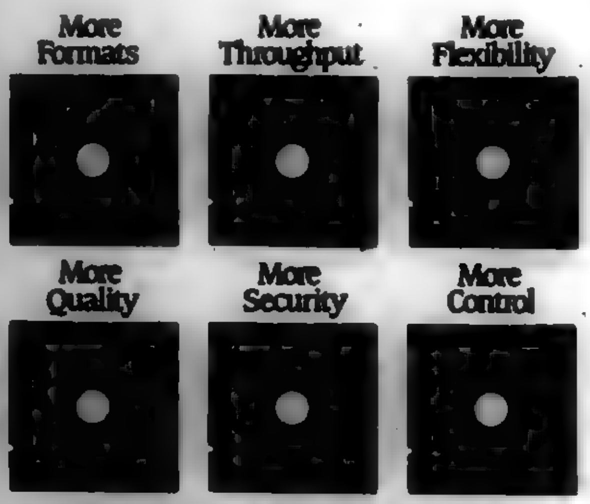
- It customized the data dictionary software and data structure to meet the particular needs of Aramco's system development methodology. A great deal of software was developed in-house to meet local reporting requirements.

The data structure of the dictionary itself was altered to support specific needs for meta data. Fortunately, this was easy to do because of the malleable nature of Dictionary/204, CCA's data dictionary product.

- It used the dictionary actively in each phase of system development, from conceptual design to system implementation. The conversion team used

See OIL SR/52

Booker is president of Sandrose Software International of Houston, which specializes in data base consulting to the energy industry. Sandrose Software helped the Arabian American Oil Co. during the oil firm's data base conversion.



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Global approach builds flexibility into programs

Lets systems keep up with future changes

By Rusty Williamson
Special to CW

Executive management's first thought is to blame MIS managers, project leaders and staff members for backlogs, missed deadlines and bugs. The real cause of such problems, however, is often built into the system itself: Many system designs do not anticipate change and cannot accept it.

If software developers hope to increase productivity, they must plan for the future. A common methodology, the use of global procedures and definitions, can help them do so.

By definition, the methodology relies on two components: global procedures and global definitions (see story below). Global procedures — procedures for common, low-logic-level tasks — are stored on disk files, as are global definitions, which are definitions for common variables, structures and files.

Compiling programs

Programmers can call on the system to compile the procedures and definitions into any program or group of programs that requires them. If a programmer changes a procedure or definition in the source code, the system will compile that change into all relevent programs. With this methodology, coding for most software systems is basic commonsense programming.

Global procedures and definitions reduce development, debugging and support man-hours. Because it removes redundant complexities from main logic, it makes the growing complexity of a system relatively easy to handle. Because it stores common components in one place, rather than in every program, it decreases source and object code memory requirements.

The advantages of using global procedures and definitions span a system's life cycle and can be illustrated using two hypothetical systems: System G, which uses global procedures and definitions, and System B, which does not. Aside from methodology, both systems are identical: Each consists of 125 programs and contains a data base of 45 files.

Development phase. During the first phases of development, Systems G and B proceed at much the same pace. At first, B outpaces G because G's development staff is spending some of its time planning global procedures and definitions disk files.

But System B's development team writes each of its 125 programs from scratch and codes each of its programs and processes as a stand-alone project. System B's development effort soon begins to snowball with increasing complexity and disorganization.

System G's effort is more coordinated. As each program is written, programmers develop, test and debug procedures and definitions. The programmers use these same components again and again in other programs. As the coding of each program proceeds, more global procedures and definitions become available for future development. More and more, developers need to create main logic only.

Time-consuming complexities gradually disappear, and file definitions no longer need to be keyed in. Systemwide naming conventions and one-change enhancements become by-products of development. G's development is smoother than B's and soon outpaces it.

Shakeout. As program development ends, a system debugging phase begins. During this shakeout period, both systems develop a loss of interprocess messages during heavy system usage — a tuning problem. To compensate, programmers must increase time-out values for interprocess messages from .01 to .08 seconds.

Programmers for System B have used a constant value, .01, in the code and must search each program for every occurrence of the interprocess message code, keying in an 8 over the 1 each time. Some of the 125 programs will be affected, and B's development team, not knowing which ones, must search each.

For System G, on the other hand, programmers have used a variable called "INTER-PROC-TIME-OUT," which resides in source code in one place — the global definition disk file. It has been set to .01. One programmer keys an 8 over the 1, runs the compiler and goes home.

The compiler links the new definition, "INTER-PROC-TIME-OUT = .08," into each affected program as the program is compiled (see chart). In each of the 125 programs, every occurrence of the interprocess message code uses "INTER-PROC-TIME-OUT," which is now equal to .08.

Production. During the production phase, Systems G and B, like most large systems, require continued programmer support. New protocols, file formats, applications, reports and other enhancements continually bombard the original system.

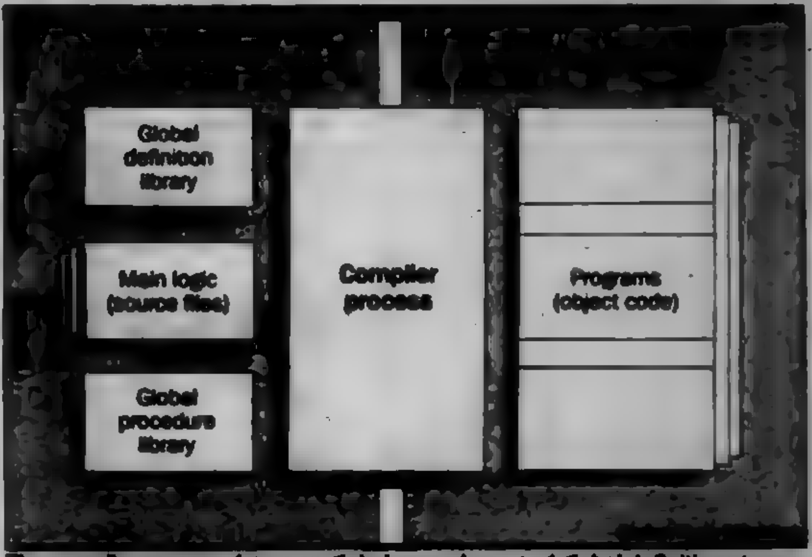
System B requires more programmer man-hours than System G does. Its code contains varying conventions and programming styles, which confuse maintenance programmers and stall their work. Moreover, maintenance employees must change code many times in many programs. Under these burdens, the programming department increases both its size and its cost to the company.

Inside the programming department, this system structure eventually brings on impossible work loads, widespread discouragement and frequent staff turnover. To make matters worse, new employees coming aboard must face the system's bewildering maze; they take a while to become productive.

System G, on the other hand, has a clean, consistent structure that is easy to maintain. Coding enhancements are easier because all changes are global.

Death. Normally, the death of a software system occurs when the effort that goes into continued support or required enhancements equals the effort that a rewrite would entail. System G outlives System B, if for no other reason than its organization and ease of enhancement.

When it dies, however, System G will be relatively easy for programmers to rewrite. If the rewrite does not involve a major environment change, for example, a new programming language, most global procedures and definitions will stay as they are.



The compiler process draws on global procedures and global definitions to create uniform, easy-to-maintain programs.

> *If software developers hope to increase productivity, they must plan for the future. The use of global procedures and definitions can help them do so.*

Williamson is a programmer/analyst for Gascard Club, Inc., a Del Mar, Calif.-based company that serves a network of independent petroleum marketers.

Global procedures, definitions: components of uniform system

[illegible]

■ The procedure entails complex calculations [illegible].

Global definitions. These are a system's variable names, structure names and file definitions.

Under global procedures and definitions, they are commonly kept in a disk file. Compiler directives then selectively pull the definitions from the disk file and insert them into main programs.

Because definitions are not repeated in each program's source code, the setup saves disk space and reduces code entry.

It also enforces systemwide naming conventions and ensures that changes to file layouts affect [illegible] programs.

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Solid maintenance spurs development

By Ronald A. Zink
Special to CW

Most MIS managers understand that good systems design and programming techniques can help reduce future maintenance efforts. Many do not realize, however, that the reverse is true as well: A good maintenance program can increase development productivity.

One of the most disrupting experiences in the development of any computer system occurs when a project begins to expand uncontrollably in scope, with users demanding more and more features they feel must become part of the system. Such expansion is often a symptom of a poor maintenance program.

In such cases, users who attempt to expand the scope of projects are acting quite rationally, for two reasons:

- They know that if development moves on to a new project, they will see little activity in their area for a long time — years, perhaps.
- They know that, from their company's viewpoint, there may be more productive projects to be done, while nonetheless feeling that it is their turn. They have been subjected to the frustration of waiting in line for years, and they are not about to give up their place until they have gotten as much as they can.

Poor maintenance programs are almost invariably caused not by the abilities of the people involved but by an improper attitude: the attitude of users and programmers that systems should be completed in one fell swoop. This attitude not only forces the user to ask for the definitive system but also causes follow-up maintenance work to become a random series of fixes.

Systems must evolve

Good maintenance programs, on the other hand, arise from a healthier attitude: the attitude that systems must evolve. This attitude allows the MIS department to take a system and break it into a series of optimal implementations, a series of properly graduated steps. It helps the organization move forward in a controlled, low-risk manner.

MIS managers fool themselves when they think they can implement a system that does all it should. They have neither the resources nor the ability to design such a system. A system is never finished; its requirements change constantly because of fluctuating business conditions and the growth of users' expertise.

In reality, managers and their staffs should try to lay a solid foundation that provides key benefits right away and can be built upon later. The DP staff should also plan on revising the system, as part of the maintenance function, on a periodic and scheduled basis. Everyone involved will then be in a better position to evaluate the next step.

Within a system life cycle that includes periodic reviews and enhancements, the user changes his attitude toward any initial development project. Users know they will get their day in court fairly soon, at a time when they will be in a good position to identify the types of enhancements they need.

Developers benefit because they can now concentrate on the major components of a system without being distracted by constant political battles about what features should or should not get added to a project. In turn, the development staff will produce more and better systems.

In order to gain the most from their computing dollars, companies must recognize the opportunity that planned, periodic maintenance affords. Recognition, however, is not enough; they must organize accordingly.

Managers must not sit by and randomly respond to user requests; this is an inefficient way to use valuable programming resources. Rather, they should do the following:

- Make planned and periodic enhancements to systems. Aggressively evaluate all existing systems on a periodic basis to identify justifiable enhancements.
- Divide the maintenance group's work into meaningful and substantial units so it can be done efficiently.
- Schedule enhancements so that they complement group members' skills and can be incorporated in the training of new people.
- Realize that users are rational beings and are willing to wait their turn if their wait is reasonable and fair.
- Maintain users' confidence by working on every system on a periodic and scheduled basis, with the effort being a function of benefits.
- Deliver enhancements the same way software houses deliver new releases: on a periodic, scheduled basis.

Zink is manager of systems planning and support for Beecham Products, a Pittsburgh-based consumer products company.

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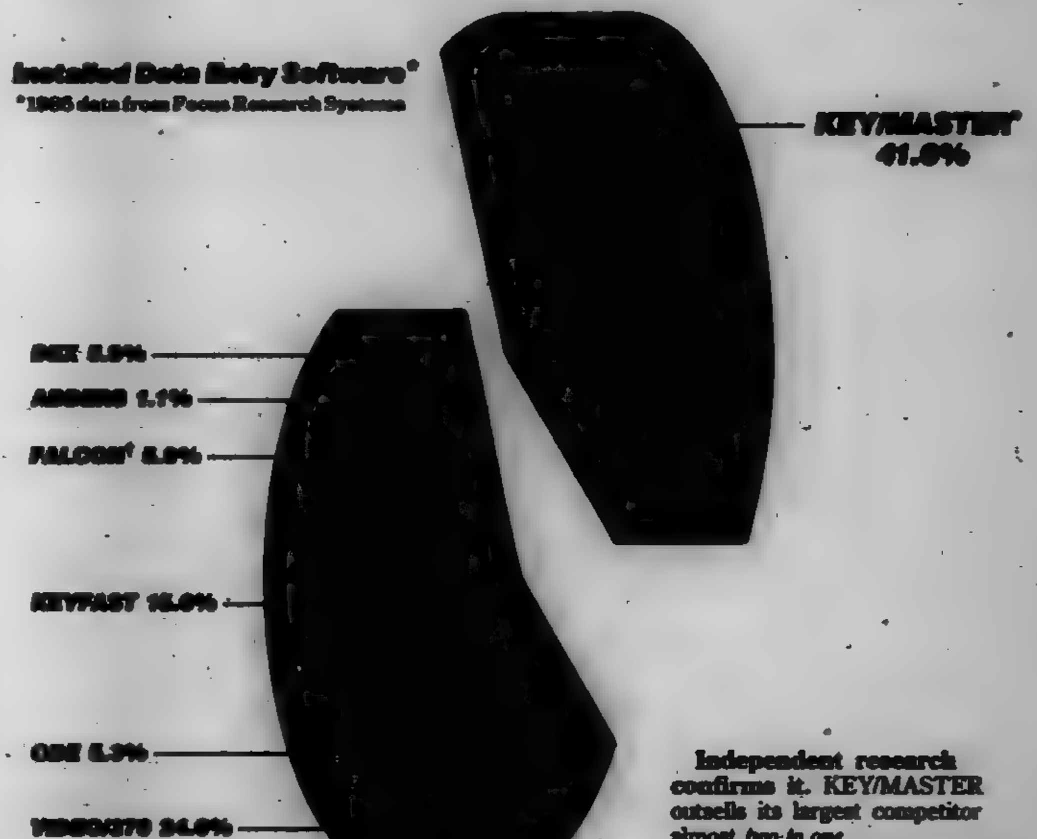

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How to negotiate a successful maintenance contract

By Thomas R. Mylott III
Special to CW

Software maintenance affects every organization's productivity, and for every organization that relies on outsiders, a contract controls the quality of maintenance.

To negotiate and draft a successful maintenance contract, an organization must pay careful attention to its expectations and must use the best means available to prod vendors into addressing its needs. MIS managers must consider many issues when they put together a contract; the following are the most important:

- Definition of maintenance.
- Duration of the contract.
- Definition of response and solutions.

Definition of maintenance. The first step toward maximizing returns from a software maintenance contract is to define software maintenance. The simplest form is a warranty extension, a promise to correct defects beyond the software's original warranty period. Many maintenance plans go no further.

If an organization's environment is static, an extended warranty will suffice, but few environments are static: Operating systems change, hardware changes and users increase their demands for performance and functionality. MIS managers should make sure that their contracts cover changes in environment as well as modifications and enhancements to software programs.

- Changes in environment. Most software maintenance agreements include no requirement that the vendor change its software to accommodate changes in the user's environment. Many vendors do this as a matter of course, but users should not wait until the time that an upgrade arrives to find out if their vendor is part of this group — they should get it in writing.

- Modifications. Some contracts imply that modifications are part of the regular software maintenance fee, but no vendor can afford to do an unlimited amount of software modification without additional compensation.

Although it may seem clever to allow a maintenance vendor to promise unlimited modifications, it is unrealistic; unless MIS managers ask for very little, they are bound to go beyond what the vendor thinks is reasonable. The result will be a dispute and the user will receive no maintenance at all.

A better approach, contractually, is to define some objective standard by which the user and the vendor can determine how reasonable a request for a modification is.

- Enhancements. Another promise vendors often make in maintenance agreements is a guarantee of enhancements. The problem is defining what constitutes an enhancement. For some vendors, an enhancement is the correction of software errors in the form of a release. For others, an enhancement is a qualitative improvement in the software's function. Any maintenance contract ought to define what the vendor is actually promising.

The MIS manager should negotiate for a written promise that for as long as the organization pays maintenance fees, the vendor will provide the organization with every release of the software at no extra charge. If the vendor improves its software regularly, this provision can save the user organization a lot of money.

Duration of the contract. Duration, or contract term, is an aspect of software maintenance agreements that many organizations overlook.

Most maintenance contracts remain in effect for only one year. Usually they renew automatically for subsequent one-year terms.

Vendors, however, often build an escape hatch for themselves, one that allows them to terminate the relationship as long as they give sufficient notice. The effect of this provision is to allow the vendor to end maintenance after one year. From one year to the next, the user has no assurance of support. This may seem reasonable, but MIS managers must consider the consequences: Without maintenance, a user organization is nearly helpless.

The manager should try to secure, in writing, a guarantee of several years of maintenance, preferably for as long as his firm will use the software. Most vendors, however, will balk at extended maintenance agreements.

The next best thing for an organization to have is the ability to maintain its software in-house. For this, the user needs source code. MIS managers should negotiate a provision in maintenance contracts for the vendor to release its source code if it discontinues maintenance.

Definition of response and solutions. When an organization plans to have outsiders maintain its software, it expects those outsiders to get the job done. It also expects the work to

See CONTRACT SR/49

Mylott, a Dallas attorney, is the author of Computer Law for Computer Professionals, *published by Prentice-Hall, Inc.*

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Dedicated maintenance staff key to smooth operation

By William W. Marks
and William D. Strowbridge
Special to CW

In most DP shops, programmers who maintain installed production systems consider themselves second-class citizens. They do not get to work with the latest applications and technologies, and they feel burdened with keeping old systems going.

The quality of staff members that managers often assign to these jobs — junior programmers or people with little chance of being promoted — reinforces the perception of low status.

In reality, these should be among the most important positions in an MIS organization. The maintenance group — more appropriately known as production support — repairs and enhances systems that are critical to the operation of the business. This group also supports management's need for information.

Keeping systems current

If an organization does not employ good people to keep its systems current and efficient, it can run into major operational disruptions.

To find the knowledgeable, experienced people who should be performing this role, MIS managers should look for DP workers who have the following traits:

- A business orientation and knowledge of company operations.
- Strong familiarity with the applications systems that need support.
- Problem-solving ability.
- A dedication to precision.

People with these traits tend to enjoy the rapid feedback that comes from solving users' operational problems. Managers should encourage any staff members who want to become involved with day-to-day business to try production support.

Identifying employees who have the personality and skills to excel in maintenance is not enough, however. To keep these experts happy, managers in MIS and user departments must take the following steps:

- Acknowledge maintenance workers' importance.
- Publicize their accomplishments.
- Offer them commendations.
- Compensate them handsomely.

Acknowledging importance. A positive attitude about production support starts at the top. MIS management should explicitly state the value of the maintenance function.

User management should consider support staff members to be an important part of its organization, as well, and should include them in staff meetings, planning sessions and discussions about operational changes. When they attend management meetings, capable production support people frequently make contributions that are worthy of recognition.

Publicizing accomplishments. Many shops ignore their production support staff members unless something goes wrong. This should not be the case; the maintenance staff must come to understand that its contributions are appreciated.

Offering commendations. Management should take advantage of every opportunity to recognize late-night or weekend calls, timely completion of new features or support for new products and smooth installation of releases. This recognition can take the form of public commendations, lunches and awards.

Compensating staff members. MIS managers should never compromise on the quality of people assigned to production support. To be able to hire and keep top-notch workers, managers must pay them well.

Marks is president of Poc-It Management Services, Inc., a Santa Monica, Calif.-based management consulting firm that specializes in information services. Strowbridge is vice-president of MIS for Dataproducts Corp., a printer manufacturer based in Woodland Hills, Calif.

ANALYST from SR/39

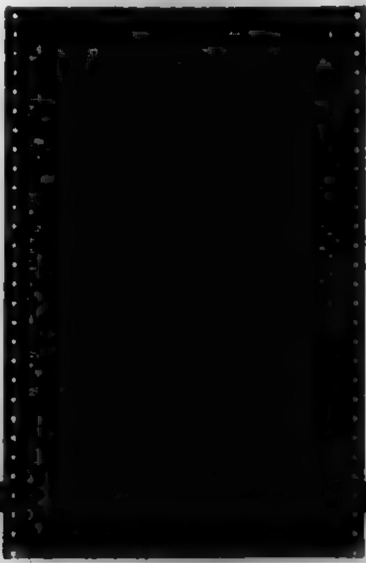
system. Are there periods of time when either the organization as a whole or a unit receives no information from outside? How long are these cycles? What happens if they are interrupted by unexpected input or by unexpected requests for output?

No unnecessary processing

The analyst who can evaluate these attributes of a system and can translate their findings into charts, data flow diagrams, data dictionaries and words clear enough to share and evaluate with users and management will succeed in the following two ways:

- He will produce applications free of the unnecessary duplication of record processing.
- He will avoid massive redundancy of data storage.

In addition, he will not select applications software that uses too much of a system's resources for the processes supported or software that loads the computer with an unnecessarily high overhead.



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Diagramming Techniques for Analysts and Programmers Prentice-Hall, 1984

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Short-shrifting design inflates maintenance costs

By Robert Todd
Special to CW

Nothing can replace hard, disciplined thinking as the ultimate means to increased productivity. Software aids, such as code generators, sophisticated data base management systems and query languages, are useful for certain functions but not for critiquing them.

In many companies, $100 worth of software money involved throughout the system life cycle is distributed as follows:

- Analysis — $15.
- Design and coding — $5.
- Testing and debugging — $20.
- Maintenance — $60.

These figures mean it costs more to fix a system after it is delivered than it does to deliver it in the first place, and half the cost of delivering a system is spent testing and debugging it.

The figures also show that if a 10% increase in design and coding can produce a 10% decrease in debugging and maintenance, the cost is 50 cents, but the benefit is $8.

Favorable cost/benefit ratio

Even if it required a 100% increase in design costs to achieve a 10% reduction in debugging and maintenance, the cost/benefit ratio would still be favorable. Doubling the design effort can cut by half the debugging and maintenance effort — surely a worthwhile effort.

These observations lead to the two primary goals of system design:

- First, to maximize the ease of modifying the system.
- Second, to maximize the ease of testing and debugging the system.

These goals show clearly that software productivity aids are useful for implementing a system and for making changes but are not particularly useful for designing the system in the first place. And that is where the beautiful systems are separated from the ugly ones. It is where good old-fashioned thinking shows up as the most fundamental productivity aid.

But what makes a system easy to modify and debug? How can the DP professional recognize a beautiful design, as opposed to an ugly one, and what hidden costs are likely to crop up in a highly maintainable design?

There are two elements involved in developing and maintaining a computerized system — the computer and the people who work with the system.

To a computer, everything is equally simple. A 10-line program in Baby Basic is as complex — or as simple — as a million-line system in undocumented Assembler. Complexity simply does not exist for a computer.

People, on the other hand, are severely affected by complexity. People can handle up to about seven different things at the same time with acceptable error rates.

Before a system can be modified, the modifier, or the programmer, has to understand the system, or at least the program, requiring modification. Understanding will come easier if the program is simple, clear, obvious, direct and without unnecessary considerations of machine or operating system peculiarities, coding eccentricities, obscure data names and so on.

Five design features are strongly related to ease of maintenance:

- Small module size.
- Modular independence.
- Black box characteristics.
- Conceptual modeling.

Todd is a senior systems analyst at Dictaphone Corp. in Bridgeport, Conn. He is a lecturer in systems analysis and design at the University of Bridgeport and a Ph.D. student at the Polytechnic Institute of New York in Brooklyn.

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- Isolation of detail.

These five design features lie at the heart of structured design and lead directly to highly maintainable systems. They can be achieved with or without software productivity aids, although good aids are genuinely useful.

Structured methodology works not only because design features have been identified, but because techniques for measuring them have been developed. It is possible to apply uniform standards of measurement to any proposed system and thereby evaluate the quality of the proposed design. The yardsticks of system design evaluation embody the following concepts:

- Normalized file design.
- Coupling.
- Scope of effect and scope of control considerations.
- Packaging.

But first it is necessary to discuss the concept of efficiency, which is not on the list. Concern about efficiency — from a machine and/or operating system viewpoint — is the unspoken golden rule of programming. It goes without saying that all code should be tight, linear and, above all, make efficient use of machine resources.

The industry has matured to the point where business objectives are far more important than technical concerns. And business objectives are invariably tied to adaptability to change. That means that maintenance is the single most important function that programmers perform. If programmers cannot respond in a reasonable time to reasonable requests from businessmen to adapt to a changing environment, they are not earning their pay.

It follows then that systems should be designed for maintainability and that the best programmers should be primarily responsible for maintenance. In fact, no program should go into production without the blessing of the maintenance team.

If a DP department adopts the principles of structured design, which lead to more maintainable systems, what will be gained or lost?

First, the losses: Systems that are designed for maintainability are harder to develop. It takes more thought, effort and iterations on paper, or with a software design aid, before coding begins. That delays the beginning of system testing, but, somewhat paradoxically, hastens its completion.

Those who do not understand MIS are suspected of these activities. To endorse a methodology that pushes visible progress even further out on the project schedule takes a fair amount of courage, not to mention a considerable sales effort.

Performance loss

Systems designed with this methodology also lose some performance efficiency — about 10%, according to Yourdon, Inc. We lose a similar amount of memory usage with added overhead and, again, a similar amount of disk resources. To take this message to machine-oriented programmers also requires courage and a firm conviction that the longer view is of greater importance to the company — and to the department.

To summarize our losses, we must be willing to tackle the following issues:

- More difficult, disciplined and time-consuming design effort — and subsequent delay in starting testing.
- Program performance.
- Memory overhead.
- Disk resources.

If you pay this price, what will you buy? You'll buy a system built of independent modules whose single function is known or easily learned. You'll buy a self-documenting system, because it is fully designed before it is coded. You'll buy a system that is structured the same way the business problem is structured and the same way the data is structured. And, because of the preceding factors, you'll buy a system that is about twice as easy to maintain.

There is another consequence of the structured methodology. The laissez-faire approach to coding, in which each programmer is free to express himself as long as the program works, will be a casualty of structured design. As programming matures into software engineering, the artistic aspect becomes subjected to the constraints of guiding principles.

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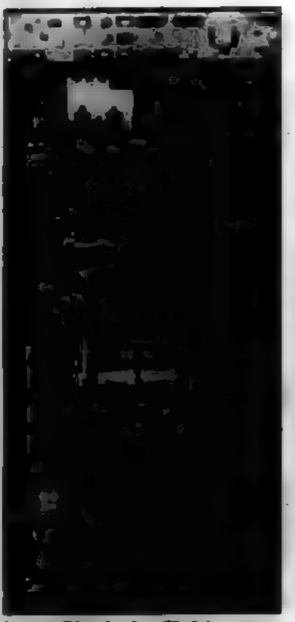
Special Report

Source code librarian conquers tight design deadline

GRAND RAPIDS, Mich. — During a project with deadlines so tight that development and maintenance overlapped, a programming team here relied on a software tool to prevent source code changes from undermining its efforts.

Programmers in the software tools section of Lear Siegler, Inc.'s Instrument Division used the tool to keep track of more than 13,000 code changes during a hectic attempt to design and build a flight management system for Boeing Commercial Aircraft Co.'s 737-300 passenger jet.



Lear Siegler's flight management system went from drawing board to cockpit in two years.

The system, which would eventually encompass 800 common blocks of code and 2,000 subroutines, was best suited to a three-year development schedule, according to Katherine Hornbach, manager of the software tools section.

However, Lear Siegler had just slightly more than two years in which to complete it: Boeing ordered the system in September 1982 and planned to have the aircraft carrying passengers by December 1984.

Given the time constraint and the size of the project, development and testing had to proceed simultaneously.

Lear Siegler staffed the project team with about 65 engineers — 20 software development engineers, 25 test engineers and 20 systems engineers — and scheduled them to work through two weekday shifts and weekends.

Software testers would be running subroutine builds while developers were designing upgraded versions of those same routines.

If the testers made changes to the code, they would have to be able to link those changes into the current development version.

"We couldn't afford to have source code control problems," Hornbach said. "We just couldn't afford to waste time because we linked in the wrong version." Such a coordination glitch could make software problems difficult to isolate and could stall the development project for weeks.

To keep on top of source code changes, Lear Siegler purchased Digital Equipment Corp.'s Code Management System, a source code library utility that controls access to code and keeps a record of changes that programmers make to it. The firm ran the software on an 8M-byte DEC VAX-11/782 under VMS, which programmers accessed through VT100 terminals.

The librarian stored one copy of the original source code. To make changes in any module during the development process, programmers at Lear Siegler checked a copy of the code out of the library. The code librarian recorded the transaction and kept track of who was using what module.

Once the programmers completed their work, they sent the module back to the library, where the code librarian assigned the changed module a generation number, noted the date of the transaction and asked for a description of any changes that had been made.

In the description, the programmer listed the number of the problem report filed about the change and gave reasons for altering the code.

Change incorporated into source code

The librarian then incorporated the change into the source code. Later in the project, when a programmer wanted to re-create any past version of a module, he asked the librarian for the specific generation number, and the librarian compiled the specified version.

Hornbach (above) said a tool that tracks source code played a key role in her team's speedy project completion.

Hornbach said the librarian provided Lear Siegler's development team with two important benefits:

- It kept track of the latest version of any subroutine. This ensured that testers never wasted time testing an obsolete version.
- It noted the generation statements that went into any given version of the source code. This helped testers link the proper versions of subsystems into any build they executed.

"All of a sudden we had complete control of our software," Hornbach said. "We know exactly what went on with each module. We have the entire history of the development of that software."

The only problem the team encountered was one of response time. During peak usage periods, the librarian took up to two minutes to fetch a subroutine, according to Hornbach.

She blamed the problem partly on the team's demanding pattern of use — Lear Siegler allowed heavier concurrent use than the VAX was designed to support — and partly on the librarian itself — the software tool's thoroughness accounted for much of the delay. DEC has improved response times in its most recent release of the tool, she said, and Lear Siegler has installed more VAX machines.

Other problems Hornbach expected, however, never materialized. She said she had worried that the source code library would take up too much disk space.

But the historical subroutine versions used less space than one clear copy of the source code.

She had also questioned the tool's reliability, but said it did not lose one line of code during the entire project.

On Nov. 14, 1984, the Federal Aviation Administration granted full certification to Boeing's 737-300, which included the Lear Siegler flight management system. The plane went into service, on schedule, during the first week of December 1984. The source code librarian played a key role in helping the development team meet its deadline, according to Hornbach.

She said other software — including fourth-generation prototyping tools, a problem report data base, a data dictionary and on-line documentation tools — also contributed to the team's success but stressed that without dedicated people, the project would have failed.

Tools, according to Hornbach, "were a necessary, but not a sufficient, condition for getting the project out."

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LIBERTY from SR/14

helped to write it.

Liberty Mutual's programming staff wanted to rewrite some of the code to make maintenance more efficient, according to Mike Nerney, assistant manager of systems and programming. But staff members had to devote most of their efforts to developing new programs instead. "We really needed to rewrite," Nerney said, "but we didn't have the staff time."

Despite the resource constraints, he said, Liberty Mutual almost decided to go ahead with some desperately needed rewrites. As the firm prepared to start the process, however, its staff members came across a software package, Group Operations, Inc.'s Superstructure conversion program, that they thought might help them.

'Programs in dire need of rewriting'

"We were in the process of identifying the programs that were in dire need of rewriting when we read an article about Superstructure," Nerney said. The firm decided to test the program to see if it could help defer the rewrites.

Liberty Mutual began testing late in 1983. In May 1984, it installed the conversion program on a 32M-byte IBM 3081. Programmers then started running the conversion program against their unstructured applications. By October, Mooney said, the programmers had restructured the 60 problem applications.

He said the conversion program made the applications' logic easier for programmers to follow. It eliminated interparagraph GOTOs and fallthroughs and removed ALTER statements and altered GOTOs. The program also organized the applications' code into modules, each consisting of a paragraph or a series of paragraphs that performed a discrete logical function.

To test the integrity of the restructured code, Liberty Mutual's DP staff compared output tapes from the original applications with tapes from the restructured ones. Mooney said output from the new code matched perfectly with output from the old code in every application.

No one has calculated how much maintenance time and expense the restructured code has saved the firm to date, but Mooney said programmers have assured him it has made their jobs easier. "The people who work on the programs day in and day out see improvements," he said.

Staff members have fewer problems understanding the logic in the applications, and run books and compiles are much cleaner than they were in the past, he said. Because programmers spend less time deciphering logic, they have more time to devote to development.

According to Nerney, the conversion program has also allowed the staff to keep running programs that otherwise would have required total rewrites. "We thought Superstructure might buy us some time, and it is doing that," he said. "It has helped us to defer the costly rewrite of at least 50 programs, without tying up programming resources needed elsewhere."

Nerney said Liberty Mutual will eventually rewrite many of the programs, but only to answer functional needs — not in response to maintenance problems. "Eventually, the existing versions are going to outlive their usefulness," he explained. "Then we can rewrite."

Besides using the conversion program on unstructured code, Liberty Mutual's programmers have experimented with running Superstructure against programs written under the firm's structured methodology. But Mooney said the results of the experiments were not dramatic.

Because most of the required restructuring is complete, the conversion program is no longer in heavy use. Liberty Mutual maintains it in a library, however, and programmers call for it when they have need, Mooney said.

CONTRACT from SR/44

be completed within a reasonable amount of time. Software maintenance contracts, however, rarely address the timeliness of a vendor's work.

To solve any software problem, a vendor must first respond to a request for assistance. Response varies among vendors: Some consider the logging of a user's telephone call as a response; others define a response as the assignment of personnel to solve a problem. If the user does not define — in writing — what constitutes a response, the vendor will make his own definition, and the definition is likely to vary over time to suit the vendor's work load.

In addition to defining response, the user organization should try to install in its contract a mechanism for expediting solutions. The MIS manager can establish a contractual time frame for a response, but any attempt to force a solution within a specific period is unrealistic. Some problems are more difficult to solve than others, and few vendors will promise to provide solutions within a given number of hours or days.

A user organization can, however, structure its software maintenance agreement so that the vendor has an incentive to fix problems. One way is to have the vendor promise to assign certain personnel to the problem after a specific period of time has passed; another is to have the vendor agree to send maintenance people to work at the user site until the problem is resolved. Such incentives do not guarantee a solution, but they increase the chances of finding one.

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OIL

from SR/40

the dictionary as a tool to complete the development effort, not as a repository for after-the-fact documentation of the completed system.

- The team wrote several data base applications that directly accessed the dictionary data as part of their processing. These programs provided a quality-control mechanism for the accuracy and currency of the dictionary data.
- Aramco took great care to ensure that anyone on the development team who served as a source for dictionary information received tangible benefits from using the dictionary in his part of the development process.

With these safeguards in effect, the project was successful. People from every part of the development group cooperated. In return, they all received some strong benefits.

Users. The user community, composed of engineers and geophysicists, was the ultimate source of information about business data and activities on which the data structure and applications would be based.

For every data element to be converted, users were assigned the task of entering into the dictionary a concise definition, units of measurement, encoding schemes, reporting precision and business-based editing rules.

In return for this arduous effort, the user community gained many important benefits. The completed dictionary would provide ready-made documentation of the system, a valuable aid in the formulation of ad-hoc queries. Dictionary-driven reporting software printed tables with prestored headings, element-based reporting precision and value decoding, thereby reducing dependence on the DP staff for the development of simple applications.

Most importantly, the user community achieved a significant degree of control over the content and structure of data in the resultant system.

Logical designers. The logical design team added information about data base structure into the data dictionary. Team members grouped data elements into records and subject data bases, identified logical keys for each record and defined important inter-record relationships and structure-based editing rules.

They were able to use the user-generated definitions in their data analysis efforts. In addition, several dictionary applications were written to aid the logical design process. Reports were generated that showed proposed record layouts in each phase of data normalization. Structure charts depicting inter-record relationships were generated directly from the data dictionary to serve as road maps for data navigation.

Physical designers. The physical design team added information about size and estimated number of occurrences of each record and data element. It also modified the logical structure where necessary to improve performance.

The physical designers were able to use the dictionary information that had already been entered by the logical designers, modifying it to reflect the physical tuning. They then used the Dictionary/204 system to generate the data definition statements necessary to build the physical data base.

System analysts. The system analysis group designed the dictionary software enhancements as well as the data conversion software and data base applications. Group members used the data dictionary to describe conversion algorithms, defining a source for each target data element in the new data base.

The system analysis group enjoyed many benefits from the dictionary. The data elements, records and structures previously defined reduced the time required to design and document the data base applications. In addition, it now became possible to design dictionary-driven generic systems.

One design effort, for example, included the development of a generic update system that would update any data base record based solely on data in the incoming transaction and the information on data structure and editing rules previously stored in the data dictionary. This generic process eliminated the need to develop hundreds of update modules, one for each record in the data base.

Programmers. The programming team developed the programs that extended the dictionary function to meet the needs of the other groups. Programmers also entered into the data dictionary information about which data elements and records were used in each program developed.

In return, the programmers were freed from a great deal of trivial coding. Code generators were written to generate record descriptions in the PL/I and SAS languages in a manner that allowed the descriptions to be included directly in an application program.

Data administrators. The data administration group was responsible for overall dictionary maintenance and development. Administrators developed standards for data element names, units of measurement and reporting precision and generated quality control software to validate the meta data in the data dictionary.

The data administration team used the dictionary to make impact analyses (for example, What programs will be affected if we change this data element?) and to facilitate development of data standards. Team members generated comparison reports, for example, that showed the units and precision for each data element of a general type.

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Aion offers AI development system

LOS ANGELES — An expert system development environment that runs on IBM Personal Computers and is targeted at solving well-understood problems was introduced last week by Aion Corp. at the International Joint Conference on Artificial Intelligence here.

Aion's Application Development System/Personal Computer (ADS/PC) is designed to permit experts who lack artificial intelligence training to create expert systems, according to Aion President Harry Reinstein. Priced at $7,000 and scheduled for commercial availability Oct. 15, ADS/PC is aimed at use within traditional DP environments.

Likely candidates are systems that can be implemented in less than six months that would have been done anyway without expert systems but that require judgment rather than mathematical computation alone and that can benefit a number of employees whose current job performance varies widely, Reinstein said.

ADS/PC consists of two parts, an Application Building System that includes the development functions required to create text and run knowledge-based systems and a runtime Application Execution System.

The Application Building System, which requires 512K bytes of internal memory, reportedly contains a set of intelligent editors. Each editor shows users a screen, allowing them to select various options, such as creating or modifying an object. The editors include Help facilities and semantic and syntax checkers. Aids for verifying and analyzing the completed knowledge base also are built in.

The Application Execution System, which requires 320K bytes of memory, interacts with the end user, directing a dialog with the user and providing Help functions and explanations of system conclusions.

Written in Pascal, ADS/PC offers subsecond response time to questions on a standard Personal Computer, with disk I/O the biggest limitation on performance, Reinstein said.

Aion also will develop software for other IBM machines, with a version for IBM 370 mainframes scheduled for delivery in first-quarter 1986, Reinstein said.

The company plans to sell to both software developers and MIS departments. "We're a little more focused on the DP/MIS environment than when we started," Reinstein commented. In each case, Aion said it expects to work closely with its customers, providing consulting and training services, with the overall cost of products and assistance typically ranging from $100,000 to $500,000.

"In any new technology, one can build excellent products the first time, but they are almost always not perfect," he said. "We want to stay very close to the people who are building the initial products."

Founded in May 1984, Aion received $2.4 million in venture funding last February.

The company is located on the Fourth Floor of 101 University Ave., Palo Alto, Calif. 94301.

■ Datacopy introduced a high-speed image scanning/storage system that works with the IBM Personal Computer XT and AT/56

■ Interface Technologies unveiled software that gives Modula-2 programmers access to Lotus' 1-2-3 files/66

INSIDE

Software/66

Slow DSS sales laid to lack of user knowledge

SMALL TALK
Eric Bender
CW Senior Editor

Although the Lightyear, Inc. Lightyear decision modeling software earned mostly good reviews and received a lot of press attention, only 3,000 copies have sold since the package, designed for the IBM Personal Computer, debuted last November.

What barriers did Lightyear face, and what do they mean for innovative microcomputer software in general?

Chris Christiansen of the Boston-based Yankee Group, who calls Lightyear "a great little program," feels that the biggest holdup was in education. "They didn't have the money to educate the public on what kind of decision support system [DSS] it really was," Christiansen said. "It basically was a tool that very few people knew how to use effectively. Very few people had enough imagination to know what to do with it."

Terry Garnett, Lightyear's founder and chairman, agreed, drawing an analogy to micro spreadsheets, which have been around since 1978. "The calculator really set the stage for spreadsheets," with thousands of people familiar with Hewlett-Packard Co.-style calculators making a natural progression into spreadsheets, he said.

But DSS software has lacked that kind of metaphor, he maintained. "This category is so new that it will take a while to develop. The barrier is more time than anything else."

While Lightyear often is described as a decision-making tool, that's misleading, because it makes decisions no more "than a word processor will write a book for you," Garnett said. Instead, it's aimed at examining explicit reasoning for decisions — a task often now addressed via spreadsheet.

Another slowdown came in marketing

See DSS page 63

Visage boosts V:Station videodisk line

Adds icon-oriented V:Tools for applications development

NATICK, Mass. — Visage, Inc. has enhanced its V:Station series of interactive videodisk systems to include V:Tools, an icon-oriented software package for applications development. The V:Stations are IBM-compatible personal computers that interface with a videodisk player to provide an interactive video system for training, sales and other uses.

V:Tools includes a program simulation tool that reportedly permits users to model video program segments interactively before coding them and a color graphics program for use with high-resolution displays.

The software package also features a variety of utilities for file management, zone creation and system configuration. A palette creation utility permits users to chose a 16-color palette from a choice of 4,096 colors, Visage said.

V:Tools will be bundled with V:Stations beginning in October and will run under V:Exec 2.5, the V:Station's systems software, Visage said. The development software will also be made available to current V:Station users at a cost of between $200 and $300, Visage said.

Also introduced were an upper end to the V:Station line, the V:Station 2080, and the V:Link 1580 upgrade package for use in converting a machine in the IBM Personal Computer line into a videodisk controller.

The V:Station 2080 is based on a personal computer that is said to be compatible with the IBM Personal Computer AT and includes a monitor, system software, a videodisk player and a choice of authoring languages and input options.

Both the V:Station 2080, priced from $9,000 to $15,000 depending on options, and the V:Link 1580 upgrade packages, costing from $3,500 to $6,000, will be available in October and will support high-resolution, 640- by 400-pixel graphics, Visage said.

At the same time, Visage announced support for still-frame audio products from both Laserdata, Inc. and Eeco, Inc. that reportedly permit users to incorporate segments of continuing audio and "frozen" video in the programs they develop on V:Stations.

Products to create still-frame audio program segments are available currently from both vendors, Visage said.

Visage is located at 12 Michigan Ave., Natick, Mass. 01760.

Iomega rolls out storage systems

ROY, Utah — Iomega Corp. has introduced a line of half-height storage systems for use with the IBM Personal Computer line and compatible machines.

All of the products use the technology pioneered by Iomega in its Bernoulli Box line, which uses a pressurized stream of air to spin the disk media. The technology reportedly prevents head crashes. The products are offered in 10M-byte and 20M-byte capacities and single- or dual-drive configurations, Iomega said. Like the original Bernoulli Box, the products use removable media. Iomega said that 20M-byte cartridges will be made available for the new 20M-byte drives only. The Bernoulli Box itself uses 10M-byte cartridges.

A single-drive unit reportedly measures 6.32 in. high by 12.6 in. wide by 15.25 in. deep, or roughly half the size of the Bernoulli Box.

The 10M-byte Bernoulli 10 (B), a single drive, costs $2,695. The 20M-byte Bernoulli 10+10, a dual drive, is priced at $3,695. The 20M-byte Bernoulli 20 (B), a single drive, is $3,295. The 40M-byte Bernoulli 20+20, a dual drive, is $4,495.

More information is available from Iomega, 1821 4000 South St., Roy, Utah 84067.

Datacopy offers Fastore archiving tool

MOUNTAIN VIEW, Calif. — Datacopy Corp. here has introduced a high-speed image scanning and storage device designed for use in digitizing and electronically storing documents.

The Fastore system reportedly will permit the archiving of historical documents, engineering drawings, maps, handwritten forms and other papers.

The unit incorporates Datacopy's Electronic Digitizing Camera and display system and runs in conjunction with a host IBM Personal Computer XT or AT, which is not included in the price of Fastore.

The system can scan a document page in less than three seconds, according to Datacopy.

Once scanned, the document is compressed. A document page of up to 11 in. by 22 in. requires 50K to 100K bytes of storage, Datacopy said.

The digitized documents are stored on the host's hard disk, and the hard disk can be backed up, permitting extensive archivals. The Smithsonian Institution reportedly uses Fastore to archive its document library.

Images captured and stored by Fastore can be displayed at high resolutions, Datacopy said. A resolution of 200 dot/in. is achieved when an 8¼- by 11-in. document is displayed using Fastore.

The host Personal Computer can be used to annotate document files and pages. The text annotations can, like the rest of a file, later be searched on the basis of keywords, authors and document names.

Fastore, which also includes a high-resolution display and controller and software, is priced at $44,500. It uses the Priam Corp. Datatower mass storage system, which is not included.

The Datatower units come in two versions — a 160M-byte unit priced at $9,995 and a 290M-byte unit that costs $12,995.

Datacopy is located at 1215 Terra Bella Ave., Mountain View, Calif. 94043.

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GTE starts home micro call service

RESTON, Va. — GTE Telenet Communications Corp. has announced a service under which home users of personal computers will be able to pay a flat fee of $25 per month to use the Telenet packet-switched public data network to call other personal computers anywhere in the U.S.

PC Pursuit reportedly will permit users to conduct real-time communications, including file sharing, with other personal computer users or electronic bulletin boards, GTE Telenet said. However, it will be available for use only during evenings and on weekends and, at present, only in certain cities. These include Atlanta, Boston, Chicago, Dallas, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, San Francisco and Washington, D.C.

PC Pursuit reportedly will permit users to call any modem's telephone number, including those of nonsubscribers, as long as the modem being called is in any city served by PC Pursuit. PC Pursuit does not support 2,400 bit/sec. modems or spoken communication.

GTE Telenet said the service, which requires users to have their own modems and software for asynchronous communications, could save them up to 75% of their current long-distance charges. Users will dial their local Telenet access number and enter their home phone number and a destination phone number to access the service. If the user's home phone number is valid, they will be called back and connected to the number they were trying to reach, GTE Telenet said.

GTE Telenet is located at 12490 Sunrise Valley Drive, Reston, Va. 22096.

Meet to feature DBMS display

DEKALB, Ill. — Next month's Entity-Relationship Conference in Chicago will feature a micro data base management software competition in which a small number of vendors will demonstrate how their products handle a case study involving personnel data.

Attendees will be able to see inexpensively a large portion of a project life cycle beginning with data base specifications, according to session chairman Rodney Zimmerman. Specifications will be written in terms of entity-relationship diagrams, a graphics documentation technique that is rapidily spreading among Fortune 500 data base professionals, he added. The session will compare solutions in terms of several factors.

The session is scheduled for 7:30 p.m. on Oct. 29 at the Chicago O'Hare Airport Hyatt Hotel.

More information is available from Kathi Davis, Computer Science Department, Northern Illinois University, DeKalb, Ill. 60115.

SPECIAL REPORT

Minis and Small Business Systems

September 30

The September 30th Special Report will take a close look at the minicomputer and small business systems market. We'll discuss the latest trends in minicomputer architectures and examine the evolving supermini market. And we'll cover what's happening in the supermicro market and how it's affecting the mini market. We'll include reports from users on the problems that they encounter in selecting and implementing minicomputer systems and the solutions they discovered.

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What do you call a mainframe application software product designed with such patient attention to detail that it will register the effects of one transaction on every other business transaction in a company?

What do you call software architecture so artfully conceived it will someday enable a person using an application to move from one database management system to another, or from one teleprocessing monitor to another, without a single change in his work style?

What do you call query and reporting tools so simply and powerfully rendered that even a novice will find them no more difficult to work with than a personal computer spreadsheet?

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Masterpiece is, in every aspect, a new family of software products.

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This means that ultimately a user can adopt a new database management system without the slightest change in either his way of working or in the application code itself.

Only software built in this manner, is software that will endure.

The Intelligent Architecture design means that all menus and screen prompts become common to all Masterpiece applications. It means that the way users interact with an application will be the same from application to application—a significant factor contributing to greater ease-of-learning and ease-of-use.

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And *that* is the fundamental difference.

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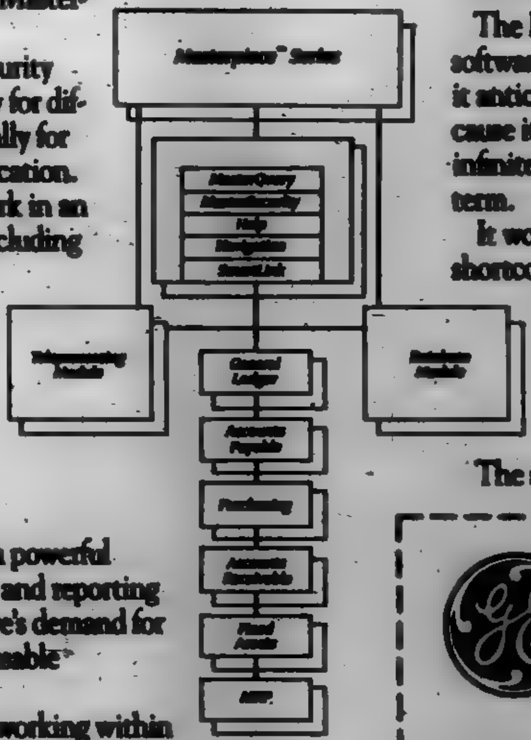
Everything is designed to work in an intelligent and modular fashion including what may now be the industry's most advanced query tool… MasterQuery.™



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The MasterQuery system is a powerful fourth generation borderless query and reporting tool designed to satisfy an executive's demand for instantly accessible and instantly usable information.

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SOFTWARE

■ United Software Security, Inc. has added a backup program to its product line.

Taketwo backs up hard disk data stored on an IBM Personal Computer XT or AT. The product copies only those files that have been added or changed during a day rather than copying all data on a hard disk, according to the vendor.

The package supplies security features for access and control of backed up files.

Taketwo sells for $1,400.

United Software Security, 6867 Elm St., McLean, Va. 22101.

■ Zedcor, Inc. has enhanced ZBasic 2, a programming language that runs on the IBM Personal Computer line, on Apple Computer, Inc.'s Apple IIe, Apple IIc and Macintosh and on microcomputers with Digital Research, Inc.'s CP/M operating system 2.2 or higher.

The language uses the same commands regardless of the type of microcomputer. The programming language features device-independent graphics, up to 54-digit numeric accuracy, a built-in interactive editor, a compiler and a choice of alphanumeric labels or line numbers.

Zbasic works at speeds up to 50% faster than other programming languages, according to the vendor.

The package costs $89.95.

Zedcor, 3438 N. Country Club, Tucson, Ariz. 85716.

■ California Computer Products, Inc. has introduced Cadvance, a computer-aided design package for use on a IBM Personal Computer XT or AT using a graphics display board and a minimum of 512K bytes of random-access memory.

Cadvance reportedly employs variable interpretive macros to save time in repetitive design. It also offers nested commands, which reduce the number of times a user must switch between menu selections, the vendor said.

The software reportedly offers the capability to zoom in or out, window and pan short, long or by page without leaving the draw command. While in the draw command, the user can change grids, move or float grids, view a fit and do other functions, according to the vendor.

Cadvance is priced at $2,500.

Calcomp, 2411 W. La Palma Ave., Anaheim, Calif. 92801.

■ David L. Aldridge Co. has introduced Precursor, indexing software for the hard disks of the IBM Personal Computer XT and compatible machines.

Precursor reportedly eliminates the need to remember DOS commands when accessing programs on a hard disk. The package, which resides in 50K bytes of memory, presents users with an index of applications on the disk and permits users to call up applications by pressing one key, the vendor said.

Included in the software are printer setup selections and three levels of password protection.

Precursor is priced at $69.

David L. Aldridge, 341 Town & Country Village, Houston, Texas 77024.

■ Network Software Associates, Inc. has introduced Adaptsna Remote Job Entry/Automatic Processing Facility (RJE/APF) software for use with the IBM Personal Computer.

Adaptsna RJE/APF reportedly permits automatic, on-the-fly post-processing and reformatting of data transmitted from a mainframe to a Personal Computer.

It also is said to allow a remote Personal Computer to function as an intelligent RJE workstation on which users can automatically determine how to reformat or modify downloaded mainframe data.

The software is priced at $870, the vendor said.

Network Software Associates, 19491 Sierra Soto, Irvine, Calif. 92715.

See TOOLS page 61

Package enables Modula-2 users to access Lotus 1-2-3

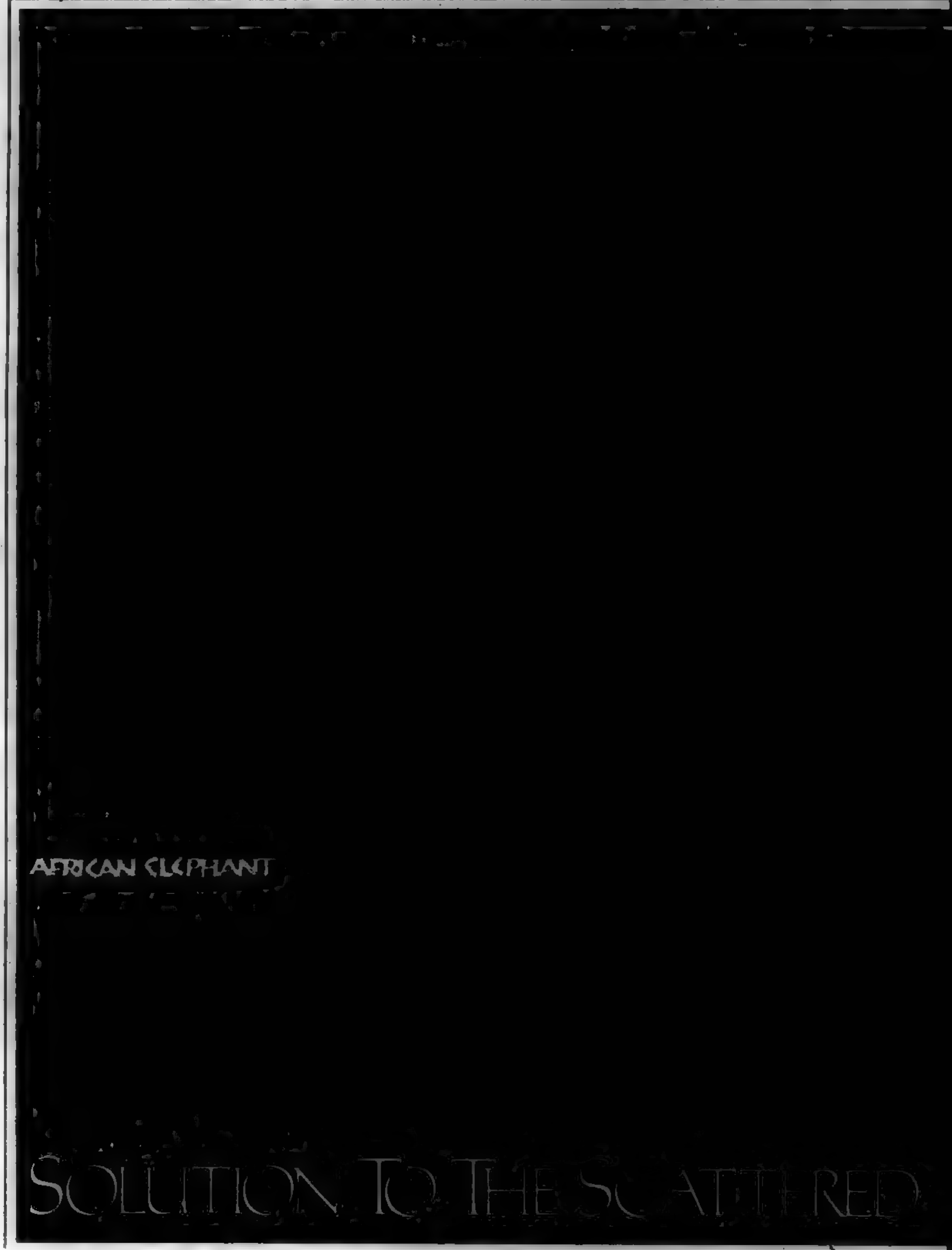
HOUSTON — Interface Technologies Corp. earlier this month introduced M2access, a $49 package designed for Modula-2 programmers that permits them to read and access Lotus Development Corp. 1-2-3 files directly.

IBM Personal Computer users who work with the Modula-2 language now can access 1-2-3 files without having to construct macros and without having to run under the 1-2-3 spreadsheet, according to Interface Technologies' President Robert Warfield.

"People can write add-on programs to 1-2-3 to do custom report generation, file manipulation and improved business graphics," Warfield said.

In addition to being available as a stand-alone product, M2access will be bundled in with sales of the company's M2SDS-XP software development system or Modula-2 Extended Libraries software until Sept. 30, the vendor said.

More information on M2access is available from Interface Technologies, which is located in Suite 200, 3336 Richmond Ave., Houston, Texas 77098.



TOOLS

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■ The Institute for Scientific Analysis, Inc. has introduced Small-X, an interpreter program for use in artificial intelligence programming on the IBM Personal Computer.

Small-X reportedly includes a programming language that combines a simple syntax with the tests and actions needed for the development of rule-based expert systems. It includes the ability to control and exchange data with other Microsoft Corp. MS-DOS-based applications, the vendor said.

The software requires 128K bytes of memory and costs $249. A manual, several example expert systems and a demonstration script are included.

Institute for Scientific Analysis, Suite 106A, 36 E. Baltimore Pike, Media, Pa. 19063.

■ Financial Decision Systems, Inc. has announced an enhanced version of its Corptax Linx tax reporting software for the IBM Personal Computer, Personal Computer XT and Personal Computer AT.

Version 2 reportedly allows users to customize reports in single-column, multicolumn and book-to-tax trial balance forms. It includes additional capabilities for consolidations, deletions and disk management and also includes the ability to convert data into general ledger format.

Version 2 requires a hard disk, a minimum of 512K bytes of random-access memory and a printer.

Cost of the software is $2,000. Users of Corptax Linx Version 1 may upgrade for $350.

Financial Decision Systems, 26035 Dorothy Drive, Agoura, Calif. 91301.

■ BST Consultants, Inc. has announced that its Management Information System software for professional design firms and other project-oriented firms is available on Digital Equipment Corp.'s Microvax II running under DEC's MicroVMS operating system and on the IBM Personal Computer AT running under Microsoft Corp.'s MS-DOS operating system.

The system is said to combine functional and organizational accounting and financial management in a multiuser integrated package. The functions include project control, billing, payroll and general accounting functions.

The system costs $12,500 for the Personal Computer AT version and $20,000 for the Microvax II version.

BST Consultants, P.O. Box 23425, Gunn Highway, Tampa, Fla. 33622.

■ Infocode, Inc. has introduced Infolok security software for the IBM Personal Computer and compatibles.

Infolok reportedly encrypts data using a passkey of up to 64 characters. Its functions include encryption and decryption, file purging, teleformatting and file hiding and finding.

Teleformatting capability is said to allow the software to convert a standard or encrypted file into transmittable Ascii format and to encrypt and transmit simultaneously using a single command.

Infolok is priced at $149.

Infocode, 19 Union Square W., New York, N.Y. 10003.

■ California Software Products, Inc. has introduced its Backrest software option for its Baby/34 and Baby/36 software products, which emulate the IBM System/34 and System/36, respectively, on the IBM Personal Computer.

Backrest, a software module, reportedly uses an incremental backup feature that indicates changes made to data during a specific period and backs up only the changes. The package also has an automatic formatting feature and indicates how many diskettes are needed for the backup.

Backrest is priced at $390 for Baby/34 and Baby/36 customers. It will also be sold as a stand-alone product for $350.

California Software Products, Suite 300, 525 N. Cabrillo Park Drive, Santa Ana, Calif. 92701.

■ Decision Resources, Inc. has introduced Diagram-Master software for the production of diagrams on the IBM Personal Computer.

Diagram-Master reportedly is a prompt-driven application able to produce organizational and Gantt charts as well as custom free-form diagrams, such as flow charts. A vector graphics package, the software interfaces with a variety of output devices including pen plotters, printers and the Polaroid Corp. Palette 35mm slidemaker.

When creating an organizational chart, users reportedly can include up to 70 boxes with up to six lines of text per box.

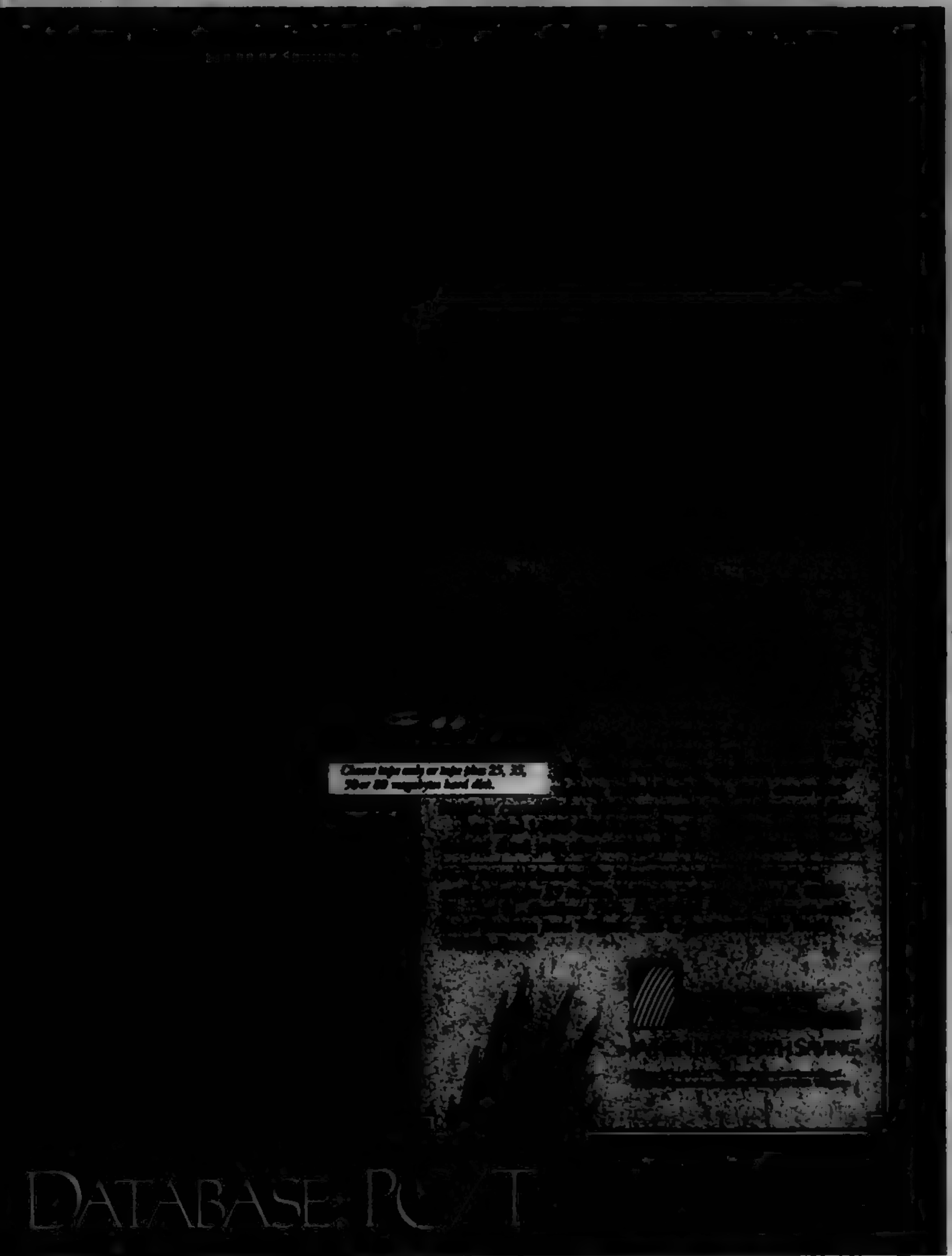
Diagram-Master is priced at $345.

Decision Resources, 25 Sylvan Road S., Westport, Conn. 06880.

■ Rand McNally Infomap, Inc. has introduced Randmap mapping software for the IBM Personal Computer.

Randmap reportedly permits maps to be created by state, county, Standard Metropolitan Statistical Area, three- and five-digit Zip code areas, congressional districts and other means. The package also features

Continued on page 62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SPERRY

DSS

from page 55

to large companies, which account for at least three-quarters of Lightyear shipments but take a long time in evaluation.

Financing the Santa Clara, Calif., start-up brought other problems. Last summer, Lightyear tried to tap venture capital, but "the market was just absolutely atrocious for raising capital, as it still is," Garnett said. Interested venture capitalists typically wanted Lightyear to merge with another software firm, which Garnett thinks would have wasted time.

The firm raised more than a million dollars privately, got the product out the door, hit a break-even point in January and has been marginally profitable ever since. While it was in no danger of closing its doors, the principles did worry about Lightyear's vulnerability to a few months of bad sales.

Snags cropped up

Snags in distribution also cropped up. "The distribution channel may be turned off right now," with distributors and dealers accustomed to products selling in large quantities, Garnett commented.

Dealer sales personnel may have little incentive to push new packages because customers often end up placing their volume orders with wholesalers. "We did everything we could to keep it out of the gray market," Garnett said. But there's a catch-22 involved because vendors seek to make their products widely available.

Through the first half of this year, Lightyear continued to examine options for raising bucks to continue the struggle.

Two months ago at a Future Computing, Inc. conference, I asked Garnett and Thoughtware, Inc. President Jack Levine an industry-standard question — are you guys buying anyone, or is anyone buying you?

There was no need for acquisitions from a product point of view, because "you can license anything you want," Levine said. But Garnett remarked that "there's so much chaos in the market now, everyone's talking to everyone."

In fact, the two began talking at the conference, and earlier this month they announced plans for Miami-based Thoughtware to acquire Lightyear.

Thoughtware's Trigger management package faces many of the same obstacles as Lightyear, Garnett said, and "it's a very good merger for both sides."

Continued from page 61

dot-density mapping and the ability to specify map boundary colors and text colors, according to Rand McNally Infomap.

Eight color boards, 11 plotters and eight mice are supported, Rand McNally Infomap said.

Randmap is priced at $995, according to the vendor.

Rand McNally Infomap, P.O. Box 7600, Chicago, Ill. 60680.

■ Felton Engineering Ltd. has announced computer-aided design and drafting software for the IBM Personal Computer, Personal Computer XT and Personal Computer AT.

Ecad is said to feature cursor-driven panning and instant zooms, regardless of the complexity of the drawing. Line thickness and patterns are displayed on the screen as they are on the plotted drawing. The software reportedly sorts and plots the lines of each thickness consecutively.

The software requires a minimum of 640K bytes of memory, an Intel Corp. 8087 math coprocessor, a Hercules Computer Technology, Inc. Monochrome Graphics Card, a Houston Instruments DMP series plotter and the IBM PC-DOS operating system.

The cost of Ecad is $2,195.

Felton Engineering, 3991 Smuggler's Cove Road, Victoria, B.C., Canada V8N 4M1.

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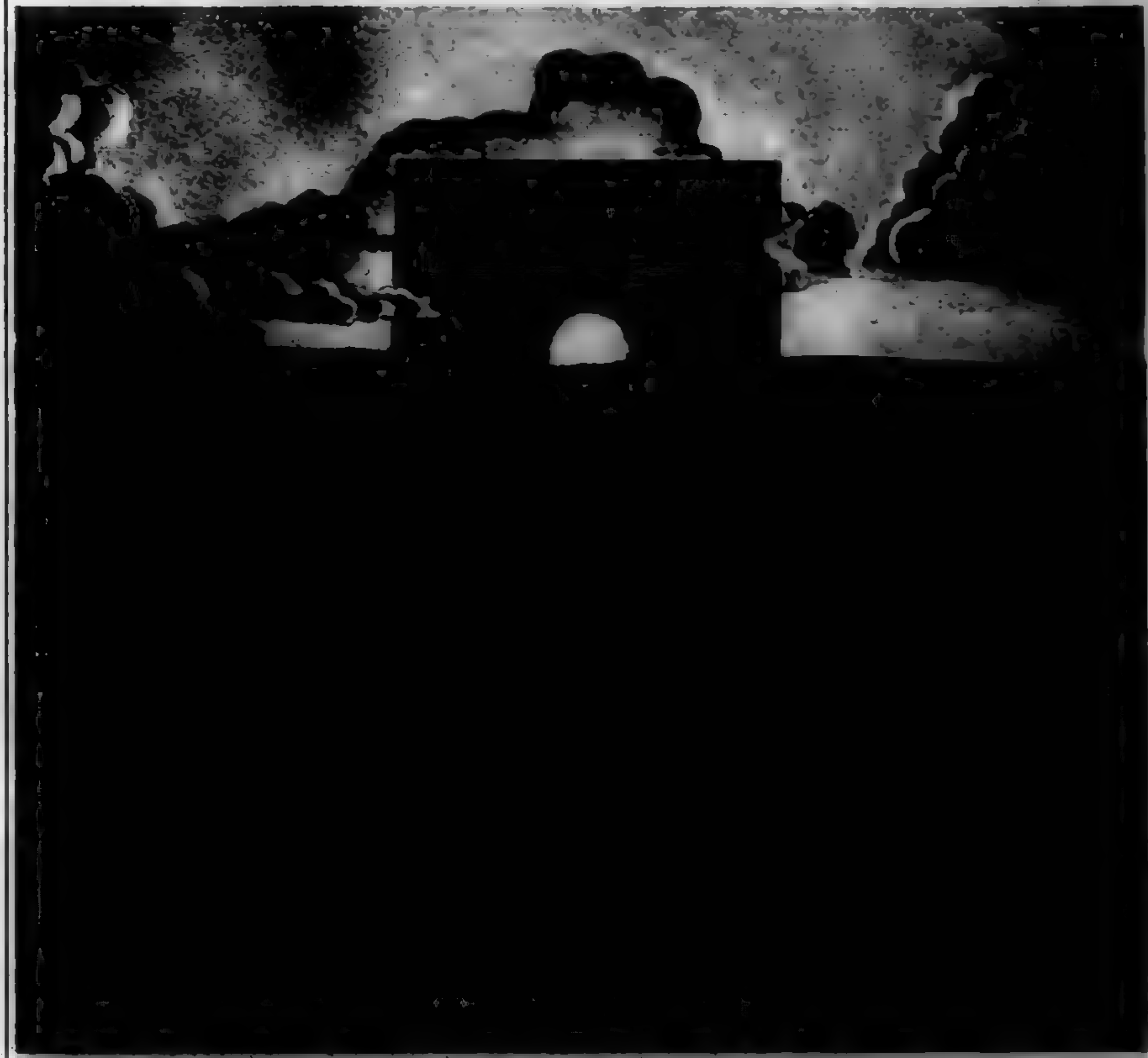

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For corporate users, Network Revelation is already off and running on both IBM's® PC Network and any hardware running Novell NetWare.™

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And for everyone, there's an advanced query language and report writer that's fluent in everyday English and eager to learn new expressions.

The secret is incomparable technology: variable-length fields to conserve precious disk space; unlimited files, fields and records; data dictionaries that make it easy to change your database when you change your mind; plus a high-speed compiler to accelerate program execution. And, of course, conversion utilities for dBase II® and Lotus 1-2-3™ are included at no extra cost.

Revelation isn't for everyone. But if you're ready for a database management system you'll never outgrow, rush to your nearby dealer.

Ask for an unforgettable demonstration of Revelation's superior capabilities.

IBM is a registered trademark of International Business Machines. NetWare is a trademark of Novell, Inc. dBase II is a registered trademark of Ashton-Tate. 1-2-3 is a trademark of Lotus Development Corporation.

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John Dix
CW Senior Editor

AT&T's reign spurs mergers

AT&T, formerly Ma Bell, probably took some lessons from Mother Nature. You can't mess with either.

At least, you can't do it alone.

The largest fly in the ointment, MCI Communications Corp., conceded this fact recently when it flew into the arms of IBM. While that agreement is significant given the importance of the companies involved, it is neither the first sign of industry maneuvering nor the latest in the turbulent long-distance telecommunications market.

It all began in late 1982 when GTE Corp., the second largest telephone company before AT&T's divestiture, moved to acquire Sprint from Southern Pacific Railroad.

It was a bold move by the local service supplier to enter the long-haul business.

Little more than a year later, United Telecommunications, Inc., the third largest telephone company before divestiture, acquired U.S. Telecom, one of the industry's largest resellers.

The MCI/IBM deal is recent history. IBM sold Satellite Business Systems to MCI in exchange for a 16% interest in the discount long-distance company.

And, most recently, Allnet Communications Services, Inc. joined forces with Lexitel Corp. Allnet is a Chicago-based carrier that operates a nationwide network, and Lexitel is a regional carrier based in Birmingham, Mich.

The impetus for the mergers and acquisitions is different in each case. As the second and third largest tele-

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Financial analysis for the communications manager

FIRST IN A THREE-PART SERIES

By Daniel Minoli
Special to CW

Communications managers increasingly are being confronted with financial decisions regarding the capital equipment needed to run an efficient and up-to-date network. Even when managers restrict themselves to technical issues and delegate financial questions to experts, they still need to understand why a particular choice was recommended over another.

In a three-part series, this column will outline the basic concepts of financial analysis that are likely to apply to data communications and to capital equipment — asset — acquisition. The first two parts will define and explain commonly used terms. The third section will outline actual decision methodologies.

Two examples will guide the development: Should the manager buy a piece of gear for $2,000 or lease it for $80 a month? Should the manager buy a piece of gear for $2,000 with a maintenance fee of $100 per month or buy another model that costs $3,000 and has a maintenance fee of $50 per month?

Basic concepts

Basic terms that communications managers should be familiar with include the following:

- Capital asset. A physical asset used by a firm in producing goods or services.
- Capital budget. A statement of the firm's planned investments, generally based upon estimates of future sales, pro-

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Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

■ Codenoll Technology has added a switch-selectable fiber-optic Ethernet transceiver/66

■ Aviv has announced an 8-line asynchronous communications multiplexer for Digital Equipment Q-bus processors/66

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Quadram unveils micro link

ROSWELL, Ga. — Quadram Corp. has announced the Quad3278 Gateway, providing a communications link between micros in a local-area net and their IBM Systems Network Architecture (SNA) hosts.

The Quad3278 Gateway provides communications support for SNA Physical Unit Type 2 and Logical Unit Types 1, 2 and 3 sessions and services. The product emulates an IBM 3274-51C/61C communications controller and emulates IBM's 3278 Model 2 and four-color 3279 displays as well as an IBM 3287 printer.

The Quad3278 Gateway is capable of 9.6K bit/sec. synchronous host communications. The product features 512K bytes of main memory and National Semiconductor Corp.'s 32016 microprocessor set.

The product can support up to 32 concurrent users while the host continues computing. Other features include session control options such as multiple concurrent IBM SNA host sessions, user-controlled session switching, printer sharing, host-initiated printing and disk logging. A session-hold option permits the user to switch from a host session to the microcomputer operating system and back.

The Quad3278 Gateway also includes on-board parity checking of memory, an RS-232C modem connection, power-up diagnostics resident in read-only memory and downloading of Quad3278 Gateway software from any local-area network-based hard disk or diskette.

The Quad3278 Gateway costs $6,000.

Quadram, 1009 Mansell Road, Roswell, Ga. 30076.

Bridge offers video modems for CATV broadband nets

BEDFORD, Texas — Bridge Communications, Inc. has announced intelligent video modems that enable users to add video capabilities to CATV-type broadband local-area networks.

The 8433 Video Modulator and 8432 Video Demodulator handle video teleconferencing, video surveillance, closed-circuit instructional television, TV distribution and remote factory process monitoring, a spokesman said. The products are based on an Intel Corp. 8051 microprocessor.

The 8433 and 8432 can be installed in new broadband networks or in existing CATV plants used previously for only data communications.

An RS-232 port is provided for control of remote devices.

The modulator can be tuned in 250-KHz steps to any frequency between 50 and 300 MHz, and the demodulator can be tuned to any frequency between 50 and 440 MHz. Other features include a separate nine-pin connector for audio signals, selectable CATV tuning schemes, selectable automatic fine tuning and a front-panel, 4-char. LED display indicating the channel selected and other parameters.

Both units reportedly are compatible with U.S. National TV Standards Commitee video standards.

The 8433 Video Modulator is priced at $1,795, and the 8432 Video Demodulator is priced at $1,495, the company said.

Bridge, R. F. Products Division, 2001 Reliance Pkwy., Bedford, Texas 76021.

Racal-Vadic enhances modem, unveils controller

MILPITAS, Calif. — Racal-Vadic, Inc. has announced that it has added Microcom MNP error-control and speed-conversion features to its 2400PA modem. The company also announced the 855M, a stand-alone error controller that supports MNP.

Both the 2400PA and 855M are said to increase throughput by converting data from asynchronous to synchronous format. The model adapts its transmission speed to the fixed speed of data terminal equipment. The modem can operate at dial-up speeds of 300, 1,200 and 2,400 bit/sec.

A flow control feature prevents data terminal equipment from overloading the modem with data. The 2400PA offers a Modem Manager and memory editor feature, said to allow remote management and maintenance from a single location. Network managers can access and set configuration options, update and store access numbers and logon passwords and redirect call-ins when a computer goes down.

An automatic logon feature in the 2400PA allows a user to log on with a single command.

Other features include RS-232 terminal interface compatibility, operation in either synchronous or asynchronous mode, tone or pulse dialing, call-progress detection, security password to prevent unauthorized access to memory contents and user diagnostics.

The 2400PA is priced at $795. The 855M is priced at $295.

For additional information, Racal-Vadic is located at 1525 McCarthy Blvd., Milpitas, Calif. 95035.

FINANCE

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duction needs and availability of capital.

■ Depreciation. A deduction of part of the cost of an asset from the company's income in each year of the asset's life. Some typical, and minimal, depreciation intervals are five years for modems, personal computers and other pieces of small equipment; and seven years for front-end processors, private branch exchanges and other pieces of large equipment.

Recently an accelerated depreciation schedule became law that allows firms to depreciate a piece of equipment fully well before the end of its useful life. The motivation was to fend off foreign competition by permitting some segments of the manufacturing industry to retire older but still functioning equipment in favor of newer, more efficient and automated equipment.

■ Investment Tax Credit (ITC). An income tax credit is given to firms for investing in plant and equipment. It ranges between 7% and 10% of the face value of the investment. This is generally considered as a reduction of the initial equipment cost.

The proposed tax simplification legislation currently being discussed would do away with ITC. This would hurt small to medium-size firms in regard to upgrading their equipment.

■ Cash flow. This is the actual dollars coming to the firm or paid by the firm as a result of adopting an investment. In other words, it is the difference between the cash income generated by the project — new sales, products, benefits and the like — and the necessary expenditures — equipment costs, labor and the like.

■ Amortization. A sinking fund established for settling debt-financed assets; writing off expenditures by prorating them over a fixed period of time.

■ Cost of capital. The interest rate being charged to secure a loan to finance a given project, for example, the prime rate or the average rate on the securities (bonds and stocks) issued by the company. This represents the minimum acceptable rate of return on an investment or project undertaken by the company.

■ Principal. The amount of money on which interest is paid by the borrower. It decreases according to the amortization schedule.

■ Interest. Same as the cost of capital. Interest can be demanded as simple interest or compounded interest. In the former case, the borrowing charge is a linear function of the initial loan; in the latter case, the charge is an exponential function of the original loan. Compounding always makes the amount due larger than under the simple interest case. In business, compounding is the norm.

All these factors come into play in the decision of how to compare alternate strategies for capital equipment acquisitions listed above.

However, more background is required before we can find the answers to the two problems presented above. This will be done in next week's column.

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MULTIPLEXERS/ MODEMS

■ **Datacom Northwest, Inc. has added a synchronous short-haul modem to their product line that complements their asynchronous model.**

Selectable data speeds range from 1,200 bit/sec. to 19.2K bit/sec. Features include analog and digital loopback, transmit and receive LED indicators and optical couplers.

The unit is available in 110V or 220V configurations and is priced at $159.

Datacom Northwest, S.W. Building 100, 3303 112th St., Everett, Wash. 98204.

■ **Aviv Corp. has unveiled the Model CC 900 8-line asynchronous communication multiplexer for Digital Equipment Corp. Q-bus processors.**

The product is based on Webster Computer Corp.'s 8-channel SDZV11 multiplexer. The companies have reached an agreement that gives Aviv manufacturing rights to the Webster multiplexer. The Model CC 900 is functionally compatible with DEC's DZ11 or DZV11 multiplexers.

The CC 900 features line programmable transmission rates, character length, parity, stop bits and transmitter enable. Two tables of 16 transmission rates each are provided, permitting access to faster rates of 19.2K bit/sec and 38.4K bit/sec.

The Model CC 900 costs $995.

Aviv, 26 Cummings Park, Woburn, Mass. 01801.

LOCAL-AREA NETWORKS

■ **Codenoll Technology Corp. has announced a switch-selectable fiber-optic Ethernet transceiver.**

The $795 Codnet-3030S can be switched to meet the interface requirements for IEEE 802.3 standards and Ethernet Version 1 and 2 equipment, the vendor said.

A user can choose from various options like ac or dc coupling and interfaces with or without self-diagnostic capabilities for standard operation or use with remote repeaters.

Codenoll Technology, 1086 N. Broadway, Yonkers, N.Y. 10701.

■ **AST Research, Inc. has introduced the AST-Netbios Option software program for its local-area networks, said to provide compatibility with software written for the IBM Personal Computer Network Adapter.**

AST's PCnet and PCnet II networking hardware emulates IBM's Network Basic I/O System (Netbios) when running the AST-Netbios Option. This enables AST to take advantage of standard IBM network applications software, a spokesman said. Netbios functions as an interface between a local network and an operating system.

The AST-Netbios Option provides support for the IBM Personal Computer Network Program. It will be available in September at a price of $195 per node.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

AUXILIARY EQUIPMENT

■ **Emcom Corp. has added an enhanced Network Control System to its product line of management tools for complex data networks ranging in size from four to 4,096 lines at speeds to 64K bit/sec.**

NCS70/30 is said to provide real-time error and status message reports.

Response time, line utilization and activity, error and status reports are presented by a local control terminal and system printer.

The system costs $75,000.

Emcom, Suite 901, 101 E. Park Blvd., Plano, Texas 75074.

MERGER

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phone companies providing local services in the U.S., it was natural for GTE and United Telecom to venture into the long-haul market.

GTE bought a healthy company in Sprint, second only to MCI in competition with AT&T for long-distance service. United Telecom went another route, preying on what appeared to be an early casualty of divestiture. As a reseller, U.S. Telecom was eking out its living by buying bulk services from AT&T and reselling them at competitive prices.

Resellers operate on very slim margins by necessity, and the uncertainty of AT&T rates at the time of divestiture and pending access charges had all resellers — and their customers — on tenterhooks. Business was suffering, and U.S. Telecom was looking for a white knight.

MCI sought the IBM deal because it needed the deep pockets of the mainframe maker to fund its network expansion. MCI couldn't capture new customers without the new facilities and would have had problems funding the facilities without the new customer revenue.

The most recent allegiance, the Allnet/Lexitel merger, was triggered by the financial difficulty Allnet was experiencing and the fact that the companies were synergistic.

Driving all this merging, shuffling and posturing is AT&T's stranglehold on the long-distance telecommunications market. While talk of competition is rampant, AT&T still controls an estimated 90% of the industry.

And yet, by rough count, there are still over 500 long-distance carriers in the business today, according to Anne Frances Bleecker of the Competitive Telecommunications Association in Washington, D.C. Other than the companies mentioned, most all of the remaining carriers — with the notable exception of Western Union Corp. — are resellers.

Read their last rites in 1983, this tenacious group of companies has been somewhat revived by the long-distance fiber-optic carriers. These networks have created a glut of long-haul capacity and have given the resellers an option that is less expensive than leasing AT&T facilities.

The reseller shakeout, however, is inevitable, leaving perhaps a few dozen companies in its wake. Mergers, acquistions and filings under Chapter 11 of the Federal Bankruptcy Act will prevail. No industry sector, it appears, can stand alone against the AT&T tide.

SYSTEMS & PERIPHERALS

Disk cache option out

WALTHAM, Mass. — Honeywell, Inc. has announced a hardware-based disk cache processing option. The option — available to users of the company's 16-bit DPS 6/75 and 32-bit DPS 6/95 minicomputers — is said to offer improvements in system efficiency, terminal response time and terminal connectivity.

The system manages disk caching on a global basis instead of assigning a disk cache buffer to individual disk controllers, a spokesman said. Increases in actual performance with the disk cache processor depend upon the specific customer environment. To determine if and by how much the option may benefit the user, Honeywell technical field staff members use a DPS 6 system monitor.

The disk cache processor can be field installed in existing systems or ordered as an option on new systems. On the DPS 6/75, the processor price, with 2M bytes of cache buffer memory, is $18,000 if factory installed and $22,000 if field installed. Additional cache buffer memory, in increments of 2M bytes, can be added for $10,000 each, up to a maximum of 6M bytes.

On the DPS 6/95, the disk cache processor price is $12,000 at the factory and $16,000 if field installed. DPS 6/95 users must allocate at least 2M bytes of system main memory for the disk cache buffer. The system can support up to 14M bytes of disk cache buffer memory.

Honeywell is located at 200 Smith St., Waltham, Mass. 02154.

Wang offers more power for mid-range VS units

Extra configurations added for up to 80 users

By Donna Raimondi
CW Staff

LOWELL, Mass. — Wang Laboratories, Inc. has announced increases in power and configuration options for its mid-range VS computers.

Main memory capacity has been doubled to 8M bytes for the VS 85 and to 16M bytes for the VS 100 system. The VS 85 can now be ordered in 2M-, 4M- and 8M-byte versions, and cache memory is standard at each level. The VS 100 comes in 2M-, 4M-, 8M-, 12M- and 16M-byte models. Existing 4M-byte VS 85 and 8M-byte VS 100 systems can be field upgraded in 4M-byte increments to the maximum configurations. Each step of 4M bytes costs $32,000.

The company has announced an increase in the number of terminals that can be connected to the VS 65 and VS 85 systems. The VS 65 now has a maximum configuration of 40 workstations; the VS 85 can support a maximum of 80 workstations.

Enhancements in configuration include the Wangnet Peripheral Band, which allows both local direct attachment and remote attachment of workstations and other devices to the VS 15/65 and the VS 300. The modular serial I/O systems were previously available for the other systems in the VS series. The cost per connection starts at $121 for VS 15 or VS 65 installations and runs up to $182 for VS 300 systems.

A 32-port serial device I/O processor for the VS 85 and VS 100 is said to double the number of physical ports per I/O processor slot. The processor supports up to 32 VS serial ports and a total of 32 logical devices. It costs $5,000.

Also announced was the ability for VS 85 and VS 100 users to add the VS-6550 telecommunications processor. The processor is said to provide all telecommunications support circuitry and 128K bytes of memory. It supports communications in a number of networks including Wang Systems Networking, IBM's Systems Network Architecture and the X.25 protocol. The VS-6550 costs $2,200.

Newly packaged configurations include a VS 65-A package that has a VS 65 CPU with 1M byte of main memory, 16K bytes of cache memory, a 147M-byte internal disk and a small data storage cabinet offering an additional 223M bytes of storage — a 147M-byte fixed disk and a 76M-byte removable disk. The system costs $47,680.

Three VS 85 and VS 100 packages have been announced — basic hardware packages, office automation packages and data processing development packages. The hardware packages add some basic Wang Office functions to become the OA packages. The inclusion of Wang's Professional Application Creation Environment data base management software, a Cobol com-

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- Computer Automation released a line of distributed DP systems that previously were only available in Europe/70
- Ampex announced DEC VT220 and VT100 look-alikes/70
- Xerox unveiled the Advantage D80 letter-quality printer/71

INSIDE

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Sequent rolls out enhancements for Balance 8000

PORTLAND, Ore. — A series of enhancements to the Sequent Computer Systems, Inc.'s Balance 8000 parallel processing system has been announced.

The Balance 8000 — announced in September — is a 32-bit parallel processing system that incorporates from two to 12 National Semiconductor Corp. microprocessors under Dynix, Sequent's version of AT&T's Unix 4.2 operating system.

An Atomic Lock Memory (ALM) enhancement, which is an add-on set of chips to the computer's multibus adapter board, is said to support 16,000 hardware locks per board, with up to four boards per system. The microsecond locking speeds of the ALM are said to support fine grain parallel programming by decreasing synchronization overhead. The ALM costs $1,000 as an upgrade for existing customers but will be standard on future machines.

A new software library is said to offer a formal, secure way to share memory among processors by adding support for dynamic allocation and reallocation of shared memory regions. A newly announced parallel programming library enables application developers to use shared memory and fast lock features through standard language library call mechanisms. It includes routines that allocate and deallocate shared memory resources and includes program synchronization primitives. There is no charge to existing customers for any of the software enhancements, the company said.

The company also announced it is replacing all of the National Semi 32016 processors in the system with the National Semi 32020 CPUs. All new machines will have the 32020s, and all existing user machines will be field upgraded at no charge.

Information can be obtained from Sequent Computer Systems, 14360 N.W. Science Park Drive, Portland, Ore. 97229.

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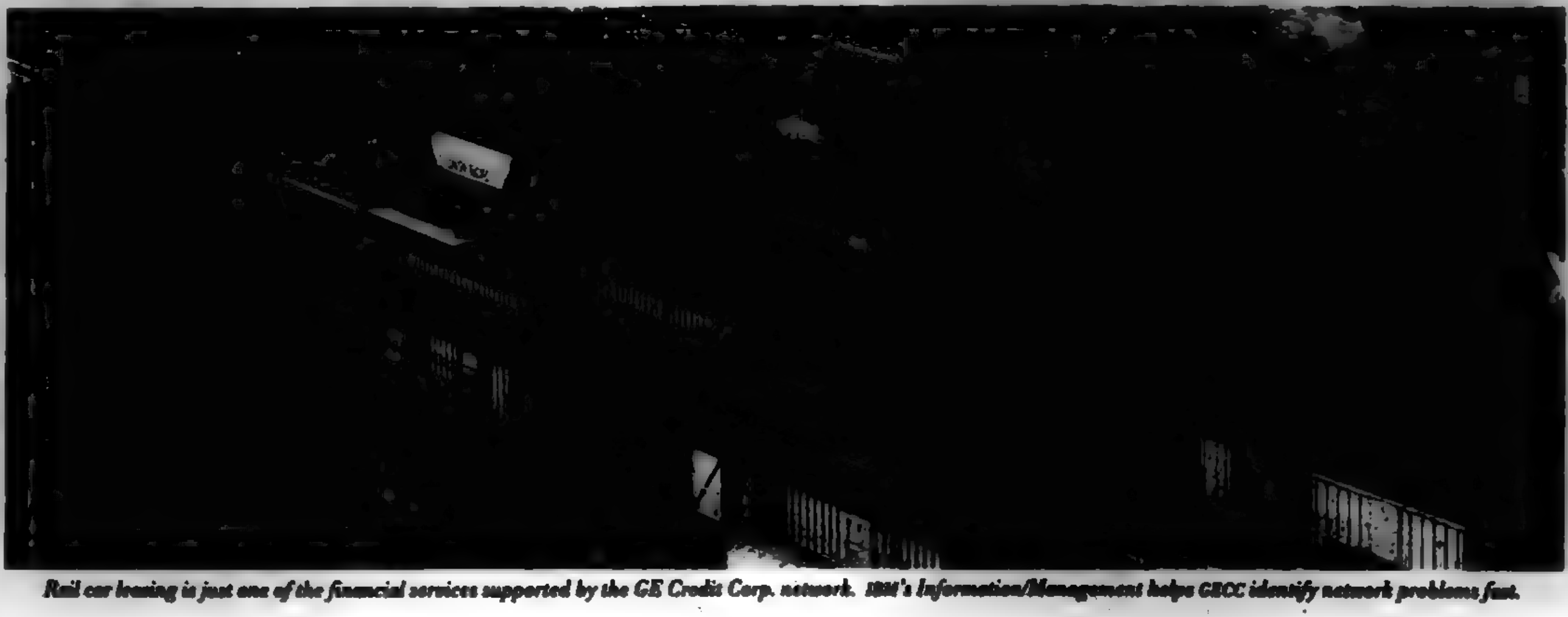
source: [illegible] Ryder Systems, Inc. Annual Report and Third Quarter Report, [illegible]

IBM Software Notes

News for the DP professional



Rail car leasing is just one of the financial services supported by the GE Credit Corp. network. IBM's Information/Management helps GECC identify network problems fast.

Information/Management Helps GE Credit Keep Network On Track

"We have happier customers," says Tom Dixon, manager of computing and telecommunication services for General Electric Credit Corporation (GECC) in Stamford, Conn. He is describing the use at GECC of IBM's Information/Management, Version 2—a licensed program that helps manage large data networks.

With assets of $17 billion, GECC is one of the country's largest commercial lenders—active in retail credit, commercial leasing and mortgage banking.

And GECC operates a very large network: one with more than 2,000 terminals. The users, Mr. Dixon's customers, are in GECC field offices, retail stores and GECC client offices. They operate workstations, point-of-sale terminals and credit authorization terminals.

IBM's Information/Management program helps Mr. Dixon's staff use its computer to provide better service to customers. It enables the staff to record and retrieve all the data relevant to any network operating problems: the list of equipment at each site, the details of every communication link, a complete record of every problem occurrence at each site, complete data on every type of equipment used in the network, and a detailed file on each vendor.

These data files can be searched to learn, for example, the history of a particular incident or of all previous occurrences of similar problems.

"We know our customer's environment," Mr. Dixon says. "Over the telephone from GECC's customer support center, we can provide procedures to identify or correct the problem. We can see every change made to the telephone circuit serving that site. We can see all problems on that circuit, year to date. And we can talk to the telephone vendor in specific, geographic terms.

"We're automating ourselves so that our present staff can handle a much larger network and a much greater rate of network change," Mr. Dixon continues. "We're already handling about ten times more devices than two years ago. And we're eliminating paperwork and becoming more responsive.

"Our next step will be to automate the management of network change with Information/Management." ▪

Pacific Northwest Bell Creates Online System Fast

"This is a very large and complex system," says John Osterfeld of Pacific Northwest Bell Telephone Company. "Yet we were able to implement it with 12 programmers—half of them brand-new to programming—in a total of 13 months from preliminary design to an online production system.

"It would have taken at least twice as long without ADF."

Mr. Osterfeld, a system analyst for Pacific Northwest Bell, is referring to IBM's Application Development Facility (ADF). Designed for users of the IMS/VS data base/data communication system, ADF greatly reduces the amount of programming required to create an application.

The programmers, under the technical guidance of Mr. Osterfeld, worked with ADF to develop a new version of the Customer Account Retrieval System (CARS) used by Pacific Northwest Bell representatives to call up account histories while answering customer telephone inquiries.

"We were up against a hard deadline. The application had to replace an older version within 13 months," he continues.

"Fortunately, ADF simplified the IMS programming to the point where we could meet the deadline using some people with no programming experience at all.

"CARS now has several thousand users," Mr. Osterfeld points out, "and a very large data base. In our largest center, CARS handles 350,000 transactions a day—12 per second at peak times. So it is an application with a lot of demand on it. Execution has to be very efficient.

"And this version handles 28 I/O calls per transaction, compared to 20 or less in our previous system.

"In other words, the system as written with ADF is actually more efficient in execution than the conventionally programmed system it replaces." ▪

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It's 2:00 a.m. You're testing a new application on a tight deadline. Suddenly, something—you don't yet know what—triggers an "abend."

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So, to keep IBM intermediate and large system customers up and running, the skills of more than 1,500 software service professionals are always on tap. Part of the IBM National Service Division, these professionals have the full power of special data bases at their fingertips.

You just call a special 800 number. At any time, 24 hours a day, seven days a week, you reach an IBM support center in Chicago, Boulder or Tampa. These locations service IBM's MVS, MVS/XA, DOS/VSE, VM and VS/1 system products and the licensed products associated with them. The centers also service licensed products for the Series/1 and the 8100.

Often the IBM Program Support Representative (PSR) taking the call recognizes the problem and gives the customer a remedy. To help the PSR, IBM maintains a data base of symptoms and solutions for known problems. If the problem requires a revision to the code, the PSR has a Program Temporary Fix (PTF) sent to the customer by the fastest possible method—in some cases, by a telephone link.

Over 50 percent of problems are solved by the PSR. But when a problem is a new one, the customer is put in touch with a program specialist, who often is located near the actual developers of the software product.

On the most severe problems—those which have halted processing—the first goal is to find some remedy, such as a bypass, that allows work to resume. The objective is to complete this within 24 hours.

The second goal for the program specialist is a permanent solution. When this requires a new PTF, the objective is to develop and test it within 14 days. The specialist re-creates the problem, functionally tests the new PTF, and then runs "regression tests" to be sure the fix is reliable.

To close the loop, IBM periodically makes available service updates which combine all recent program changes. ▪

To consult a data base of software symptoms and solutions, IBM representatives at customer sites talk by phone to these specialists at the IBM support center in Chicago.

Cross System Product Set–Version 2 Recently Announced

With the recent announcement of Version 2, the IBM Cross System Product Set becomes a strategic productivity tool for large systems, as well as for intermediate and distributed systems. This application generator includes three licensed programs: one for creating applications, one for executing them and a third that permits end users to query the VSAM or CMS files.

The Cross System Product Set runs under all operating systems for 30XX and 4300 systems and under DPPX/SP in the 8100. With this version, support is added for IMS/VS/DB and DL/I as data bases for CICS/VS. In addition, it has been enhanced to run in systems with large networks of terminals.

Simplify MVS Installations

The IBM Custom-Built Installation Process Offering (CBIPO) is a simplified packaging of MVS. A CBIPO can cut the time to install an MVS system or subsystem from weeks to days.

Conventionally, a major system change involves a separate tape, documents and installation procedure for each program product.

With CBIPO, you first select the program products you intend to use with MVS. Then, with an automated process, IBM custom-builds an MVS system consisting of the ordered products in the form of distribution data sets.

The CBIPO also includes customized documentation that provides a step-by-step single installation path.

[illegible]...

If you're interested in the growing information needs of business professionals, you'll be interested in *IBM Software Notes for the Business Professional and Manager*, an advertisement in recent business publications that featured these products:

- IBM's Query Management Facility (QMF). QMF is part of Dow Corning's end-user computing program. QMF lets employees do ad hoc queries on relational data bases.
- The Information Facility (TIF). Pratt & Whitney manufacturing experts create computer applications quickly, easily and in plain English.
- Info Center/1 is a new functionally integrated decision support product, combining and enhancing three popular IBM products: ADRS, APL/DI, and FPS.
- The IBM Personal Decision Series (PDS) lets PC users perform a variety of tasks on corporate, departmental or personal data bases.

For literature on these products, check "Business Professional Software" in the coupon at the right.

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IBM

Computer Automation's Syfa System 2 out in U.S.

Distributed DP unit debuted in UK, Europe

DALLAS — Computer Automation, Inc. has released its Syfa System 2 family of distributed data processing systems in the U.S. The hardware and software offerings were announced in the spring in the UK and Europe.

The Syfa System 2 is a direct replacement for previous Syfa systems, which can be field upgraded to the new capabilities, the vendor said. Five multiuser, multifunction transaction processors for high-volume interactive applications are said to provide data entry and inquiry response to both local and remote data bases. Each can be field upgraded to be attached to the company's broadband local-area network bus as a resource processor.

According to Computer Automation, systems include the entry-level 150TP configuration with eight local or remote terminal ports, 128K bytes of random-access memory, 258M bytes of disk storage, 60M bytes of tape cartridge backup and one system printer.

The 170TP is similarly configured but is expandable to 256K bytes of memory and 16 terminal ports, the vendor said.

Another model, the 190TP, reportedly features a 2K-byte cache memory.

The 300TP expands to a 24-port capability, up to 680M bytes of fixed disk storage and up to two system printers.

The 1000TP — the largest Syfa System 2 configuration — is said to support 384K bytes of memory and 1.36G bytes of disk storage. In typical configurations the above models range in price from approximately $23,000 to more than $150,000, the vendor said.

Computer Automation also announced four Syfa System 2 Resource Processors (RP) that function as file servers on the company's shared resource local-area network.

An RP — operating on a Syfanet distributed network architecture — can support 128 individual sessions simultaneously.

Up to 15 RPs can be attached to a single Syfanet network, the vendor said.

The models 170RP, 190/195RP, 300/350RP and 1000/1500RP range in price from approximately $65,000 to more than $350,000.

Additional information can be obtained from Computer Automation, which is headquartered at 1800 Jay Ell Drive, Richardson, Texas 75081.

Microvax II gets EMC cards

NATICK, Mass. — EMC Corp. has announced 2M-byte and 4M-byte add-in memory cards for Digital Equipment Corp.'s Microvax II computer system.

The MVXII-2MB and MVXII-4MB are quad-height cards that reportedly use 256K-byte random-access memory devices. They are said to be compatible with the Microvax II hardware and operating system and to support all memory system features, including diagnostics and parity checking.

The MVXII-2MB costs $2,900, and the MVXII-4MB costs $5,100, the vendor said.

More information is available from EMC, 12 Mercer Road, Natick, Mass. 01760.

DATA STORAGE

■ Anritsu America, Inc. has announced a series of ¼-in. tape drives for backup and archival storage of Winchester disks in small systems that operate on the same command set as ½-in. tape drives with no modifications to existing tape handlers.

The DMT 730 series uses 8-track, ¼-in. tape cartridges and offers up to 48M bytes of storage and a mean time between failure of 10,000 hours. Data can be recorded using either serpentine or separate channel mode.

The DMT 730E model operates in a streaming mode at a data transfer rate of 86.7K bytes and tape speed of 90 in./sec. The DMT 730C operates in a start/stop mode at a data transfer rate of 28.9K bytes and tape speed of 30 in./sec. The units cost $1,400 to $1,500, depending upon options.

Anritsu America, 128 Bauer Drive, Oakland, N.J. 07436.

TERMINALS

■ Ampex Corp. has announced terminals for corporate network and multiuser systems that emulate the Digital Equipment Corp. VT220 and VT100 terminals.

The Ampex 220 is said to include an adjustable slope alphanumeric keyboard with key grouping and layout that emulates the DEC VT220. The user has a choice of data formats — either 24 lines by 80 col. or 24 lines by 132 col. The unit comes with a 14-in. nonglare screen. The Ampex 220 costs $749.

The company also released its Ampex 219 terminal that emulates the DEC VT100, VT102, VT131 and VT52 terminals and the Wyse Technology, Inc. WY-75 terminal. The terminal includes the four DEC general-purpose function keys. The unit has a 14-in. screen. The Ampex 219 costs $649.

Ampex, 401 Broadway, Redwood City, Calif. 94063.

■ Tektronix, Inc. has released a color version of its 1200 series logic analyzers.

Based on the earlier 1240 model, the 1241 logic analyzer combines a proprietary liquid crystal color shutter with a 7-in. monochrome monitor. The 1241 features a vertical expansion mode that is said to double the height of timing diagram traces.

Three primary colors — yellow, green and red — make up the color display.

The 1241 costs from $8,600 to $21,000 for 9- to 72-channel systems.

Tektronix, P.O. Box 500, Beaverton, Ore. 97077.

■ Digi-Tech Consultants has released its Satellite Terminal, said to allow up to five users to access a single-user Convergent Technologies, Inc. Ngen or Burroughs Corp. B25 workstation.

The Satellite Terminal is said to allow the Ngen workstation, which is also sold as the NCR Corp. Worksaver and as Mohawk Data Sciences Corp.'s Hero workstation, to be used as a multiuser, multitasking computer.

It will reportedly enable users at remote sites to use a workstation via a modem. Features include a 14-in. green phosphor screen and full compatibility with most existing Ngen software. No changes will be needed to any user software, the vendor said.

The unit costs $1,750.

Digi-Tech Consultants, P.O. Box 12144, Dallas, Texas 75225.

PRINTERS/PLOTTERS

■ Xerox Corp. has announced a daisywheel printer from its subsidiary, Diablo Systems, Inc., that is said to be connectable to most personal computers, word processors and workstations.

The Xerox/Diablo Advantage D80 is said to produce letter-quality documents at speeds up to 80 char./sec. with noise measured as low as 58 dbs. The unit features Diablo's all-purpose interface, which allows connection to RS-232, Centronics Data Computer Corp. or IEEE 488 interfaces.

Features include a semiautomatic paper feed, with an optional automatic dual-bin, cut-sheet paper feeder, an envelope feed and a bidirectional tractor for feeding forms and computer fanfold paper through the printer. The D80 uses Diablo's extended character set, which contains 200 char./print wheel. Multilingual print wheels are also available.

The unit costs $2,195. The bidirectional tractor costs $300, and the dual-bin, cut-sheet paper feeder costs $903 and will be available in the fourth quarter of 1985. The envelope feeder costs $300 and snaps onto the cut-sheet paper feeder.

Xerox, Xerox Sq. 006, Rochester, N.Y. 14644.

POWER SUPPLIES

■ Solidstate Controls, Inc. has unwrapped a series of uninterruptible power supply (UPS) systems for minicomputer systems.

The Powerbase 4000 series protects against blackouts, brownouts, sags, surges and frequency deviations. The UPS comes in four power-range sizes: 5, 10, 15 and 20 kVA with either single- or three-phase output for any real-time application.

Prices range from $5,000 to $30,000.

Solidstate Controls, P.O. Box 1216, Columbus, Ohio 43216.

■ Power Systems & Controls, Inc. has unveiled its Monopowerpac power distribution and conditioning system for minis and mainframes.

The Monopowerpac is said to protect against sags, surges, transients and brownouts. It uses a synchronous motor for continuous performance at -15% low voltage and -25% for up to one minute. The Monopowerpac is available in 30, 60 and 95 kVA ratings with I/O voltages of 208/208, 480/208 or 480/480.

Prices range from $30,000 to $35,000.

Power Systems & Controls, 3206 Lanvale Ave., Richmond, Va. 23230.

BOARD-LEVEL DEVICES

■ Modular Computer Systems, Inc. has announced its Classic CT/15 single-board minicomputer that supports Modular Computer's MAX IV real-time operating system and virtual memory addressing capability.

The CT/15 processor — a low-end addition to the company's Classic series — consists of a single-board CPU and contains either 512K bytes or 2M bytes of memory. An optional storage subsystem includes a 20M-byte Winchester-type formatted disk drive and a floppy disk drive for software loading. Standard Modular Computer peripherals and I/O subsystems are supported.

The 512K-byte version costs $11,500 without the storage subsystem, and $15,900 with the storage subsystem. The 2M-byte version costs $16,500 minus the storage option and $20,900 with the option.

Modular Computer Systems, P.O. Box 6099, 1650 W. McNab Road, Fort Lauderdale, Fla. 33310.

■ National Instruments has released its general-purpose interface bus (Gpib) 410 interface card and software that is said to convert an IBM Personal Computer into an IEEE 488 bus analyzer.

The product is said to be useful for Gpib troubleshooting and analysis applications, such as designing and debugging a network of test and measurement equipment controlled by a general-purpose computer.

The unit costs $495 and will be available in mid-September 1985.

National Instruments, 12109 Technology Blvd., Austin, Texas 78727.

See BOARDS page 74

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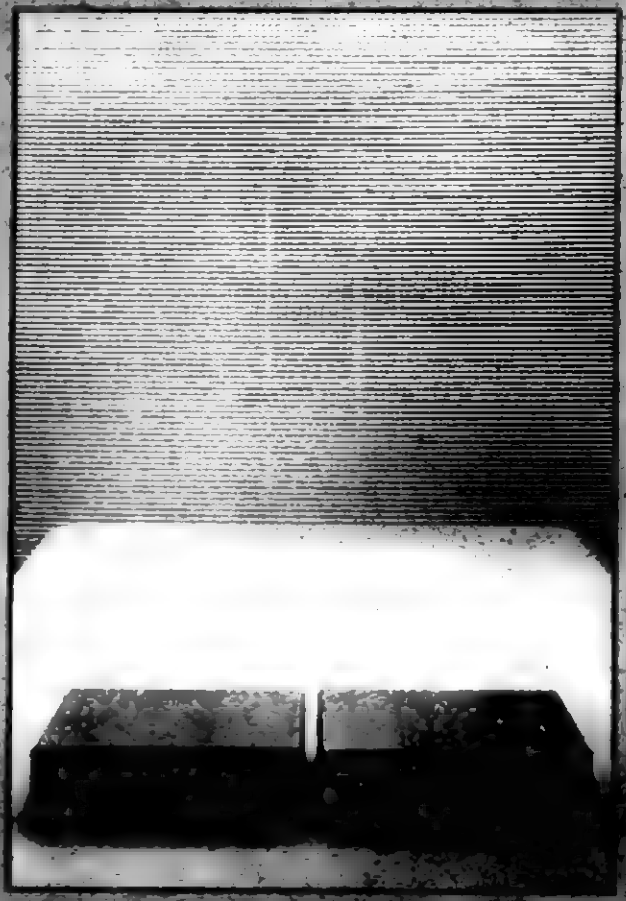

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BOARDS

from page 71

■ **Lexidata Corp. has announced Virtual Windows, an engineering workstation window management product supported by a board on the controller module of the company's LEX 90 graphics display processor. The product can be used with minicomputers from Digital Equipment Corp.; Data General Corp.; Honeywell, Inc.; Prime Computer, Inc.; Hewlett-Packard Co.; and others.**

Virtual Windows can display solid overlays and support color images in up to eight windows, a spokesman said. It does not require information stored on computer screen windows to be moved between display memory and the host CPU or disk memory.

Because the screen and bit map are separated, the need for a tightly coupled CPU and graphics display is said to be eliminated. Functions supported by Virtual Windows include split-window text scrolling, dynamic window size, dynamic priority setting, panning and scrolling of color graphics, solid overlays and double-buffering of bit map areas.

The product includes medium resolution of 640 by 512 pixels and high resolution of 1,280 by 1,024 pixels. Both configurations are based on the company's LEX 90/35 high-resolution graphics display system.

Virtual Windows as an option to the LEX 90 family costs $3,000. The price for Virtual Windows with the LEX 90/35 is approximately $17,000. The price for a high-resolution LEX 90/35 Virtual Windows system is approximately $23,000.

Lexidata, 755 Middlesex Tnpk., Billerica, Mass. 01865.

■ **Intel Corp. has announced a Multibus II development tool that is said to allow designers to use existing or proprietary Multibus I products in developing boards, systems and software based on the Multibus II bus architecture.**

The ISBC LNK/001 board serves as a translator between Multibus I- and Multibus II-based systems, allowing the Multibus II product being developed to gain access to the capabilities of Multibus I products as if they were resident in a Multibus II system. The board is a Multibus I form-factor board that resides in a Multibus I system and connects by ribbon cable to the Multibus II central services module.

The board costs $1,225.

Intel, Literature Department W242, 3065 Bowers Ave., Santa Clara, Calif. 95051.

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■ **AST Research, Inc. has announced a hardware and software package that facilitates bidirectional file transfer between IBM Personal Computers and the IBM System/34, 36 and 38.**

The AST 5251-11 is a board with software that resides on the IBM Personal Computer and emulates the IBM 5251 Model 11 terminal. Included in the AST 5251-11 is VDI software, a virtual disk interface to IBM's File Support Utility that runs on System/34, 36 and 38 minis. The VDI software was developed by Tenman Systems, Inc.

The system costs $895.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

■ **Emulex Corp. has introduced its SC03/MS controller for Digital Equipment Corp.'s Microvax, MicroPDP or LSI-11 computers.**

The SC03/MS, which uses one quad slot in the computer's backplane, reportedly permits the use of drives of various capacities without the use of driver patches. It also incorporates a storage module drive interface, giving it the ability to handle large drives.

The SC03/MS reportedly transfers data at rates up to 1.8M byte/sec. and assumes such functions as error checking and correction, bad-block replacement, command prioritizing and seek optimization.

The SC03/MS is priced at $2,000.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

■ **Network Sciences Corp. (NSC) has released local-area network interface cards that allow IBM Personal Computers and compatibles and Digital Equipment Corp.'s Rainbow microcomputer to communicate with DEC minicomputers via a Corvus Systems, Inc. Omninet local-area network.**

NSC offers two types of DXZ cards: the DQZ for Qbus machines and the DUZ for Unibus machines. The DQZ emulates DEC's DZV11 multiplexer on a dual-size card, and the DUZ emulates three DEC DZ11 multiplexers on a single hex-size card. DXZ cards are said to remove the limitations of RS-232 connections while retaining compatibility with existing DEC software.

A complete DQZ kit is priced at $2,825, and the DUZ kit is priced at $6,400.

Network Sciences, 1857 Port Charles, Newport Beach, Calif. 92660.

WANG

from page 67

piler and Wang's System Activity Monitor II make up the DP development packages.

Prices range from $115,000 to $145,000 for the VS 85 and from $137,000 to $167,000 for the VS 100 lines.

Wang's 7585VST system — the U.S. government-accredited Tempest version of the VS 85 — can now be upgraded from 4M to 8M bytes of main memory, and the number of workstations that can be added has been increased from 60 to 80.

The memory upgrade costs $44,000.

More information can be obtained from Wang, One Industrial Ave., Lowell, Mass. 01851.

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COMPUTER INDUSTRY

TRW enters bid for Datapoint spin-off

By Peter Bartolik
CW Staff

Just one month after its birth, the nation's youngest publicly traded third-party computer maintenance company last week became the subject of a takeover bid by the biggest nonaffiliated maintenance company.

Intelogic Trace, Inc., the San Antonio-based service spin-off of Datapoint Corp., became the target last Tuesday of a $177 million takeover bid by TRW, Inc., the $6 billion electronics and aerospace company that operates the largest computer maintenance organization not directly affiliated with a computer vendor. Intelogic Trace said it will consider the offer at its regularly scheduled Sept. 4 board of directors meeting.

Datapoint in early July spun off its service division into an independent company with shares owned by Datapoint shareholders. Under a proposal first announced in April, Intelogic Trace is negotiating to acquire the service division of Mohawk Data Sciences Corp. A spokesman for Intelogic told *Computerworld* that negotiations are continuing with Mohawk Data.

TRW, based in Cleveland, said its offer of $9.50 per share was contingent upon negotiation and execution of a definitive agreement, revisions to Intelogic Trace's service arrangements with Datapoint and TRW's satisfaction with the controversial Mohawk Data deal. Intelogic Trace's stock closed at $7.75 on the New York Stock Exchange the day prior to TRW's announcement.

The Mohawk Data transaction has been controversial due to Datapoint's stated intention to lend the troubled manufacturer $20 million upon acquisition of the service division. Both Mohawk Data and Datapoint were the targets last year of arbitrageur Asher B. Edelman, currently chairman of Datapoint and Intelogic Trace, who acquired large holdings in both companies with the intent of selling off various divisions of each. Some analysts have seen the Datapoint-Mohawk agreement as an attempt by Edelman to bail out Mohawk after failing in his initial liquidation strategy. A TRW spokesman said the company had become familiar with the Datapoint service operations during Edelman's earlier attempts to sell those operations.

One industry analyst said the Intelogic Trace acquisition is an indication of a growing trend toward consolidation among the leading third-party maintenance companies. According to John Erlandson, manager of the customer service

See SERVICE page 84

■ Three big U.S. companies recently doled out money for investments in companies involved in artificial intelligence and advanced software development/80

■ Paradyne became the latest company to take an unplanned vacation/82

■ A Control Data division announced it will begin providing third-party maintenance for IBM's System/34, 36 and 38 product lines/84

Start-up firms go overseas for capital backing

By Peter Bartolik
CW Staff

Reception of U.S. investors to initial public offerings by high-tech companies is lukewarm at best these days. This means that venture capitalists have to pour additional money into existing ventures to protect their investments, so resources are somewhat strained for start-ups. But some companies are avoiding the problem by finding new investors in other countries.

"What we are witnessing is the forming of an international [capital] market; there are opportunities in certain places at certain times," according to David Nosnick, partner and international financing specialist with the Boston office of Deloitte Haskins & Sells' High-Technology Industry Group.

In a recent interview, Nosnick said the Big Eight accounting firm's high-tech group is working with three U.S. companies that are prepared to float their initial public offerings on London's unlisted securities market. The group also is working with 10 others that hope to make that move. "There are at least 25 companies in the U.S. that are in different stages of going to the London market," he said.

David Elsbree, managing partner of the group, said that any disappearance of U.S. venture capital is a myth, but the inability to float initial public offerings at favorable rates is making new demands on the venture capital groups. Because the response of public investors is not favorable, the venture capitalists are required to participate with companies for a longer period and pump in additional rounds of financing to protect their initial investments.

The solution for start-ups is to link up in corporate partnering with larger companies, such as Eastman Kodak Co., that invest in start-ups. The alternative for start-ups and those seeking initial public offerings is to go international.

Nosnick said the London market is most receptive to U.S. companies, but opportunities are opening up in Amsterdam, Van-

See CAPITAL page 84

INDUSTRY INSIGHT
By Clinton Wilder
CW Staff Writer

And the crunch continues . . .

The battered computer industry is in for continued hard times well into 1986, according to William F. Zachmann, one of the few analysts who predicted the current slump at the beginning of this year.

The often iconoclastic Zachmann, vice-president of International Data Corp. in Framingham, Mass., said he believes that sluggishness in the overall U.S. economy will continue to affect computer purchases for the next several quarters. In a recent interview, he said that as corporate profits are squeezed and capital spending is trimmed, expensive computer acquisitions are, and will continue to be, harder for the MIS executive to justify.

"I think we are sliding into a recession, and I just don't see what is going to sustain high tech," the bow tie-clad Zachmann said. "Corporate profits are down, and the DP shops in those companies are trying to cut expenses.

See ZACHMANN page 83

Harvard expected to OK merger plan

LITTLETON, Mass. — Shareholders of Harvard Software, Inc. are expected to give final approval today to a plan to merge with Software Publishing Corp., maker of the PFS series of microcomputer software.

The acquisition will put an end to Harvard's operations here, which will be consolidated into Software Publishing's Mountain View, Calif., offices.

Eight of Harvard's 30 employees, all within its research and development and marketing and sales areas, were offered jobs at Software Publishing, according to Software Publishing President Fred Gibbons. Termination programs have been offered to the remaining 22 employees, he said.

Harvard Software President Richard Wolfson said he will work on a consulting basis with Software Publishing through the remainder of the year. Others at Harvard, including Shakeel Mozaffar, vice-president of marketing, would not comment on whether they were offered a position at Software Publishing.

The acquisition, announced in July, [CW July 8] is valued at approximately $4 million, Gibbons said. It is expected to give Software Publishing a presence in the corporate marketplace with Harvard's Project Manager software.

Software Publishing last year recorded a profit of $3.2 million on sales of $23 million. Harvard Software recorded net sales of $2.5 million for the six months ended June 30.

Judge sends NEC, Intel suit to trial

By [illegible]
CW Staff

SAN JOSE, Calif. — The long-running battle between Intel Corp. and NEC Electronics, Inc. over alleged copyright infringement will go to trial in April 1986, a U.S. District Court judge has ruled.

Judge William A. Ingram recently denied Intel's request for a summary judgment on NEC's suit filed last December. The judge said the issue was too complex and should be determined through a complete trial. An April 28 court date was set.

The NEC suit, which represented the first shot fired in the copyright battle, attempted to thwart Intel's stated plans to sue NEC, a U.S. subsidiary of NEC Corp., over alleged copyright violations of its Intel 8086 and 8088 microprocessors. NEC argued that microcode — the set of instructions embedded on a microchip — can not be copyrighted.

In April 1984, NEC announced the V20 and V30 microprocessors, dubbed supersets or enhancements to the Intel chips, and Intel threatened legal action. Intel subsequently filed a counterclaim against NEC this past February, alleging copyright infringement.

NEC general counsel Robert Hinckley said the company was pleased with Ingram's decision to bring the case to trial. There are a number of issues that need further legal exploration, according to Hinckley. "We are confident that the NEC micro-

See LAWSUIT page 82

TI, Raytheon report ventures into AI

Two electronics giants, Texas Instruments, Inc. and Raytheon Co., recently announced ventures in the burgeoning artificial intelligence field.

Another leading manufacturing concern, Lockheed Corp., announced that it invested $10 million in Rational, the Mountain View, Calif.-based developer of the R1000 system that is designed to reduce the cost and time of developing large software systems written in the Ada language.

Dallas-based TI agreed to purchase a 10% equity interest in the Carnegie Group, Inc. of Pittsburgh, a privately held developer of AI software for manufacturing applications. Under terms of the agreement, Carnegie will receive cash and equipment credits for its stock and intends to use the credits to purchase TI hardware and software. Financial details were not released.

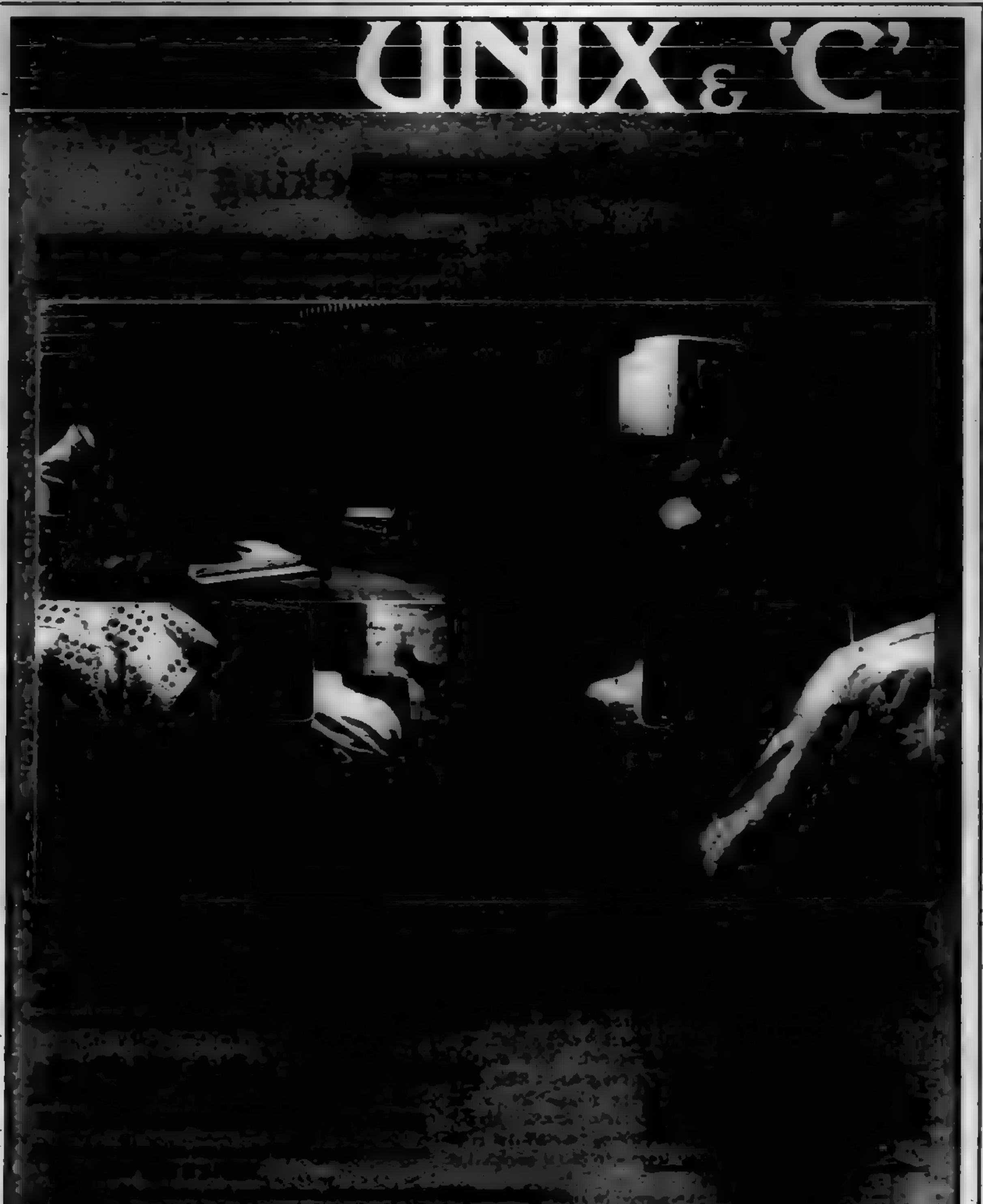
In addition, TI agreed to fund part of Carnegie's research and development for three years in exchange for technical training from Carnegie engineers and a license to distribute Carnegie technology and products internally.

Grant Dove, executive vice-president of TI, said the agreement would enhance the use of AI technology in TI's internal manufacturing operations as well as its position as a vendor of AI hardware and software products.

Raytheon announced a $4.5 million investment in Lisp Machines, Inc. of Cambridge, Mass., a developer of Lisp computers and associated software. The deal was the first struck by Raytheon Ventures, the new venture capital investment arm of the Lexington, Mass.-based defense electronics leader.

Raytheon Ventures President David A. Steadman said the company has no plans to acquire Lisp Machines.

Lockheed, the first beta test site of the R1000 hardware and software system, said its investment in Rational is "important to Lockheed's continued leadership in the aerospace industry."



Profit dip hits Cullinet

WESTWOOD, Mass. — Cullinet Software, Inc. last week reported that first-quarter profits dipped 23% from the year-earlier period as revenue increased by only 5%.

That news marked the first decline after 29 reporting periods of increasing profits. But it was not quite as severe as the 27% dip the company had projected earlier this month [CW, Aug. 12].

The company posted profits of $4.2 million, or 14 cents per share, compared with $5.5 million, or 18 cents per share, in the year-earlier period. Revenue was $42.3 million, up from $32.1 million.

Cullinet President and Chief Operating Officer Robert N. Goldman said in a statement announcing the results, "The earnings for this period represent a significant accomplishment in these economic times for our industry."

Altos earnings up 7% in '85

SAN JOSE, Calif. — Dampened by a fourth-quarter earnings drop of 39%, Altos Computer Systems, Inc.'s fiscal year ended June 29 showed only a 7% increase from fiscal 1984, the company announced recently.

Altos earned $2.24 million, or 15 cents per share, in the fourth quarter, compared with $3.71 million, or 24 cents per share, in the year-earlier quarter. Fourth-quarter revenue rose 2% to $33.7 million from $32.9 million a year ago.

Altos' profits for the fiscal year were $10.4 million, or 70 cents per share, compared with $9.75 million, or 65 cents per share, in fiscal 1984. Revenue rose 21%, from $102.7 million to $124.4 million.

Dave Jackson, Altos' president, chairman and chief executive officer, attributed the weak fourth quarter to the industrywide slowdown and Altos' shifted focus to its high-end, multiuser supermicros.

Sykes files for Chapter 11 aid

ROCHESTER, N.Y. — Sykes Datatronics, Inc., a vendor of telephone cost management systems and software here, recently filed for protection from its creditors under Chapter 11 of the Federal Bankruptcy Act.

Sykes filed the petition Aug. 15 after its two banks, Chase Lincoln First Bank and Chemical Bank, demanded payment of $7.5 million in loans, a spokeswoman said. In its most recent quarter ended May 31, Sykes posted a loss of $2.3 million on $2.7 million in revenue.

Sykes lost $14 million in the fiscal year ended Feb. 28, recording sales of $20.2 million during the year. Sykes employed about 270 people at the beginning of 1985.

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   90. Computer/Peripheral Dealer/Distributor/Retailer
   75. User: Other ____________________ (Please specify)
   95. Vendor: Other ____________________ (Please specify)

2. **OCCUPATION/FUNCTION** (Circle one)
   11. President/Owner/Partner/General Manager
   12. VP/Assistant VP
   13. Treasurer/Controller/Financial Officer
   21. Director/Manager/Supervisor DP/MIS Services
   22. Director/Manager of Operations/Planning/Admin. Serv.
   23. Systems Manager/Systems Analyst
   31. Manager/Supervisor Programming
   32. Programmer/Methods Analyst
   35. OA/WP Director/Manager/Supervisor
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   41. Engineer/Scientific R&D/Technical Mgmt.
   51. Manufacturing Sales Reps/Sales/Marketing Mgmt.
   60. Consulting Management
   70. Medical/Legal/Accounting/Management
   80. Educator/Journalist/Librarian/Student
   90. Other ____________________ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor or consultant.
   A. Mainframes/Superminis
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Info line out

DENVER — McGraw-Hill, Inc. recently joined a corporate partnership to provide on-line data base information to home and office microcomputers through CATV systems.

The venture, called X-Press Information Services (XIS) and headquartered here, is also owned by Tele-Communications, Inc. and Telecrafter Corp. XIS will supplant Data Cable, the cable-to-computer news service launched by Tele-Communications and Telecrafter in 1984.

The partners said XIS will provide business, financial and economic information to subscribers.

A spokesman said XIS is scheduled to be available through 400 cable systems by the end of 1985.

Tandon, Teac announce out-of-court settlement

CHATSWORTH, Calif. — Tandon Corp. last week announced the out-of-court settlement of its lawsuit against Teac Corp., one of three Japanese companies orginally charged with infringing upon Tandon's patent for double-sided floppy disk drives.

Tandon had previously settled similar claims against Sony Corp. (CW, July 15).

Charges made by the American organization, based here, against Mitsubishi Electronics Corp. are still pending and being heard at an International Trade Commission (ITC) trial. The ITC trial began on Aug. 19.

Tandon to get royalties

Teac agreed that its 5¼-in. disk drives will be licensed under Tandon's patent, allowing Tandon to earn percentage royalties from the sale of the Teac drives.

In addition, Teac agreed to pay Tandon an undisclosed lump sum of money, which a Tandon spokesman called "a significant amount."

The settlement ends the actions filed by Tandon against Teac both before the ITC and in U.S. District Court in Los Angeles.

Paradyne plans leave

LARGO, Fla. — Paradyne Corp. recently announced that it will require an estimated 85% of its employees to take six unpaid vacation days during the balance of 1985.

The furlough will affect all of the data communications equipment vendor's approximately 3,300 employees except customer field service engineers and national technical support and service personnel.

George Pressly, Paradyne's senior vice-president of communications, said exempted employees will make a comparable contribution to furloughed employees but declined to elaborate.

The six furlough days include two this month, one each in September and October and two in December. Pressly said the days will generally be tacked on to holiday dates or weekends.

Paradyne laid off approximately 200 employees in June.

Delta Data posts first-quarter loss

TREVOSE, Pa. — Delta Data Systems Corp. recently reported a $1.99 million loss for the first quarter ended June 30 on a 39% decline in revenue.

The maker of terminals and turnkey systems for the legal and publishing markets lost 29 cents per share in the quarter. A year earlier, Delta earned $28,000, or 0 cents per share, including a one-time gain of $8,000. Sales dropped from $7.2 million in the year-earlier period to $4.4 million.

Delta President and Chairman Robert J. Smallacombe blamed most of the loss on a delay in placement of orders by a single large customer. He said the market for commercial data processing had softened considerably since the prior year.

The company will concentrate more of its marketing efforts in sales to government customers, which accounted for 69% of Delta's revenue in fiscal 1985, Smallacombe said.

LAWSUIT

from page 79

processor is an original design that was independently developed," Hinckley said.

When the Intel lawsuit comes to trial next April, NEC will argue against copyright protection for microcode.

Issue addressed last year

According to Hinckley, the U.S. Congress addressed the issue last year with the introduction of the Semiconductor Chip Protection Act.

The act protects chip designs but does not extend copyright protection to chips, Hinckley asserted.

Intel counsel expressed disappointment with the judge's ruling.

"Obviously we felt that [microcode] is copyrightable, but basically I can understand why [Ingram] wants the experts to testify," counsel said.

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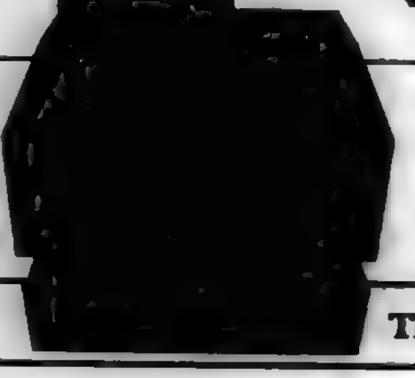

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Masscomp announced revenue for the fiscal year ended June 29 of $45.2 million, down from $21.9 million a year earlier. The company experienced an operating loss of $896,000, vs. a loss of $1.2 million last year.

■

QMS, Inc. achieved record third-quarter revenue of $11.6 million for the fiscal period ended June 28, compared with revenue of $8.3 million for the third period one year ago. Profits were $1.2 million, or 13 cents per share, compared with profits of $1.4 million, or 17 cents per share, for the similar period last year.

■

NBI, Inc. announced that revenue for the year increased 22% to $216.7 million from $177.1 million recorded last year. Profits were $13.2 million, or $1.41 per share, compared with $13.8 million, or $1.40 per share, for the prior year.

■

Hogan Systems, Inc. reported a net loss of $3 million, or 23 cents per share, compared with a net loss of $1.5 million, or 11 cents per share, in the prior year. Revenue was $4.1 million, compared with $6.7 million for the like period a year ago.

■

Intelligent Systems Corp. recorded revenue for its fiscal quarter ended June 30 of $28.4 million, compared with $30.2 million last year. Profits for the quarter were $857,000, or 8 cents per share, compared with $3.8 million, or 34 cents per share, in the prior year's quarter.

■

Miniscribe Corp. reported a net loss for the second quarter of $7.1 million, or 37 cents per share, compared with profits of $2.3 million, or 12 cents per share, for the corresponding period last year.

■

Modular Computer Systems, Inc. announced profits for the second quarter of $708,000, or 12 cents per share, compared with $1.3 million, or 24 cents per share, in the like period one year earlier. Revenue was $18.4 million, compared with $20.8 million in the second quarter of 1984.

■

Mentor Graphics Corp. reported second-quarter revenue of $33.5 million, compared with $18.5 million for the same period last year. Profits were $1.8 million, or 12 cents per share, compared with $1.4 million, or 10 cents per share, in the comparable period one year ago.

■

Wicat Systems, Inc. reported revenue for its first fiscal quarter ended June 30 of $9.6 million, up 48% over $6.5 million for the same period one year ago. Profits were $110,000, or one-half cent per share, compared with a loss of $1.8 million, or 9 cents per share, in the comparable quarter one year earlier.

■

Intergraph Corp. announced revenue for the second quarter of $130.6 million, compared with $96.8 million in the corresponding period last year. Profits were $16.8 million, or 31 cents per share, compared with $16.5

See NICKELS page 84

ZACHMANN from page 79

I don't see the purses opening anytime soon."

In addition to the macroeconomic picture, Zachmann said he sees a fundamental change in the nature of the computer market that bodes ill for many vendors — especially IBM. Zachmann said that price/performance ratios have become increasingly better as users move down the product line, with superminicomputers replacing mainframes and with multiuser micros, with their ability to run departmental applications, replacing minicomputers.

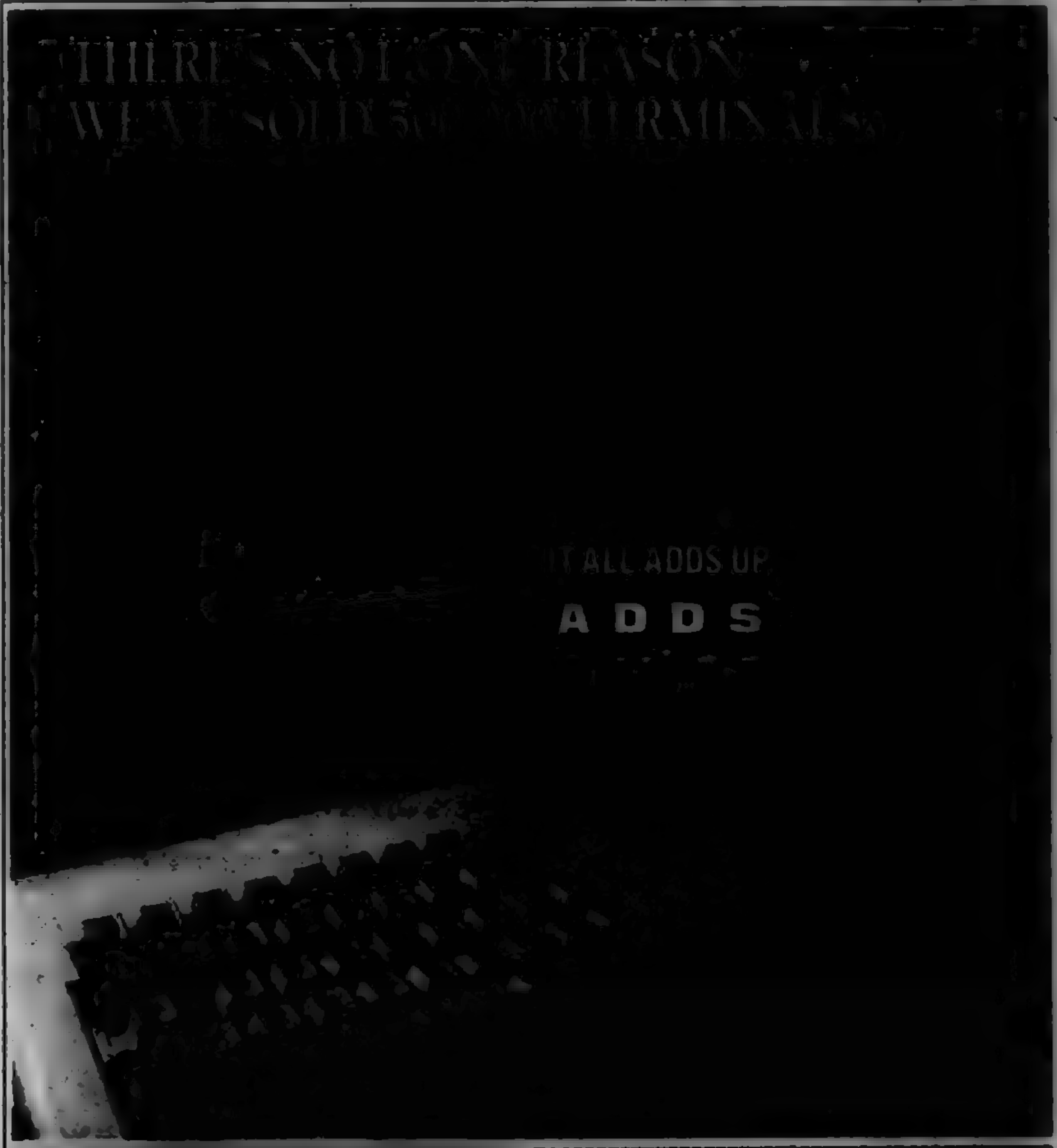
"Price/performance has historically been better on bigger systems but not anymore," he said. "There is no more expensive way to process data than a big IBM box running MVS. IBM is losing sales of its larger machines to 4381s and to [Digital Equipment Corp.] VAXs, which are in turn losing to cheaper, smaller minis. The idea that departments will outgrow their personal computers is a myth. Most of their applications don't even come close to using the capacity of an [IBM Personal Computer AT]."

Zachmann is particularly bearish on IBM's high end, feeling that the flow of dollars from the upcoming 3090 Model 200 will be considerably less than what Big Blue is counting on. "They have a very tough time ahead," he said. "The economy is mushy, and users have a big incentive not to buy more stuff, just when IBM needs strong volume sales of the 3090 to sustain its growth."

IBM's estimated 75% mainframe market share will change from an asset to an albatross, Zachmann said, as users increasingly concentrate their purchases in the more competitively priced mini market. "IBM can't have its quasi-monopoly prices in that area," he said. "I think IBM is vulnerable from below."

Zachmann predicted that the economy will not lift the computer industry out of its doldrums before the latter part of 1986. But he noted a few bright spots in his otherwise gloomy scenario — innovative niche companies whose technologies spell real solutions for users. In his view, the local-area networks of 3Com Corp., the network servers of Banyan Systems, Inc. and the fault-tolerant systems of Stratus Computer, Inc. are prime examples.

"Products that provide truly better price/performance or better functionality will sell well," he said.



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SERVICE from page 79

program with the Mountain View, Calif.-based market research firm Input, Inc., leading companies in that industry segment are seeking acquisitions in order to meet their customers' requirements for improved service.

Third-party maintenance revenue

Input last year published a study indicating that revenue of third-party maintenance companies — not including vendor-owned organizations — was $1.14 billion in 1984 and will grow to $2.12 billion in 1988.

A study by Arthur Andersen & Co. published last year for the Association of Field Service Engineers predicted that the service industry — including both third-party and vendor-owned organizations — would generate revenue of $46 billion by 1990, more than double the revenue in 1984.

Analysts from Input and other firms have determined that lower prices are no longer the prime reason equipment users turn to third-party companies, according to Erlandson. "Users are becoming more demanding of a high level of service," Erlandson said.

Large third-party companies often provide better response time through regionalized operations and have highly trained field engineers, he said.

Datapoint, according to Erlandson, "has [had] an excellent service reputation in the past" and will provide TRW with a large installed base to service, a well-trained service force as well as a large base of revenue.

In 1984, according to Input estimates, TRW's Customer Services division was the country's largest third-party maintenance provider with estimated revenue of $198 million and a 17.4% market share; one industry source said the division generated revenue last year in excess of $150 million.

Datapoint officials earlier this year said Intelogic Trace, together with the Mohawk Data service organization, would represent the largest third-party organization with revenue amounting to more than $200 million.

Last year, Management Assistance, Inc. — another Edelman target organization that was successfully liquidated — sold its Sorbus Service division to Bell Atlantic Corp., an AT&T regional holding company, for $179 million.

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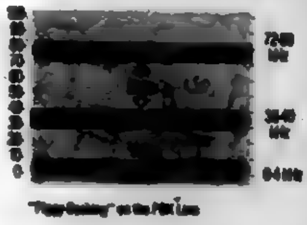

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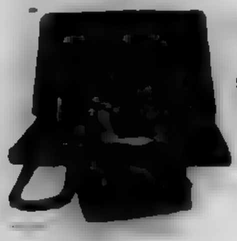

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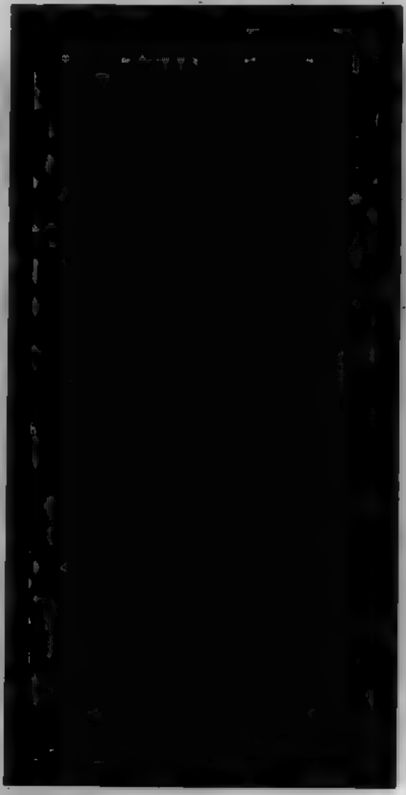

CAPITAL from page 79

couver, B.C., and other areas. The cost of making the offering in London is about 9% to 10% of the amount raised, compared with 15% in the U.S., Elsbree said.

According to Nosnick, the requirement to travel to London for annual meetings is a very attractive prospect for some entrepreneurs, but a more significant benefit is that they may also find international marketing opportunities simply by becoming "plugged into the network" abroad.

International investors at any particular time may have different concerns than U.S. investors, Nosnick said. Until Sinclair Research Ltd. and Acorn Computers Ltd. ran into difficulties in recent months, UK investors were still receptive to new hardware companies, he said. Similarly, the Amsterdam market is receptive to biotechnology firms, he added.

Elsbree said he doubted the U.S. would see another investor feeding frenzy like the one that occurred with the large number of IBM Personal Computer clone producers.

"I think the venture capitalists strayed from their own rules when they got into all these [Personal Computer] companies," he said, noting that a key rule to successful venture capitalism is to invest early and liquidate when the public market discovers the technology at issue.

NICKELS from page 83

million, or 32 cents per share, in the like quarter one year ago.

■

Sterling Software, Inc. said revenue for the third quarter totaled $6.8 million, compared with $4.6 million for the same period in 1984. Profits were $576,000, or 13 cents per share, compared with $335,000, or 8 cents per share, last year.

■

VM Software, Inc. reported an increase in second-quarter revenue to $4.2 million, compared with $2.7 million in the prior year's quarter. Profits were $590,543, or 16 cents per share, compared with $527,113, or 15 cents per share, last year.

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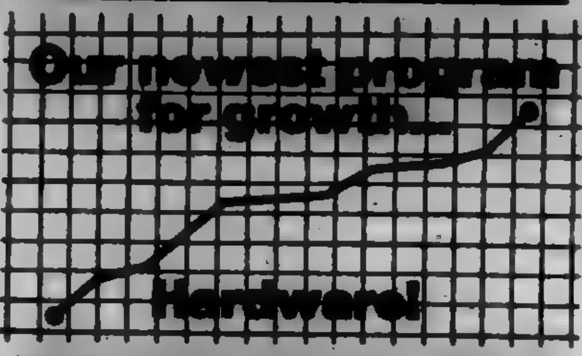
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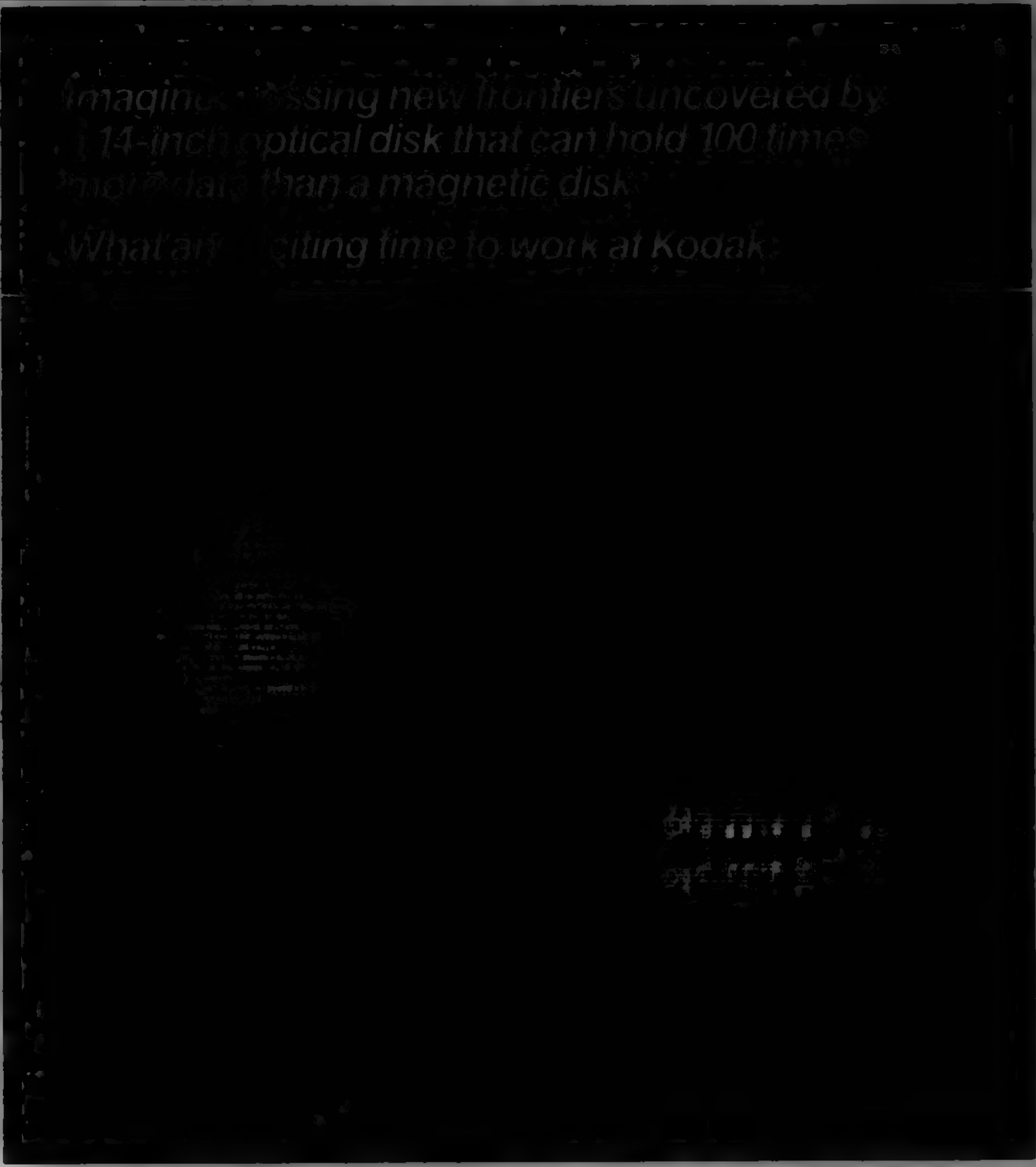
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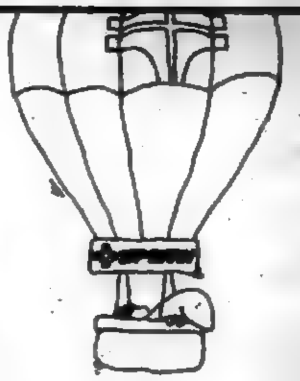

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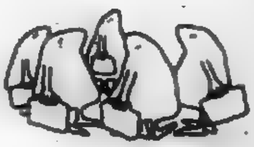

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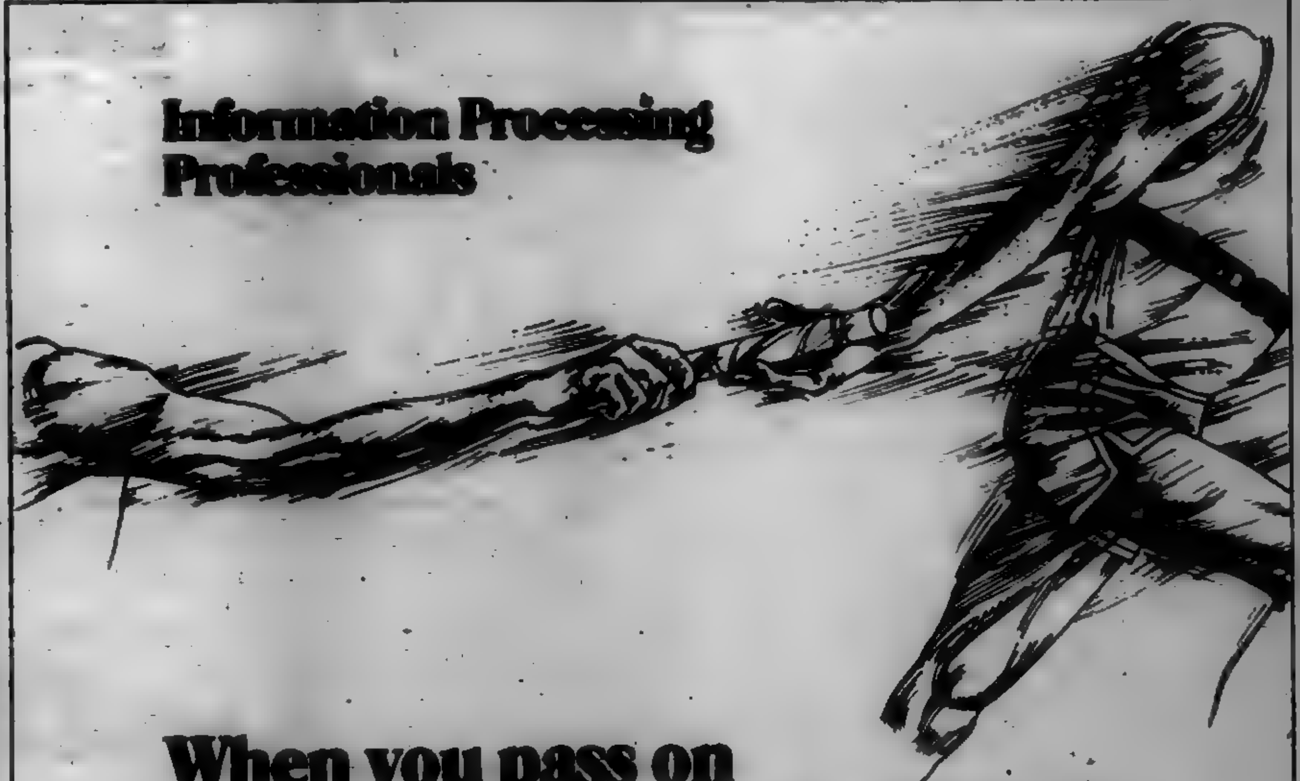

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Electronic Data Systems Corporation
Corporate Headquarters Recruiting
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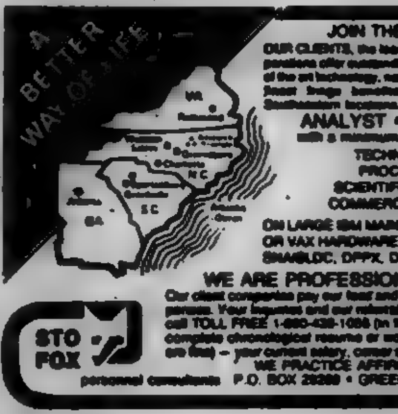

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County of
FRESNO

DATA BASE ADMINISTRATOR

The County of Fresno in California is looking for an experienced Data Base Administrator to manage the data base, security and program library functions within the Computer Services Department. This is an excellent opportunity to manage the development of an organization responsible for data design, data dictionary, security administration and program change control/configuration management. Qualified applicants will have solid experience in at least two of these areas.

The County is a progressive [illegible] with over [illegible] employees serving a population of more than [illegible] located in California's San Joaquin Valley. The Computer Services Department serves as the data processing agency for the other 27 departments in the County. The department manages several [illegible] totaling over [illegible] terminals running off IBM 3033 and 4341, DEC VAX 11/780 and Wang VS100 computers. The software environment includes MVS, VM/CMS, ACF2, CICS and [illegible]. The department also supports Wang office automation and IBM information center products.

In addition to an annual salary range of $[illegible],714-$47,[illegible], the County offers paid life insurance, paid medical/optical/dental insurance and a retirement plan. For more information about this opportunity and to obtain an application, contact:

[illegible]
Fresno County Personnel
[illegible] Tulare Street
2nd Floor, Golden State Plaza
Fresno, CA 93721
([illegible]) [illegible]

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SUPERVISORY SOFTWARE ENGINEER

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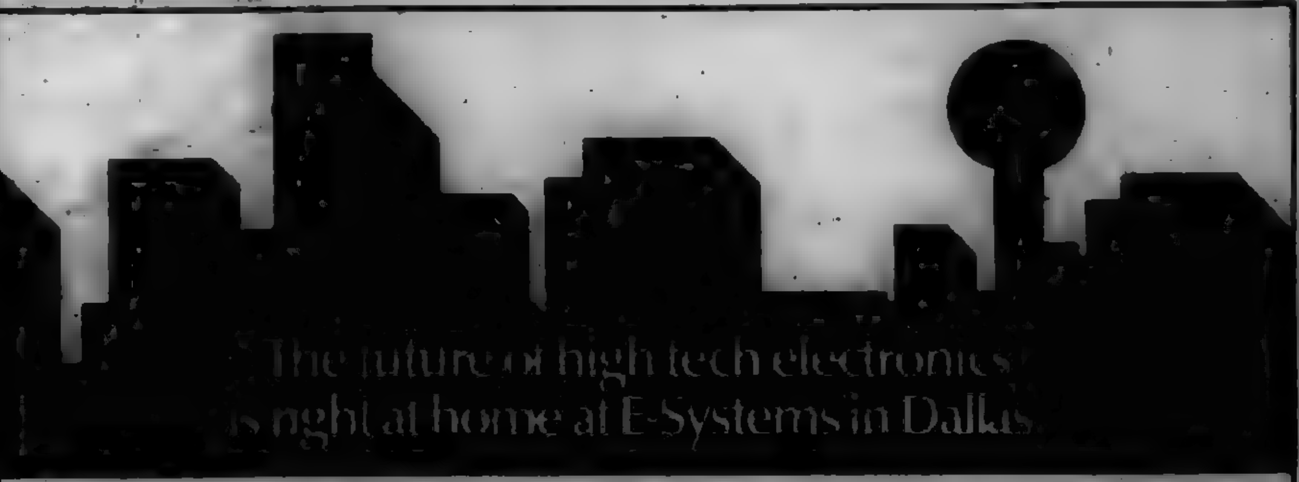
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Responsible for definition, development and enhancement of software development environment on VAX systems, BSEE (MS) or CS with seven plus years related experience with VAX systems in PASCAL fluency required. Must be VMS internalist within I/O driver systems. Defense environment background a plus.

Reba McCarvell will give you more information regarding the following:

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Responsible for design, coding, and testing of systems level software. Position requires minimum of BSCS or BSEE degree with at least two or more years experience with the VAX 11/750 or 780 and VMS operating systems. Experience in one or more of the following areas is desirable: MIL-Standard documentation, UYK series computers and real time signal processing architecture.

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Responsible for development and maintenance of on-line systems in an IBM OS/MVS IDMS CICS environment. Must have a college degree in Business, MIS or related field, and three to five years experience developing/maintaining on-line systems, supporting Accounting, Manufacturing or Purchasing/Inventory control.

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Responsible for the installation of IDMS in an IBM OS/MVS environment, for the design and maintenance of the data base and related data dictionary, and for the development and enforcement of standards and procedures for its usage. Requires a college degree and three to five years data base Design/Administration experience.

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Office of Administrator for the Courts
Personnel Department, [illegible]
[illegible], Olympia, WA [illegible]

POSITION ANNOUNCEMENTS

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SUPERVISOR OF SYSTEM ANALYSTS & PROGRAMMERS

Black Hawk County has an immediate opening for a Supervisor of System Analysts and Programmers for the Data Processing Department. Qualified candidates will have experience with the IBM system 4381, COBOL language, VM-CMS/VSE CICS, DMS [illegible] as well as possess strong oral and written communication skills. Salary range $[illegible] - $27,[illegible] with full fringe benefits. Send resume with salary history to:

Douglas J. [illegible]
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Black Hawk County Courthouse
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EOE M/F/H

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Senior Scientific Programmer

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The National Radio Astronomy Observatory, has commenced work on a new radio telescope array (Very Long Baseline Array), which will consist of ten antennas located in Hawaii, St. Croix and the continental U.S. We are presently seeking a computer professional who will collaborate with astronomers and engineers in developing an on-line, real-time monitor, control and data acquisition system for the array. The successful applicant will have a degree in computer science or astronomy (preferably an advanced degree) plus significant experience with real-time control software. Experience with astronomical instrumentation or data communications is desirable.

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We're seeking people to assume complete management responsibility for the shift operations and production control area, including supervision and development of a talented professional staff. Qualified candidates will have a 4-year degree and at least 5 years' successful DP experience that includes one year shift operations management responsibility as well as one year of IBM OS/MVS and JCL experience with expertise in production control.

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Your creativity and strong technical expertise will come into play as you lead applications development projects of major importance to the company. The candidate we seek will have at least 8-10 years' DP experience and a minimum 3-4 years' managerial experience. Your background must include key participation in the development of new systems and applications. A 4-year degree is required, and an advanced degree would be an added plus. Our ideal candidate will have a demonstrated record of successfully leading major projects under aggressive deadlines.

MVS SYSTEMS PROGRAMMERS

These important positions will support application programmers, operations and MIS management through problem solving, design and consultation. Candidates must possess a 4-year degree in Computer Science coupled with 3-5 years' experience installing and maintaining MVS and related software products.

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We are looking for an individual capable of planning and directing the activities of the corporate data center. Scope includes: machine operations, production control, customer service and scheduling. The successful candidate will possess a 4-year degree in Computer Science, augmented by extensive experience in operations.

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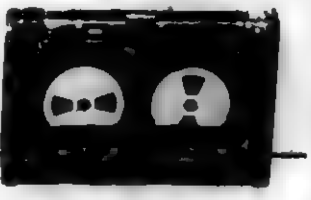

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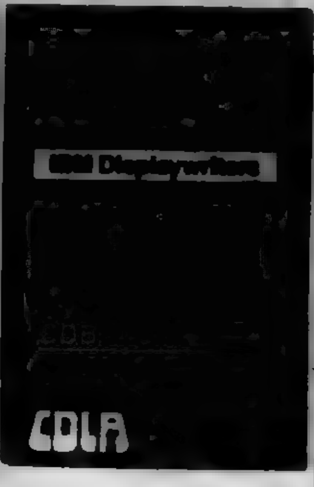

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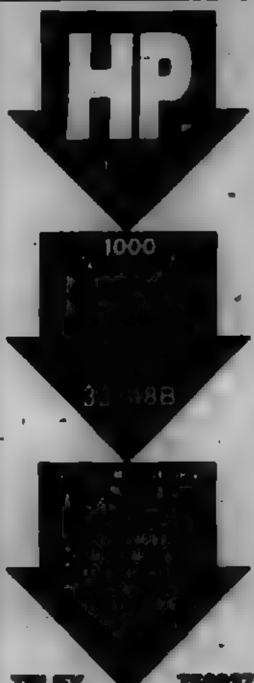

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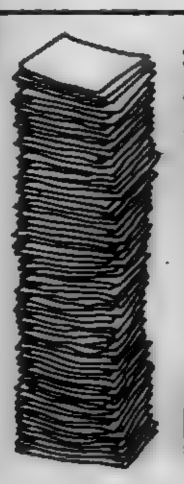

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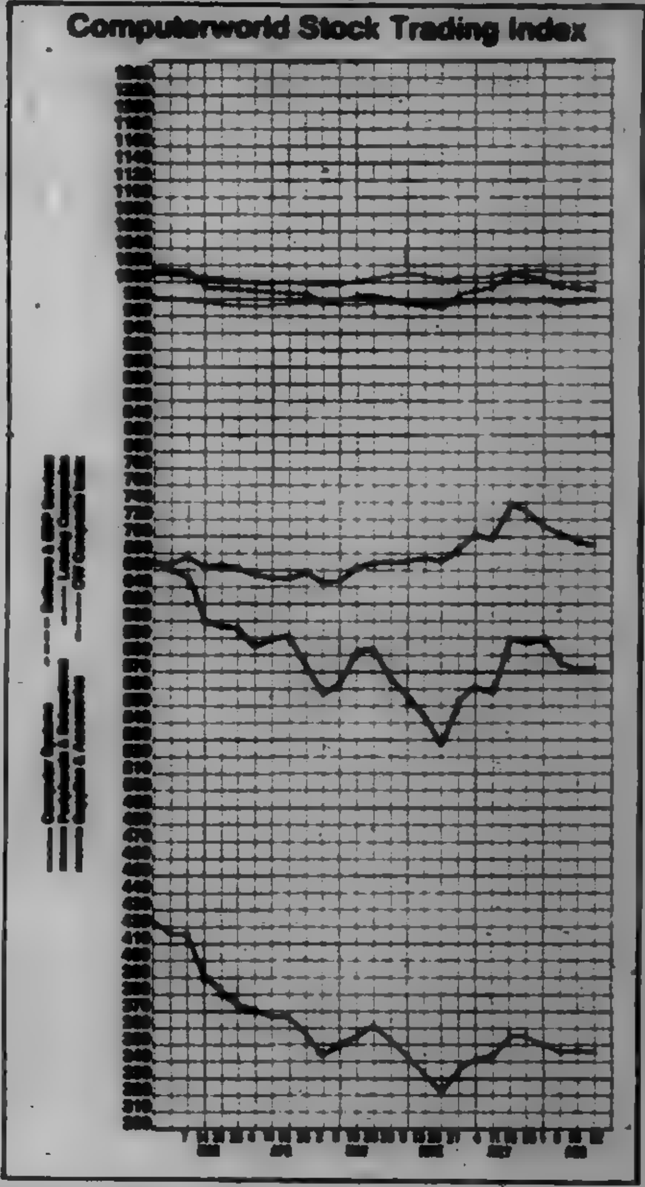

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Editorial Insider

Back to the Good Old Days?

In the old mill and mining towns of yesteryear, the townspeople bought their provisions from the company store — they had no other choice. The town's one main company employed them and sold them all their supplies. It was called keeping it all in the family.

In its quest for market share, IBM may be resurrecting those good old days by putting a lock on users' choices. It almost seems that prior commitment to IBM — and who isn't committed to IBM — may leave little for users to choose from in their communication needs. With its integrated approach to systems development, IBM is attempting to instill in users a cradle-to-the-grave solution that could lock up communications alternatives in the same way much of the computer hardware environment has been locked up.

IBM's aggressive pursuit of market share is clearly evidenced in its recent acquisitions and alliances. Its acquisition of Rolm Corp. provides a major entree into the PBX market and its new alliance with MCI Communications Corp. ensures access to a major long-distance carrier. The IBM-compatibles, in fact, may find themselves edged out as IBM tries to make systems that are more interdependent — meaning you can't get one piece of equipment without the other.

IBM, of course, is trying to challenge AT&T on that company's own turf. While AT&T is attempting to develop and market computers, IBM's strategy is to acquire telecommunications companies to quickly utilize their technologies in the coming battle between the two giants.

Almost all the major computer companies have adopted the "if you can't beat them, join them" philosophy in recent months. Digital Equipment Corp., Data General Corp. and Wang Laboratories, Inc. have recently announced or broadened their technology to connect their equipment with IBM. And AT&T will undoubtedly soon be offering hardware and software packages allowing its equipment to exchange documents with IBM mainframes.

While all of this market maneuvering is occurring, the MIS manager is still left with lots of gaping holes in IBM's telecommunications offering. This cloud hanging over any communications decision rests on what IBM will offer, particularly in local-area networks. The wait has been a long one, and no one is assured that it will be worth it.

So users are once again caught in the middle.The devil riding on every MIS manager's shoulder is the fear of making a decision that would make life more difficult in working with IBM's present and future product path.

IBM will call what's happening healthy competition, but users caught in the middle may have other words for it.

Not-So-Radical Perspectives

By Thomas Willmott

International Data Corp. has long tracked the progress of distributed resources systems (DRS) to describe the future of large organization computing architectures. In 1981, we looked forward to networks of processors that automated business functions far beyond the walls of the data center and that could, in fact, provide computing power and information access to a universal audience of end users. These concepts are driven by networking technology.

It is to be expected that all members of an organization — whether on the factory floor, in the reprographics center, throughout the administrative and sales offices or in the traditional data processing facility — would eventually be the beneficiaries of personal computing and global information access. This was a radical perspective, however, until recently.

DRS continue to evolve, and our research presently considers these three network categories: back-end (represented by high-speed mainframe connectivity), distributed data (reaching the local-area nodes) and microcomputer networks (that serve the work group). These distinct networks are complemented by gateway utility conversion products that have begun to tie together each piece of the DRS.

Back-end communications provide multimegabit-per-second file transfer among large CPU. IBM offers back-end channel adaptor technology to its customers, but the multivendor mainframe connection market is largely dominated by Network Systems Corp. (NSC) and its Hyperchannel products. NSC provides CPU adaptor devices and Netex, a proprietary network control program, to execute its high-speed network strategy. Paradyne Corp. and Masstor Systems Corp., while not providing precisely the same type of back-end products, are active participants in the market. Digital Equipment Corp.'s VAX Cluster is also a contender in the back-end communications battle that looms before us.

Distributed data networks are used to connect nodes on the next level of a processing hierarchy. Many of these installed networks conform to IEEE local-area network standards: 802.4 in manufacturing (General Motors Corp.'s Manufacturing Automation Protocol project is an good example); 802.5 token ring, which may be used to network multiple IBM System 36 or other departmental processors; and 802.3 carrier-sense multiple access with collision detection (CSMA/CD) Ethernet/Decnet, which corporations such as Ungermann-Bass, Inc. have had substantial success with. These distributed data networks typically provide for communications one level below the large data center CPU and one level above the individual's workstation.

At the low end — but by no means the least important — is PC Cluster. Substantial growth has occurred in this market over the past 12 months, and dramatic increases in microcomputer work group networks can be expected over the next three years. The technology here is clearly moving to IEEE 802.3 standards. A number of exciting young companies — 3Com Corp., Novell, Inc. and Sytek, Inc. are the first three that come to mind — are defining boundaries of the work group cluster.

The promise of global communications has not yet been kept. Gateway Technology and International Standards Organization (ISO) presentation standards are still evolving. Applications software integration in multivendor environments (and across multiple IBM systems) is still the Achilles' heel of DRS. IBM's Logical Unit 6.2 standards are promising, but usable products have yet to be delivered. Multiuser software for PC Networks is in alpha test, not in the office. And integration of voice and data networks continues to elude us.

Nevertheless, tremendous progress has been made in all areas of the communications industry. As the following pages attest, prospects for all types of networking products and companies have never been better.

Information Systems departments are excited by networking technology, and executive management has recognized the potential of DRS as a competitive tool.

■

Willmott is vice-president of user services for International Data Corp. in Framingham, Mass. and a regular columnist for Computerworld Focus.

Computerworld Focus

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Manager's Corner

Good Things Come to Those Who Wait . . .

By Jim Young

We have all heard the old platitudes — patience is a virtue, good things come to those who wait and watched pots won't boil and all the rest. However, given the current state of communications offerings, wait and see has become something of a necessity for today's data processing manager.

Indeed, biding time is almost a survival tactic today as managers try to anticipate the trends of communication technology, time their own investment, react to their organization's pressure for improved services and avoid premature commitment.

The experienced manager is lucky to have had a lot of on-the-job training in how to wait. When Winchester disk technology was introduced, years went by before products that fit into many environments were announced. When memory prices started falling dramatically, managers had to explain to impatient executives that their companies could not reap the benefits from lower-priced technology until leases on old equipment expired and, even then, would have to migrate to the new technology.

However, these improvements were all technical. Unless the speed of light can be increased, we can expect no basic change to the technology of communications. With the possible exception of fiber optics, the delay in the convergence of communications technology is for standardization and integration of known technology. But when the jigsaw puzzle comes together, it will have been worth waiting for.

After all, the potential of networks that could include all remote applications, all users, multiple vendors, batch and interactive transmissions, data and voice as well as document and image is enormous. Unfortunately, this environment is not available today.

Many growing pains affect the communications industry and leave most of today's offerings "not ready for prime time." Anyone who has tried to get true compatibility between modems from various vendors knows we are a long way from standardization.

Any hope for progress in merging technologies took a giant step backwards when the AT&T breakup occurred. Further delays can be expected as this new competitive environment tries to reconstruct the simplicity that existed before. This process will take some time as new vendors like IBM step into the arena and add new dimensions to the compatibility problem.

Today's managers must deal with a difficult situation — finding offerings that can fit into the existing environment. Several solutions exist for those with the luxury of starting from scratch. However, where existing data or applications must be included, either immediately or eventually, finding compatible communications products is difficult.

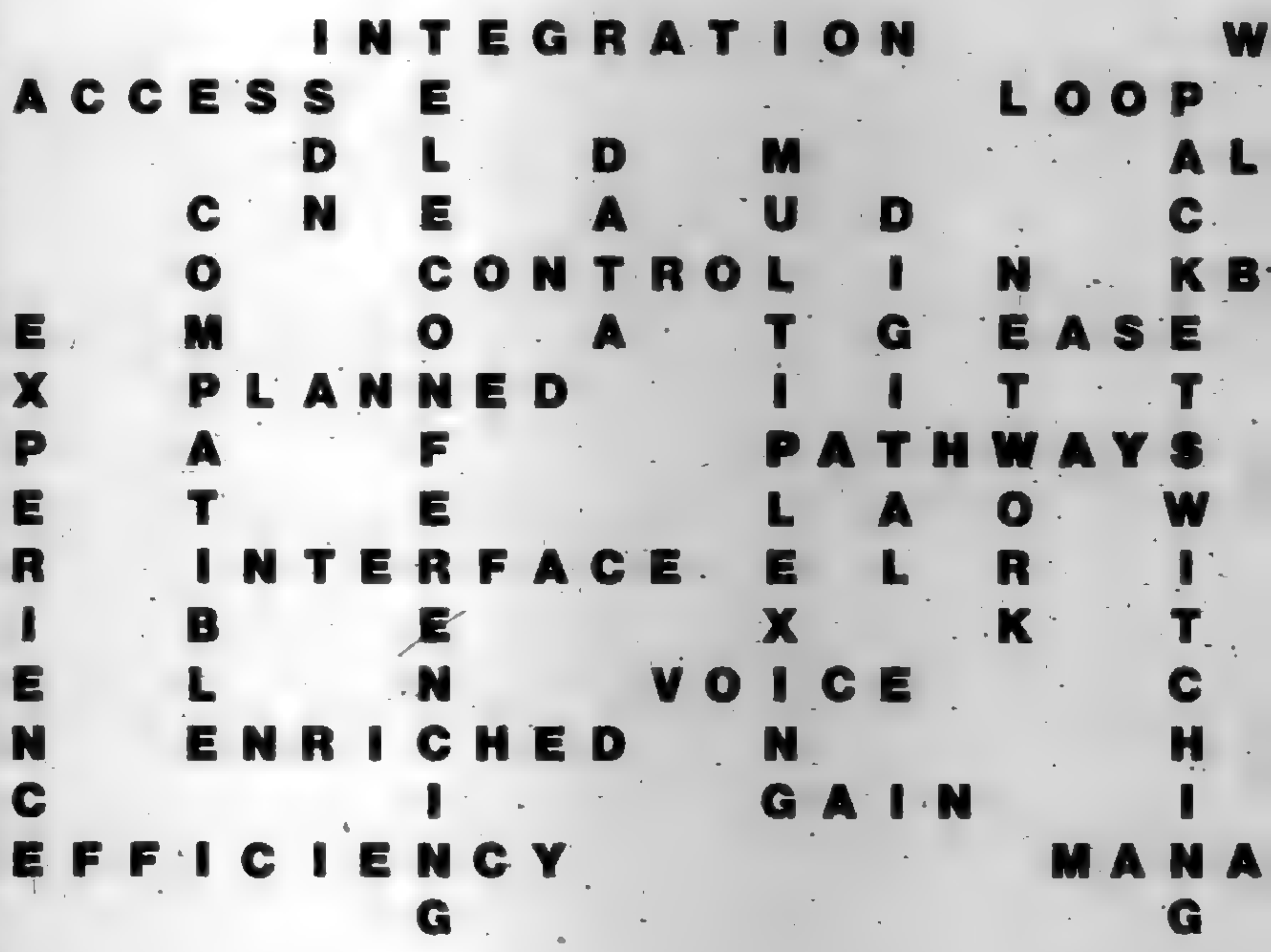
Local-area networks are a good example. When Datapoint first pioneered this concept with Arcnet, the problem was not that the company didn't have a fine product, but that it was hard to fit Arcnet within the then-typical DP network.

In a similar situation, the advent of voice-over data products has a real disadvantage — it is largely unable to work using existing wiring schemes and is therefore not practical unless a user starts all over again. To accommodate this possible future environment, DP managers can only hope to have a plan of how they can migrate to a future environment that is only a fuzzy concept today.

One waiting strategy is to pick a direction that looks promising and hope that as the whole architecture develops (one piece at a time), the total solution arrives on time and intact. This approach is not for the squeamish; investing in an undeveloped product may lead to a dead end or frustrating detours, as those who are pinning their hopes on products like Ethernet know.

The same drawbacks are true for IBM's SNA approach. The only difference is that a large number of people are betting IBM will once again be able to coerce the market. However, even the IBM followers are beginning to get an uneasy feeling as SNA takes shape around its various announcements. Other IBM products, such as document filing, do not fit within a smoothly integrated office environment, a key expectation of the communications environment. Moreover, long-term issues exist, such as those connected with potential voice or image protection: Will performance be there? Will IBM commit to necessary products? Once again, managers are forced to wait and see.

This confusion requires DP managers to take special care. Regardless of how aggressive or conservative a path one follows, some fundamental rules can be used to advantage, among them the following:



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NYNEX Pathways services will include a wide range of digital operations that will eventually provide complete ISDN capability. But while Pathways services will be growing for years to come, you don't have to wait years to start. Already, your business can take advantage of services such as:

Digipath™ digital service, to provide multi-point data transmission that can send data at speeds up to 56 kbps with exceptional accuracy.

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Flexpath™ digital PBX service provides direct inward and outward dialing for digital PBXs over a 1.5 mbps facility.

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Infopath™ packet switching service allows economical and reliable transmission for interactive data applications.

Switchway™ switched 56 kbps service offers a cost-effective alternative

Manager's Corner

. . . But This Is Getting Ridiculous!

- Whether or not you want to commit to a technical direction, a strategy must be defined to include the applications that meet your business needs. Remember, even though communication capabilities can be elaborate, your needs may not be.

As you support your environment, focus your discussions around these applications. You can bring daydreaming executives and rabid vendors back to reality by talking in terms of the business benefits within your organization.

- Don't be afraid to commit to interim technology or products to solve specific localized needs. Just don't confuse this with a complete answer. The long-term solution will continue to grow in size and scope, but it's probably not on the market today.

- Beware of too stringent cost-benefit analyses.

Investment in a communications network pays back through the many applications that can use it. Frequently this takes time and the right combination of communications products. Culmination of this investment may take several years.

- Keep your technical skills and knowledge current at all times. New announcements constantly change the potential direction of this turbulent marketplace.

Begin building a strong technical staff whose skills can manage and grow a communications network. This talent will not appear overnight; it's best to start now.

- Keep an eye on what your colleagues are doing.

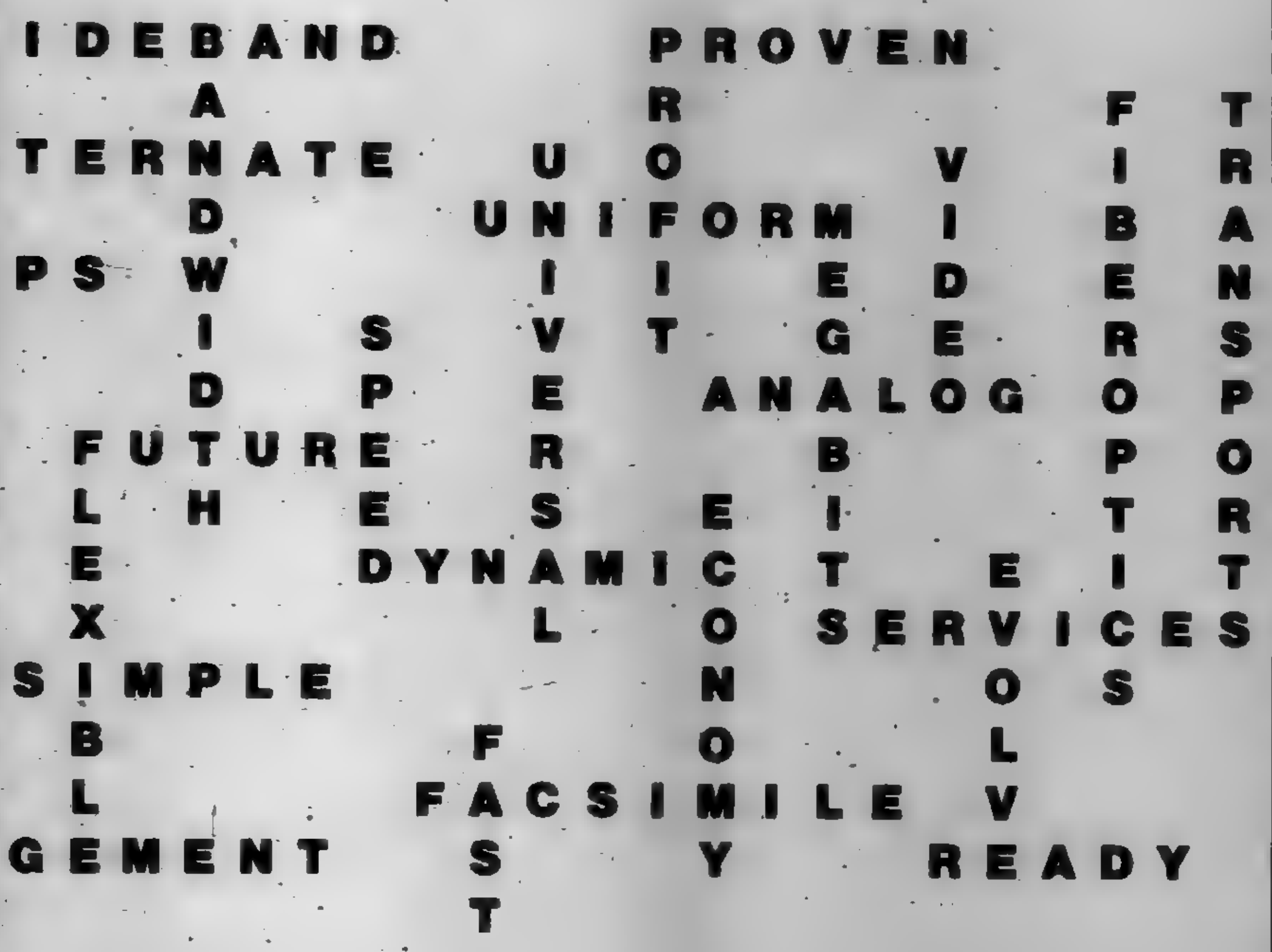
When the right combination of products is announced, others are sure to take advantage of integrated offerings, giving you a key tip-off to what may work in your environment.

Until the confusion of the communications environment straightens out, DP managers must understand the risks inherent in any long-term communications investment. The tremendous benefits available from an integrated communication network make it worthwhile to wait for the development of the proper products that will fit the larger picture.

Until this happens, all managers will have to become specialists in the techniques of waiting.

■

Young, a new columnist, is management information systems director and responsible for user technology at Wright Line, Inc. in Worcester, Mass. He has been working in the industry for 15 years.



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Letters

The Spirit of Lukens

Your article in the June 19 issue of *Computerworld Focus* caught the spirit of our efforts.

Systems and process control have been elegant tools for our people — not the converse.

We appreciate your accurate portrayal.

A. H. Aronson
President and Chief Operating Officer

Lukens Steel Co.
Coatesville, Pa.

Lots of Gears — So What?

Artistic license or simply a visual bit of editorializing on the quality of software designed to control manufacturing processes?

Whichever — the Rube Goldberg gizmo on the cover of *Computerworld Focus* [June 19] just won't work. Gives one the impression of the mechanical equivalent of an infinite do-loop.

Actually, it looks rather like some of the software systems I've tried — lots of gears and mechanisms — and nothing much happens.

Gil Klajman

The Markham Co.
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Computerworld Focus Welcomes Your Letters

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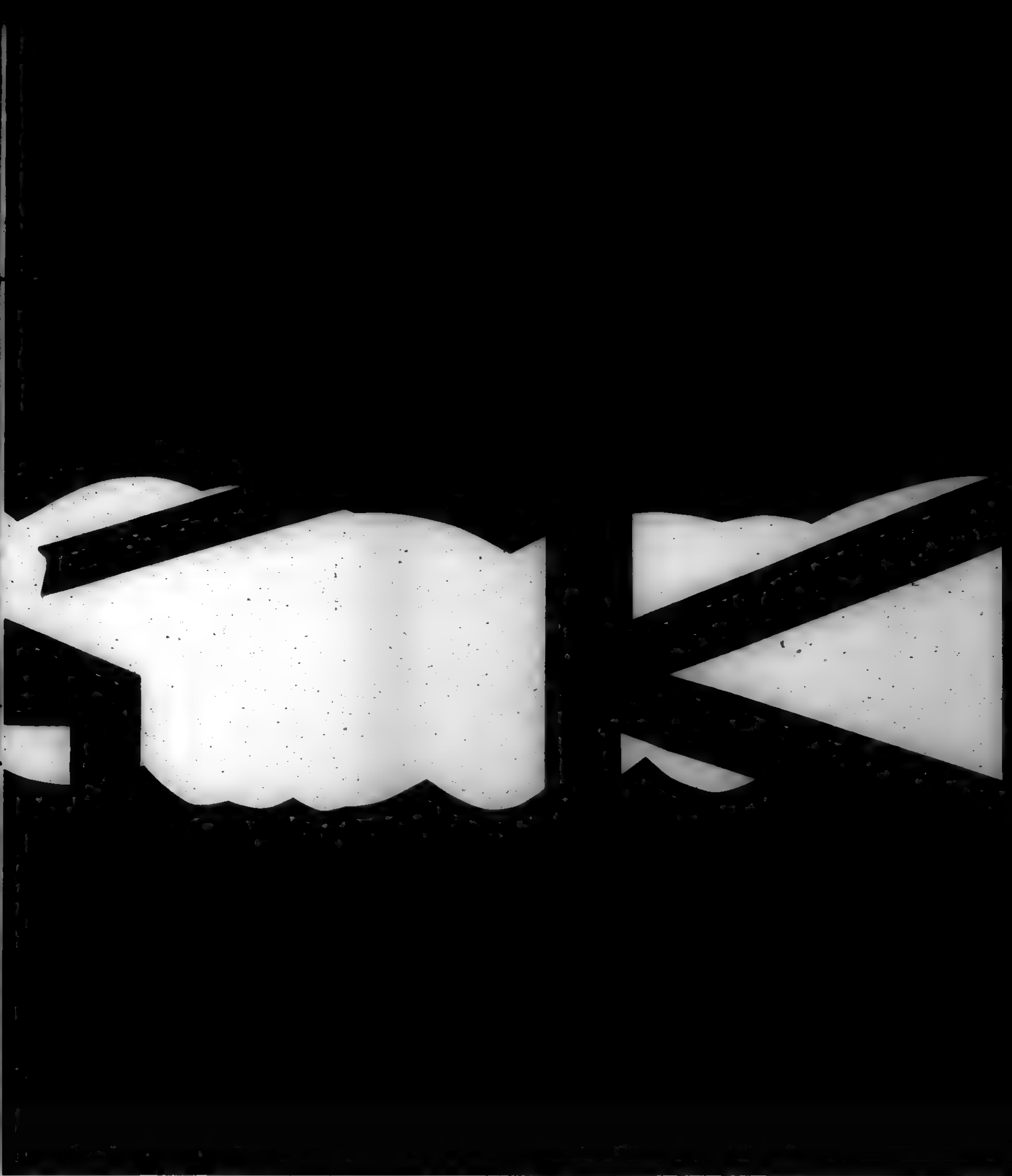

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Q&A

Telecommunications consultant and noted industry analyst Dixon R. Doll is founder and president of the DMW Group, Inc., a consulting and research company in Ann Arbor, Mich. He recently shared with Computerworld Focus *some of his views on the current status and future directions of data communications.*

How far are we from true voice, data and image integration?

We're very slightly down the path. Some people paint a grand vision of the totally integrated all-digital network, but even in the middle of the twenty-first century there will probably be bits and pieces of those networks that won't be fully integrated.

Can you characterize the direction in which we're moving?

Where we're going can be characterized in terms of the networks, including all the transmission facilities, switchers and, to a great extent, many of the applications engines that drive the networks. All those will be based on the use of digital technology. Voice will become just another class of user of these digital nets. The model of the future is clearly the ISDN [integrated services digital network].

But that answer focuses only on the technology. We have lots of bits and pieces of the networks, but the deployment of the digital networks is more of a patchwork quilt. Many so-called networks only partially allow the objectives of universal networking to take place. And many networking products that the various vendors have pitched into the marketplace create incompatibilities and make it difficult for this universality to take place.

During the last two or three years, a tremendous wave of renewed interest has taken place in open networking. The major DP vendors in Europe decided the enemy was IBM. Then they decided they'd all be better off if they collaborated to develop common rules, standards and protocols that would allow all their machines to interconnect freely and to intercommunicate. This effort is paving the way for some improvements and enhancements and for the so-called OSI [open systems interconnection].

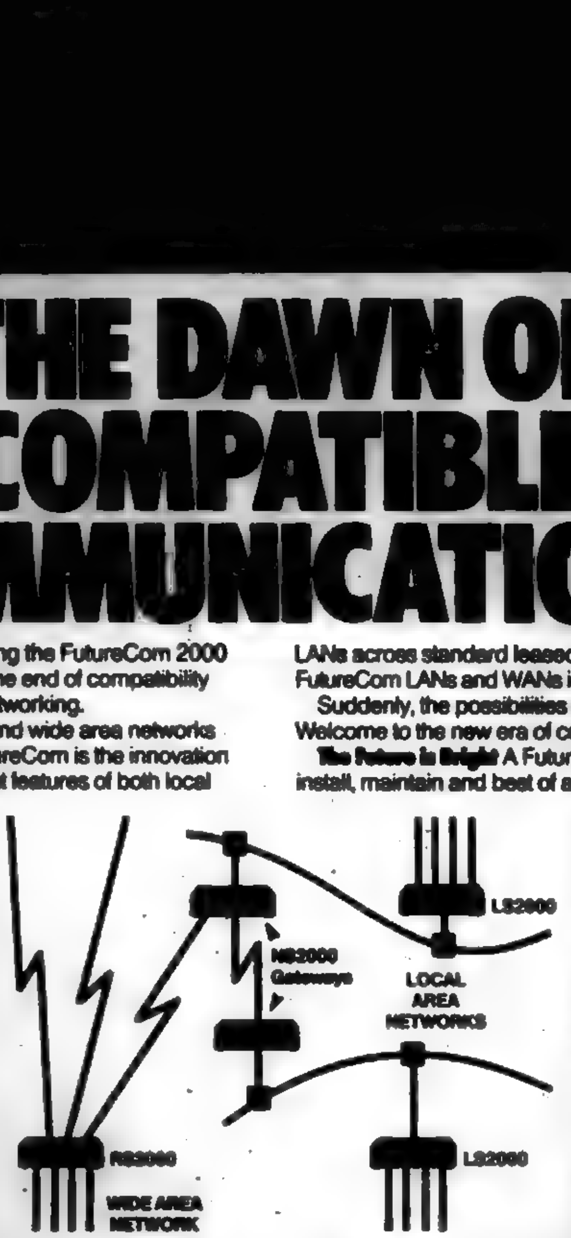
Do you think the U.S. will follow Europe's lead in banding together against IBM?

No. In the U.S., there is no belief that either the government or individual computer companies needs to compete against IBM. The two that will set the standards in the U.S. are AT&T and IBM. It won't be that much different from the case of local-area networking, where the battle was between supporters of the token passing ring and the Ethernet camp.

You'll also see joint ventures and collaborations. One good example is Wang and DEC in the office automation area; each company has announced it will comply with IBM's standards in the document interchange and document content architecture. Wang would most assuredly say that its main competitor is IBM and that its most important task is a coexistence strategy so customers don't have to choose between Wang and IBM.

Do you think that this concentration on the part of major vendors is going to further the shakeout of the smaller ones?

The shakeout we're seeing right now is a direct manifestation of the lack of concern many vendors have shown over developing broad-based communications strategies. Lots of Apples and IBM PCs bought in the last three years now sit around collecting dust. Why? Because they can't be attached to a local-area network, or they can't extract information or get at data necessary to run spreadsheet packages and decision support systems at the end-user workstation.



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FutureCom Integration The key to the Integrated Area Network is the NS2000 Network Server, a bridge between Ethernet and RS-232. The NS2000 consists of one Ethernet link and up to four RS-232 links. Use it to connect multiple LANs across standard leased telco lines, and/or integrate FutureCom LANs and WANs into a single network.

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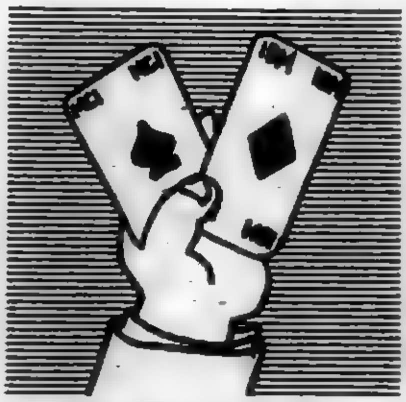
*X.25 and other networking capabilities are currently under development.

In the News



Stacking the Deck With MCI Acquisition

IBM Corp. made an impressive move in its quest to become a serious player in the communications market recently when it announced its intention to acquire up to 30% of MCI Communications Corp. (MCI) of Washington, D.C. IBM's communications strategy in fact counterbalances rival AT&T's strategy in the computer field.

In the first place, IBM has unburdened itself of its unprofitable Satellite Business Systems (SBS) operation, handing it over to MCI. From its inception SBS had been an uncomfortable fit for IBM, according to a recent industry bulletin from International Data Corp. (IDC), a market research firm in Framingham, Mass. "From a strategic and organizational standpoint, [the agreement] is nothing but positive for IBM," the IDC bulletin pointed out. "IBM gets out of the day-to-day operations of SBS and gets SBS off of IBM's bottom line. IBM hands SBS over to a company with a good track record in long distance. IBM gets a major piece of what will be a much stronger long-distance carrier. The deal is a short-term, tactical retreat for IBM, but it is a strategically aggressive move in the long term." The move also gives MCI direct access to the confused but still-promising industry of satellite data communications. With an installed SBS base of 200,000 customers combined with its own customer base of 2.5 million, MCI could in a flash become more than twice as big as GTE Sprint Communications Corp. of Burlingame, Calif., the third largest long-distance telephone company.

MCI might also get the substantial backing it needs to expand its long-distance facilities while providing a path to the communications future beyond the intensely competitive and relatively unstable present market of long-distance telephone services.

For the lower tier competitors, the IBM/MCI venture does not bode well. GTE Sprint will be pressured to scramble for more customers, especially for high-volume business accounts (given MCI's access to SBS's 200,000 large customer accounts). James Broadhead, president of GTE's communications services group has stated GTE does not intend to change its present strategy, contending the MCI/IBM alliance is basically a tempest in a teapot. "It really doesn't show a major commitment by IBM yet," Broadhead said.

Others, such as Allnet Communication Services, Inc. in Chicago and United Telecommunications, Inc. in Kansas City, are thought by many industry watchers to be placed in jeopardy by the alliance. Allnet has announced its intentions to go into servicing specialized communications niches, which the larger companies might not find profitable enough. Charles Skibo, president of United Telecommunications, said his company would be increasing its development of private fiber-optic networks.

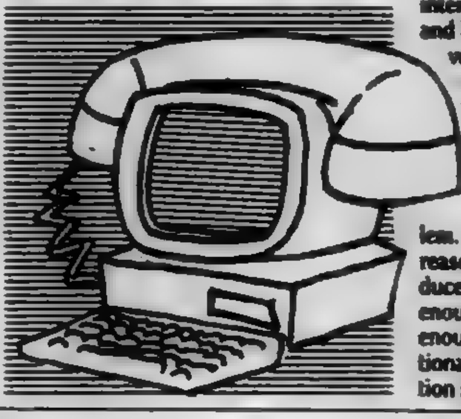
Some industry analysts are more blunt, predicting that a shakeout is around the corner unless the smaller long-distance companies can form some sort of consortium to bring economies of scale to bear on an intensely competitive market. If not, the long-distance telephone industry could become a two-company race.

Companies' OA Needs Drive PBX Selections

A study of office communications by New York-based Omni Group Ltd. found that 26% of decision makers surveyed considered their office automation communications needs exerted a heavy influence over their selection of a PBX system. An additional 60% said their communications needs exerted moderate influence in PBX selection. Only 14% said it had no influence whatsoever.

More than 500 OA purchasers in 2,000 large industrial companies and 2,000 large service companies in the U.S. were interviewed for the study, according to David Cushing, associate director of The Omni Group, a research and consulting firm specializing in technology.

Another study question asked what type of transmission medium was selected when respondents wished to have workstations communicate with each other. Approximately 39% of the respondents said they used current phone wiring; 35% said they installed new phone wiring; 18% said they used their existing data communications network (which includes IBM 3270 terminal wiring); and 8% said they used some other choice (primarily fiber optics).



What can be concluded from these statistics? According to Cushing, "The more people who said that their office communications needs drive their PBX purchasing decisions, the more people we could assume are getting into highly integrated voice and data applications in the office. Our results suggest that when corporations evaluate digital PBX equipment, office automation objectives are influential but not decisive."

Further information is available from The Omni Group, 115 E. 57 St., New York, N.Y. 10022.

Glitches, Expense Cause Satellites' Fall From Grace

Poised just a few years ago as the wave of the business data communications future, satellites are falling short of expectations.

Technical glitches and wrangling over international transmission techniques and broadcast boundaries slowed the development of satellite data communications in the late 1970s and early 1980s. Add to that the average $100 million cost of a satellite and the average satellite life expectancy — between seven and 10 years — and you have a problem. Why are satellites so expensive? One reason is that they are not mass produced. They have to be lightweight enough and their circuitry must be tiny enough to be carried into space by a National Aeronautics and Space Administration shuttle or a European Space Agency

Q&A

Vendors are paying the price right now, and they're all scrambling. John Young, head of Hewlett-Packard, said the solution to getting out of the jam is to broaden the communications capabilities and to become more effective in a systems integration role.

Are vendors following Young's advice?

Lots of examples are just beginning to hit the surface — the AT&T Information Systems/EDS joint venture and IBM's fledgling efforts to design custom networks that might possibly include other vendors' equipment.

Users are tired of being locked into dealing with only a narrow product set of particular vendors. They want single-vendor support with the ability to mix and match boxes and devices and special functions under the management leadership of the so-called integration vendor.

Did Apple err when it introduced the Macintosh and said it didn't have to talk to IBM?

Apple has already rewritten its strategy. The significance of Apple as a player in the computer industry will be a function of how well it coexists with IBM. If Apple had paid more attention to communications from the beginning, it wouldn't have found it so bloody difficult to get into the business environment. Apple should have had a greater sense of vision about what was important in communications when its products were closed off at the pass in terms of impacting the IBM business user.

You mentioned earlier that the two interconnect leaders will be AT&T and IBM. What will AT&T's role be?

AT&T's influence will be felt predominantly in the areas of the premises controller and the PBX and in its influence in the marketplace on standards for connectivity on the premises and in the long-haul market. AT&T has gone on record saying it will spend $500 million over the next few years enhancing the System 85 PBX. The company is a massive player and will have a very significant influence on the kinds of things people can do on the premises. AT&T will continue to utilize the PBX as a way of motivating customers to implement high-productivity OA applications — not necessarily keyboard-sensitive applications, but the more innovative ones like voice mail, teleconferencing and document composition distribution. It's already setting de facto standards in office wiring and cabling. Each time AT&T puts in a PBX, it usually gets its customer to put in [AT&T-recommended] wiring and cabling.

Does AT&T have a lock on that part of the market?

The trend in the marketplace is for both AT&T and IBM to separate the PBX selection process from the building wiring and cabling systems selection process. This trend is yet another manifestation of how AT&T and IBM are going to be the two leading factions in networking.

The vendor that supplies the PBX and the wiring and cabling system is going to be in a very attractive position with respect to getting a lot of additional add-on applications. That vendor will certainly be in a position to drive and control the local-area network protocols, so a lot of buying will be going on.

That's the good news. The bad news is this buying won't happen until companies are satisfied and comfortable that they can glue all this stuff together. It's going to take quite a few more years before all these problems are sorted out. In the meantime, systems integrators and internal telecommunications people will be in great demand.

Where are most users now?

Right now the vast majority of companies we work with have identified high-payoff application opportunities. One thing everybody is doing today is installing an all-digital backbone network deploying T1 facilities. The key to success in this type of undertaking is the ability to manage the T1 facilities as a network itself — to dynamically share the capacity across different applications.

— Lee White

In the News

rocket. Satellites must also be incredibly reliable because they can't be repaired when they are in orbit. Finally, the precision of their controls has to be exact, more so than for their terrestrial data communications counterparts. Even the smallest deviation in their controls can render the satellite inoperable and plot a course of disaster with no hope of recovery.

Though nations and international standards organizations are still coming to terms on broadcast boundaries, many of the transmission details have in the meantime been ironed out. Geostationary satellites operate in two frequency bands. The C band operates in the 4 to 6 GHz range, and the Ku band operates in the 12 to 14 GHz range. Antenna size is an inverse of frequency; a C band therefore needs a very large antenna.

To date, satellite data communications has had tepid response from U.S. businesses. Though satellites remain unsurpassed as the technology for broadcasting to remote distributed sites, most satellite business has come from government and private weather agencies and television broadcast stations, not from private business. Despite the growing improvement and miniaturization of sending and receiving earth stations, satellites are getting stiff competition from other forms of bypass technology such as fiber-optic and microwave networks. The latter networks often prove to be less expensive, more reliable data carriers and important links in long-distance terrestrial data networks.

Aggravating the situation is a glut of data communications satellites. Demand already is well below the supply of satellites now in geostationary orbit. Telesat Canada recently sold its Anik C1 satellite before it was scheduled to be launched, and companies such as Allstate Insurance Co. of Northbrook, Ill., and Merrill, Lynch, Pierce, Fenner & Smith, Inc. of New York are looking for buyers for part of their unused satellite capacity.

There is some hope. Mobile communications is one alternative. Many say the spread of mobile communications in the latter part of the '80s could provide a stimulus for satellite business communications. In this scenario, the satellite would provide the key link in a worldwide communications chain among mobile telephones.

A Surfeit Of Standards

In the beginning, there were too few communications standards; now there might be too many.

That's the opinion of Subhash Bal, vice-president of marketing for Excelan, Inc., a network vendor in San Jose, Calif.

Communication standards are beneficial, Bal explained, because they bring down costs and help the industry grow. In light of the current computer industry slump, Bal said, users are going to pressure vendors to "standardize" on fewer standards.

"In any given organization or department there is always a variety of systems. The time has come for people to get more out of existing systems by making them communicate with each other. It's impossible with so many operating systems and vendors. The only way is to adopt a standard and eliminate the differences in the operating systems among computers."

According to Bal, the time might be near. Standards in communications can be divided into two areas. The first is the standard related to the medium itself and includes things like Ethernet, baseband and broadband, token bus or token ring, speed of transmission. These characteristics are based on the actual physical connection of the network.

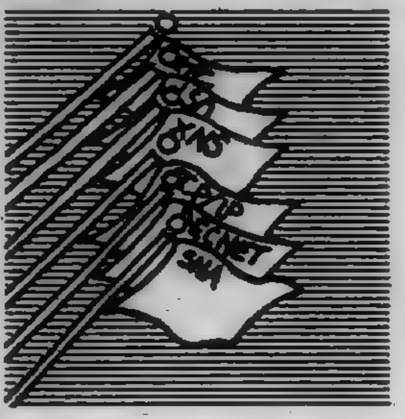
The second area that Bal classified as more important is the communications protocol, the set of conventions by which two computers can "talk to and understand each other." Bal likened this area to the ability of two people to carry on a conversation in a certain language.

A number of communications protocols exist — Decnet from Digital Equipment Corp. and XNS from Xerox Corp., for example. Some are better than others, but Bal believes the transmission control protocol/internet protocol (TCP/IP) may have a good chance to succeed. TCP/IP is available, complete (after 15 years of work by the U.S. Department of Defense, its developers), well documented and growing in popularity.

IBM's Systems Network Architecture (SNA), celebrating its 10th birthday, will be around for a long time simply because it is IBM. Otherwise, it has network shortcomings, Bal noted. SNA works in a layered, hierarchical network approach, as contrasted with the peer-to-peer approach TCP/IP, XNS, Decnet and others offer. "Most people install SNA emulators," Bal explained, "when they wish a non-SNA computer to talk to another computer that is on the SNA network. It simply provides a way to make the outside computer act like an IBM terminal to communicate with the IBM 370 computer on SNA."

Bal had some predictions for five years down the road: the eclipse of more proprietary networks such as Decnet and XNS; the beginning of the decline of fast riser TCP/IP; and the emergence of the still-to-be-completed International Standards Organization (ISO) protocol, which he thought would be the big data communications winner.

"It is well documented, has international support and is already the basis for General Motors Corp.'s Manufacturing Automation Protocol, a force in the industrial sector. There is tremendous momentum for the ISO protocol," Bal concluded.



In Brief

FRANKLIN LAKES, N.J. — Implementation of the integrated services digital network (ISDN) communications protocol in the U.S. is inevitable, but will evolve slowly over the next 15 years with limited network capability appearing in about five years, according to a recent study announced by the Perspective Telecommunications Group, a telecommunications consulting firm. The study also concluded that the primary market for ISDN will be intra-local access and transport area network applications, and the major beneficiaries will be local telephone companies and user corporations with sufficiently diverse circuit requirements to utilize ISDN.

Further information is available from Perspective Telecommunications Group, 808 High Mountain Road, Franklin Lakes, N.J. 07417.

RYE BROOK, N.Y. — IBM is adopting the Phonemail voice messaging system from Rolm Corp. of Santa Clara, Calif. Rolm has also announced a new version of Phonemail to serve companies that do not have Rolm private branch exchange or Centrex systems.

IBM said it will combine with Rolm in marketing Phonemail and IBM's other messaging products. IBM added that it will no longer actively market the audio distribution system, its existing voice messaging system, in the U.S. It will, however, provide central service support for ADS through 1986.

FRAMINGHAM, Mass. — The microwave systems market will approach $500 million by 1989, according to *Microwave Market*, a report published by International Data Corp.'s Communications Industry Research program. The report stated the 1989 figure will be double the 1984 market of $250 million and will experience a growth rate of 16% annually, spurred by trends toward private networks, compatibility with other transmission alternatives and technological advancements. By 1989, the study said, the private carrier segment will be 42% of the total communications market.

Further information is available from International Data Corp., 5 Speen St., Framingham, Mass. 01701.

PARSIPPANY, N.J. — Deregulation has been mostly or extremely beneficial to their industry, their companies and their customers, according to almost half of top-level executives surveyed in a recent research study by Trinet, Inc., Parsippany, N.J., and the Gallup Organization, Princeton, N.J.

Of the executives surveyed from the communications side, 49% of respondents said deregulation was beneficial to their industry, 47% said it was beneficial to their company and 34% said it was beneficial to their customers. The report indicated the low communications customer figure of 34% was a result of customer confusion and "upheaval" in the industry as a result of the AT&T divestiture. For further information contact Trinet, Inc., 9 Campus Drive, Parsippany, N.J. 07950.

DALLAS — Common carriers should start developing business plans for marketing integrated services digital network (ISDN) services, according to Al Boschulte, vice-president of Pacific Bell, San Francisco, Calif. Speaking at a recent International Communications Association meeting of telecommunications managers, Boschulte stressed that involvement of sophisticated users in the evolution of ISDN is crucial for assuring widespread operating efficiencies.

Market demand for ISDN will revolve around issues such as customers controlling their own networks, transmission predictability, an integrated features package and cost-efficient pricing, Boschulte added.

ROCHESTER, N.Y. — The Eastman Kodak Co. will enter the fiber-optics market through its newly formed Lamdek Fiber Optics division.

Lamdek will initially market a "high-precision field-installable" connector and related products for single-mode optical fiber. The company said the connector utilizes aspheric glass lenses to expand the optical fiber light beam, providing what Lamdek claims to be a high-quality durable connection between single-mode fibers.

Kodak said the fiber-optic connector will be available in the U.S. and Canada by the end of 1985, followed by its introduction into some international markets by late 1986. Citing industry analysts, Lamdek said the fiber-optics communications market in the U.S. is expected to grow to nearly $2 billion by 1990, the market for connectors alone accounting for nearly $200 million of that figure.

RESTON, Va. — A new annual conference on telecommunications and end-user computing has been announced by the National Computer Conference Board. Called NCC-Telecommunications, the show will first be held Sept. 8-10, 1986, at the Philadelphia Civic Center. It will be sponsored by the American Federation of Information Processing Societies, Inc. (Afips).

Spokesmen for NCC-Telecommunications said the new show will include technical sessions and professional development seminars combined with a full exhibit program representing major manufacturers of advanced integrated technologies and telecommunications products and services. For further information write Afips, 1899 Preston White Drive, Reston, Va. 22091.

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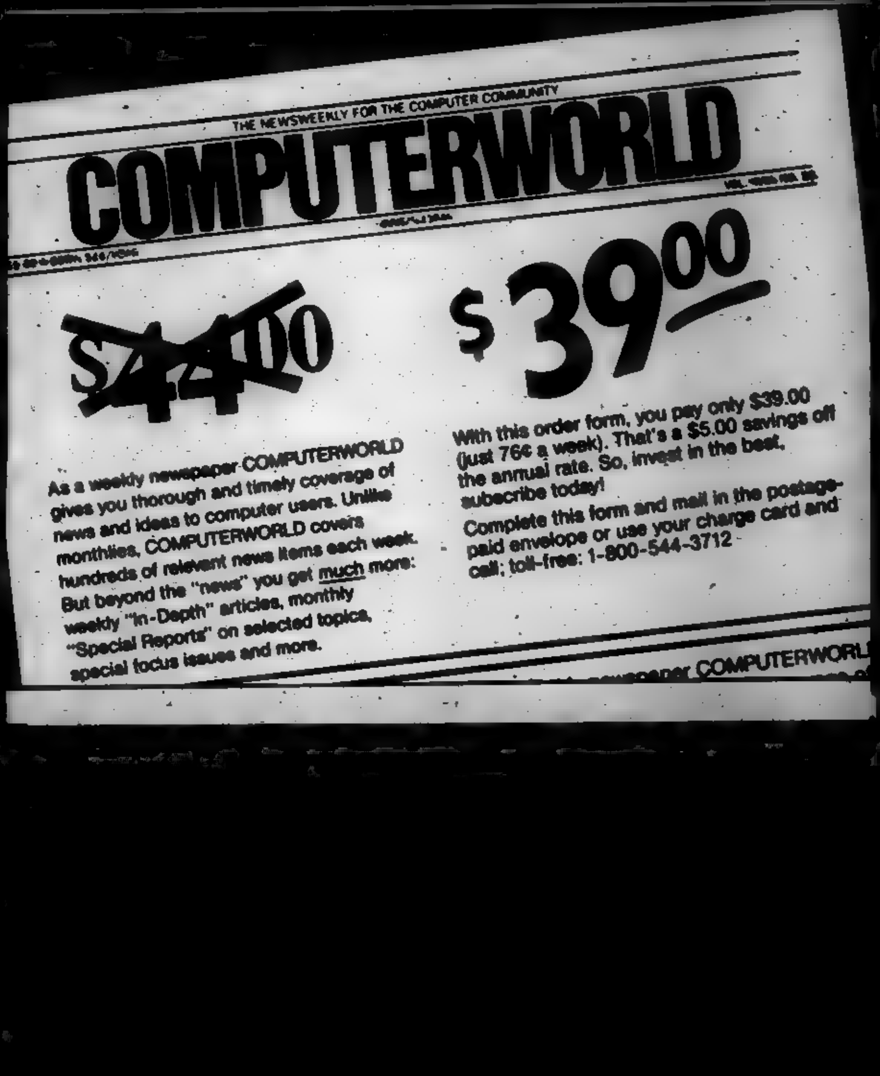

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- 95 Other Vendor ______

2. **OCCUPATION/FUNCTION (Circle One)**

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- D. Communications Systems
- E. Office Automation Systems

3313-0155

By Stan Kolodziej

Corporate executives are taking a hard look at the micros in their offices, and what they're seeing is the result of several years of high-rolling buying practices. What's more, not only have these micros grown more expensive; they've also been utilized less than management first anticipated. To meet end-user demand and to utilize these micros better, management information systems departments are searching for ways to bring more corporate data to the micro. As a result, micro-to-mainframe link vendors are being kept very busy.

The micro-to-mainframe link has been both a buzzword and a subject of speculation for some time now. Why so much controversy? One reason is that micro-to-mainframe products can be confusing. Simple on the surface, these products in fact can become a cat's cradle of hardware, software, communications and file conversion levels.

The most common mistake users make is assuming a micro-to-mainframe product is some plug-in panacea that will instantly merge micro and mainframe into a completely integrated computer system. Not so. Micro-to-mainframe products can be as simple as the basic conversion of mainframe data to Ascii format and slow (300 bit/sec) asynchronous transmission to a personal computer emulating a terminal. It can also be as complex as a real-time transaction processing system employing mainframe software, specialized controllers, expensive protocol conversion software and long-distance full-duplex communications at 19.2K bit/sec.

Another common mistake is the assumption that when data from the mainframe has been transferred to the micro, it can be handled like any other data on the microcomputer. Some users have

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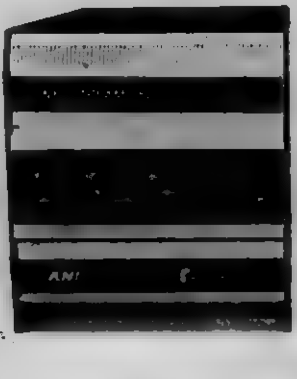


been surprised that a file transferred from an IBM machine running Vsam cannot, without difficulty, be loaded into a spreadsheet program written for PC-DOS and the IBM PC. Data must first be converted into proper file format.

For micro-to-mainframe links to work properly, the user should be aware that three areas have to be addressed:

- The actual method used to connect the micro to the mainframe.
- The communications method for transferring data.
- The actual conversion process used to get the data into a workable format on the micro.

The micro-to-mainframe connection can be either through a direct physical link such as hardwiring with a coaxial cable or through a modem and telephone hookup.

The communications method for transferring data, however, is not so straightforward. Communications software can lie in the firmware of a personal computer's expansion board, can be loaded from floppy disks or can be resident on the host mainframe. Such software allows a personal computer to handle the specific communications protocols given by the host mainframe. Speed is important. Some communications protocol converters can only handle transmission speeds of 1,200 or 2,400 bit/sec. For most batch or casual micro-to-mainframe processing, this speed is adequate for downloading data. Real-time transactional processing, however, needs something more like 9,600 bit/sec and up.

The third link in the micro-to-mainframe chain, the process used to convert data into a workable format, is the most important. The evolution of multivendor computer installations has helped create entire niche industries of protocol conversion products.

As is true of so many other areas of the computer industry, protocol conversion is an IBM-driven market. Perhaps the oldest and still largest market for converters involves IBM 3270 terminal emulation, followed a distant second by the market for DEC VT 100 terminal emulators.

Terminal emulators are the fast food of the micro-to-mainframe industry: They are mass produced, and they seem to be everywhere. Today's market for terminal emulators centers primarily on making an IBM PC act like or emulate an IBM 3270 for communicating with one of the large installed bases of IBM mainframes.

Terminal emulation in its simplest guise consists of using utility software, hardware expansion boards or a combination of both in such a way that the microcomputer is made to act like a terminal. By "fooling" the mainframe, the emulated terminal can instruct the host to present information to the terminal following protocols established by the host systems software. In other words, the two can talk in the same language. Terminal emulators have one major drawback, however; when the terminal and host are in session, that's all the terminal can do. The emulating micro cannot actually process incoming data until talks have been broken off.

Two of the most popular emulation boards are the Irma board from Digital Communications, Inc. (DCI), Norcross, Ga., and the Blue Lynx from Techland Systems, Inc., New York, N.Y. Both boards retail in the $1,000 range.

Most emulation board products offer only basic micro-to-mainframe functionality. Because the micro becomes a dumb terminal during emulation, it cannot be used for local functions until it has been disconnected from the host. Users who want to process mainframe files are finding they must follow the path many corporate users are taking: They first develop programs to extract the necessary information from the large mainframe files and then input the data into personal computer software formats such as the document interchange format (DIF). DIF, developed jointly by the U.S. Department of the Navy and the National Bureau of Standards, has been adopted by several major word processing vendors as the standard for transferring text between different WP systems.

Although many are similar, no two emulation board products are alike. The Blue Lynx board handles standard functions such as conversion to Ascii and local storage of 3270 files, but it also comes bundled with a utility software program that runs on the IBM PC and converts Ascii files into applications software formats such as Lotus Development Corp.'s 1-2-3, Ashton-Tate's Dbase II and the DIF standard.

Terminal emulators are not just for microcomputers. Before micros, terminal-to-terminal emulation (turning a Wang OIS terminal into an IBM 3270, for example) was and still is good business.

So-called independent micro-to-mainframe links are also big business. These products, which generally consist of software running on the mainframe or the micro, are usually produced by smaller companies unaffiliated with specific mainframe hardware or software products. Most of these software links require — but do not usually include — communications hardware such as the Irma or Blue Lynx boards. In addition to file format conversion to DIF, Ascii or other file formats on the personal computer, these links also usually offer some sort of security feature, either in the form of a data dictionary or an interface to the security already in the mainframe. Where these products excel, however, is in protocol conversion.

Software-driven links can involve cost savings because no additional hardware is required. But those savings could be offset by the cost of multiple asynchronous ports on the host as well as by the potential increase in host memory requirement.

One example of an independent software link comes from Linkware Corp. of Waltham, Mass. Linkware recently introduced a series of file conversion products that link various popular personal computers with DEC VAX and IBM mainframes. Other examples of software links are Tempus Link from Micro Tempus, Montreal, and that company's recently introduced Tempus Data, the latter being mainframe software allowing PC users to select and extract data from IBM mainframe data management software access methods such as Vsam, Isam, Qsam and IDMS.

These products are more sophisticated than simple terminal emulators, and their price tags reflect that fact. Linkware's prices range from $6,000 up; the Micro Tempus line ranges from $7,000 to $12,000; and more advanced mainframe-based links, such as PC Link from McCormack & Dodge of Natick, Mass., can run well over $30,000. For the extra price you can expect to get enhancements such as advanced security features, uploading into an IBM mainframe data format and full on-line Help and documentation.

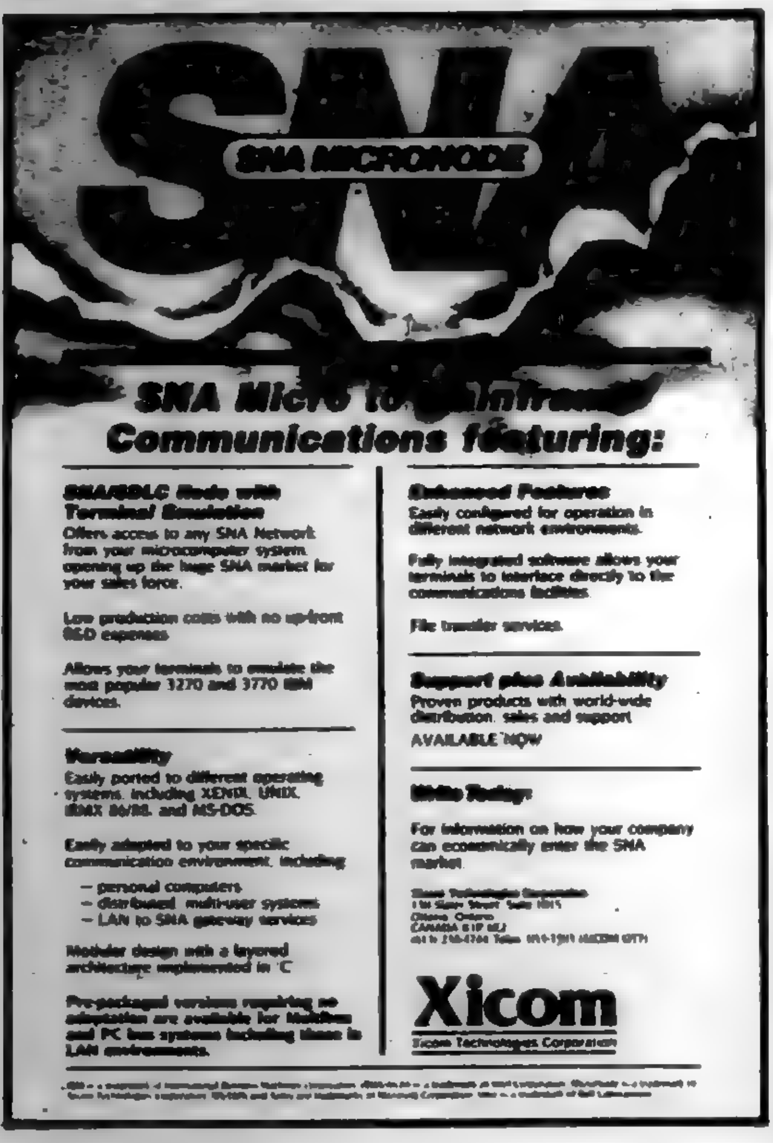
The most popular type of independent link is hardware-driven. A link of this type replaces the host controller (usually an IBM 3274 or 3276) with a hardware product that attaches directly to asynchronous terminals. The controller-emulation function of the protocol converter responds to polls from the host, collects the received blocks of data and then performs code conversion. The controller also emulates an IBM terminal by accepting keystrokes from the terminal keyboard and then interprets the characters according to the data editing rules of the 3278 terminal.

Another hardware link method is disk-to-disk conversion. Disk to disk does not depend entirely on a communications link; instead, all of its data protocol conversion is accomplished within a self-contained unit. A major vendor in this area is Altertext, Inc. The $15,000 Altertext System II is about the size of a microcomputer and features a 12-in. monitor, a keyboard, up to six asynchronous and/or bisynchronous communications ports and four 8-in. and 5¼-in. floppy disk drives. Disk-to-disk software transfers information directly from one type of disk to another. The system translates information from one disk into A-Code — Altertext's central code set controlling the two-way exchanges — and from A-Code to the target system's format.

The most common complaint generally heard about protocol converters is the lack of performance, resulting in delayed response times. The burden of handling the host protocol and at the same time handling several terminals can make some hardware converters (especially those with single processors) drag their feet.

One of the fastest growing areas of micro-to-mainframe links concerns tapping into IBM's popular Distributed Office Support System (Disoss), which resides on an IBM MVS mainframe and helps IBM's office systems exchange documents. A number of third-party vendors are making a career of providing interfaces between the Disoss architecture and the products of various office automation vendors such as NBI, Wang, Xerox Corp. and Data General. Soft-Switch, Inc. of King of Prussia, Pa., was one of the first companies to bring such a product to market when it introduced its Soft-Switch Disoss link.

From these rather specialised micro-to-mainframe products, some vendors are beginning to join forces to provide a more integrated solution to customers. In the past few months, joint venture and marketing agreements among some vendors have led to some interesting micro-to-mainframe offerings. One example is the agreement between mainframe software vendor Cullinet Software, Inc. of Westwood, Mass., and DCI. Under this



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arrangement, Cullinet produced its Information Database link software to handle communications links with DCI's popular Irma emulation boards. Cullinet's Goldengate PC integrated software package has also been equipped with the ability to enter mainframe extraction requests in a spreadsheet cell.

Compared with other computer markets, the micro-to-mainframe product market is tiny, but it looks forward to steady if not spectacular growth. U.S. revenues from the combined categories of general purpose communications software, dedicated terminal emulation products and intelligent/integrated links (including the revenue derived from the mainframe software content of the links) reached nearly $60 million in 1984, according to estimates from Natick, Mass.-based Venture Development Corp. This figure will reach $400 million by 1990, the research firm said, despite continuing confusion on the part of users toward the many types and technologies in the micro-to-mainframe area.

If IBM begins selling near what it predicted for its PC Networks, an area sure to heat up is a link between IBM's SNA mainframe environment and its PC Network.

Helping with revenues is a small subindustry that is starting to provide gateways between local-area networks and mainframes. Such links are new, largely because users of local-area networks — especially the newer PC nets — are still busy trying to figure out what to do with them. For those apparently lucky enough to have solved this problem, a few PC local-area net/mainframe products are now waiting.

Most of these local-area network/mainframe gateways employ some sort of file server or controller to handle data distribution and protocol conversion between the mainframe and the local net.

The Network Data Mover (NDM) and Network Access Services (NAS) products from The System Center in San Mateo, Calif., provide links between Corvus Systems' Omninet local-area networks and IBM mainframes, utilizing Systems Network Architecture (SNA) protocols. NAS resides on the local net gateway and gives IBM SNA access to any applications running on the PCs. NAS software is bundled into the gateway, and the combined product sells for about $9,000. NDM is an application program that moves files from one processor to another. NDM is actually two products: NDM/MVS for mainframes and NDM/PC for the local-area network.

Another gateway product, Virtual Networking System (Vines), was introduced by Banyan Systems, Inc. of Westboro, Mass. Vines centers around a 32-bit, Unix processor functioning as a network server, data dictionary, protocol converter and communications gateway. The front end of Vines supports a variety of personal computers and local nets (up to a total of four local nets simultaneously, including Ethernet, Omninet, Applenet and the IBM PC Network).

The back end of the processor communicates with host computers and other Banyan servers connected to other remote or local-area networks. The back end provides access to host applications, files and electronic mail through terminal emulation. Streettalk, the system's security software, is bundled into the system.

Other gateway products are available from Intel Corp. of Santa Clara, Calif., with its Intel Database Information System (Idis) featuring a local processor with software to access mainframe data bases and software to support local processing; and from Interlan, Inc. of Westford, Mass., whose NTS10 provides protocol conversion from and to users on an Ethernet network and IBM hosts (though no SNA links are provided).

Another area sure to heat up (if IBM can begin selling near what it originally predicted for its PC Networks) is a link between IBM's SNA mainframe environment and its PC Network. IBM has begun shipping its PC Network/SNA 3270 Emulation Program and has also announced a Series 1 PC Connect that allows the Series 1 minicomputer to act as a gateway between a PC Network and a mainframe running SNA. One of the few other SNA/PC Network links is from California Network Systems of Milpitas, Calif. That company's PC Network/SNA gateway software package, like IBM's, is available at $375 per user. California Network Systems, however, claims it offers a clearer migration path toward an eventual support of 48 concurrent sessions and does not, unlike the IBM product, require a dedicated PC as a gateway. At this stage, other PC network companies are keeping watch. This is a fledgling market. If IBM's SNA gateway begins to sell in volume, however, you can be sure those companies will soon jump in with its own better SNA mousetrap.

■

Kolodziej is a senior writer at Computerworld Focus.

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IBM's LOCAL-NET POLICY: WHEN WILL IT SURFACE?

IBM's local-area network announcements send ripples through the industry each time they appear in the press. What is the strategy behind these seemingly disparate network pieces? Is there a strategy?

BY BRIAN JEFFERY

Are we all clear on IBM's local-area network strategy? There's the token ring, which will be available in 1986 or 1987 if it's not introduced in 1985. It's the strategic product everyone is waiting for, although it's going to be unpleasantly expensive and fits in more with the Systems Network Architecture (SNA) 3270 world than anywhere else. It runs on the IBM Cabling System, which consists of five — or possibly seven — types of cable, and it has something to do with the Rolm Corp. CBX II, or possibly it doesn't. It will support virtually all of the IBM product line, but not right away.

Then there's the PC Network, which IBM announced in three versions: a 72-device configuration available through IBM and distributors; a 255-device configuration, which IBM won't sell; and a custom configuration supporting several thousand devices, but IBM won't sell that either. PC Network supports Personal Computers and the Series/1, but, although the PC Network is aimed at corporate departments, it doesn't support the System/36, IBM's much-vaunted "departmental system."

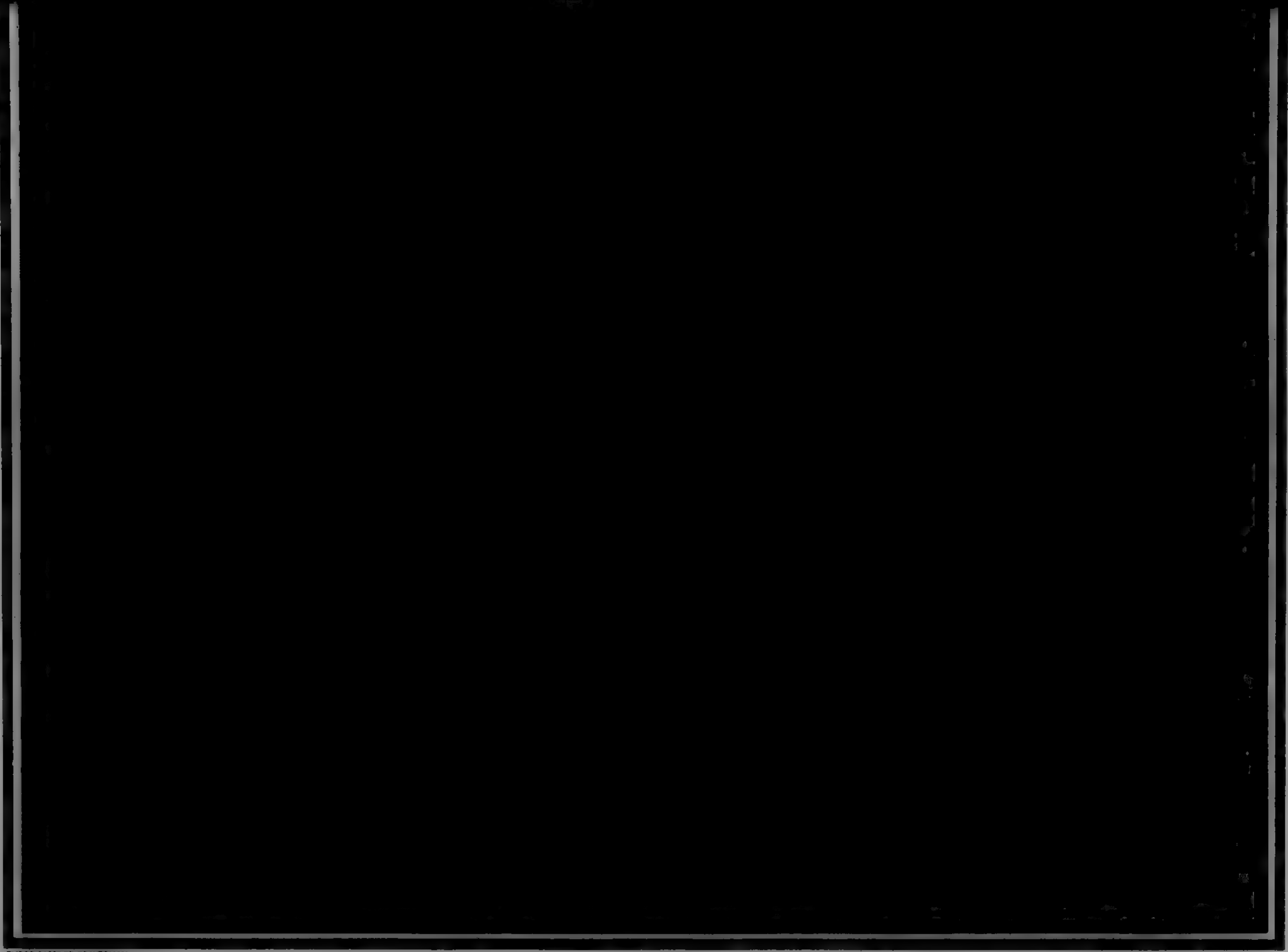
IBM's working with Sytek, Inc., (broadband commitment) and Ungermann-Bass, Inc., (Ethernet commitment) but it's not supporting broadband or baseband coax for the token ring.

IBM is committed to the PC Network for attaching PCs in small groups, but IBM sales forces will also peddle Cluster Kit (the local-area network IBM said wasn't a local-area network); Corvus Systems, Inc.'s Omninet; Nestar Systems, Inc.'s Plan; and Orchid Technology, Inc.'s PC-Net — assuming they're not instead pushing a low-end System/36.

If this sounds confusing, it is. The main problem is IBM has been developing, describing and even introducing local-area networks for years without a single central plan. Only in June 1985 was a single unit formed to coordinate product and marketing directions, and only recently has IBM had anything that can reasonably be described as a local-area network strategy.

As is so often the case with IBM, strategy for local-area networks has been a case of piecing together a set of products developed by different IBM units with little or no coordination with the others, using different technologies and approaches, all incompatible. The situation is reminiscent of the confused office automation direction pattern that resulted when different IBM divisions peddled different office systems in the late 1970s and early 1980s.

The story goes something like this. In the beginning was the token ring. In the late 1970s, IBM got rather worried about



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something called Ethernet, which was getting a very good press. The IBM problem was felt to be one of reacting to this Ethernet threat with a product that would incorporate local-area network technology while preserving the basic IBM host-based hierarchy. A solution of sorts was found in a token-passing ring that had been developed at the company's research and development laboratory in Zurich. In its original form, the token ring was an extension of the 8100 Series loop architecture and had the advantage of being SNA-based and hierarchical.

Then the trouble started. IBM had a bad time with its development partners. Mitel, Inc. failed to deliver on high-end digital private branch exchange (PBX) technology; Texas Instruments, Inc. failed to deliver on very large-scale integration (VLSI) interfaces; and later problems developed with Rolm, Mitel's replacement. After publishing a barrage of papers and descriptions of the token ring — which naturally created the impression that it was imminent — IBM announced in April 1984 that, although the token ring was still two to three years away, users could have the wires now. Timing problems hindered attempts by IBM to tie the token ring system into SNA networking, and the five-chip set for the local-area network interface is still too expensive to compete effectively.

For several years, the token ring project was the joke of IBM. Then Big Blue staged a notable recovery. It wasn't so much that technical problems had been resolved, because they hadn't — they still haven't. Rather, IBM corporate management did some hard thinking in 1984 and decided that, whatever its faults, the token ring was a useful part of the SNA scenario. It would significantly contribute to SNA usage and, as any end user will tell you, SNA usage contributes significantly to IBM revenue streams.

Enter the PC Network, sometime in 1982. The PC Network was codeveloped with Sytek, the Mountain View, Calif.-based broadband local-area network vendor. PC Network was a project of IBM's Entry Systems. In those days, Entry Systems was regarded as a high-flying entrepreneurial outfit, and IBM corporate management was inclined to let it go its own way. Entry Systems had great ambitions for the PC Network. Not only would it let IBM move in on the market for PC local-area nets — an area where vendors like Corvus and Nestar were making the running — but the capacity and modularity of broadband coax would provide a new and more efficient method for large end users to hook PCs to hosts. PCs would be used as file servers, gateways and network management systems. At least that was the plan.

As the system neared completion, the fur started to fly inside IBM. IBM's Communication Products Division (CPD) objected to having the PC Network compete with the token ring. During 1984 Entry Systems' popularity inside IBM began to slide, and IBM corporate management put the brakes on. The result was a compromise: PC Network would be introduced only as a 72-device system and would be pitched by IBM only as a PC local-area network. This was scarcely an efficient utilization of the PC Network technology, which could easily support upwards of 200 devices (at least one PC Network in Boca Raton, Fla., happily supports more than 220 devices). The token ring was, however, moving back into popularity. By year-end 1984, it had reestablished itself as the focus of IBM local net strategy. Delays in delivering the PC Network interface boards got the system off to a bad start early in 1985. Then IBM hindered it further by saddling it with the elderly Series/1 as a file server and began to pitch combinations of the S/36 minicomputer and PCs as, effectively, an alternative for departmental automation and future components of the token ring scenario. A sad fate for what could have been an interesting product.

In 1984, IBM decided the token ring was a useful part of the SNA scenario. It would significantly contribute to SNA usage and SNA usage contributes significantly to IBM revenue streams.

Cluster Kit, introduced in February 1984 as a low-end 256K bit/sec CSMA/CD star for PC clusters, was also from Entry Systems and seems to have been aimed at organizations like small businesses, corporate departments and high schools. Cluster Kit never enjoyed much of a commitment from IBM and, when it became clear the PC Network was going to be positioned as a low-end product (supporting up to 72 devices compared with Cluster Kit's 64), the system was quietly "forgotten to death" by IBM.

The Industrial Network turned up as an official IBM product in August 1984. It grew out of IBM's involvement with General Motors Corp.'s Manufacturing Automation Protocol (MAP) program and is essentially identical with the MAP standard. It was adopted by the IBM Industrial Systems group, later re-formed as Manufacturing Systems Products out of Boca Raton, Fla. The group inside IBM successfully argued that there was no way they could offer the other IBM

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local-area networks for factory use and they should join the MAP bandwagon.

As early as 1982, Ethernet support seems to have been targeted by IBM as a requirement, and Santa Clara, Calif.-based Ungermann-Bass has been developing an Ethernet gateway for IBM to the token ring. But IBM is more than a little reluctant to be seen backing Ethernet. Such backing could cause people to install Ethernets rather than token rings, and IBM will doubtless wait until the token ring is up and running before so much as breathing the word Ethernet.

The 3270 PC Communications System was mentioned by IBM in August 1984, at the time PC Network was launched. The system was vaguely described as one that allows peer-to-peer communications, file-sharing and peripheral-sharing by 3270 PCs. This doesn't seem to exist, at least not in the form pitched by IBM. In practice, it looks like a 3274-based solution supported as a local token ring configuration or over point-to-point 3270 coax and handling a variety of devices under 3270 protocols. The new IBM high-end 3274 model clearly goes with it. IBM's description of this system as supporting primarily 3270 PCs seems to be an attempt to prevent users from thinking that because it wasn't supported on PC Network, IBM wasn't backing it. IBM is backing it — not selling many, perhaps, but certainly backing it.

The various third-party products sold by IBM (the Corvus Omninet and Orchid PC-Net as cologo products, or the Nestar Plan under a cooperative marketing agreement) seem to have been adopted primarily as stopgaps until appropriate IBM solutions became available.

All these maneuvers can be seen in one of two ways: either IBM has made a clever move to sell multiple solutions for different applications and thereby bracket the market (that's the way IBM tells it) or IBM is making an improvised attempt to pull a bunch of disparate and incompatible products together into some semblance of a scenario (which is what has actually happened).

Some major problems arise for end users thinking of going the IBM local-area net route or at least waiting to see what IBM's local-net scenario looks like before making commitments. Not the least is that any kind of coherent IBM scenario is still several years out. The much publicized token ring looks as though it will make an initial appearance this year, but in a partial form and with limited availability. The interface cost is still high, and IBM is likely to stall full token ring availability until it can lower the cost of the token ring VLSI chip set to a more attractive level. This means a probable wait of at least another year before the token ring begins to resemble a final product.

PC Network's status also contributes to the confusion. The product has undergone at least a change in positioning, with the Series/1 now being pushed as a file server. PC Network was also recently transferred from its home at Entry Systems to a new unit IBM set up at Raleigh, N.C., to handle product strategy for all IBM local-net systems. There will probably be further changes, notably in integrating PC Network into the token ring environment. With the token ring taking priority, PC Network will likely remain crippled at the 72-device level. Sytek makes larger configurations of the system available but doesn't push them very strongly, and IBM isn't talking much about them. In addition, IBM seems to be planning to support Ethernet, but isn't talking about it.

All this activity suggests a certain caution for those who are looking at IBM local-area network solutions. The token ring and 3274-based solutions fit primarily into the SNA 3270 world; indeed, IBM has described the token ring as being primarily a subset of SNA implemented at the Data Link level. It may appeal to those with heavy SNA 3270 investments, perhaps, but scarcely qualifies as a general-purpose local-area network, and end users who aren't already deep into SNA may find it not worth waiting for.

PC Network could be a good product, but it's not clear IBM will allow it to be one. PC Network could be crippled further to protect the token ring. It would be a good candidate for attaching PCs and other devices in Ascii environments, but IBM is edging it into the SNA world.

Of the other IBM products, Industrial Network is merely an IBM implementation of MAP and more credible vendors with greater factory experience exist for this type of solution. Cluster Kit is dead in the water and certainly not guaranteed a future. The various third-party PC local nets marketed by IBM could be dropped at any time by the IBM direct sales forces. And, finally, for Ethernet support, there are also better candidates than IBM.

The bottom line seems to be that if you're waiting for IBM, don't. IBM's local net portfolio consists of a bunch of disparate and incompatible products, which the company has only recently gotten around to sorting out. Its key strategic product, the token ring, is a specialized system designed for SNA environments and 3270 device bases; and IBM shows no signs of bringing in the kind of general-purpose, modular, multivendor local net most of the market wants.

As an alternative, you could wait for IBM to present its definitive scenario, but you may wait a long time and you may not like it when it finally arrives. ‡

■

Jeffery is director of research for International Technology Corp. in Palo Alto, Calif.

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Martin Reber, Carrier's National Marketing Manager-Information Systems, in reference to 10-NET™ capabilities: "The people at Fox Research must have sat down with a real end-user and listened to what they needed before going to the drawing board to design the network."

The 10-NET™ LAN, being used at Carrier Systems' Chadds Ford headquarters, ties together two dozen various PCs and two printers that serve the entire network. "The spooling feature, itself, minimized the necessity of having to buy a hard disk drive and printer for each workstation," stated Mr. Reber. "The Fox Research 10-NET™ is not only extremely cost-efficient in that manner, but also it is extremely flexible. The network gives us the capability to continue operating even though several machines are down."

Reber related that the key to the entire Carrier Systems' operation, which includes the addition of the Fox Research 10-NET™ LAN to its ten other motor freight terminals, is its "ease of installation and portability. We were able to add PCs to the network, and gain access to the superstation at the rate of one PC per 15 minutes. We've increased productivity because the Fox Research 10-NET™ LAN gives any number of our users simultaneous access to all our data files."

After installation of the 10-NET™ LAN, in its Chadds Ford headquarters, Carrier Systems proceeded to equip its operation with Fox's 10-NET™ SNA Gateway which then linked them to their Salt Lake City mainframe. "We eliminated an eight-port IBM 3274, six terminals and estimated a cost savings of approximately $1000 per week in the telecommunications area," stated Reber.

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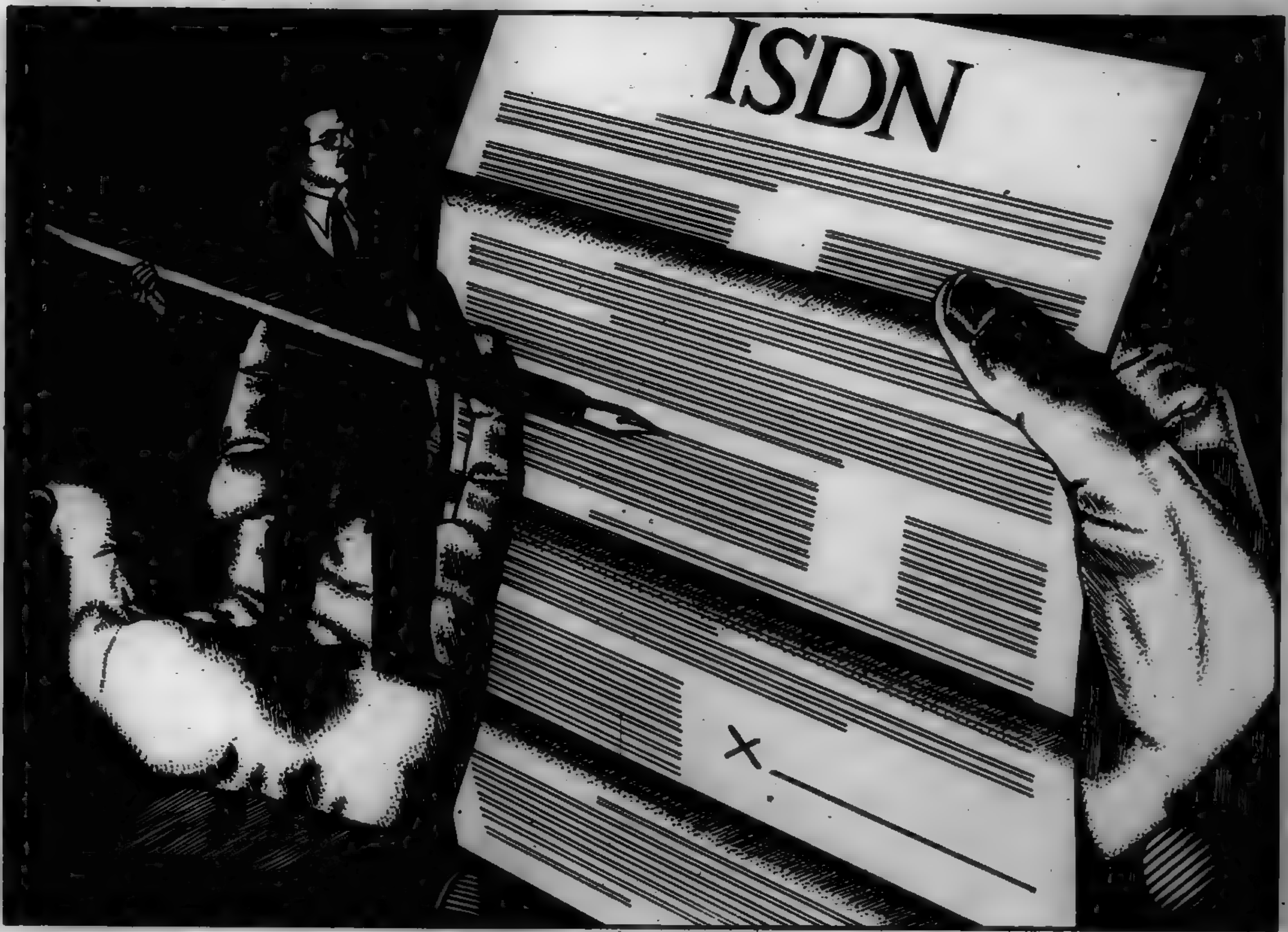

RON CHIRONNA

Has AT&T Got a Deal For *You*...

Always in the forefront of technology, AT&T is now pushing integrated systems digital networks. When will ISDN become a reality, and what will they mean to your operation?

By H. Paris Burstyn

Since divestiture, the new AT&T has taken its lumps in unregulated markets. Current word has it that the new AT&T is a technological also-ran and that its computer technology and line of computers are too late into the field to make any difference. This philosophy discounts two important facts: AT&T invented the transistor that started the computer revolution, and its 3B line of computers forms an integral part of the world's most sophisticated and most reliable telecommunications network. What AT&T really lacks is not technology, but the ability to sell these systems into a commercial environment.

AT&T's true strength lies in its communications orientation and its increasing ability to interconnect devices from a wide variety of vendors. Although many businesses consider the ability to interconnect different computers a high priority, few are actually in a position to use that facility. In some cases, therefore, an AT&T weakness may stem from its technology's having outstripped its customers' needs.

This technology/application imbalance may also account for the softness in the personal computer market: Personal computer users are not using today's machines to their fullest potential; they are waiting to buy new ones, thereby accounting for the market slowdown.

As customer needs and new markets grow, other companies will develop comparable technology to challenge AT&T, but it is more than likely AT&T will set the pace for intervendor communications. By stressing communications over computers, AT&T's computer product line may never become a core business — a strategy that plays to AT&T's traditional strength. But when one of its communications network customers needs to expand computing facilities, AT&T will be able to supply new hardware compatible with the customer's installed machines. Even if AT&T does not acquire or form a joint venture with a computer manufacturer, as has recently been speculated, the company's current line is serviceable enough to fulfill the role of secondary supplier.

Although some AT&T products may be solutions looking for problems, competitors quickly respond to any move AT&T makes and rush to emulate communications products. In communications technology, AT&T leads the pack.

Nevertheless, AT&T has had some major setbacks. Net 1000 has yet to make a substantial contribution to company revenues — despite innumerable evolutionary steps and name changes. The company is also conspicuously absent from the public electronic mail business. AT&T's slow starts in these arenas make sense, however, when put in market perspective.

Net 1000, a sophisticated time-sharing network, made its debut just as the entire remote computing services market began to slip in the face of competition from distributed data processing. Competitive ventures, although more successful than Net 1000, have not turned in stellar performances. For example, IBM's Information Network accounts for only a small percentage of the DP giant's sales, and General Electric Information Services Co., the market's leader, recently laid off more than 400 employees.

Industry rumors abound regarding AT&T's pending entry into the electronic mail market. The company's caution is well considered because AT&T would have to bring some special characteristics to any system it introduced to the market. It must set itself apart from MCI Communications Corp.'s Mail and Western Union, Inc.'s Easylink if it is to avoid the also-ran label.

If it does bring a sophisticated electronic mail service to the market, AT&T runs the risk of bringing a too-sophisticated product to a market where even simple systems have yet to earn any substantive profits.

If AT&T were to enter the public electronic mail market, it would have to deliver a traditional electronic mail service (such as GTE Telenet Communication Corp.'s Telemail or ITT's Dialcom) combined with hard-copy capabilities of MCI Mail and Western Union's Easylink. That service alone, however, would not be enough; it would have to add an applications level — adding value to, and setting itself apart from, basic services readily available from other providers.

A likely strategy could see AT&T linking electronic mail service to a Net 1000-like computing service. This tactic would provide users with automated access to data base management and DP functions. Early this year, AT&T announced plans to deliver central office equipment necessary to support the first commercial integrated services digital network (ISDN) to Ameritech (the regional holding company that provides local telephone service to Illinois and neighboring states) for service trials in the fourth quarter 1986. Shortly after that announcement, virtually every major vendor of central office switches from around the world hustled to announce comparable equipment and to line up test sites for their equipment. Similarly, when AT&T announced Software Defined Network Service, other long-distance carriers — known as other common carriers — quickly announced comparable services.

Software defined networks (SDN), or virtual private networks, provide a stepping stone on the road to ISDN. SDN take advantage of the constantly increasing capacity of the public switched telephone network and the intelligence of new digital switches to provide private network availability without the cost of leasing private lines. Instead of leasing private lines, customers that now make heavy use of private-line and Wats services can take advantage of software that resides in network switches to program the public network to meet specific point-to-point and point-to-multipoint communications requirements.

Virtual private networks allow customers with heavy communications needs to create their own networks. Each customer's network routing functions will be contained in network switches where specialized hardware and software will allow customers to call other virtual private network locations, off-network locations on that carrier's switched network and interconnected private networks.

In such virtual private networks, transmission facilities are dynamically allocated on an as-needed basis, instead of being physically dedicated to a particular customer on a full-time basis. AT&T Communications, United Telecom Computer Group, MCI, Satellite Business Systems and Western Union have announced intentions to provide such service.

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When AT&T filed with the Federal Communications Commission to begin service by July, the other common carriers and some regional operating companies petitioned the FCC to reject or suspend the proposed AT&T tariff. Early in June, the FCC suspended the AT&T Communications tariff; this action will delay the company's beta test for as long as five months — the length of time allowed by FCC statute. In effect, the delay allows AT&T's competitors to get their products ready for market.

To provide virtual private network services, carriers use two different approaches. For the most part, the other common carriers take advantage of their switches' functions to create an independent dialing plan for each customer. That dialing plan is distributed throughout the network at each switch that will be involved in the customer's software-defined network.

To do this, memory in each switch is partitioned to accommodate a separate dialing plan for each company. The company identity is carried from switch to switch to maintain the individual dialing plan. When configurational changes are required (by company reorganizations, consolidations and so on), network changes are implemented by modifying routing information at each switch.

AT&T employs a different architecture that leverages the common channel signaling capability of its long-distance network. AT&T will maintain its customers' specialized dialing plans in a centralized data base rather than distribute them throughout the network. AT&T's common channel signaling technology is not available to other common carriers, so when customers require a configurational change, they must do it at every switch. Common channel signaling allows AT&T to make one change at the central data base.

AT&T's relatively advanced technology will allow it to provide virtual private networking more efficiently than its competition can, but it won't prohibit other common carriers from delivering similar service. Other common carriers will test and commercially offer their software-defined networks before or at the same time AT&T will. Nevertheless, AT&T was the first to announce it, and then competitors jumped on the bandwagon.

Software-defined networks will allow users to combine a range of communications services into a single, integrated service, which will give them greater on-site control of their network. In this way, SDN resemble ISDN; AT&T notes it has designed SDN as a precursor to ISDN.

Against this background, the availability of virtual private networks (from all carriers) will put pressure on local telephone operating companies to offer virtual local connections to match the long-distance virtual network. Such links would allow customers to have dedicated access to virtual networks without having physical facilities devoted to their exclusive use. Local service offerings are a key part of AT&T's strategy to sell the No. 5 Electronic Switching System (5ESS) central office switch to local operating companies.

AT&T's 5ESS is the cornerstone of its ISDN and Universal Information Service strategy. Although ITT's System 12 is considered a more advanced central office switch, ITT has had trouble manufacturing System 12 and is behind in its shipment schedule around the world. In addition, System 12 is not compatible with the telecommunications network in the U.S. and ITT is currently working to adapt it to domestic standards. This leaves AT&T's 5ESS and Northern Telecom, Inc.'s DMS line of digital switches as the main competitors in the U.S. central office market.

According to AT&T, 5ESS is designed to incorporate most ISDN features in one primary processing unit. Northern Telecom's DMS requires peripheral devices to provide similar ISDN capabilities. Northern Telecom announced ISDN for the DMS about two weeks after AT&T announced functions for 5ESS. AT&T's technology offers network planners an advantage in facilities they will need. They won't have to plan for additional room to house extra equipment, and the AT&T switch could be more reliable because it requires fewer cabling connections to other equipment.

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The general concept of ISDN has it functioning as easily and as invisibly as today's telephone network system. It will allow people and their computers to talk to any other person or computer over a network that can store, transport and deliver any combination of voices and data at any time from any place.

ISDN are the stuff of every equipment and service suppliers' dreams. ISDN will bring these companies new sources of revenue as they provide customers with a wide range of new services.

Today, interconnecting all those people and systems is a technical nightmare; as a result, many people involved with the U.S. telecommunications industry believe ISDN will remain a dream — at least into the next century. But for the U.S. market, AT&T seems to have the technological advantage over the other central office switch manufacturers.

While a few of the major central office switch manufacturers have sold auxiliary equipment (such as trailer-mounted portable switches and signal transfer point equipment) that will perform some ISDN functions for operating telephone companies, AT&T and Northern Telecom will probably take even shares of 90% of the 1985 market (with GTE capturing the remainder by selling to its own operating companies).

In 1986, AT&T can be expected to increase its share of that market to 70%, which it held prior to 1984. (In 1984, Northern Telecom won the majority of contracts because its digital switch was ready and AT&T's was not.)

In 1986, Ameritech plans to test the nation's first ISDN in Chicago. Initial ISDN service will provide simultaneous voice and data transmission capabilities over the same wire.

Today customers can send both voice and data over the same telephone line, but they can't send both signals at the same time. If customers want to send large amounts of data at high speeds, they must order lines that have been specially conditioned to handle the data. ISDN allows simultaneous transmission and obviates the need for conditioning arrangements.

As its technology evolves, AT&T sees the advent of Universal Information Services, which it likens to its earlier goal of universal telephone service. Universal Information Services will allow telephone companies to give customers the ability to custom configure their telephone system and data communications network without buying specialized equipment; they will use the intelligence that resides in the telephone company's central office. Just as it uses 5ESS for ISDN products, AT&T plans to use 5ESS as the core for the broad range of products composing Universal Information Services.

Universal Information Services will give users the ability to call up the services they need when they need them and to pay for them as they use them. Although ISDN integrates voice and data storage and transmission services, Universal Information Services gives customers the ability to change the network's configuration at will as well as handle image transmission (teleconferencing).

Only a fraction of ISDN-type services are available today, and they require making special arrangements with value-added carriers — companies that allow customers' computers to talk to other computers regardless of the computer manufacturer; some also provide access to public data bases, remote computer services and electronic mail. Value-added carriers lease lines for long-distance and local telephone companies (some build their own communications networks), add computerized functions to them and then resell them to their customers.

This data transmission facility, available over so called value-added — or overlay — networks, is only one piece of ISDN, and it isn't integrated with voice or image transmission services. Lumping all these features into one integrated network will make it very easy for users to perform any communications applications they want.

Demand for integrated services already exists. Many large companies subscribe to overlay networks such as Telenet and Tymnet. But customers subscribing to these services must pay monthly membership fees as well as minimum usage and per-use charges.

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To a local telephone company, new services mean more revenues. These services, available through software, are inexpensive to acquire, but very attractive to users.

Pricing services to entice users to apply them will increase network usage levels. Because new services can be installed incrementally and at relatively low cost, ISDN technology translates into improved margins for the telephone company and improved service for customers.

AT&T will drive competitors to keep pace and further enhance services and margins; its technology development will drive the evolution of new applications to take advantage of these services.

■

Burstyn is a staff member of World Telecommunications Information Program, Arthur D. Little Decision Resources in Cambridge, Mass., and is editor and product manager of its monthly publication, Telescope.

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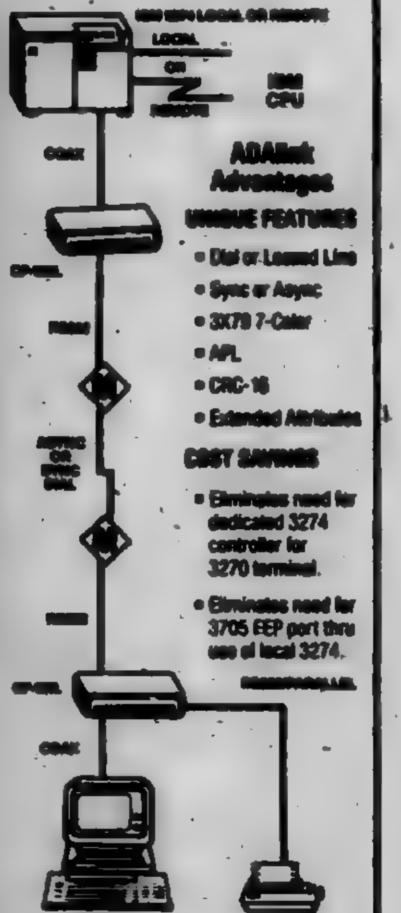

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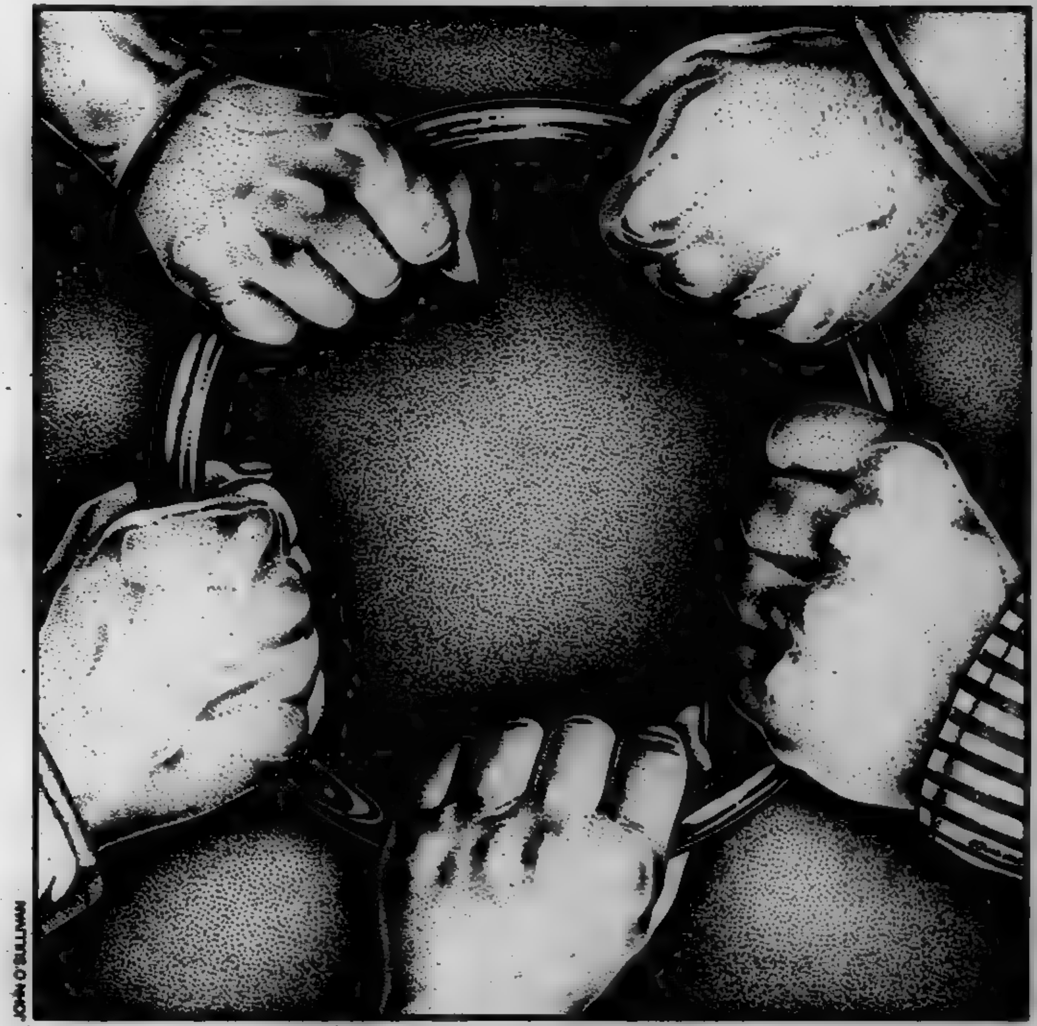

JOHN O'SULLIVAN

Token-Passing Ring Networks

Local-area networks don't just happen; the good ones are the result of a lot of careful planning. Before you commit your company to a local net, take a look at token-passing technology — it may be worth the effort.

By Edwin G. Brohm

Local-area networks have developed in response to problems that have cropped up in the area of data communications. Like computers, these nets have different characteristics, specifications and applications. Unlike computers, however, their selection often fails to receive the hours of careful attention data processing managers devote to finding the best choice for their applications.

One choice for a local-area network is the token-passing star-shaped ring, which is one of the most reliable, fault-tolerant and easily maintained local nets available. Token-passing star-shaped ring nets solve several problems encountered with other types of networks, including those employing carrier-sense multiple access with collision detection (CSMA/CD) such as Ethernet and token-passing bus architecture. To determine a network's superiority, a potential buyer should pay careful attention to four key networking attributes: reliability, ease of maintenance, ease of expansion and network performance.

Reliability: Reliability is a major cost factor in selecting a local-area network; a network that lasts longer without breakdown will obviously cost less to own than one that fails weekly.

To be reliable, a network must be distributed. Pure star-shaped networks that employ a central processing node are susceptible to total network downtime from this single point of failure. In a star-shaped ring, wire centers, which connect nodes to the ring, allow the ring to be distributed. If any point in the network fails, other nodes on the local-area network will not be affected. In addition, in the event of a cable break, the ring automatically partitions into smaller subrings that continue to function.

Networks based on token-passing bus architecture that employ CATV components must be swept periodically and tuned if they are to function properly. In contrast, the passive wiring system used by token rings is based upon the wire center and contains no power supply or logic.

The only active components of the token ring are relays, which are specified for millions of operations. As an example of reliability, the mean time between failures of a wire center is measured in years. The token ring employs a more distributed topology and will last longer without failure, increasing reliability.

Maintenance: If a failure does occur on a network, a quick and easy method of locating the problem should exist. A good deal of network downtime is often spent trying to find where the fault occurred. A properly designed token ring network will minimize the time needed to make repairs.

Token rings have a maintenance advantage over bus networks because token rings can be self-diagnosing. For example, an LED indicator positioned on the passive wire center can indicate which station is malfunctioning. If the LED is designed into a central panel, locating breaks in a system will be even easier. Repairs or replacement of a faulty node can be made immediately. And, because the token ring local net bypasses the failed node, the network continues to operate during repairs.

Another method that incorporates self-diagnostics allows the token ring network to indicate the node or point between nodes where the problem is occurring. A network monitor could interrogate the host controllers containing the error and allow the operator to locate the failure quickly and to repair the network.

Expansion: In a token ring network, new computing devices can simply be connected to a wire center. In comparison, if new computers or workstations are added to a CATV-based network, the system will eventually have to be realigned, and modems and amplifiers may have to be adjusted to compensate for network growth.

Token ring local-area networks generally operate using a single frequency and therefore do not require rebalancing. Stations can be added to a network without frequency adjustments. In addition, token rings do not contain amplifiers or splitters.

The cable in a bus network will have to be physically tapped to add nodes if a network is expanded. This process, boring small holes into the cable, cleaning with tweezers and clamping with a tap may be cumbersome. In a star-shaped ring, users simply plug nodes into a wire center and the process is more conducive to prewiring.

The token ring also offers another advantage, flexibility in network media. In a factory, for example, inexpensive shielded twisted-pair wiring may be sufficient for most areas; in an electrically noisy area, fiber-optic cable may be used as part of the same network.

Performance: Although many networks claim high signal rates, the best measure of a network's performance is its data throughput. A CSMA/CD throughput may actually be much lower than its optimum data rate for two reasons. First, transmission can be slowed or halted when two or more stations send data at the same time; second, there is often a large amount of overhead per data packet, such as message preambles and host addresses.

The collision problems of CSMA/CD local-area networks are not shared by token ring nets, and their overhead per packet is low. In addition, token passing local-area networks allow orderly transmission between stations. As the token is sent along the network, each station has the option of sending data or passing the token on to the next station, which means that each station has equal and predictable access to the network. No opportunity for collisions or garbled transmissions exists. CSMA/CD networks have a potential for delayed or aborted transmissions when multiple users contend for access to the network.

An increasing number of vendors and users are looking toward token ring local-area networks as the new standard. IBM, both in its Statements of Direction and in an extensive advertising campaign, has announced its support for token ring local-area networks and is promoting its new cabling system, which will support token ring networks. According to IBM, token ring networks are reliable and offer greater predictability of performance and greater network management capability.

As data bases grow and become accessible by multiple departments, accuracy and speed become major factors in data transmission. Token ring local-area networks can offer more speed and accuracy than CSMA/CD-type networks. In addition, token rings have proven to be more reliable, easily maintained and expandable for future growth.

In the final analysis, the user must choose a local-area network according to specific applications. Selecting data communications equipment is just as important as finding the correct computers. Reliability, maintainability, fault tolerance, flexibility and speed should be some of the criteria for selecting a local-area network.

■

Brohm is product marketing manager of Proteon, Inc. in Natick, Mass.

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“...Fiber Optics...”

Fiber-optic cable is no longer just the domain of large telecommunications companies. Fiber optics solves problems ranging from overcrowded conduits to data integrity, and DP managers are now jumping on the “speed-of-light” bandwagon.

By Lee White

The year was 1983 and Terry Rosga, manager of network services for the city of Dallas, had a big problem. The city's tremendous growth and its progressive attitude toward automation were being stifled by yesterday's technology.

Rosga investigated many avenues for solutions, not only to the problems the city was facing in 1983 but to those it might encounter for the rest of the 20th century. He looked at high-speed digital lines, but ruled them out because of the better than 6,000-feet distances. He turned down the possibility of AT&T's Dataphone Digital Service because of the nearly prohibitive expense involved. Microwave communication was tossed out, primarily because security couldn't be assured. And all the alternatives were susceptible to weather glitches. Fiber optics looked like the best choice for Dallas, especially because there would be no month-to-month recurring costs after the fiber was purchased.

Rosga recalled how bad things were in 1983; for example, at that time, police called in information from the beat, and clerical personnel entered it. From that entry point, data would go over one of several leased lines to a central file and be sent to any number of places — from the jail facility at one end of town to the criminal justice court facilities at the other end of town. Response time was critical, but the seconds became minutes. In addition, leased lines were costing the city a great deal of money.

Complicating this problem were others, including printing of the next day's court docket. Although a high-speed printer was used for this task, police department personnel who didn't understand how the printer worked would go into the “supposedly” locked room and push buttons in an attempt to achieve higher speeds.

Before Rosga presented his recommendations to the director of network services and the city manager, he decided he had better make sure fiber optics was the right solution for Dallas. He called in Phalo/O.S.D Corp. and Fibronics International, Inc., for a system test. The Fibronics demonstration was successful. With the groundwork laid by Rosga and his team, his employers not only gave the initial go-ahead, but granted some money for research and development. With this imprimatur, Rosga was able to investigate the best method for installing fiber and found that, because of a 15-year-old franchise statement, the city would be able to install fiber through conduits owned by Southwestern Bell Telephone Co.

The next step was to write exact specifications and go out for bid.

The city received several responses, with Fibronics a low bidder at $155,000 for cable and boxes. "Bell was trying to do it, but didn't have the black box — and it was the time of the split-up. They wanted $1.3 million just for the cable and five years' maintenance on the cable. We would never own it, and Bell would have to get the boxes from somebody else," Rosga said.

Rosga hired Dallas' traffic signal employees to carry out the installation procedure — lay cable, actually pulling it through manholes. It took 17 workers four weekends to accomplish the task, running two different routes for redundancy. Each cable consisted of 12 fibers; each fiber could handle 32 terminals.

The project for the city of Dallas took two years from inception through implementation. Rosga, who is now a systems engineer with General Datacomm Industries, Inc., estimated the installed fiber-optic cable would indeed meet Dallas' needs through the end of the century.

The end of the century seems like a long time indeed in a technological field where longevity is measured in five-year blocks of time and where the management information systems (MIS) director's fondest wish is to install a machine that's not 50% obsolete by the time it's up and running. But spokesmen for the fiber-optics industry talk in terms of cable that will last forever.

J. Morris Weinberg, chairman of Fibronics International, Inc., in Hyannis, Mass., stated that, although fiber optics isn't doing everything today, it will; he added that 99% of the world's networks today are done with coaxial cable. Some people are saying, "Wait a second, slow down. Isn't there a better way of connecting all those assets together than having lots and lots of cables, each of which has limited bandwidth capacity?" Weinberg said that those people are only the tip of the iceberg.

Perhaps one reason more data processing people have not gone the fiber-optics route is the newness of the field. Brian O'Brien Sr. developed image-transmitting bundles of fibers in the 1950s at American Optical Co. in Southbridge, Mass. In 1963, Elias Snitzer, also at American Optical, suggested optical fibers could transmit communications signals. It was not until 1970, however, when Robert D. Maurer, Donald B. Keck and Peter C. Schultz at Corning Glass Works, Inc., were able to produce a fiber that had acceptable attenuation rates of 17 decibels per kilometer. It was another seven years before both the Bell System and General Telephone and Electronics put prototype fiber-optic systems into service carrying live telephone traffic.

Charles DeLuca, vice-president of sales and marketing for the Spectran Corp. in Sturbridge, Mass., characterized the eastern corridor as Silica Valley. That area includes many fiber-optic companies in the Sturbridge/Southbridge, Mass., area; Corning Glass Works in Corning, N.Y.; AT&T Bell Labs in New Jersey; and Sperry Corp. in Pennsylvania.

DeLuca came up with the same phrase Fibronics International's Weinberg used — "tip of the iceberg" — to describe the state of fiber optics as it relates to data technology. He stated that fiber optics' usefulness is limited only by engineers' creativity. "The future is as bright as engineers perceive it can be. The whole technology has risen out of the curiosity stage and into the real world. It's no more wishful thinking. What were perceived notions five years ago have become reality today because the components are here and can move right into production."

Journeys into outer space put Artel Communications Corp. in Worcester, Mass., into fiber optics in a big way. During the first space shuttle, the National Aeronautics and Space Administration encountered problems with television cables radiating and affecting its tracking systems. According to Dave Monk, Artel's director of marketing, Tadeusz Witkowicz, president of the fledgling company, went to CBS and offered to build fiber cables and fiber-optic modems that didn't radiate and took up far less space than traditional cable. CBS accepted Witkowicz's offer, and Artel Communications was off and running.

Fiber-optic technology has had an impressive albeit slow acceptance. The biggest forward leap in legitimizing the use of fiber optics for data communications, however, was IBM's announcement of its Sierra series, which uses optical fiber to extend controllers, DeLuca said. MIS directors who have been burned in the past by adopting a here-today-gone-tomorrow technology should begin to feel more comfortable. "Now IBM has the lead. When Big Blue has taken the lead, that's it," DeLuca explained, adding, "We haven't seen the beginning of it yet. It's just mind-boggling."

What exactly is fiber-optic cable and how does it differ from the more commonplace coaxial cable or twisted-pair technology? The only real difference is the method by which information is passed through the cable. Over copper wire, digital information is changed to analog signals and back again; over fiber-optic cable, the digital signal is turned into light.

One of the biggest selling points for fiber-optic cable is security. Fiber-optic cable transmissions cannot be compromised or intercepted without actual physical access into the cable. This bug-free characteristic has made fiber optics the cable of choice for military installations.

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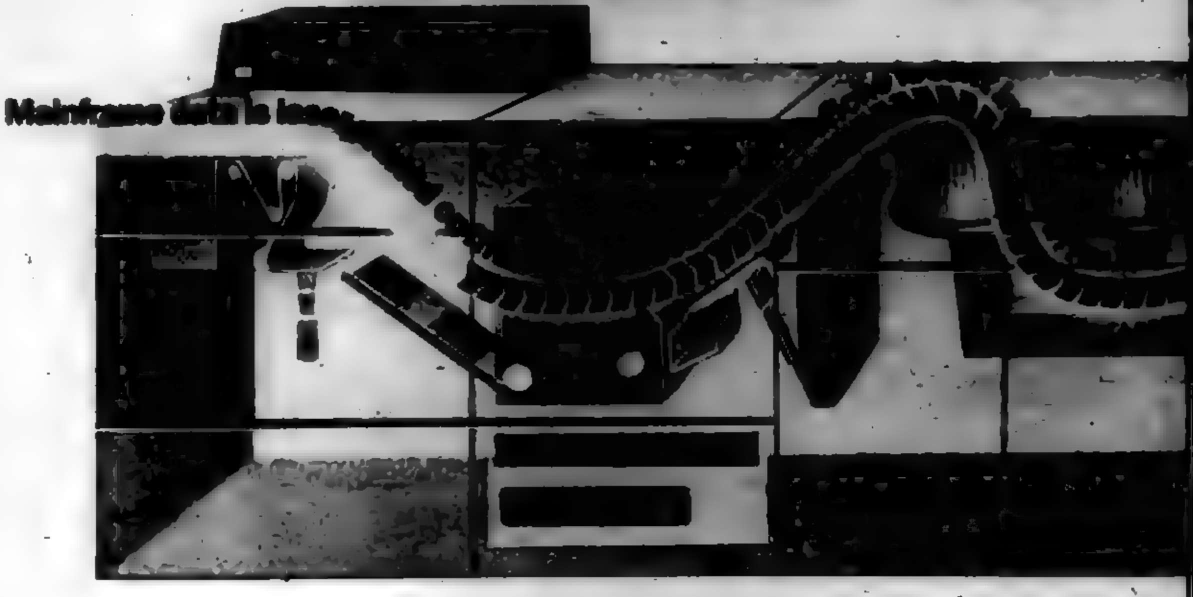

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Another plus for fiber optics is its compactness. A fiber-optic cable as wide in diameter as a pencil may contain as many as 144 optical fibers, each fiber equal in capacity to a large coaxial cable plus a ribbon data cable. Size becomes a critical factor in installations where ceilings and floors are already clogged with coaxial cable or when underground conduits are full to overflowing with cable.

> **Perhaps the biggest advantage to the DP world is the integrity of signals passed over fiber-optic cable. Bandwidth of fiber-optic systems remains high, regardless of length, thereby eliminating signal degradation and poor picture quality.**

A big disadvantage of coaxial cable and satellite transmission is electrical interference from power lines, other cables, lightning and other weather problems and radio-frequency sources. Fiber-optic cables are immune to all forms of interference.

But perhaps the biggest advantage to the DP world is integrity of signals passed over fiber-optic cable. The high-frequency response, or bandwidth, of coaxial cable decreases with increased length. High-frequency signals are lost by coaxial cable over distance and a high-resolution picture degrades. Bandwidth of fiber-optic systems remains high, regardless of length, thereby eliminating signal degradation and poor picture quality. These factors become especially critical for organizations considering cabling for graphics terminals or computer-aided design and manufacturing terminals.

According to Richard Cerny, chairman and chief executive officer of Artel, a fiber-optic company whose niche is the graphics market, the bandwidth for graphics used to be 20 to 30 MHz. Recent trends, however, have been to increase resolution and refresh rate, both of which significantly increase the bandwidth. "With a 1,280 by 1,024 picture that's going at 60 MHz refresh rate, you have a 120-MHz bandwidth. That means coaxial cables have to be shorter and shorter. That's going in the reverse direction from what people want," Cerny said.

Even after taking into account the many advantages to fiber-optic cabling systems, price has been the most obvious stumbling block to widespread implementation. At a cost per cable foot of approximately $1.25 for coax, compared with the $3.12 per foot Rosga paid for Dallas' fiber-optic cable, the difference certainly appears to approach 300%. The cable installed for Dallas, however, was 12-fiber cable that could support 12 times 32 terminals, or 384 terminals, with multiplexers that might cost $500 each, at each end. Although coaxial cable can also support multiple terminals with the addition of multiplexers, it does not support nearly as many of them and it does not support them nearly as well. It also has none of the known advantages of fiber-optic cable.

Why then, given the choice, would anyone choose coaxial cable over fiber-optic cable? One reason might be the enormity of a failure, should one occur. When terminals are hooked to controllers via coaxial cable, should the cable fail, one tube goes dark. In the case of a fiber-optic highway in which fibers are connecting dozens of terminals to a mainframe via multiplexers on each end, a failure is a very big deal. According to Weinberg, however, the problem is very seldom in the fiber. "Once the cable is in, I don't think I can recall one [cable break] out of the thousands of networks we've installed," Weinberg said. Rather, he explained, the problem is in the high-speed electronics end, "and that's why we work so hard to preclude that from happening with tremendous overdesign, robust systems, burn-in and all the other things we do."

But according to Artel's Monk, the roadblock to overcome is lack of awareness of the extensive capabilities of fiber optics. The industry has no spokesman, he explained, and, although the subject is well-covered in the engineering design publications, it has not received wide attention in the computer-related literature. "Most of the companies in the business are small like us, and we don't have education departments. We aren't on the chicken circuit thumping the tub for fiber optics every 10 minutes. We don't do an extensive job of educating people. We could do a better job, and it wouldn't cost us much," Monk added.

Until the time fiber-optic education filters down to the rank and file of DP

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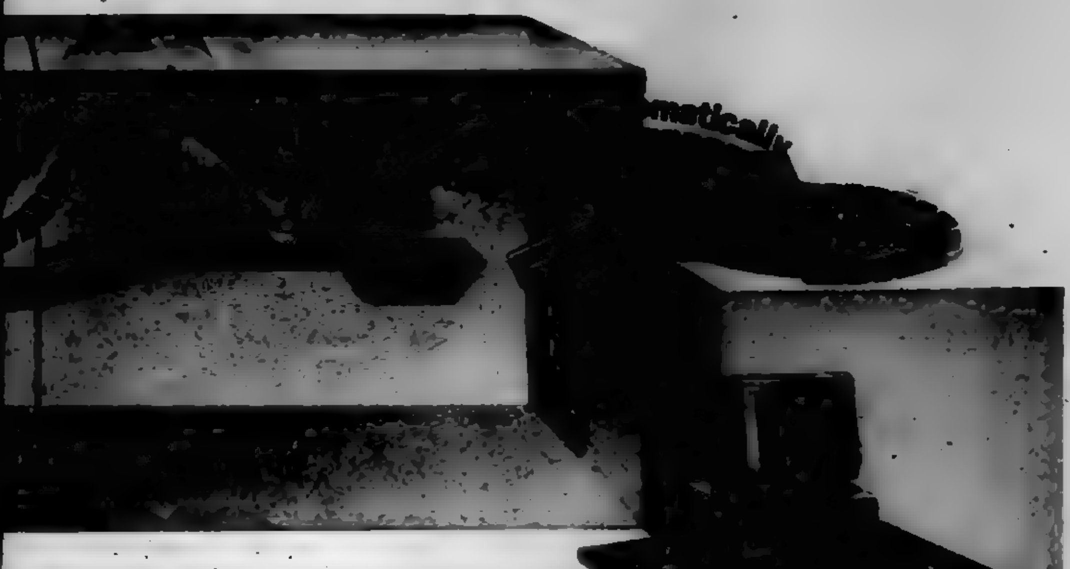

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management, use of the new technology will continue to be primarily the domain of telecommunications firms and government areas that need high security networks.

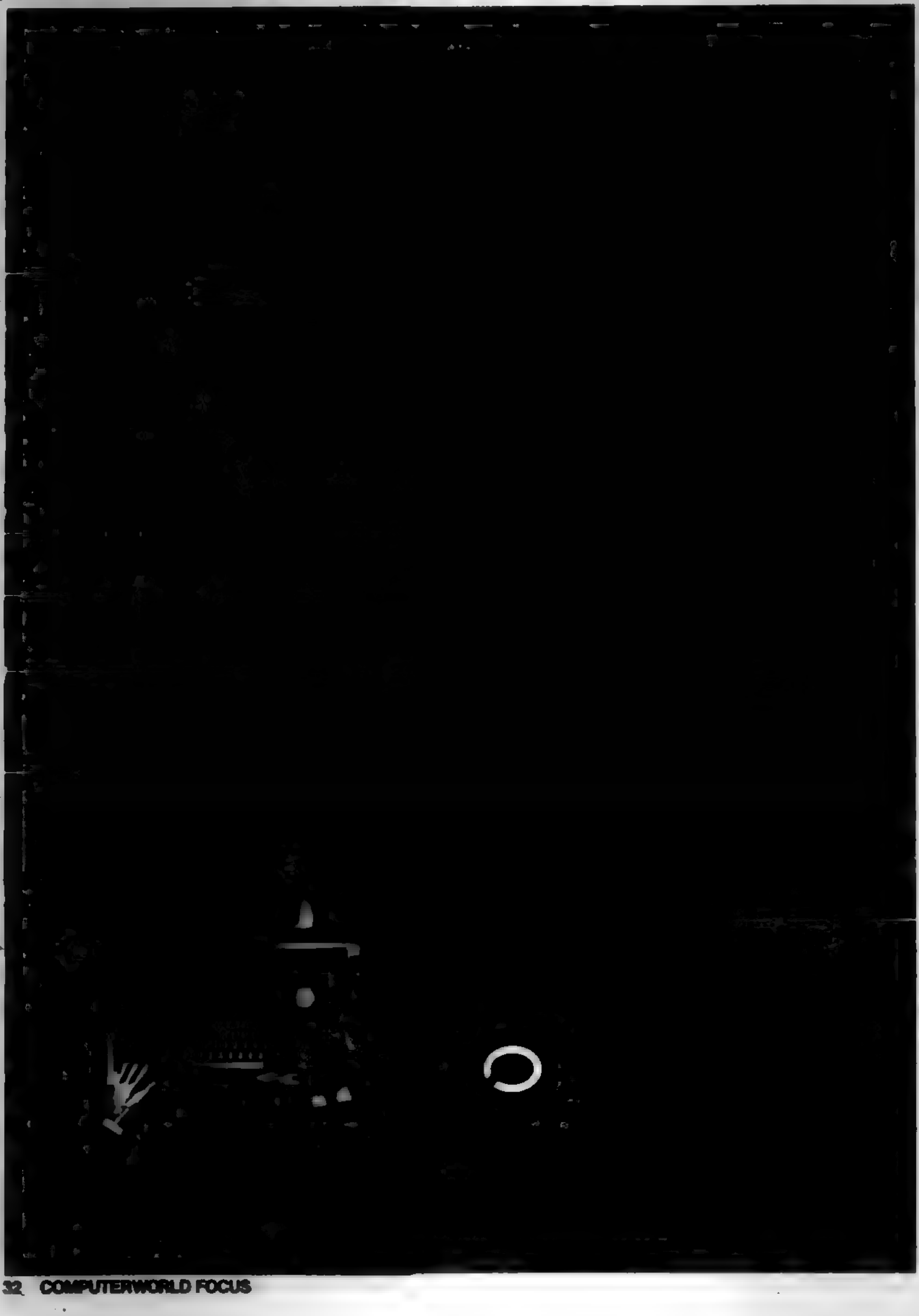
Companies constructing new buildings, however, are finding fiber optics is the most cost-effective and efficient way to go. Dave Stein, staff manager of business customer equipment for Southwestern Bell Telephone Co. in St. Louis, Mo., was involved in the decision-making process for data communications networks when his company built its new 42-story headquarters.

The choice of fiber optics was dictated in part by constraints that were in place, one of which was the inability to use the ceilings to pull ordinary coaxial cable. "The ceilings were air plenums and if we had put cables in the ceilings, they would have had to be Teflon-coated; the polyvinyl chloride jackets on normal cables put off chlorine gas if there is a fire around it," Stein explained. The Teflon-coated cable was prohibitively expensive and difficult to get.

Stein also wanted to get away from cable because of his experiences with it in the buildings Southwestern Bell had rented in downtown St. Louis. He found that when a cable was put in, it was never pulled out or reused, even if a terminal was moved. "They just pull a new cable and pretty soon you've got some places where you can see the ceiling literally falling down because of the weight of the cables," Stein said.

Stein and his team chose a fiber-optic network for the entire Southwestern Bell building, the tallest in the state of Missouri, figuring that once a good fiber-optic distribution system for data was installed, cable would never again have to be pulled. Even when the company changes computer systems or terminals, Stein enthused, "all we'll ever have to do is change the type of optical-to-electrical converters that go on the end of the fiber cable."

Southwestern Bell took a novel approach to its network. There is a horizontal floor distribution system with 11 nodes. Four fibers go out to each node from a wire closet, and each node location consists of eight workstations. The four fibers are brought out at the center of a workstation cluster, and at that point the optical-to-electrical converters are attached. Southwestern Bell then leads terminals off that converter with conventional cable.



The other part of their network is the vertical distribution system. With this network, eight fibers from each floor return to the 22nd floor, which is the heart of the system. From the 22nd floor, floors can be patched to one another. The horizontal network consists of 45.8 miles of fiber and the vertical net has 46.3 miles, for a total of 92.1 miles.

Of interest is the fact that Southwestern Bell purchased their cable from Belden Corp., even though AT&T is a cable manufacturer. Stein didn't find this unusual at all. "We divested from AT&T. We put out the bid to several different manufacturers and took the lowest bid that met the spec," he explained.

Southwestern Bell chose a fiber-optic net for the entire building, figuring that once a good fiber-optic distribution system for data was installed, cable would never again have to be pulled.

Stein's experience with AT&T should not lead anyone to believe the communications giant doesn't have a mighty strong foothold in the fiber-optic market. According to David Stonehill, vice-provost for computing at the University of Pennsylvania, AT&T is installing $8 million worth of fiber-optic cable and electronics to connect 130 campus buildings and interconnect parts of the AT&T Integrated Services Network (ISN) at the University of Pennsylvania (Penn). Although the University of Pittsburgh, Carnegie-Mellon University, Cornell University and Johns-Hopkins University all have fiber optics, Stonehill believes Penn is the largest installation to date in the ISN realm.

The enormity of the Penn installation is underscored by the fact that no "digging" has been necessary. "Some far-sighted person in 1973 put in a number of data tunnels," Stonehill said. "We have manhole covers saying 'U of Penn Data Communications,' along with steam and telephone."

There is little question the amount of money being spent by organizations such as the University of Pennsylvania will result in cost-savings in the future. Stonehill hopes to save money, but certainly sees cost-avoidance as a by-product. "The thing is, if communications connections keep moving along as they are — about 30% more each year — this will save a bundle in the next five to seven years."

White is a senior writer at Computerworld Focus.

FOCUS ON:
PLANNING

Local-Area Network Installation: Plan Now Or Pay Later

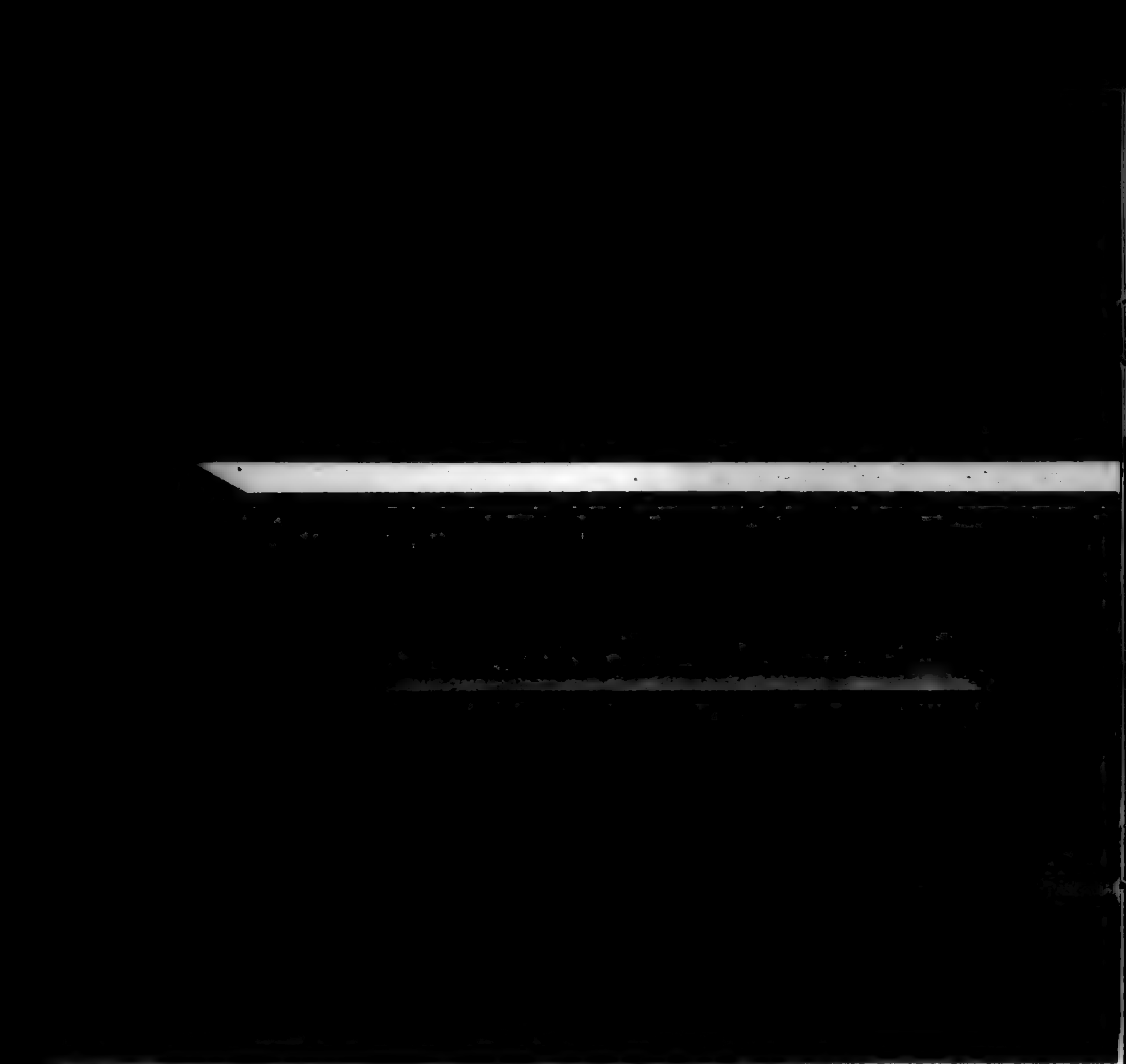
By Edward Cooper

A chorus of ayes could be raised in support of the statement that local-area networks offer many advantages. Modify that statement to include a description of how these networks should be installed, however, and that consensus would disappear, especially among management information systems managers. MIS managers who want to avoid headaches later will take time to be sure their planning has been wise and well-informed. The cabling design and installation a vendor provides will have a major impact on how smoothly a company's project proceeds, whether the specific local-area network technology is broadband, baseband or private branch exchange.

The local-area network market now contains more than 200 local-area network vendors, many of whom offer more than one installation option, and companies should familiarize themselves with the trade-offs and cost benefits associated with network installation. If the MIS manager makes the right choices in the beginning, the company will not only save time and money but will also ensure that future local-area net expansion will be easier. Someone within the organization should become very familiar with the capabilities of vendors, the technological details involved in local-area nets and the company's networking requirements. This knowledge will not only be useful in picking a vendor, but will also be crucial in assessing the best installation method.

A company has three installation options: It can install the network itself; it can use third-party vendors and hire consultants or contractors for certain aspects of installation; or it can have the network designed and installed by a vendor that offers a turnkey service. Because it demands a high degree of knowledge and involvement, the first option, the user-installed network, is probably the least popular choice. It does, however, offer some advantages.

Before the request for proposal can be written, someone in MIS or elsewhere in the company must be well-versed in the technology; otherwise, there is no way of knowing what equipment should be purchased and from whom. Even if members of the staff are technically competent, the company will often have to augment the group with a specialist or two. A local-area network consultant should be retained to review design and



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equipment specifications. System layout is a craft that relies on repeated trials and comparisons, rules-of-thumb and experience. Without this expertise, a novice will find it difficult to predict all the "oops factors."

A properly designed network has the major advantage of being able to be expanded more easily. When the initial design is created, a company should consider future applications, know the maximum geographical extent of the local-area network and do a thorough building survey.

After network architecture and topology have been determined, other key decisions include location of the network maintenance center, backbone design and level of redundancy within the network to ensure maximum reliability.

After the design has been completed, the funds allocated and the products ordered, an array of local-area network equipment will be drop-shipped to the company's door by the many different vendors.

The do-it-yourself method of installation will take longer and can be more problematic than other installations. Four months or more can pass before an average-sise network is up and running.

Self-installation can cause upheaval within the company because in most cases personnel will not have had the experience of putting in a local-area network. Also, staff members who otherwise would be performing regular jobs will now be working on the local-area network project, which will put a burden on the rest of the staff.

The advantages of the do-it-yourself option are that the company's data processing specialists will have more control over the network and be more self-sufficient in maintaining it. Also, during the long and complicated process of network design and installation, staff members will have had excellent on-the-job training in local-area network technology and operation. As a result, they will be better prepared to repair and expand the network.

Nevertheless, this installation option is now less popular than the other two options for several reasons. Purchasing many products from many local-area network equipment suppliers will cause confusion in the form of multiple purchase orders and a drawn-out purchasing cycle. MIS managers will be vying for resources within the company for each equipment purchase and subsequent installation. Finally, buying equipment at lower volumes can result in a more expensive local-area network.

Although some companies assume self-installation will cost less, this is untrue. The cost of the extensive time a staff spends in learning, designing, installing and maintaining the network should be considered a local-area network cost.

Although some companies assume self-installation will cost less, this is untrue. The cost of the extensive time a staff spends in learning, designing, installing and maintaining the network should be considered a local-area network cost. Another handicap of user-installed local-area networks is that some time may elapse before they are operational. Many companies don't want to wait.

The second option — using third-party vendors — is a more popular choice than self-installation. When the third-party vendor choice is made, either the MIS department designs the network or the company hires design consultants. Equipment purchase becomes the company's responsibility, although some vendors will provide service during and after installation. In most cases, a contractor will be hired to install the transmission medium, which is usually coaxial cable.

As in the case of self-installation, this option works best if at least one staff member is knowledgeable about local-area network technology and the requirements of the network. This staff member's knowledge will make it easier to create the performance and design specifications and the acceptance criteria the cable consultant will need to install the transmission medium correctly.

Usually, the company purchasing agent confers with the contractor about performance and design specifications and acceptance criteria. The contractor will then get clarification on certain points, make recommendations and present a bid.

The final negotiated price can increase if something was forgotten or if complications occur with the job. Using third-party vendors is more demanding on a company's purchasing department because separate purchase orders must be budgeted, negotiated and drawn up for each consultant, contractor and supplier.

After the contractor installs the transmission cable, the company attaches its equipment to this transmission medium. Future communication requirements should have been taken into account during the initial planning; the network almost always needs to grow immediately. Most companies find that when a network is installed and people within the organization see its benefits, the demands for network expansion will surpass original expectations.

Putting in an average-size local-area network usually takes two months or more when the third-party vendor option is chosen. Installation is faster with this method than with self-installation. Less disruption occurs within the company because most personnel are still performing regular jobs. However, a certain amount of upheaval takes place when workmen and representatives from different contractors and vendors are on site.

In the case of the backbone system, the contractor usually includes a warranty with installation. The contractor can, however, also offer maintenance service under a separate contract. Most companies utilise this service because they do not want to maintain the transmission system themselves.

What happens if equipment problems develop? This fear constitutes one of the biggest drawbacks to the third-party vendor approach; various suppliers and consultants frequently indulge in finger-pointing exercises rather than quickly isolating problems in the local-area network. When a device breaks, the failure must be located, the defective unit replaced and the system returned to operation. Most vendors, understandably, want someone else to be responsible.

The third option — using a turnkey vendor — is quickly becoming the method chosen by many companies installing a network. A few local-area network vendors offer everything from initial network design to long-term maintenance as part of a single consolidated package. The turnkey vendor looks at a company's communications requirements, draws up a workable design that keeps future expansion in mind, installs the network and then trains staff in equipment use. Finally, this vendor will maintain the network.

One vendor does everything. This greatly simplifies purchase and approval cycles because only one purchase order is required. Unlike the second option, which uses multiple vendors and contractors, the choice of a turnkey vendor involves just one price quote, which includes everything involved in the local-area network. The customer is given a clear picture of the actual cost of a network.

Tracking all the costs — particularly time put in by staff members — is often difficult when a company installs its own network or hires contractors. At first glance, the price quoted by a turnkey local-area network vendor might seem much higher than the prices of the other available options. If a company tallies the entire expense of other installation methods, the cost of the turnkey approach will be about the same.

Putting in a system as complicated and expensive as a local-area network creates anxiety for those within the company responsible for it as well as among staff members in general. A proficient turnkey vendor will have asked all the right questions beforehand. The Murphy's Law syndrome that occurs with distressing regularity in network installation can usually be avoided.

Installing an average-sise local-area network through a turnkey vendor takes about six weeks. Less internal disruption results than with any other method. Few company staff members are involved, and the vendor's well-trained installation crew is experienced in putting in cables and components smoothly.

Turnkey vendors also offer the advantage of taking singular responsibility for any problems with the network. Most MIS departments, which usually handle the company network, are chronically understaffed and being able to call just one vendor for problems or repairs is very convenient.

The disadvantage in going with a turnkey vendor is that sacrifices must be made in the area of response time should network problems occur. An outside vendor will never respond as quickly as well-trained, in-house technologists. Most vendors will allow a company to specify response times as part of the contract or will include an on-staff expert in the original deal.

Companies should be demanding as well as choosy when they select a vendor. They should think of today's needs as well as tomorrow's. Each vendor offers something different as does each installation method. Managers owe it to themselves and their companies to become aware of the costs and benefits and to decide what works best for their organizations. ‡

* * *

Cooper is director of product marketing at Sytek, Inc. in Mountain View, Calif. He is author of the book, Broadband Network Technology.

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Your SNA Network – Do You Manage It or Does It Manage You?

By Thomas W. McDonald

The communications network is the circulatory system of today's corporation. It is responsible for maintaining the flow of corporate information among all appendages and branches of an organization. A network that operates in degraded mode or totally fails causes repercussions that are felt throughout the corporation, all the way from customers through middle management to senior executives. Degraded network service translates directly into lost productivity. An unhealthy network means service-level objectives are not met, tasks are not completed on time, budgets are overrun and, finally, corporate business plans fail.

Maintaining the flow of corporate information, consistently and cost-effectively, through Systems Network Architecture (SNA) networks is essential. To accomplish this task, a properly implemented strategy of network management will fulfill two criteria. First, it will allow service-level targets of end-user response-time and network availability to be met in a confident, consistent and cost-effective manner. Second, it will allow the network manager to change posture from a reactionary pose of fire fighting to a more proactive stance of anticipation and planning. A key point is avoidance of crisis. When the problem exists, damage has already been done. When the user is experiencing the problem, it is too late.

A critical step is identifying any transaction rate, activity or service that could cause available capacity of individual network resources to be surpassed to the extent that the network fails to meet its service-level targets. To accomplish this goal, the network manager must be in a position to evaluate the current network, optimize the performance of current network resources and plan for the integration of new users and services into the network.

The network manager who successfully implements this strategy will be able to determine when to provide additional service from the existing configuration and when it will become necessary or cost-effective to justify expenditure for additional resource.

The first activity necessary to implement a plan of network performance management is to produce network performance reports that allow the network manager to evaluate the utilization of the resources in the network. For example, information in these reports would tell if a front-end processor is approaching a slowdown (buffer depletion) condition or if a line utilization is reaching a critical level. A review of some simple performance reports will point out underutilised resources and resources pushed to capacity.

The reduction of network measurement data is the foundation of a successful strategy of network performance management. The first step is the reduction of performance measurement data.

The most obvious gauge of how well the network is performing is response time measurement. Response time information can be gathered by hardware or software measurements. Almost all software response time monitors work by implementing a trace in Vtam (the communications access method in the host processor). This trace will time stamp a message at five points. Reduction of this trace data shows the time the message spent in Vtam, in the host environment and network time. This data is collected and reduced in batch mode. Reports that are produced tell the response time as experienced by the end user. This trace can be initiated on a user and/or application basis. This method allows accurate information on end-user response time to be gathered and breaks the response time into major components of host and network time; however, this method also has two major drawbacks.

The first drawback is the requirement that a definite response be requested by the application. Without the implementation of definite response mode, no network response time information can be produced. In most cases, the implementation of definite response puts only a minimal overhead on the network.

The second drawback is the overhead in running the trace, storing accumulated trace data and reducing that data. Although processor overhead is usually acceptable during the running of the trace, space for storing continuous trace data for large networks is considered a problem at some sites. This second drawback can be overcome by running the trace selectively. If it is feasible to implement definite response mode in the application and to control storage resource, accurate end-to-end response time information can be produced by the use of a software monitor.

If response time measurements that can be viewed in a truly real-time fashion are needed, a hardware monitor is the tool required. If you need immediate knowledge of what response time end users are receiving at any moment, the delay incurred in the reduction and processing of software monitor trace data will be unacceptable.

By interacting with the network at the digital interface between the front-end processor and the modem, the hardware monitor can remain transparent to the network while it monitors all messages going across the lines to which it is attached. It breaks response time into major components: inbound and outbound transmission time, poll wait and host time.

A hardware monitor, however, also has drawbacks. The first is cost. To completely monitor a medium-size to large site, purchase costs can easily climb into the $250,000 to $500,000 range. Those who are willing to look at the network piecemeal will find that a less expensive approach is available. For example, for well under $10,000 a user could purchase a single line monitor that would tell the response time for all terminals active on a line as they access all applications. It would also break this response time information into its major components.

The second drawback occurs in both multiline and single-line configurations. Because the hardware monitor interfaces at the line side of the front-end processor, the amount of time it measures as the host delay is actually a combination of total time in the front-end processor and the host environment. For a hardware monitor, host time includes any time spent in the front-end processor due to outbound queuing at the line; any delay caused by insufficient buffers or cycles in the front-end processor; as well as any delay in the host processor, memory or I/O configuration and so on.

IT'S TIME TO STOP PUTTING BAN

Without doubt, the proliferation of personal computers throughout your organization has done much to increase personal productivity within departments.

But it has also given rise to an increasing – and alarming – decentralization of information, much of which is vital to the whole organization.

The answer, of course, is networking – tying together groups of PCs on a system that allows them to communicate with others.

Unfortunately, however, most currently available networking solutions address only part of the problem. Sure, they tie compatible PCs together within departments. But can they communicate with similar networks in other departments?

And where does that leave the information needs of the company as a whole? What about communications between non-compatible PCs, LANs, host minicomputers and mainframes?

What is really needed is a solution that addresses all of your networking problems. A solution like Banyan's Virtual Networking System.

Unlike LANs and other partial solutions to the problem, Banyan approaches networking from the standpoint of distributed computing, where one or more LANs must be supported within departments, between departments, between buildings or even in other cities.

Likewise, network time is not broken into components of local-line time and internodal or backbone time. In most cases, this detail is insufficient for solving response time problems.

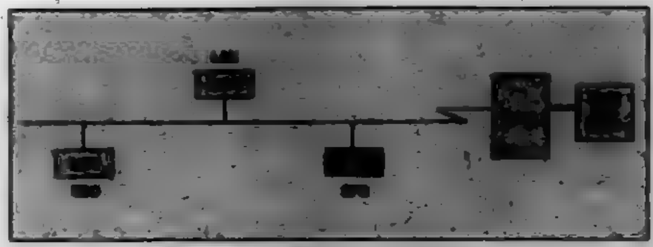

Figure 1. Full-Duplex SDLC Line

Without doubt, the hardware monitor is unsurpassed for accurate real-time data on end-user response time. For cases where the question is why response time is poor, however, the hardware monitor often offers incomplete answers. For those who have access to true host time figures or to a model of the network (for example, Best1/SNA), the host time can be broken out into front-end processor and true host time. A model will also break the network time into boundary time and intermediate backbone time.

There is a class of simpler hardware monitors — control unit or terminal monitors — which are less expensive and easier to implement than line monitors. They report total response time for users at a particular terminal or control unit, but do not break response time into component parts.

Although response time continues to be the most popular indicator of network performance, no simple inexpensive method allows continuous comprehensive response time information to be reported.

Other indicators of network performance do exist. Equally important data can be found in products that allow the determination of utilization of the major network resources. For example, IBM's measurement tool — Network Performance Analyzer (NPA, now a subset of NPM) — allows the user to see utilization of the front-end processor as well as line and control unit utilization. When response time information is unavailable, a review of resource utilization will often point to the problem areas of the network as well as the overconfigured areas.

Successful completion of this first step — production of performance reports — allows the network manager to be alerted to potential problem areas in the network and to look at the balance between network cost and service. The network manager is able to make a gross approximation of where the network is overconfigured and where it is lacking resource. The network manager is able to weigh the dollar cost of existing hardware and software as well as personnel salaries against the service the network is providing.

After the baseline has been established, the second step is performance tuning and balancing. In this step, the network manager can optimize the service being delivered based on effective use of resources — to provide the best network service for the network dollars spent.

Whenever possible, tuning is chosen over adding resource when new users are added to an existing network or when new service is required. Tuning allows new users to be added or better service to be provided for existing users without spending any money.

The most obvious method of tuning is reconfiguring lines, control units or terminals. Configurational tuning simply means moving hardware and users into different physical arrangements. The user experiences a better level of service as more of the network resource is dedicated to him.

Another kind of tuning is software tuning. SNA is a cost-effective network architecture because it allows end users to share resources. The control unit resource is shared by the terminals, the line resource is shared by the control units and the front-end resource is shared by the lines. SNA has tuning parameters (PASSLIM, PACING, RUSIZES) that allow priorities to be set for service to individual users in the network.

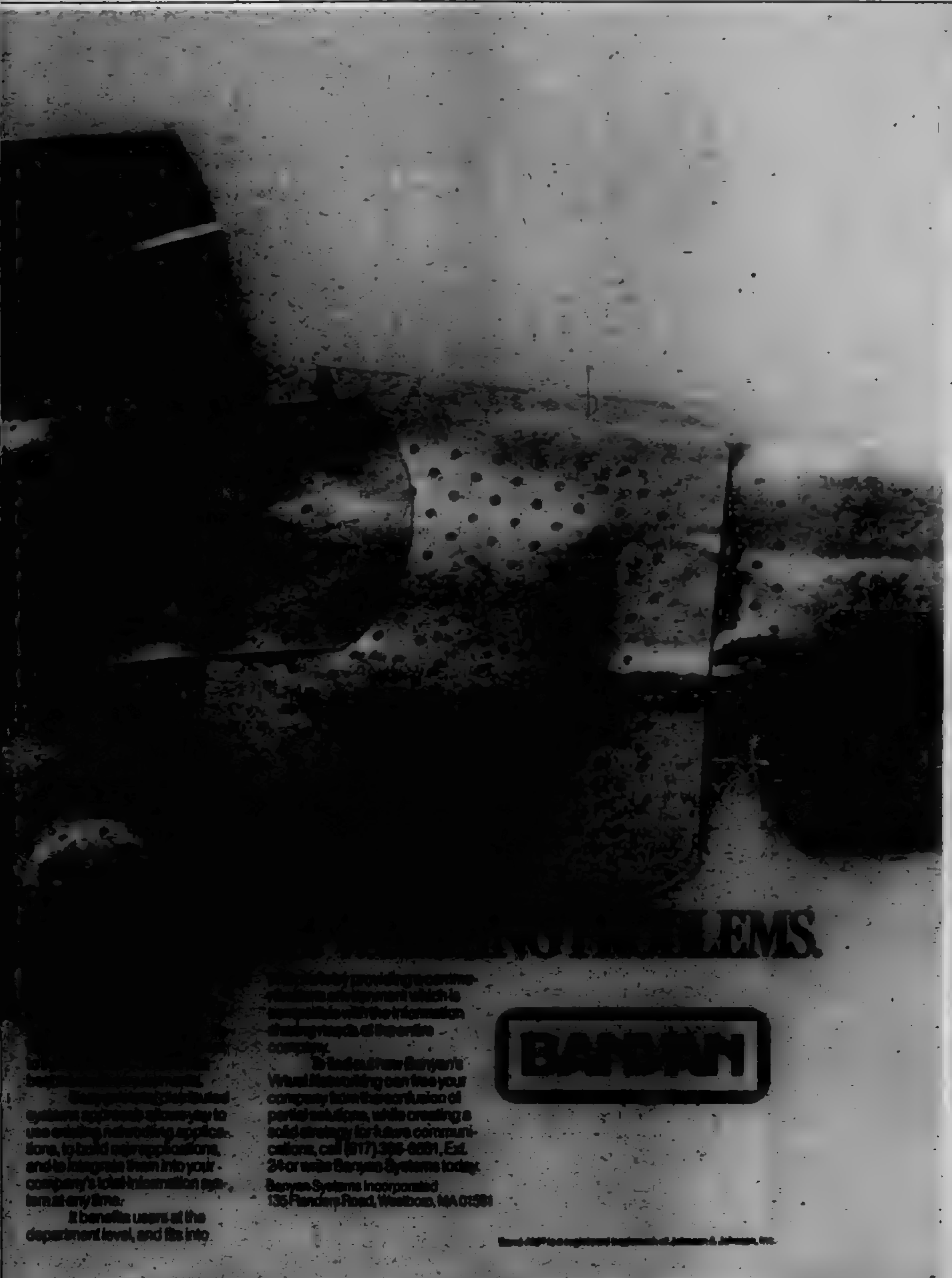

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Figure 1 on Page 39 shows a full-duplex synchronous data link control (SDLC) line with IBM 3274 control units in San Francisco (SFO) and Los Angeles (LAX), and a less active control unit in San Diego (SDO). Figure 2 shows response-times and line utilization for these 3270 users. The users are accessing IMS and CICS and receiving total response-times of about three seconds. (The inbound and outbound message sizes are approximately 40 bytes and 240 bytes for IMS and 30 bytes and 210 bytes for CICS.) From this performance report, the network manager knows the service-level objective — four seconds — is being met.

A short time later, the network manager receives complaints about response-time on the line. Again, a response-time report for that line is gathered. Figure 3 shows the new response-times. All users are experiencing a degradation in service. Upon closer inspection, the network manager discovers 3279 color graphics terminals have been added to the San Diego control unit. The graphics outbound message size is about 3,000 bytes. This work load has a serious impact on existing users. The large graphics messages are using up more than their share of the line and are blocking other users on the line.

How can service levels be restored their targets for all users or for as many users as possible? Figure 4 shows that after adjusting the PASSLIM value from seven to two for the graphics control unit (thereby prioritizing flow to LAX and SFO by allowing them seven frames per service and SDO only two), response-time for IMS and CICS can be brought back into a reasonable range. To provide low response-time to all users on this particular line, it would be necessary to add resource.

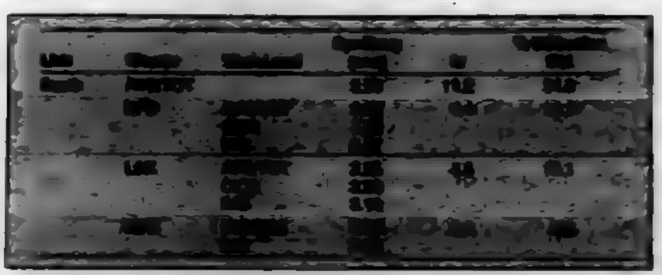

Figure 2. Principal Results Report, 6/30/86, 10 a.m. to 11 a.m.

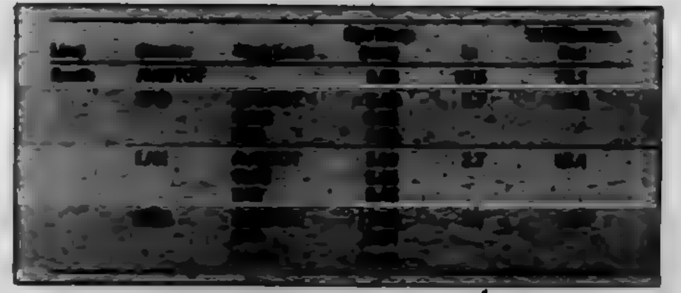

Figure 3. Principal Results Report, 7/8/86, 10 a.m. to 11 a.m.

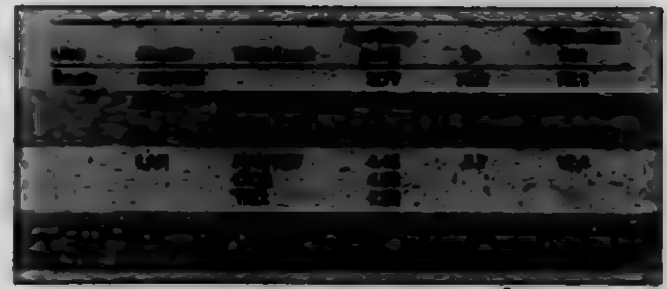

Figure 4. Principal Results Report, 7/8/86, 10 a.m. to 11 a.m.

By balancing and tuning network components, the network manager can control network service among users and optimize the balance between the amount of money spent on network resources and the service the network is delivering. The manager can determine when existing configurations can provide new service and when adding resource to provide new service is cost-justified.

Balancing and tuning the network is not without risk. Tuning as a way out of performance problems or a means to accommodate new users has the major advantage of no visible costs. However, a great risk is associated with this approach. Tuning data flow control parameters is not simple or predictable. Prioritizing and deprioritizing service can have adverse effects on network performance. A change that improves some users' service might have disastrous consequences to others.

Because the network manager is intent on crisis prevention — reacting to problems before they occur — network modeling is crucial. By modeling the proposed tuning changes before their implementation, the manager can predict the system-wide effects of the tuning change before implementing it.

In the example above, the risk-free way to implement change in PASSLIM is to model the change before the new PASSLIM is integrated into the NCP GEN and implementation takes place on the live network. Modeling shows any positive or adverse effects of changing the parameter, eliminates experimentation on the live network and plays a further role in performance management in the network planning phase.

Capacity planning is the third activity required to properly manage the performance of an SNA network. If consistent service levels are to be maintained and the corporation is to continue to meet its goals, crucial new network activities must be anticipated and, if necessary, appropriate compensatory action must be taken while time allows.

The heart of a successful capacity planning strategy is the modeling function. Modeling the network allows the network manager to assess the impact of new users, services, hardware or software before the change takes place.

In the tuning example above, if the proposed graphics users had been modeled before actual implementation in the network, no degradation in response-time would have occurred. There would have been no need for lost production or revenues or bad morale caused by poor response time experienced between the time of adding the new users and implementing the tuning solution.

When new users are added to an existing network, the network manager has the following three main concerns: What hardware (terminals, printers control units, lines) is required in the local and intermediate nodes to support the new users? Can the service-level objective be met with existing resources? Will the new users adversely affect the service of the current network users?

The network model will indicate which configuration of hardware and lines are appropriate for these users. This decision can have a great impact on network cost. For example, an IBM 3274 control unit can support up to 32 devices. Modeling results indicate the performance of different numbers of terminals per control unit. If 10 control units can service 200 terminals as well as 15 control units can, the network planner must be aware of this. A 3274 control unit purchase runs between $6,000 and $12,000. Significant amounts of money ride on these hardware decisions.

After the terminal/control-unit configuration is settled, the number of control units per line must be decided — the second area of configurational planning where the model plays an important role. The model will indicate the optimum number of control units that may share a communications line.

When the configurational question has been answered, the service-level concerns of new and existing users can be addressed. Modeling allows you to cost-effectively plan for the integration of new users and service to the network. It allows you to look at potential service-levels and costs associated with delivering those service levels. The crisis situation can be avoided.

Today's corporations call on the data communications network to deliver their lifeblood — information. The network manager plays a crucial role. Network performance can be directly translated into corporate performance. A network can be a consistent and dependable component of the corporate plan through the implementation of a strategy that employs measurement, tuning and planning and allows modeling to play a strategic role.‡

McDonald is senior consultant for data communications, BGS Systems, Inc. in Waltham, Mass.

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Life in the Fast Lane–Can Telecommunications Managers Keep Pace?

By Stan Kolodziej

Today's telecommunications manager lives life in the fast lane — at least in a corporate sense. The January 1984 divestiture of AT&T opened the flood gates to new communications products, technologies and vendors — all aiming their respective sales guns at beleaguered telecommunications managers who are running hard to keep up.

Telecommunications managers find their galaxy of communications suddenly part of a vast, complicated universe. Where there were once only analog, there is now digital; where there were only twisted-pair wiring, there is now cable, microwave, fiber optics and satellites; where computers and telephone exchanges were once apart, they are now being married; where tariffs were simple, they can now produce migraines.

Communications technology is leaping forward. T1, statistical multiplexers, network managers and computerized branch exchanges are part of the new telespeak. Local-area networks, hybrid private branch exchange (PBX)/local-area networks and PBX versus local-area networks remain controversial topics. Network standards are the next hot contention points: IBM's Systems Network Architecture (SNA) versus integrated services digital network, open systems interconnection versus SNA, broadband versus baseband and General Motors Corp.'s Manufacturing Automation Protocol versus everyone.

Telecommunications managers must keep pace simply because they have suddenly been thrust into the center of the telecommunications vortex. More is expected of the telecommunications manager because more is expected of telecommunications. As a result, perceptions of corporate telecommunications are changing.

According to Dan Muecke, vice-president of technology at Bankers Trust New York, "Telecommunications was once perceived as a cost control center with little business impact. Now it's recognized as an area where corporations can gain a direct competitive advantage."

Duane Heidell, vice-president, corporate telecommunications at Marriott Corp. in Washington, D.C., and president of the Dallas-based International Communications Association, said telecommunications management "is viewed not so much as a technical exercise now as it is a business management function."

Telecommunications in larger corporations is being reshaped to fit into the corporate cutting edge. Telecommunications is a strategic offensive weapon, no longer on the defensive.

Corporations have increased their telecommunications operating budgets on an average of 11% in 1985. New telecommunications employees are commanding up to $35,000 in starting salaries, with directors and managers culling $100,000 and beyond.

Ironically, all this new attention can create an identity crisis. Telecommunications is getting more room to flex its muscles, but sometimes it finds there is no audience. This is not surprising because senior executives have been nurtured on two decades of IBM-dominated data processing. Corporations have long accepted at face value the importance of DP. Not so with telecommunications. Perceptions of telecommunications as a cost-cutting role will take time to change. Until then, telecommunications managers have a selling job — to convince those controlling the purse strings that telecommunications deserves its new place in the sun.

"Telecommunications has been around longer than data processing, but the concept of data and data processing has always been easier for executives to understand and consider important," explained Mary Johnston, senior analyst at the Yankee Group, a market research firm in Boston. Telecommunications can, therefore, find itself at a disadvantage. Management information systems, a DP domain, has over time paved avenues of access to executive power structures in many large corporations.

Equipped with little boardroom clout or inroads to corporate power, telecommunications departments can find themselves in a dilemma: while new technologies increase the competitive importance of telecommunications, only a few telecommunications managers possess the corporate support that is required to transfer this power into tangible benefits for their own departments.

The benefits of technology can be further fickle. The thrust of the new communications technology focuses on integrating voice and data. Though traditional voice analog technology kept telecommunications a weaker corporate department, it also kept it separate and often autonomous. Digital data, however, forms the lifeblood of MIS. And, like an extension of some natural law, the greater the role digital technology plays in telecommunications, the greater the influence of MIS over telecommunications.

Though the sway of MIS over telecommunications was strengthening even before local-area networks and digital PBX came to the fore in the early 1980s, the divestiture of AT&T seems to have accelerated the process. In response to the confusing array of tariff rates and vendors, many corporate executives have decided to face uncertainty with a united front — usually in the form of a merger with MIS. Many telecommunications managers have found themselves in the paradoxical position of having increased prestige (and salaries), but decreased autonomy, often reporting to the MIS director or equivalent.

Another corporate tactic gaining ground is to keep telecommunications and MIS separate, but place them under an umbrella information group. As industry watcher Johnston pointed out, however, the supposed emphasis on separateness can be misleading. "Some companies," she said, "are saying they hold telecommunications on an equal footing with data processsing. They place the two under an umbrella organization, but typically the person in charge of the umbrella group is from MIS. There are a number of parallel organizations [from telecommunications and MIS] in the making, but it seems that MIS is taking the lead and getting more people at the top."

If this is the case, many corporations don't seem to mind. Muecke explained that a year ago at Bankers Trust, after both departments were merged under a new technology umbrella group, the telecommunications manager and the MIS director became "peers." They report to

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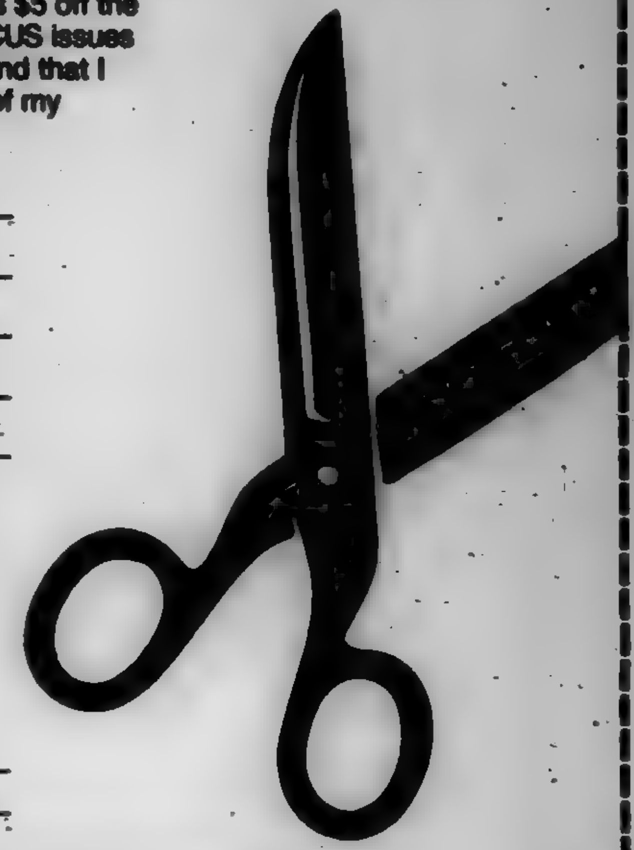

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the same executive vice-president, and things are working out nicely.

Harry Venable, director of telecommunications services at Celanese Corp., Charlotte, N.C., said although the telecommunications and management services (MIS) departments at Celanese report to the same vice-president, they are separate at the director's level. Venable stressed this has been in effect and working admirably for years.

At Shearson-American Express Corp. in New York, telecommunications and MIS were separate until a few years ago, when they were merged under the umbrella communications systems group. Andy Sokolov, senior vice-president, said, "Now that voice and data are using the same T1 systems and there is a good deal of joint coordination in effort and implementing [office] branches, it makes sense to combine these forces under an umbrella group." Sokolov reports directly to the executive vice-president of MIS.

In a recent poll conducted by The Conference Board, Inc., New York, the group found almost 40% of the companies responding had the MIS executive sharing responsibility for telecommunications planning with the telecommunications manager. The actual number, however, is generally agreed to be even higher.

Just as major technical forces such as T1 transmission seem to be bringing telecommunications and DP together, some smaller forces that are steadily growing in importance are pulling them apart. Many forms of bypass technology such as fiber optics, microwave transmission systems, satellite stations and teleconferencing are increasingly being used as ways of circumventing overburdened public telephone and packet-switched lines. As these new technologies gain ground, so does the influence of MIS.

"A lot of telecommunications products and services are now being marketed directly to data processing people," explained Jerome Lucas, president of Telestrategies, Inc., a McLean, Va., consulting firm. "In our case, we're seeing a lot of small-apertured satellite earth stations for two-way transmission being purchased directly by data processing people. The data processing people have a strong interest in things like satellite networks because it gives them total and complete control."

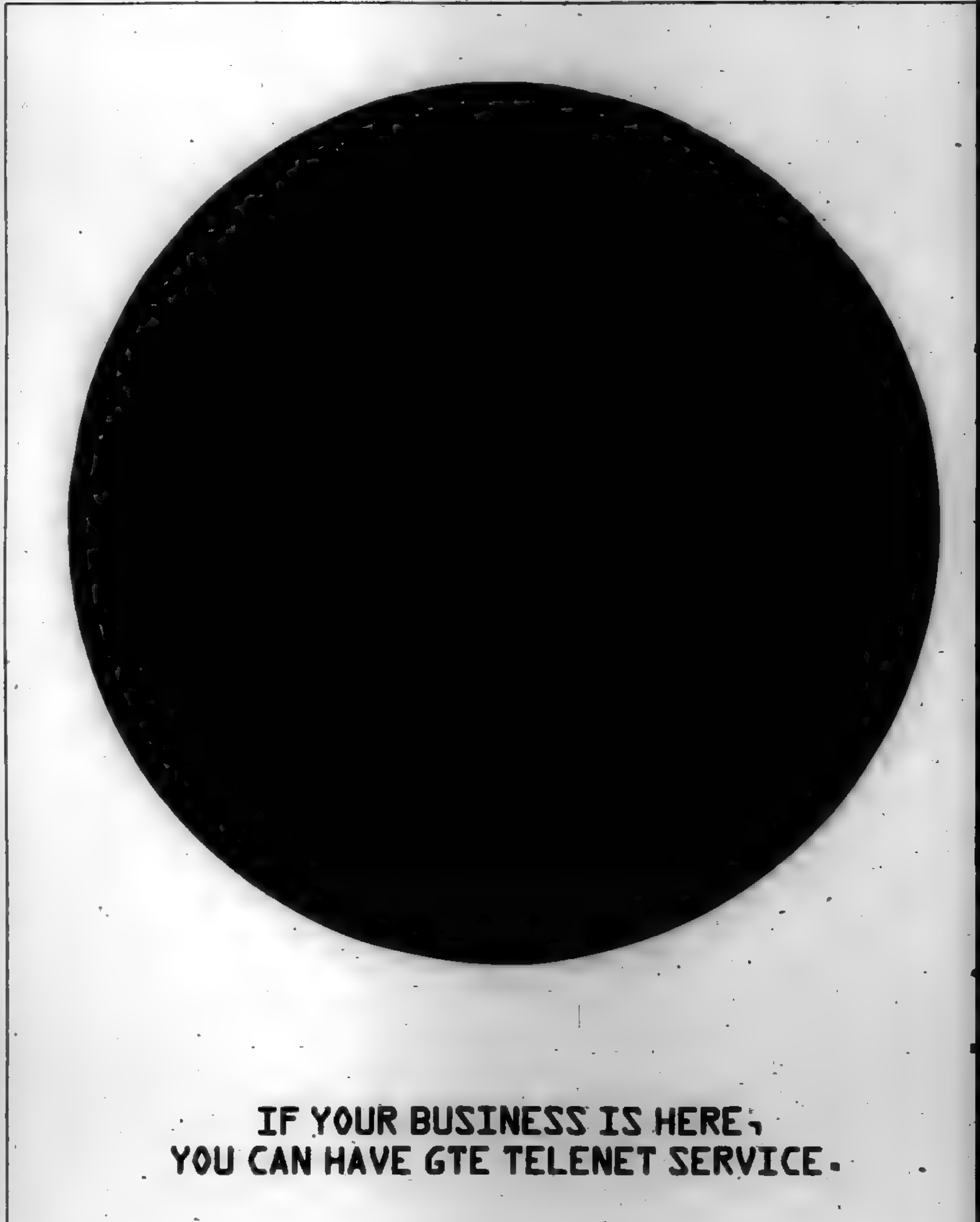
The pros and cons of having MIS gain more control of telecommunications are debatable, but telecommunications managers do agree on two things: Divestiture was good for the industry, and there is pressure on telecommunications managers to expand their knowledge beyond the technical sphere.

The pros and cons of having MIS gain more control of telecommunications are debatable. Telecommunications managers, however, do agree on two things: divestiture was good for the industry and there is pressure on telecommunications managers to expand their knowledge beyond the technical sphere.

Telecommunications managers do not wish to turn back the clock to predivestiture days. They treat the chaos of the year following AT&T's breakup as a necessary penalty to pay in the worthwhile transition to the more rewarding, albeit confusing, marketplace of competition and choice. "Where it once took a single call to get something done, it might take three or four now," Bill Coopman, manager of telecommunications at Deere & Co., Moline, Ill., explained. "In some cases there are more headaches, but when I look at today's products and services, the competitiveness and pricing structures, I get excited about it. I wouldn't want to go back."

In light of the rush of new vendors and products following divestiture, users are stressing reliability and service as top selection criteria. Companies fear an industry shakeout and look to long-term vendor stability. As Jerry Marcone, assistant vice-president of telecommunications at Crum & Forster Corp., Morristown, N.J., put it, "You can save all the money in the world, but if you can't get a person to come in and give you dial tone, voice/data integration doesn't mean a heck of a lot."

Though it could be argued that such a situation breeds an overly conservative attitude on the part of corporate telecommunications users, the figures can show the opposite. A recent survey conducted by Newton-Evans Research Co., Inc., of Ellicott City, Md., found more than 50% of the respondents planned to be less reliant on AT&T for communications services by 1987. Only 9% thought they would make more extensive use of AT&T during the next few years. So much for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AT&T being the telecommunications life raft. If anything, it is fighting to retain a share of the telecommunications pie.

The flood of new technologies places the telecommunications manager at the hub of corporate life. Communications has become "sexy," and attractive, according to Kerry Overlan, director of corporate telecommunications at the United Brands Co., based in Boston. Career paths are opening wide. Telecommunications is now managerial as well as technical in scope. Many telecommunications managers are earning masters' degrees in business and degrees in finance on top of degrees in electrical engineering, programming and computer science. Many are learning the ins and outs of their businesses. Telecommunications managers no longer are expected to be just "techies." They have to know how all the pieces of an organization fit together and, more important, where telecommunications fits in. To do that, they also have to keep on top of current technology. "Telecommunications managers have to be more involved with the technology," Lucas said. "The day is past when the telecom manager relied very heavily on vendors to do analysis and understand the technology. Telecommunications managers are taking on more responsibilities in planning and operations. They just can't pass everything off on a management or maintenance contract."

In a recent speech, telecommunications consultant Richard Kuehn of RAK Associates, Cleveland, Ohio, said the era of system purchases to supplant rental costs is virtually gone for the telecommunications manager. The telecommunications manager, Kuehn stressed, must now compete within the organization for capital dollars that will provide a sufficient return on investment to justify their expenditure. Corporate production, distribution and other administrative areas will all be vying with telecommunications for scarce resource money. Telecommunications managers, like their colleagues in MIS, will have to know more than just communications; they will have to sell it to the top brass.

Muecke put it more bluntly: "Any telecommunications manager of any reasonable-size company who doesn't know financial management is saddled with a severe career disadvantage. You might not need an MBA, but you need to know financial analysis and be able to make presentations to senior management. If you can't do that, you have a problem."

Bernie Kemple, central-region manager for Tymnet, Inc., in Dallas, has seen a dramatic change in telecommunications managers in the past few years. "We would call on people [to sell networking services] and there would only be a data processing or MIS manager," he explained. "Many companies did not even have telecommunications managers, and those that did were relatively naive in their technical knowledge of communications. Now, because of the dollar volumes of these telecommunications budgets, companies are hiring more educated, credentialed people, some with MBAs on top of technical degrees. In many cases, they are becoming peers of MIS managers."

Telecommunications is demanding more from personnel, but the supply of personnel to fill telecommunications is tight. Finding and keeping qualified telecommunications people is not easy. Among corporations, heavy competition in recruiting and head-hunting is heating up, causing salaries to spiral upward. The days are probably gone when telecommunications recruits could be gradually nurtured through on-the-job training. The acceptable learning curve is growing shorter. Companies want newcomers plugged in and quickly operable. Many companies now recruit directly from the few colleges and universities offering telecommunications courses and degrees. Those that cannot find adequate personnel from outside are recruiting from within their MIS ranks, accelerating in-house training.

As telecommunications in the large Fortune 500 companies becomes complex, specialization is necessary. Like the medical profession, telecommunications sees a growing number of specialists in tariffs, PBX, T1 systems, fiber optics and network management. Coopman, who has been in telecommunications for 17 years, explained, "Back when I started, you could be a jack-of-all-trades. Now you have to begin specializing in PBX systems, in network engineering and enhancements like teleconferencing, voice mail and electronic mail. We have an expression, 'Nothing is easy anymore.' "

Maybe not easy, but life in the fast lane does seem to be more agreeable to most telecommunications managers. "As I go to seminars, I find telecommunications managers are enjoying their jobs more . . . even the telephone companies are enjoying it more," Lucas said. "Everyone complains, it's confusing, we'll make mistakes, but it's a more fascinating business to be in."

■

Kolodziej is a senior writer at Computerworld Focus.

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Packet Switching: What's Down the Line?

On March 1 the FCC opened the gates for the BOC to enter the packet-switching arena. That's both the good news and the bad news. New equipment, new services and new problems are arising as the players reposition in the market.

By Pamela Powers

Packet-switching has been widely promoted lately as a preferred method of transmission. Traditionally, the medium best served users that sent large amounts of asynchronous, bursty data over long distances. With improvements in technology, however, usage has evolved to encompass a variety of environments. This evolution is apparent in both sectors of the marketplace: the services sector, which includes value-added networks, and the equipment sector, which includes vendors of packet-switching nodes and packet assemblers/disassemblers.

Since the days when GTE's Telenet and Tymnet, Inc.'s Tymnet were the only players in the field, the value-added network marketplace has grown tremendously; an impressive array of fledgling vendors have now come to hawk their wares. At least 15 value-added networks of varying degrees of sophistication are currently available in the transport and manipulation of data. The veteran players retain the lion's share of the market; a large chunk of the remaining share is occupied — in descending order of penetration — by the following companies: United Computing Systems, Inc.'s Uninet; Compuserve, Inc.'s Compuserve; IBM's Information Network; ADP Network Services, Inc.'s Autonet; and AT&T Information Systems' Net 1000. (See Figure 1, Page 52.) Despite other companies' demonstrated enthusiasm for joining the fray, Tymnet and Telenet reaped profit from their ventures into the value-added net business only last year. With due respect for this caveat and the confused regulatory and competitive climate, vendors have adopted diversified approaches in order to attack niche markets.

The regulatory vagary the Federal Communications Commission (FCC) has promulgated in recent years is radically altering the texture of the value-added marketplace. On March 1, 1985, federal regulators authorized Bell operating companies' provision of asynchronous-to-X.25 protocol conversion, heralding the full-fledged entrance of Bell operating companies to the packet-switching arena. The decision enables Bell operating companies to offer asynchronous-to-X.25 conversion over their own public data networks rather than through a separate subsidiary. According to the FCC, the waiver will heighten the efficiency and availability of packet-switched services as well as contribute to the operating companies' revenues, thereby allowing cheaper local rates. This further relaxation of the rules enables Bell operating companies to stick a large finger in the packet-switching pie.

The fear that lurks behind the ruling is cross-subsidization. In the event of local packet-switching, Bell operating company-to-Bell operating company links and/or inter-local access and transport area service would encroach upon the value-added network turf by eliminating a primary source of revenue for value-added networks — access charges from the local loop to the public data network.

> **Despite some doomsday prophecies and an air of uncertainty, the value-added networks market will continue to hold its own. Bell operating companies' participation in the marketplace will complement services available across the value-added networks.**

The silver lining — and a factor that will have a more significant impact on the marketplace — is the role the Bell operating companies will play in extending value-added network service to previously untouched areas. This expansion into the local access and transport area will lure a new potential user base — small business and residential users.

In this incipient frenzy to keep their heads above water, the value-added networks are busily cleaning house. The following distinct trends have emerged:

- Increasing node intelligence. Micros have preempted minis as intelligent node processors, and protocol conversion capability is increasingly integrated into hardware, firmware and integrated chips.
- Increasing node accessibility. Value-added networks are evolving to hierarchical architectures utilizing smaller nodes in less concentrated areas and larger nodes in more heavily trafficked areas. This will permit greater geographic dispersion of the networks.
- Increasing applications specificity. More intelligence and the attempt to corner niche user markets is resulting in networks dedicated to specific applications.

Despite some doomsday prophecies and an air of uncertainty, the value-added networks market will continue to hold its own. Bell operating companies' participation in the marketplace will complement services available across the value-added networks.

Provided the FCC keeps a lid on anti-competitive behavior, the entrance of the operating companies should serve to open up new niches of potential business for value-added networks. In 1984, vendors reported earnings reflecting steady growth, with Telenet and Tymnet retaining positions at the top. The overall pattern suggests several lucrative years ahead with a five-year compound annual growth rate of 35% predicted, totaling to a year-end 1989 market of more than $1 billion.

Development of new private networks, upgrading for public nets, expansion of installed base and increased use of hybrid networks as carriage to the value-added networks all contributed to a healthy climate for vendors of packet-switching systems in 1984. Systems vendors are approaching high-volume businesses more aggressively; the swing to private networks is imminent. Government, banking, transportation, retail and manufacturing concerns all have immediate needs for efficient data transport and are becoming more willing to invest initial capital to ensure reliability later. In the interim, systems vendors continue to reap handsome profits from their installed bases, whose needs continue to grow.

Finally, carriers (especially the Bell operating companies) provide a hefty chunk of the yearly shipment revenues (particularly for Northern Telecom, Inc. and Databit/Siemens Corp.). These customers own vast amounts of backbone that require continual upgrading to support density of data traffic across lines. As switch offerings continue to improve and user needs expand correspondingly, systems vendors will enjoy some healthy profits. In 1984, shipments of nodes totaled $222 million, up from $105 million in 1983. The industry can be expected to achieve a 23% compound annual growth rate, culminating in $541 million in worldwide shipments in 1989.

The packet-switching equipment market is dominated by a few heavyweights, (with GTE Telenet, Tymnet, Northern Telecom, BBN Computer Corp. and M/A-Com, Inc., at the top, ranked in descending order of penetration), yet the U.S. harbors an enormous demand that allows for a steady infiltration of new players. The domestic market still sits at the beginning of the demand curve, such

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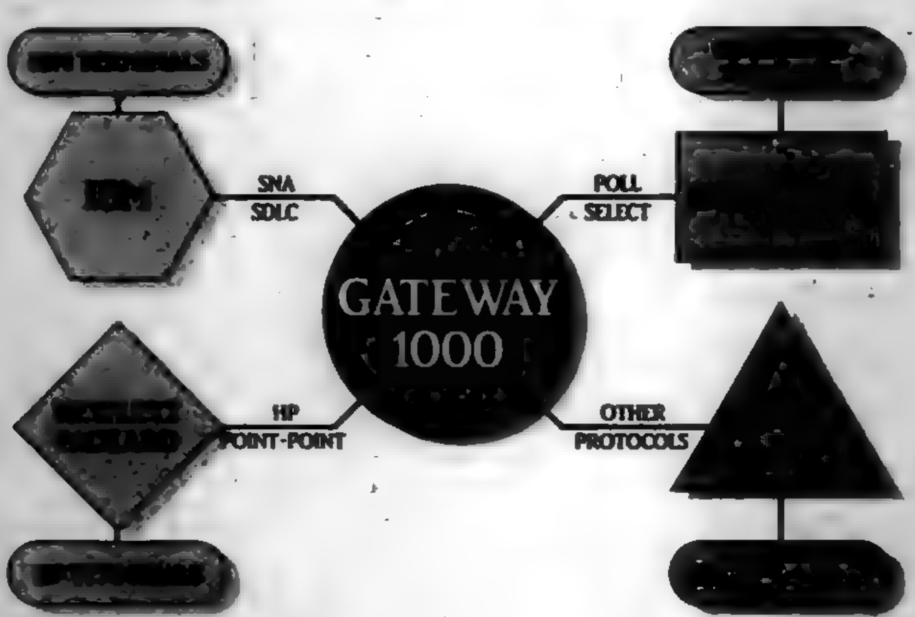

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that supply will most likely not surpass profitable bounds for years to come. Most corporations with heavy communications requirements are at the very least considering packet-switching as a viable option. Many of them are currently drawing up requests for proposals or negotiating contracts. This large base of potential users is where entrants will gain a toehold.

Entrants have found OEM arrangements to be a highly beneficial tactic. Credibility is easily gained by this route. If a switch is private-labeled by one of the hottest names in the industry, the low-visibility manufacturer will receive credit where it is due.

OEM arrangements are all the rage for other reasons as well. Given the initial capital outlay required to research, develop and market a node, it is not advisable for most companies to brave the marketplace alone. Typically, a vendor toying with the systems sales idea has the technological know-how available in-house for some of the job. The rest is most profitably arranged through a joint venture or OEM deal. Almost all vendors currently manufacturing and/or marketing packet-switching equipment expect a significant increase in OEM arrangements over the next five years.

As vendors attempt to accommodate users with all levels of communications requirements, nodes are manufactured on a sliding scale: up in capacity for the vendor with a low-end offering and vice versa. Dynapac Co., which has always targeted the low end of the market, has plans to develop a high-end switch. Northern Telecom, at the other end of the spectrum, intends to OEM a smaller switch. Increasingly, companies contemplating a private packet-switching network have some low-end requirements in areas of the country with a low concentration of traffic.

Under these circumstances, a node purchase is cost-efficient only when its minimum capacity is small. In the future, large nodes will manage traffic in central locations on the network and smaller nodes will manage less trafficked portions on the ends of the network.

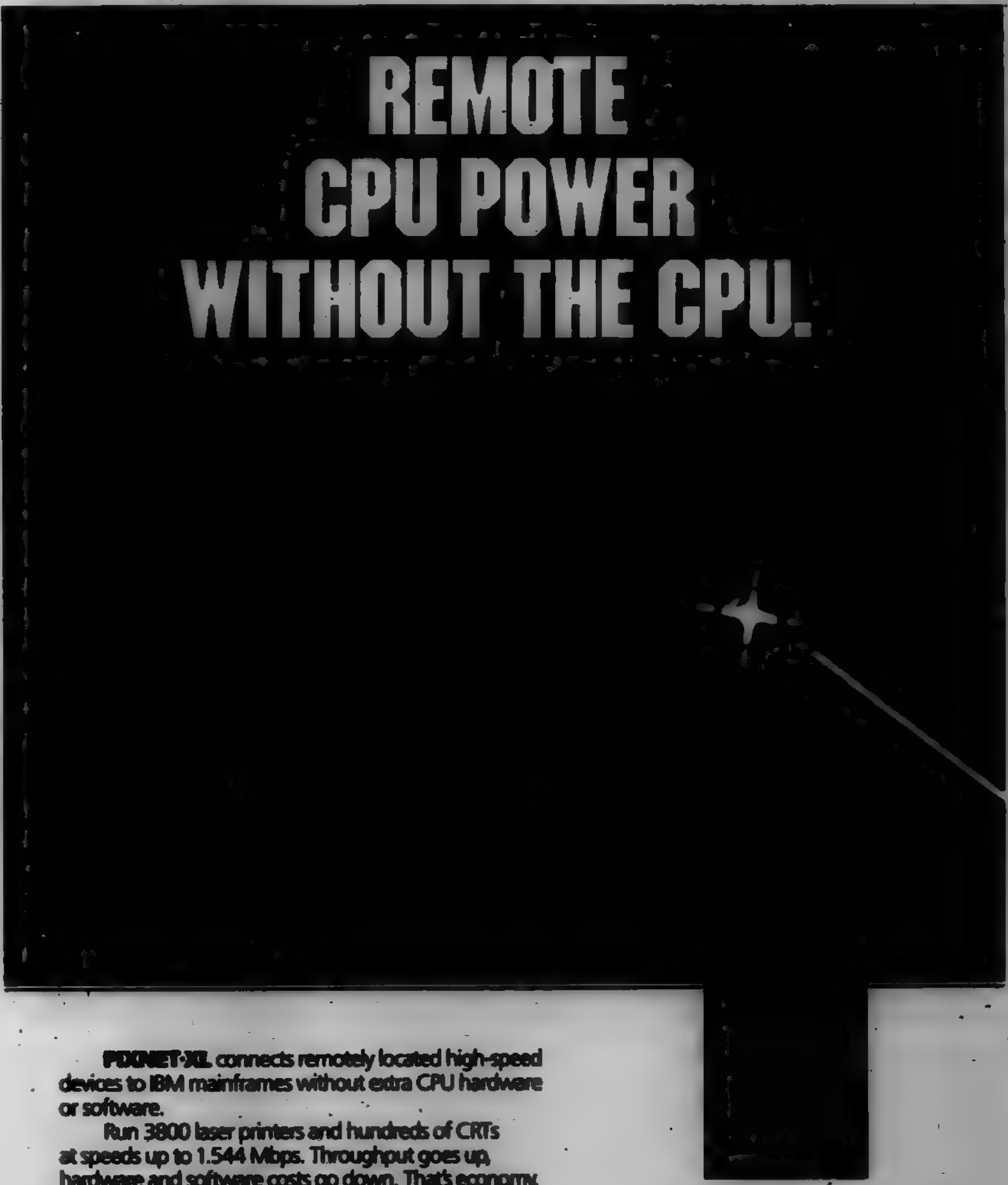
Finally, vendors have placed more emphasis on network management capabilities. For the user, the first level of concern is not the statistics collection; rather, it is fully functional diagnostics. In some proposals, the network management represents as much as half the cost of the network.

Capability will lose to cost-efficiency when stakes are that high. The year 1984 showed a maturation of network management in terms of functionality. New systems address the ever-changing status of the network by employing user-generated alarms, multilevel network security and on-line diagnostics with improved user-friendliness.

In 1984, worldwide stand-alone packet assembler/disassembler sales by U.S.-based vendors reached $34.5 million. A 30% growth year should occur in 1985, followed by a slight decline over a four-year period. Total worldwide shipments for 1989 are projected at $89.1 million. Vendor survey research conducted in March 1985 indicates Micom Systems, Inc., Dynapac and Memotec Service Corp. hold the lion's share of the packet assembler/disassembler market.

Marketing effort over the next year will be heavily concentrated on sales to the Bell operating companies. Local-area data transport (LADT) networks are about to undergo some major overhauls, and packet assemblers/disassemblers will play the largest part in the face-lift. The long-awaited improvement in local data transport and dial-up access to value-added networks will undoubtedly shore up a bountiful grab bag of new users. Everyone is clamoring for a piece of the action.

The U.S. is becoming the largest target market for packet assembler/disassembler vendors. Companies that have successfully penetrated the Canadian market — Memotec for example — are in the process of



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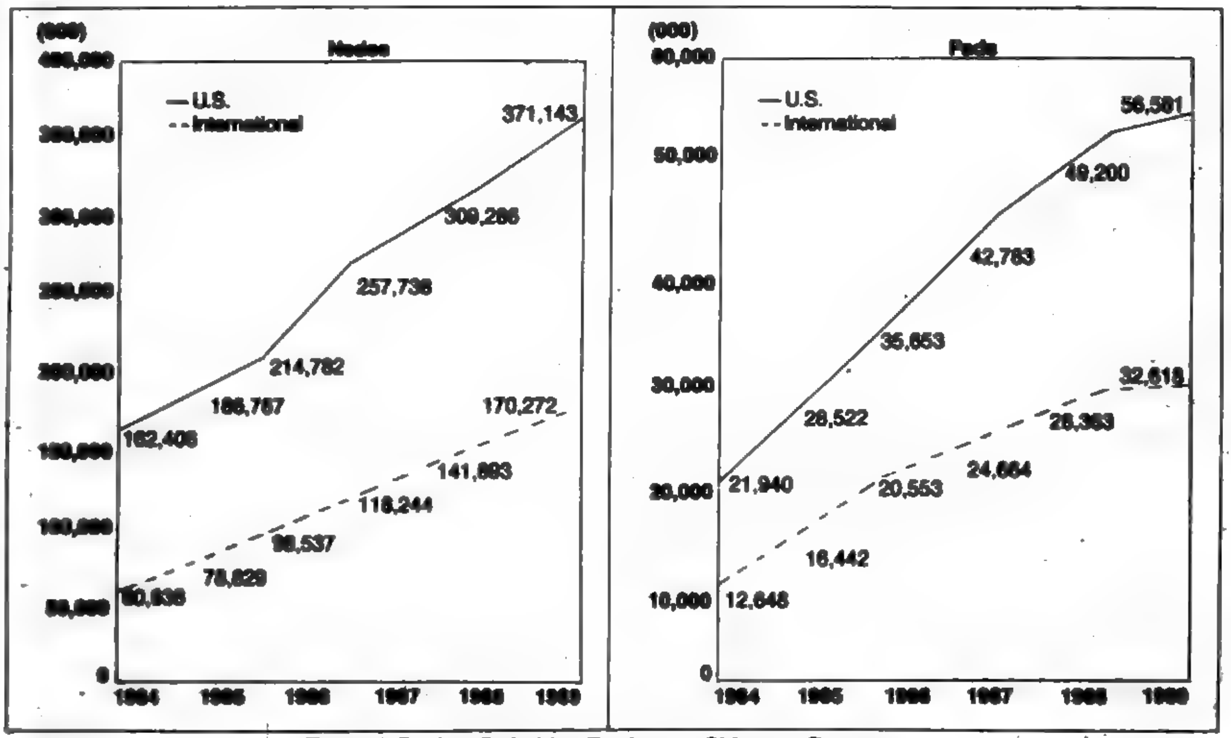

Figure 1. Packet-Switching Equipment Shipment Revenues

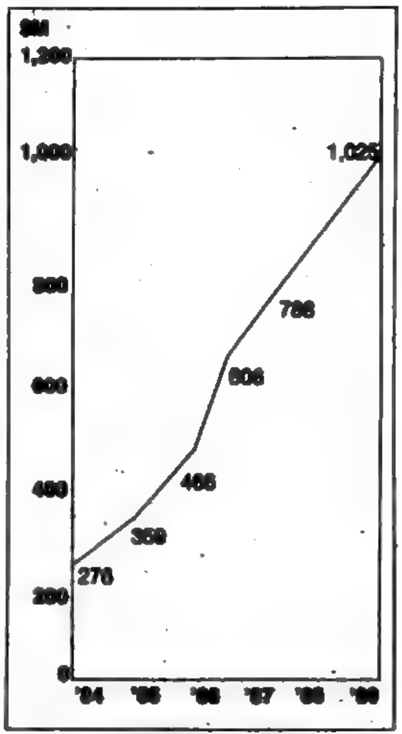

Figure 2. WAN Service Revenues

training their sales forces to attack the U.S. front. Domestically, the demand for packet switching is approaching its ripest moments. We will witness a greater division of the spoils in the near future. As the market approaches saturation (still many years off), the number of packet assembler/disassembler vendors will slack off again. Some will fail; many, as is the case with systems vendors, will develop OEM arrangements.

The X.25 gateways on wide-area networks are being introduced with increasing frequency, as are X.25/Systems Network Architecture (SNA) interfaces. The new generation of private branch exchanges (PBX) has X.25 support. AT&T's new PBX supports Levels Two and Three for X.25, for both permanent virtual circuit and virtual call modes. Northern Telecom's Meridian PBX will implement an X.25 interface, to be operable in the near future. All this suggests that access to X.25 will attain near-ubiquity within the next 10 years. As more and more data communications equipment supports this function, the packet assembler/disassembler manufacturers will inevitably fall upon leaner days.

An emerging trend that is not yet a threat to packet assembler/disassembler distribution is X.25 on a board. The protocol conversion function is now available on

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an add-on board the user can buy with the terminal. Both Western Digital Corp. and Rockwell International Corp. manufacture X.25-on-a-chip for use with add-on boards. This offering won't penetrate the market for a while because hardware costs are too expensive to allow competitive product pricing.

Dial-up X.25, which was brought to market in 1984, will alter product functionality in the near future. On the terminal end of the network, X.25 has not caught on because synchronous interfaces are difficult to develop. X.PC and other proprietary protocols have fulfilled an intermediate need. As synchronous interfaces become better defined, X.25 will be available from terminal to network. With this new phase in communications, the procotol conversion function will become a commodity of sorts and will be available with greater frequency on modems and multiplexers. Vendors of 2,400 full-duplex modems will develop X.25 conversion capability as soon as it is feasible, and the resulting products will become significant contenders in the packet assembler/disassembler marketplace. Modem vendors will have an edge with their installed base. Although retrofitting modems for X.25 conversion does not seem a viable solution at this time, the installed base of users will go for a known evil and purchase the capability from their modem companies.

In anticipation of this emerging market, some versions of integrated packet assemblers/disassemblers and modem functions are already available. In February 1985, Wolfdata, Inc. announced its WD212-X.25 Integral Modem/PAD and its WD212-X.25 Stand-Alone Modem/PAD. The integral unit is compatible with the IBM Personal Computer, Personal Computer XT and Personal Computer AT systems and the AT&T 6300 PC. The stand-alone unit interfaces through RS-232. Both connect with Telenet's

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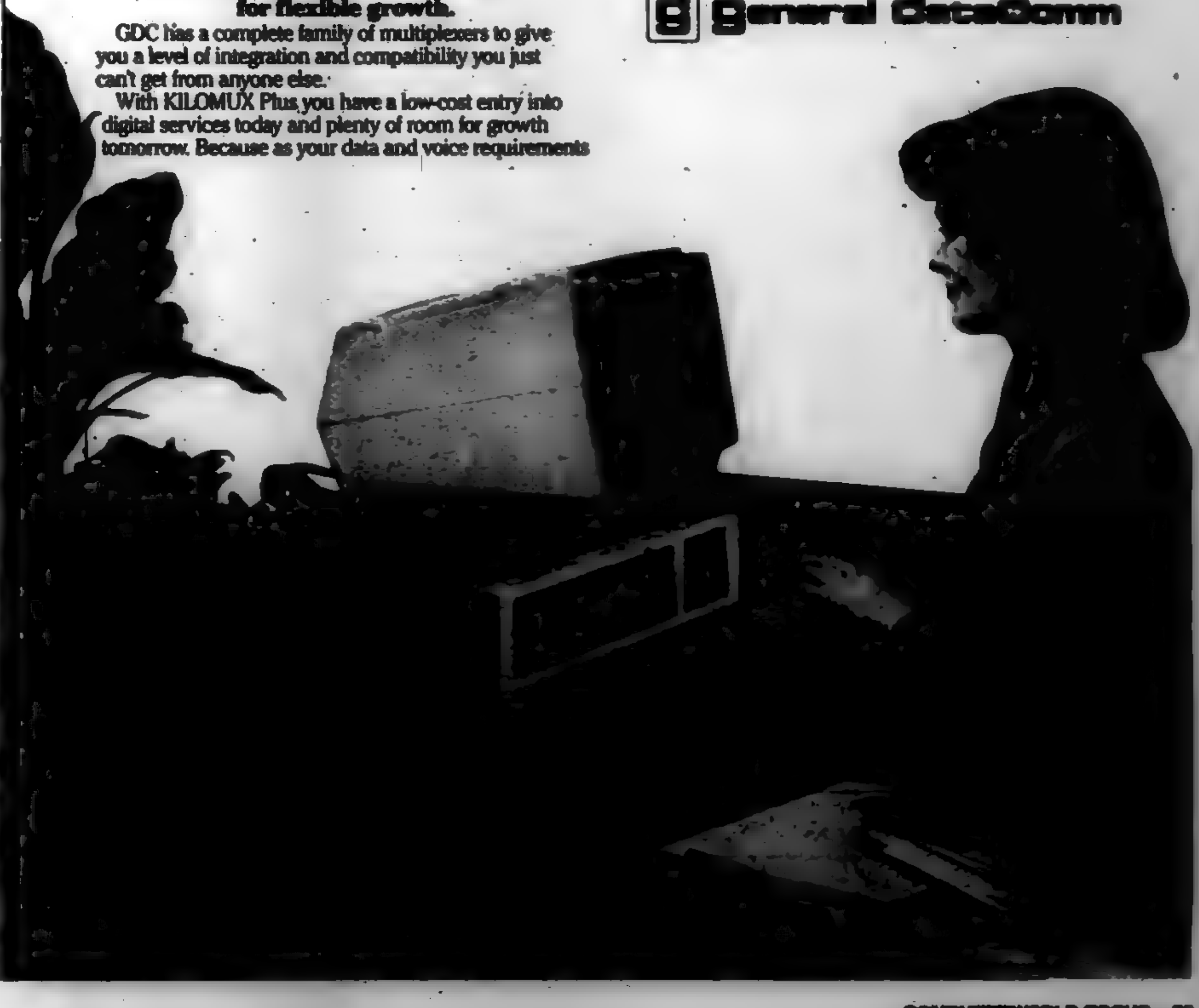

recently announced dial-in service and are upgradable to X.32.

The packet assembler/disassembler function will expand as the board gets smaller. A considerable portion of the traffic out there runs on asynchronous, but IBM's 9-bit bisynchronous Synchronous Data Link Control (SDLC) will continue to grow in popularity. Over the next few years, vendors are looking to further accommodate the IBM environment. SDLC packet assemblers/disassemblers are becoming more prevalent. Asynchronous-to-X.25 and SDLC-to-X.25 will more frequently be available on the same packet assemblers/disassemblers. Multivendor compatibility is the overriding theme; better to accommodate too many than too few. Market revenues for 1984 reflect, at most, 20% bisynchronous-to-X.25, SNA/SDLC-to-X.25 packet assemblers/disassemblers. Current offerings are still comparatively expensive. The price will be driven down as more such products are brought to market (several companies are developing or looking to OEM a bisynchronous/SDLC packet assembler/disassembler).

In anticipation of lower margins a few years from now, packet assembler/disassembler manufacturers developed cheaper hardware in 1984. New products, as was the case with nodes, reflected a commitment to accommodation of all user types, from large to small. But they also boasted higher speeds and more flexible conversion capability in smaller boxes at lower list prices. The development of dial-in X.25 will significantly contribute to future customer premise equipment sales, which currently comprise only a small portion of 1984 packet assembler/disassembler shipments. Further, the Bell operating companies' asynchronous-to-X.25 conversion waiver targets them as packet assembler/disassembler users on a grand scale. Most players are repositioning to grab a piece of this emerging business.

Overall, we can safely project a bullish packet assembler/disassembler market over the five-year forecast period.

■

Powers is a senior analyst, Communications Industry Research, International Data Corp., Framingham, Mass.

Forecast Notes

☐ Dollar value of nodes and packet assemblers/disassemblers is forecasted at a decreasing growth rate over a period of five years. Price competition is expected to become stiffer in the equipment marketplace. Packet assemblers/disassemblers in particular will decrease in price for the following reasons:

- The bisynchronous packet assembler/disassembler, which is included in this forecast, is still very expensive. As more vendors introduce these products, the price will fall.
- The packet assembler/disassembler function will be available on other types of data communications equipment such as modems and add-on boards, which will force the packet assembler/disassembler price down.
- Down-sized packet assemblers/disassemblers with a lower minimum port capacity are already infiltrating the market.

☐ Market size is based on total shipments of U.S.-based vendors. Shipments represent units/systems that are newly built and sent to end users or OEM suppliers in any given year. Refurbished equipment that is reinstalled is not included in shipment estimations. In some cases, shipments are greater than the net addition to the installed base, a discrepancy that is attributed to the retirement of currently installed products.

☐ The dollar value of shipments is based on the total revenue intake from surveyed vendors over calendar year 1984. Numbers for the revenue forecast are derived by increasing this shipment base by a given percentage each year. The forecast for nodes runs at a compound annual growth rate of 19%. The stand-alone packet assembler/disassembler market will grow at 30% until 1986 and will then experience a more rapid decline due to the introduction of alternative product offerings.

☐ Dollar value of packet-switching services and equipment is represented in nominal dollars throughout the forecast.

☐ The dollar forecast for nodes reflects a depression in overall revenues during the 1984 and 1985 time period, at which point growth picks up to 20% yearly until 1989. This illustrates the fact that node prices are rapidly declining. International Data Corp. attributes this drop to the entrance of new players that can offer switches at a greatly reduced price as a result of new micro-based technology.

Some vendors still manufacture dinosaurs, which must be sold at a premium to compensate for production costs. As a result, node prices have been maintained at an artificially high level. Over the next two years, these vendors will adopt existing new technology, and node prices will drop consistently across product lines.

Following these reductions, the market will experience a small resurgence in price escalation as newcomers become established. Price/performance ratios will assume the texture of the minicomputer-based markets (for example, they will be based on improvements in technology).

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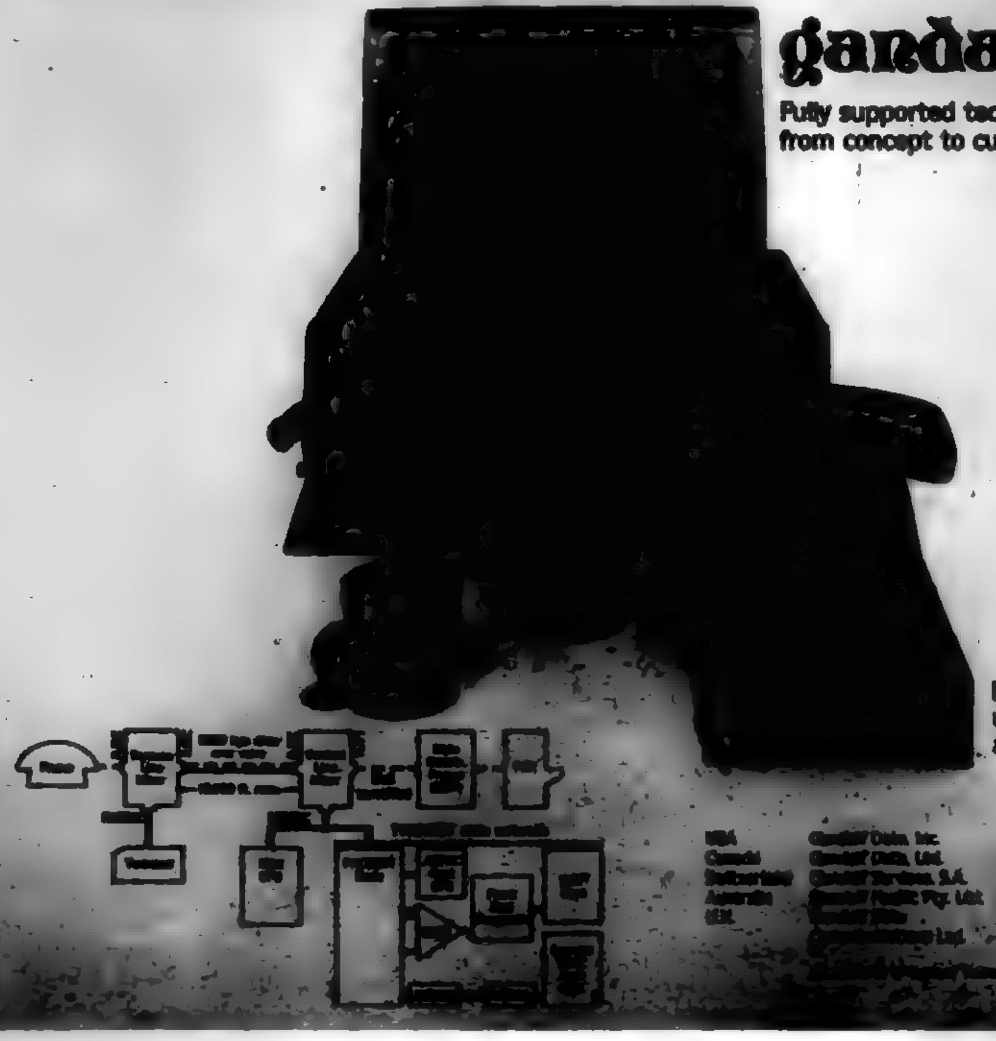

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HERSHEY'S
GETS CONNECTED

Hershey Chocolate's goal of a computer on every desk by 1990 is requiring clever space planning. Hershey has met the challenge through some innovative cabling strategies aimed at reaching that goal.

By Lee White

What do you do when your long-range directive is to put a computer on every desk, but a jungle of cables is already threatening to overtake normal operations?

Dennis McNamara is a mechanical engineer in the Technical Services Department of Hershey Chocolate Division, Hershey Foods Corp. in Hershey, Pa. McNamara's technical expertise is unquestioned, given the 14 years he has spent at Hershey, but a sideline to his chosen field is an aesthetic sensibility that was offended on a daily basis by the cable jungle.

McNamara had been reading about flat undercarpet wiring for data communications and hoped someday to try the concept in a small pilot project. About this same time, members of the executive suite at Hershey were looking at how best to couple the company's short-term and long-term growth with sophisticated future office automation plans.

Instead of a small pilot project, McNamara was given what he saw as the plum assignment of his career: 52,000 square feet of project, half of which is new construction and half of which is renovation. When finished, the space would house Hershey's entire computer center, 10 other departments and more than 270 employees.

The project began in October 1983 with an in-house study. Because so many people with varying needs were involved, input was solicited from everyone. "We surveyed people throughout and asked them what they wanted, what their needs were and what it would take to do their jobs better," McNamara said.

From the beginning, it was obvious that trying to update the wiring system using conventional methods would nullify many of the benefits anticipated from the change to a modular, open-office environment with movable partitions. The old wiring, which included floor ducts, power poles and a network of surface wiring, could no longer accommodate employee needs. Because management's goal was to place a computer terminal on every desk by 1990, the company decided to connect all electrical, communications and data processing equipment with flat, undercarpet wire.

All the engineering for the project was done with Hershey employees; McNamara was the project manager and mechanical engineer. His skills were supplemented by an in-house electrical engineering group, staff from Information Services Department and Network Control Center representatives who provided needed information regarding the telecommunications function.

As a hedge against future needs, the team elected to install three-pair telephone lines, although only one is being used at this time. The cost to install the cable with an extra two pairs was minimal compared with the cost of installing more cable some years down the road.

As a hedge against future needs, the project team elected to install three-pair telephone lines, although only one of the pairs is being used at this time. As with most facets of new construction or renovation, the cost to install the cable with an extra two pairs was minimal compared with the cost of installing more cable some years down the road. Installing spare pairs is becoming quite common, according to Chris Rottman, market manager for undercarpet wiring for AMP Products Corp., the supplier of undercarpet wiring for Hershey. "We see a lot of people putting in even four pairs, and they only use one for the electronics, which gives them two or three additional if they eventually want to go into their own PBX and carry data and voice."

The initial cost of flat wire — $1.25 to $1.50 per foot, compared with conventional round wire or twisted-pair at about 20 cents per foot — did not deter McNamara and his group, nor did it faze upper management. In order to use traditional round cable, the company would have to lay ducts beneath the floor, at a price of about $3 per foot. By directly installing flat power, telephone and data cable on the existing floor, Hershey would avoid costly disruptions to its building, half of which was occupied throughout the renovation. Faster installation time for undercarpet wiring made tight deadlines practical. The final argument for flat wire was that the company retained the option to implement new designs at any time, a strong possibility given the historical and anticipated growth rate and practicality of an open-office environment.

Work first began on the 24,000 square foot north side, formerly a warehouse for finished goods and constructed with concrete floors covered by tongue-and-groove maple flooring. This area was completely rebuilt: new rooms; new heating, ventilation and air conditioning (HVAC) system; and dropped ceiling. The walls and ceilings were insulated with 2½-inch fiberglass sound-absorbent batting, one of several measures taken during the renovation to reduce noise pollution from electronic equipment.

The engineering group decided to locate the uninterruptable power supply room on the north side and to increase its capacity from 100 to 300 kilowatts. This upgraded facility will provide 15 minutes of backup battery power to the computers in case of electrical failure. Also located on the north side were the main computer room and the network control center linking all Hershey's computers.

The undercarpet wiring was laid directly on the wooden flooring. The wiring was 3- and 5-conductor, size 12 American wire gauge flat power-cable rated at 20 amps. The 5-conductor cable provides an isolated ground to protect sensitive computer equipment. Because the cable was supplied in preshielded form, it already had the top and bottom protective polyvinyl chloride layers attached to the basic cable assembly. It could be unrolled on the floor in a single pass, following chalk lines that had been snapped on the basis of Hershey's blueprints and AMP's computer-assisted design. The copper cables are encased in laminated polyester. The .043-inch thick power cable, which is flexible and can be folded over on itself to change direction, was run from flush wall transition boxes, where it connected to the round wire conduits, to AMP's low-profile, safety seal floor fittings.

To service its electronic equipment, Hershey specified AMP's 75- and 93-ohm undercarpet data coaxial cable. Single red cables for IBM Model 3178, 3180 and 3279 CRT devices and printers and twin gray cables for Wang Laboratories, Inc. word processing workstations were run from separate wall boxes. Changes in direction could not exceed a 5-inch radius and were made by notching the cable's

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supporting web. Intersections with power cables were kept to a minimum and were made only at right angles.

To complete the undercarpet wiring, Hershey used 3-pair flat telephone cable on reels and 25-pair flat cable in predetermined lengths with connections, a total of about 1,300 pairs. All rooms were completely wired before being carpeted with 18-inch Milliken and Co. tiles. Unterminated branch lines were run in anticipation of future desk and equipment placements and, with an eye to future flat wiring, even conventionally wired private offices were carpeted with modular tiles.

When the north side was ready for occupancy, employees from the south side were shifted to their new quarters. Undercarpet wiring installation on the south side was similar to that of the north, except that, after it had been cleaned, patched and leveled, the concrete floor was coated with a commercial sealer to hold down dust and improve adhesion.

Rather than abandon its floor ducts, Hershey utilized them for the telephone wiring in conjunction with the flush floor service boxes. Openings were cut in the concrete for the approximately 14-inch square by 2-inch deep service boxes, and conventional telephone wiring was pulled to them through ducts, with the aid of nearby access ports. At this point, the transition was made to flat telephone cables that extended throughout the room.

Because undercarpet wiring did not require any noisy or dirty construction, work proceeded during daytime hours without disrupting office activities. McNamara said extensive research at the beginning of the project led to the estimate of four man-hours per receptacle for installation. By the time the project was completed, the time was down to one man-hour per receptacle. "We can't put in hard wiring in an hour's time. We can't even put a receptacle in a wall in an hour. In the third phase of construction, we did around 7,000 square feet and did all the electrical work in a week's time. That's everything — data, telephone and power," McNamara enthused.

Although Hershey representatives would not divulge the actual cost of the project, McNamara said the tracking systems in place indicate costs are "right at the level of approval." And expensing the project was very difficult. "When you consider that we put dollar values together for things like the uninterruptable power supply room, the network control center, conference rooms and flat wiring, you couldn't talk to anybody who could really give you a lot of insight into [project cost]. There were so many new concepts," McNamara explained.

One of the new concepts was the Quadralong lighting system, designed by Armstrong World Industries, which allows for running computer analysis of lighting levels. Hershey settled on Steelcase, Inc. as the sole vendor for furniture and movable partitions. The choice of Steelcase was a good one, McNamara explained, primarily because of Steelcase's accommodation to Hershey's methods of construction. At one point, Steelcase had 17 tractor-trailer loads of furniture delivered to the site, McNamara said. "Right in order, everything in [each trailer] just the way it's supposed to go in. Talk about coordination. It was phenomenal the way they brought it in."

Perhaps the most amazing piece of the whole project was the short amount of time that elapsed from beginning to end. McNamara got funding approval in the spring of 1984, work began in July and the entire project was completed by June 1985.

Perhaps the most amazing piece of the whole project was the short amount of time that elapsed from beginning to end. McNamara got funding approval in the spring of 1984, work began in July and the entire project was completed by June 1985. McNamara attributed the speed of the process to the project team — one person from purchasing, the building office manager, an industrial engineer, information systems representatives, two full-time construction coordinators and telecommunications specialists.

In addition to in-house personnel, vendors played an important role. After construction began, meetings were held every two weeks with the foreman of the outside construction firm and the electrical foreman. Also on the project team were in-house regulatory affairs people; safety officers; and electrical, mechanical and HVAC-type support staff. All these people went over power requirements, reestablished distribution panels, arranged for new lighting and power panels and brought the 1,300-pair phone system up to the IBM 3083 mainframe computer.

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During the period of construction, staff who previously occupied the floor were moved to other areas for short periods of time. The one area that stayed put was the computer room, according to Bruce Dieffenbach, director of the Information Services Department. Other systems personnel were moved, but arrangements were made for temporary dial-up capabilities.

> **The computer people experienced no downtime and were never out of the system during the day. Cutovers were arranged to occur on a Sunday, when scheduled computer operations were finished.**

The course of construction did not always run smoothly. Problems abounded, according to McNamara, but the team took great pains to see employees were not affected. In the first phase — the north side ex-warehouse area — McNamara requested that AMP supply the wiring in predetermined lengths with standard connectors. When installation began, he found last-minute routing adjustments resulted in excess cable that had to be trimmed and reterminated. Because this wasted great amounts of wire, McNamara decided to purchase reels of cable for the south side and terminate it to the exact lengths required.

The biggest problem McNamara and his team faced was the possibility that something very big could go wrong. They worried about equipment deliveries, scheduling, "just the day-to-day routines of having everybody provide services and equipment they had to provide to keep everyone going," McNamara said. A persistent fear was that an accident could shut down the entire computer system. "We had to make tie-ins to the uninterruptable power supply room which are also tied into the halon system," McNamara explained. If a mistake were made during the construction operation, the halon system could be tripped, which, as part of the normal shutdown procedure, would in turn trip and throw the equipment down.

Dieffenbach shared McNamara's fears. "We were ready for all kinds of problems. We thought surely something was going to jump up and bite us, but it never did." Dieffenbach attributed the success to McNamara and the project team. The computer people experienced no downtime and were never out of the system during the day. Cutovers were arranged to occur on a Sunday, when scheduled computer operations were finished. "[The project team] would make a cutover from the old power system to the new power system and cut over to new transformers and new telephones — all that was done so it didn't interrupt our operations. It was probably a burden to schedule, but it was no problem for us. We had no disruptions. But [McNamara] used to have jet black hair before this job started, and he was 6 feet tall, too, before we beat on him," Dieffenbach laughed.

Dieffenbach was also pleased with the final results of the flat wire system, but tempered his enthusiasm with the caveat that flat wire could not work in all installations. At Hershey, the development staff, the computer room and the room where all experimental equipment for system development and printer and terminal trials are made are connected with flat wire, but the average run is 30 to 40 feet. AMP's Rottman explained that short runs are safe runs for flat wire and added that with flat wire, "the attenuation rate is about three times as great as with normal round wire." There are systems staff members who are in buildings other than that which houses the mainframes, Dieffenbach said, but their terminals are connected to the mainframe via short-distance modems, local dial-up, dedicated phone lines and control units in their locations.

Whether the flat wire concept will be carried out in other parts of the Hershey facility remains to be seen, but the renovation project has attained high visibility in the company. According to McNamara, the anticipation level as the project neared completion was very high. "There was a buzz going on. People were really excited about moving into something they were going to appreciate. I think it has been very well accepted by the employees," McNamara said. But he added that it couldn't have been done without the top-down support from management. "Nothing was done 50% or 75%. What you see is representative of what people's needs were, and they got it."

White is a senior writer at Computerworld Focus.

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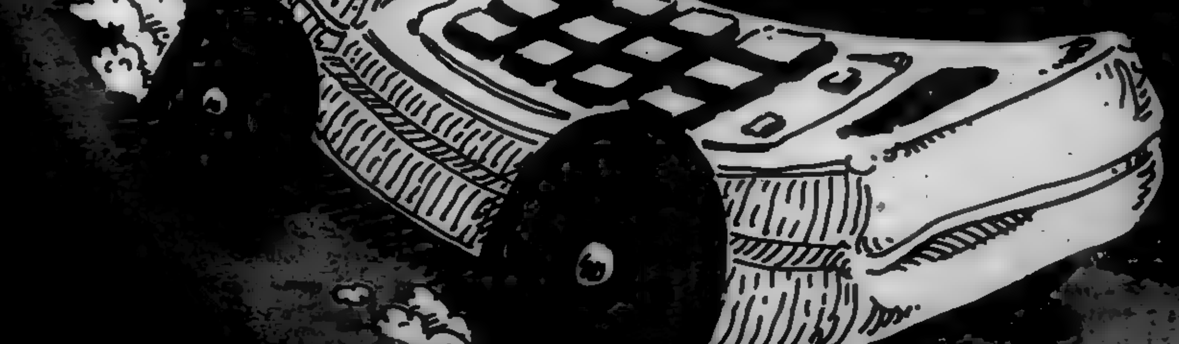


will be a key issue in all facets of communications.

What form will this portable and mobile communications system take? Cellular telephones in automobiles constitute an intriguing and interesting beginning, but car telephones simply are not the wave of the future many would like you to believe. The form that telecommunications device will take presents interesting possibilities. Systems that were gizmos yesterday are becoming feasible and practical. Telephones in briefcases, for example, are becoming lighter, smaller and less expensive. And, if the evolution of the electronic calculator from 1970 to 1976 is any example, we can anticipate that these telephone sets will become increasingly more portable, which will lead to our taking them anywhere we go, not just in our cars.

These roaming telephones in turn begin to pave the way for Dick Tracy-type wristwatch radios, which — believe it or not — will be with us in a short time. The actual devices will be utilized for cellular services and are only as limited as our design and marketing imagination.

Applications for cellular services appear to be endless. Cellular services for bypass? Why not? In essence, that's already happening with the nine-wire line carriers. Cellular service in lieu of terrestrial services for remote costly service areas? Of course. This becomes a strength of the operating company.

But operating company or not, industry experts agree the future for cellular service takes us into areas far passing our present realm of imagination. George Blasingame, general manager of Cellular One in Memphis, gave the following description of the future scenario: "Any person, business or resident will have a personal communicator. When you walk out of your home, your personal communicator will be in your pocket. In your automobile, you will plug it into a cassette-type device that will operate on a hands-free, voice-actuated process. Data communications will be built into a screen in the car. The personal communicator is charged as it is used.

"The personal communicator is popped into your desk module upon arrival at work. During this process, it works behind the PBX attached to the cellular network.

"After work, the personal communicator accompanies you for nine holes of golf or a couple of hours on the tennis court. At the end of the day, the personal communicator is popped into a charger by your bed, and during that time it is charged as well as utilized for your bedside telephone," Blasingame said.

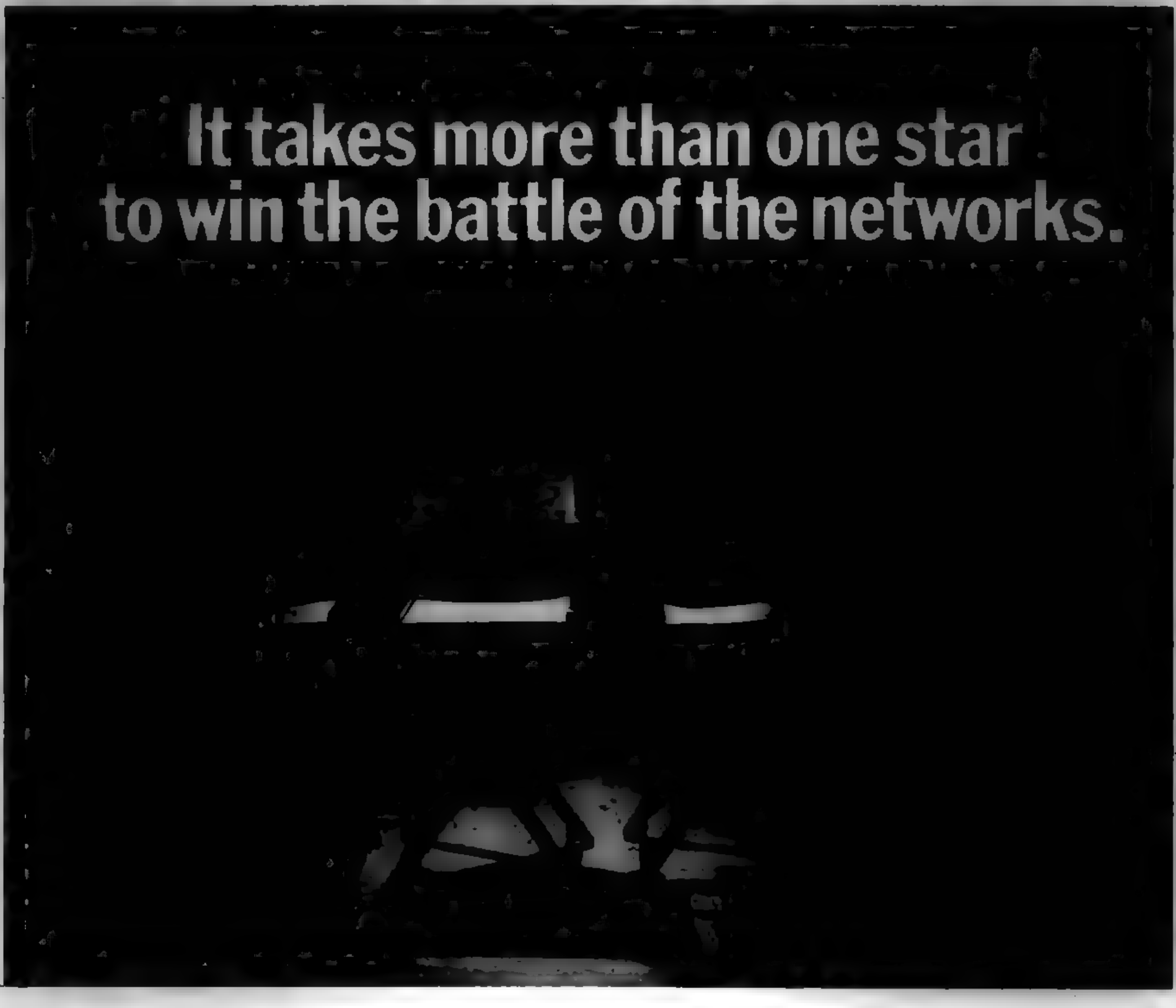
Comparing technology of cellular services today with technology a couple of years from now is similar to comparing an IBM 360 with today's personal computer. Technology enhancements that will lead to this future world of communications are surprising, for they will not be memory storage enhancements, improvements in chips and integrated circuits or improvements in networking itself. The key will be battery technology, and estimates state that AT&T is now spending well into the tens of millions of dollars on improving current battery technology.

The good news of all the activity in the area of cellular services will be better service in remote locations; less expensive service for rural areas; executive and senior management mobility; opportunities for handicapped and severely disabled people to work from home; more flexibility in business locations; and new products, concepts, technologies and jobs.

The bad news? More interruptions. More people will be able to find you. More ways for people to know where you are — remember, the computer has to know where you are to place the call. More invasions of privacy. More regulations. More decisions. But most important of all, the opportunity to get a wrist telephone with a little antenna like Dick Tracy's.

■

Horrell is president of Mitchell and Horrell, Inc., a telecommunications consulting firm in Memphis, Tenn.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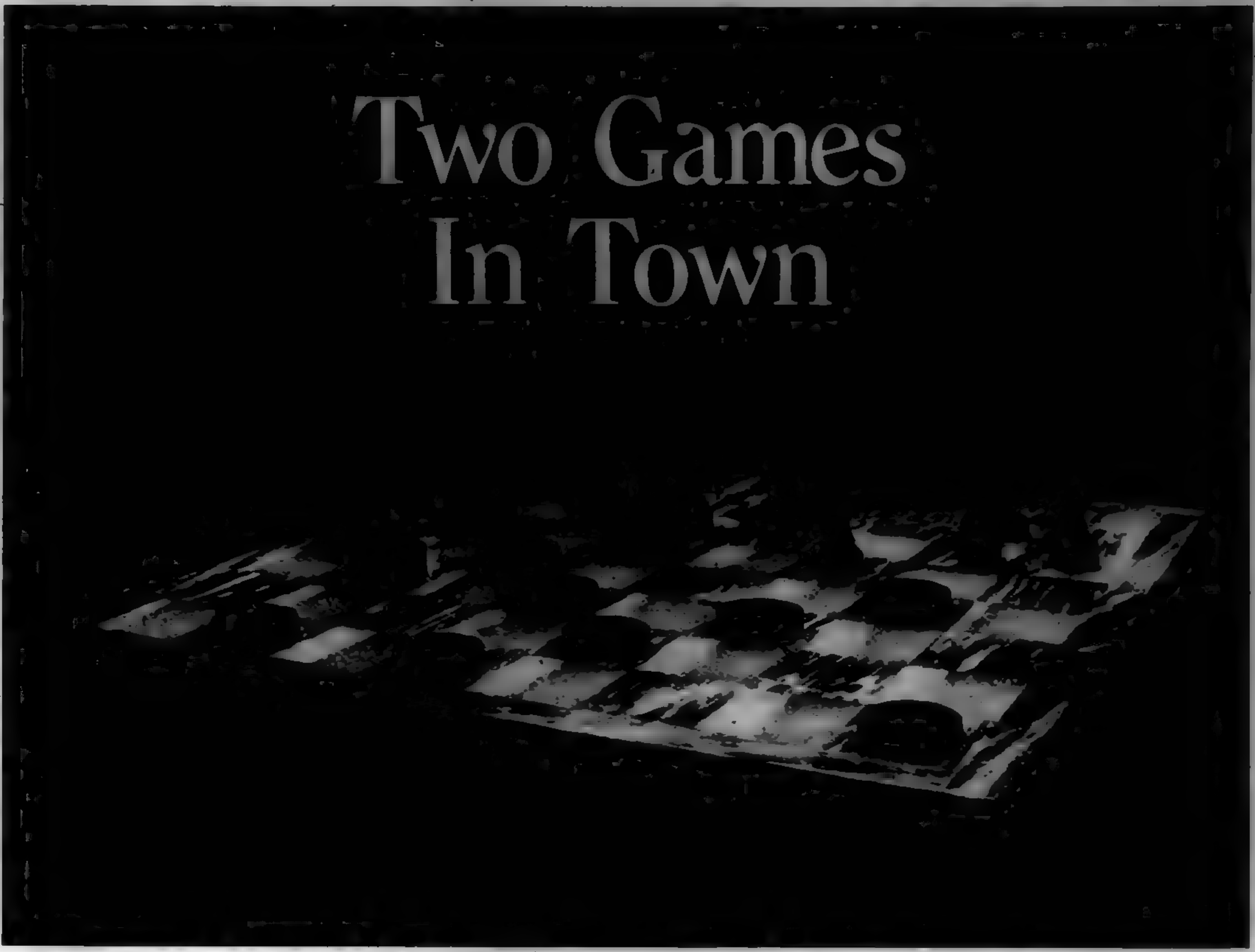

PHOTO ©1985 GEOFF O'CONNELL

The rivalry between local-area networks and private branch exchanges has heated up as the need for efficient and cost-effective communications grows more urgent. Here are some pointers that will help your organization win this round.

By Stuart Wecker

Local-area networks and digital private branch exchanges (PBX) are the focal points of current communication network developments. Local-area nets provide efficient mechanisms for interconnecting computers, terminals, word processors, facsimile and other systems within a local environment. PBX add data communication capabilities to the voice system for interconnecting computer equipment and digital devices. We will focus on the digital PBX and the integration of voice and data communications within a common switching system framework.

Information applications can be seen to consist of four components: the user component, providing the stimulus to the application and the recipient of the response; the application program, the information processing unit; the file system, the storage unit component for temporary and permanent information storage; and the communication network, connecting the other three components and providing the necessary communication paths for information exchanges. This model applies to both data and voice communications.

The communication network can be totally local or it can be nationwide or worldwide. If the capacity of the network is sufficient to carry the required traffic among the other three components and provide the proper response characteristics, the user will be totally unaware of whether the application and the file system are local or thousands of miles away.

Integration of voice and data communications means the unification or sharing of components or information. Integration is, therefore, an individual perspective as viewed from each of the four components. There are four possible alternative definitions of voice/data integration. At the user component, integration is the coupling of the voice and data user components (for example, a terminal device with voice and data capabilities). This integrated device can provide services such as Rolodex dialing, where a user data base of names and phone numbers is brought to the screen. When the cursor is placed over the correct location, a call button is pushed and the phone number is dialed. Typical examples of devices with such capabilities are the Displayphone from Northern Telecom, Inc. and the Cypress terminal from IBM/Rolm Corp. It is possible to build such an integrated terminal with voice and data capabilities, yet have this device connected to two separate networks — a data network and a voice network. It still appears to the user as providing an integrated voice and data service. The integration is brought together at the user level.

Integration at the application component could be via an electronic mail application with voice and data mail segments. An editor for this system would have the capability of editing both the data component of the document and the voice component of the document. Such a system would provide information in its most appropriate format to the mail user. Similarly, the third perspective for integration is at the file system component, where a common storage file subsystem could be used for both voice and data components.

The last component for integration is at the communication network itself. Information can be sent from voice telephone instruments to other voice instruments and from terminals to host computers and filing systems over a common network structure. This integrated network is currently the domain of the data/voice PBX, integrating voice and data transport services within a common network. The public version of this integration will be the integrated services digital network (ISDN) providing worldwide integrated data and voice services. A combination of these public and private networks will then lead to a total integrated network where the local integrated voice/data PBX, local-area networks, terminals, applications, host computers and file storage subsystems can all be interconnected on a global basis (see Figure 1).

What are the advantages of integrated voice and data communications over separate network systems and services? Integration at the user, application and file system components provides a flexible set of user information services. That is, information can be presented in its most appropriate format.

Integration at the communication network is desirable for reasons other than for user services. An integrated network is economical due to the sharing of channels and switching system capabilities. This sharing results in reduced installation and maintenance costs for the network compared with two separate networks. By integrating two networks into one, the management and maintenance of the combined network should only cost about as much or only slightly more than that of one of the individual networks. Integration of the networks also increases its data connectivity — the ability to access digital data components at any location where there is a telephone instrument. PBX offer integrated voice and data communications with high function network management features. These include the ability to account for the usage of the PBX for information transfer and the ability to divide users into various service classes restricting their service to specific connectivity and features within the system.

Another benefit of an integrated voice/data PBX is the eventual interconnection to the worldwide ISDN mentioned above. Over the next few years, the major PBX vendors will be building interfaces to this network.

The purpose of a communication network is to provide an information path among communicating resources. These resources may be computer terminals, host computers, file servers and other digital communication devices. The service requirements of each resource pair conversation vary with the requirements of the specific application. What is important is that the network must satisfy the service requirements of its applications and its users. Possible network service requirements are:

- Performance (throughput, delay).
- Data (integrity, block size).
- Flow (sequencing, control, guarantees, uniformity).
- Connectivity (addressing, establishment).
- Reliability and Availability (failure modes).
- Maintainability (failure isolation, removal, testing).
- User Interface (circuit, transaction, burstiness, rate).
- Information Mode (analog, digital).

An examination of a range of information applications shows that the service requirements of each application differ. The purpose of a network is to meet as broad a range of service requirements as possible to serve the needs of a wide range of users.

PBX have evolved from an analog-based technology to a digital-based technology. This has been due in large part to the reduced cost of integrated digital circuits, making it more economical to build a digital PBX than an analog one. The development of the digital PBX has also been driven by the need for stored program control to manage the ever-increasing array of PBX user features. The evolution has additionally been motivated by the move to digital transmission technology, resulting in the ability to transport more information over the same pair of wires.

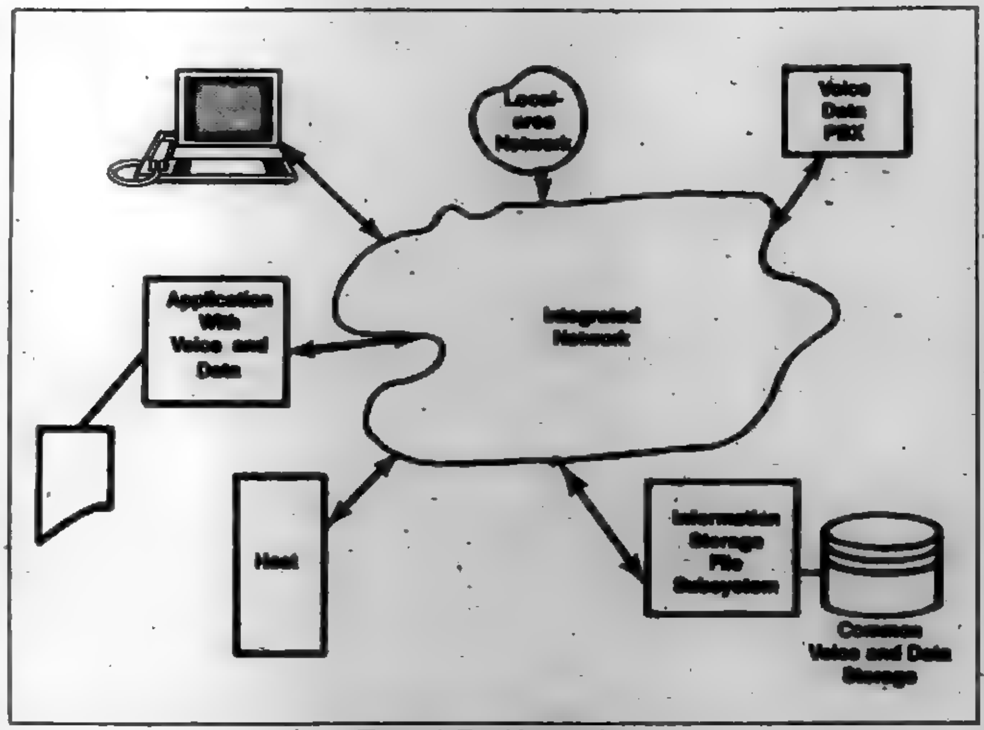
Local-area Network
Voice Data PBX
Application With Voice and Data
Integrated Network
Host
Information Storage File Subsystem
Common Voice and Data Storage

Figure 1. Total Integration

The newer digital PBX are designed to provide integrated voice/data services, thus expanding their domain from voice-only services to digital data services as well. Prior to integrated digital PBX, data could always be sent over a voice-only network by making the data appear as a voice communication (see Figure 2). Modems convert the digital bit stream into an analog representation compatible with the frequency characteristics of the human voice, thus enabling the data to be transmitted through the analog network. The major drawbacks are the limitation on the maximum speed of transmission and the relatively high cost of the modems.

The alternative is to transform voice into a digital representation. In a digital PBX, the analog voice signal is converted into a digital form by representing the amplitude of the analog signal at periodic sampling points by the corresponding digital value. In computer terminology, this is an A to D conversion. The telephone industry uses the term pulse code modulation (PCM) for this signaling conversion. If the signal is sampled frequently enough and a fine enough representation for the amplitude of the signal is used, the digital values can be transmitted over the network and at the receiving side of the network converted back into their corresponding analog voltages. Using smoothing circuits, the original analog signal will then be re-created.

The standard digital representation used in the U.S. telephone PCM system is an 8-bit value, the high-order bit being a sign bit and the low-order 7 bits being the value of the signal on a logarithmic-type scale. The signal must be sampled frequently enough to retain all of its information.

Information theory tells us this sampling rate must be at least twice the highest frequency of the signal. It is assumed that voice in the analog system is bandwidth limited to be between 300 and 3,400 Hz. Sampling this signal at 8,000 sample/sec is, therefore, a safe value. This rate times 8 bit/sample results in the standard bit rate of 64K bit/sec for each voice pathway. A two-way conversation requires two 64K-bit/sec paths, one in each direction. Digital PBX create digital conversation paths that have the capacity for transporting 64K-bit/sec streams, specifically divided as 8,000 samples of 8 bits each. Because digital data is also typically in the format of 8-bit units (bytes), it is a relatively straightforward task to use a digital PBX that can transport digitized voice and have it transport digital data as well.

Contrasting the service requirements of digitized voice and typical digital data transmission, the timing requirements of a digitized voice transmission are significantly more stringent than those of an interactive or transaction-based data transmission. The voice requires a 64K-bit/sec constant bandwidth and delay path, an 8-bit sample arriving every 125 microseconds. Interactive terminal and transaction base traffic are significantly less stringent in both their bandwidth and delay requirements. For this reason, a PBX designed to meet the timing characteristics of voice can easily meet the requirements of most digital data transmissions.

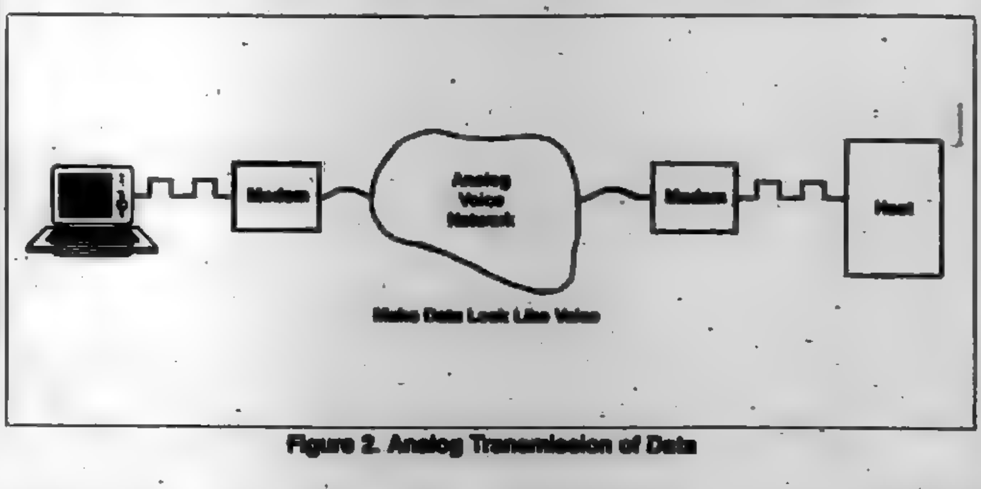

Figure 2. Analog Transmission of Data

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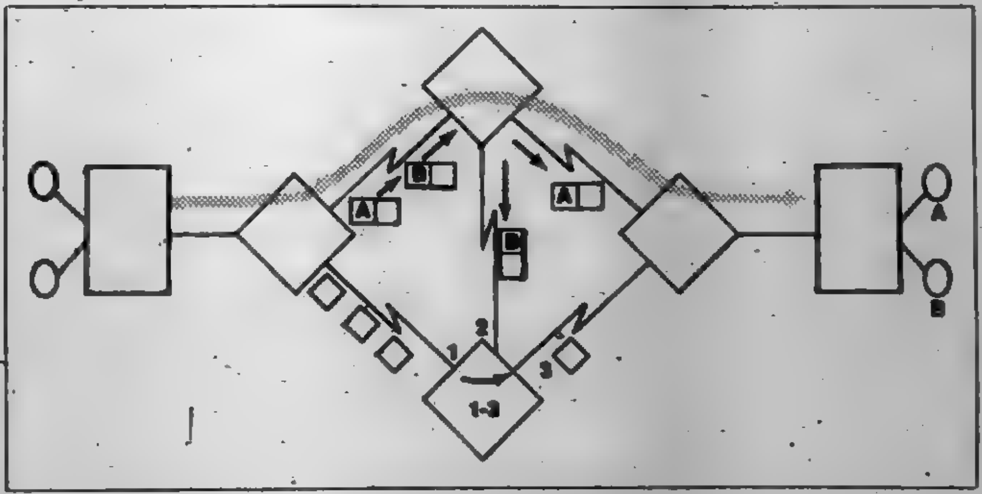

Figure 3. Switching

Switching is the heart of a communication network. It is the component that transfers information arriving at an entry point or port in the network to an exit port. Each switching unit in the network performs this transfer from incoming to outgoing ports. If the communication network consists of more than one switching unit — switching nodes connected together with intermediate channels — a routing algorithm is required above the switching technology to build paths through the switches, creating paths between the endpoints of the network. Routing is, thus, a cooperative execution by all of the distributed switches to create common paths.

Switching requires identification of the incoming information to determine to which port or channel it should be sent out. In circuit-switching technology, channels are dedicated to conversation paths and the incoming physical channel or port address is used to identify the information. In packet-switching technology, channels are shared among conversation paths and information is switched based on an address that is part of each information block — a data item address. Circuit switching is used by digital PBX. Packet switching is used by both local-area networks and wide-area data networks (see Figure 3). In circuit switching (in the lower part of the figure), data blocks arriving on Channel 1 are switched out to Channel 3 through the switching unit, independent of information contained in the incoming data blocks. The upper part of the figure shows packet switching, where individual data blocks are preceded by an addresis. The switching entity uses the address to decide on which outgoing channel to send the information.

Circuit switching implies dedication of channels to specific information streams; packet switching allows channels to be shared dynamically, block by block, among a number of information streams. These two technologies have evolved based on the specific flow characteristics of voice and data. Digitized voice transmission is a smooth, steady flow of information, well-suited to circuit switching. Interactive data traffic is a flow of bursty blocks of information, well-suited to the channel sharing of packet switching. In typical circuit switching, a dedicated path is formed from dedicated channels and switching elements, the path being reserved for the duration of the connection. The path is of fixed bandwidth and delay, and unused bandwidth cannot be shared with other users. It is efficient for constant flow traffic as in digitized voice transmission. Packet switching creates a path formed from shared channels and switching elements. There are ususally no fixed paths through the network; each packet is independently routed according to a routing algorithm. Channels are, therefore, shared and bandwidth dynamically allocated on demand. The routing algorithm can create static or fixed routes or be adaptive — changing routes when changes occur in the network topology. Bursty traffic over package switching networks results in a network with high component utilization and efficiency. For smooth flow traffic, circuit switching is highly efficient.

In the typical local-area network approach to data using packet-switching technology, information from one network interface unit (NIU) is sent to another NIU by creating an information block with the appropriate destination and source addresses preceding the data and sending it out on the media. This information is received by all NIU and processed by the one to whom the destination address corresponds. Different users at different points in time can transmit blocks on the media, interleaving conversations among a variety of users. The media in the local-area net is performing the packet-switching function. When many user conversations are active, virtual circuits — a higher level concept — keeps one conversation path separate from another by creating a second level of addressing within the data field. This address multiplexes the conversation of each user into the single stream between NIU. The PBX approach to voice uses circuit-switching technology. When one telephone wishes to create a conversation path to another telephone, the PBX assigns a fixed portion of its bandwidth to that conversation, two 64K-bit/sec pathways. These paths are dedicated to the digitized voice conversation between the users for that conversation.

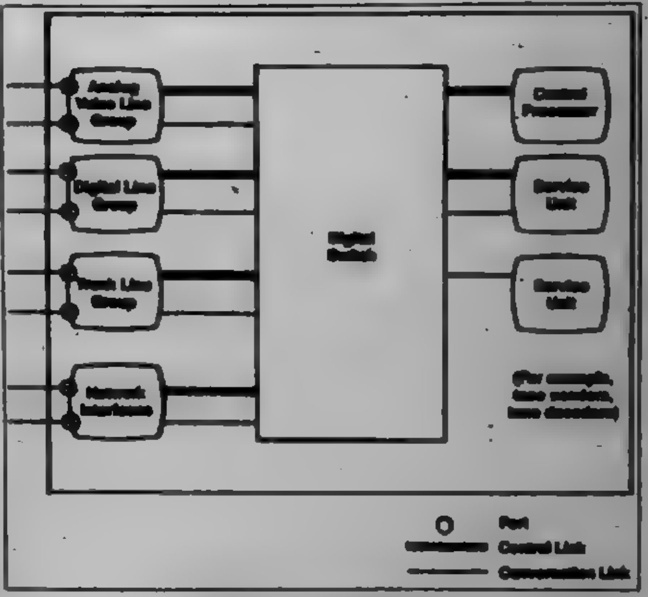

Figure 4. Voice/Data PBX

It is important economically to strike a balance between service requirements and cost of the switching system. Usually you would optimize the switching system technology around the service requirements of the highest usage application with the constraint that the service requirements of all the users of the switching system must be met. Generally, voice has more stringent service requirements than data. Most current digital PBX can easily support the service requirements of both voice and data. The worst consequence of sending bursty data over a circuit switch network is that some of the bandwidth of the dedicated conversation path will be wasted. On the other hand, voice cannot usually be sent over packet networks. The packet network would have to be designed to meet the stringent delay characteristics of the voice and be structured to economically transmit the small blocks of digitized voice information. Generally, it is not economical or efficient to use packet technology for the smooth voice transmission. As a result, there is a movement toward the use of digital PBX to carry data.

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There is no reverse movement with local-area networks adding voice.

Integrating voice and data communications through a common digital PBX is motivated by the sharing of the communication system, within both the wiring structure and the switching electronics. This sharing results in lower installation and maintenance costs for the integrated network. In addition, the capacity of the switch can be shared between the data and the voice usage. Digital PBX, based on circuit switch technology, provide privacy of data on each user conversation path compared with the open nature of the shared concept in local-area nets. Digital PBX also offer high-function centralized network management, and some offer very high bandwidth digital data transmission over inexpensive twisted-pair wiring.

Figure 4 on Page 63 shows the typical architecture of a voice/data PBX. The digital switch component creates 64K-bit/sec circuit switch pathways between the users or ports attached to the switch. Attached to these ports are a set of interface units that transform incoming and outgoing information into the standard 64K-bit/sec internal format and local-service units that serve as internal end points of circuits. The interface units include standard analog voice line groups interfacing standard analog telephone sets, digital line groups interfacing digital telephone sets and trunk line groups interfacing to the public telephone network. The analog voice line interfaces provide the digitized sampling and the creation of the 64K-bit/sec stream from the incoming analog voice. The digital interfaces manage the incoming voice, data and control information from the new digital telephone sets. Trunk group interfaces provide an interface to the public telephone carrier central office using standard ground start or loop start trunks. The most recent developments in interfaces have been in network interfaces that provide the transformation between external network standards and the internal digital switch. The most common interfaces are to X.25 and IBM Systems Network Architecture (SNA) nets. The service units are internal information sources and sinks and provide services such as tone decoding, conference bridges and various signaling tones for use by the other interfaces.

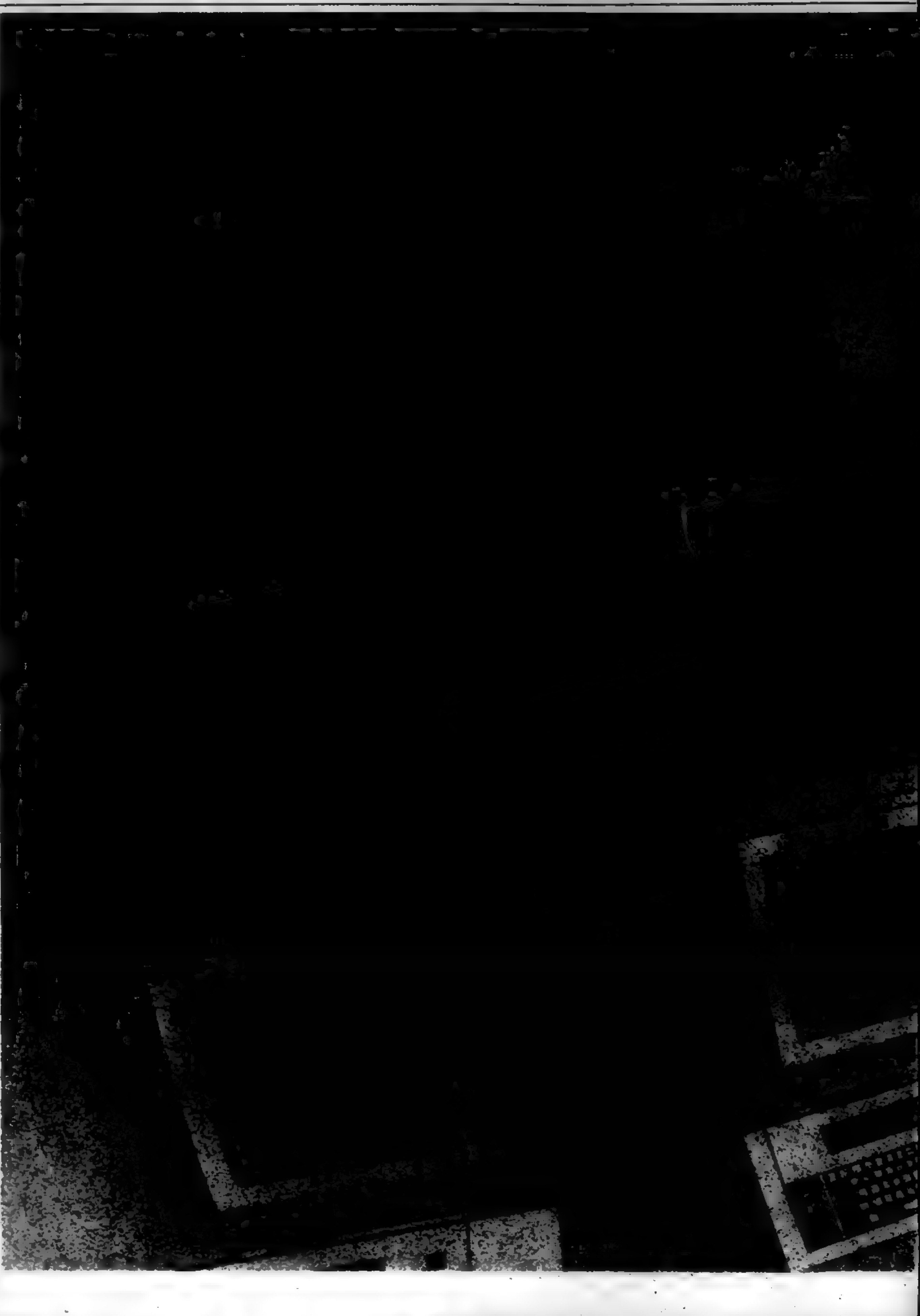
The switch operates on the principle of creating 64K-bit/sec circuit switch paths in the format of 8,000 samples of 8 bit/sample. It does this by creating conversation paths between the interfaces and/or service units attached to the switch. When a conversation path has been established, each 8-bit sample arriving at the digital switch on an incoming port in the conversation path is switched to an outgoing port. This switching involves information movement in space and time domains. In space switching, the 8 bits of information are physically moved from the incoming port on the digital switch to the outgoing port. In time, switching the 8-bit samples may arrive at the incoming port at an instant out of time synchronization with those to be sent out on the outgoing port. Time delays are needed to compensate.

The time switching is managed via buffering, where the incoming stream is buffered in intermediate 8-bit buffers until the proper time arrives for them to be sent to the outgoing interface unit. The buffers create a time independence through switch. Space switching is typically handled via a high-speed time slotted backplane bus, where the 8 bits of information are physically sent from an incoming interface to the outgoing interface through time slot positions on the bus. In some cases, buffering and time synchronization is managed within the interfaces. In other cases, an intermediate memory is added to the bus. Each vendor has a unique approach to implementating voice and data integration.

In the Oct. 16 issue of Computerworld Focus, *Wecker will discuss wiring and planning, the coexistance of PBX and local nets and current offerings.*

■

Wecker is president, Technology Concepts, Inc. in Sudbury, Mass.



Products

PALO ALTO, Calif. — Three micro-to-mainframe accessory products have been announced by **CXI, Inc.** Keyboard Mate is a keyboard attachment that adds 3270 series and 3270 function keys to existing keyboards, allowing CXI's Pcox and Digital Communications Associates, Inc.'s Irma emulation board customers to invoke 3270 functions with single keystrokes, the company said.

CXI's Coax Mate multiplexes signals from two controller ports through a single coaxial cable. The product links two category A coaxial devices (such as IBM Personal Computers that use any of CXI's coaxial connection boards or IBM 3270 series terminals) for data transmission over a single coaxial cable.

Daisy Chain Kit, the third product, is a modem bridge designed to permit several IBM PCs to be attached to a single leased-line synchronous modem.

Keyboard Mate's suggested retail price is $185. The Daisy Chain Kit and Coax Mate, the latter sold as a pair, are priced at $135 and $250 respectively.

For further information, contact CXI, Inc., 3606 W. Bayshore Road, Palo Alto, Calif. 94303-4229.

PALO ALTO, Calif. — **The Wollongong Group** has introduced a new line of networking software called Wollongong Integrated Networking Solutions (Wins), which the company said conforms to the TCP/IP protocols, a U.S. Department of Defense standard for networking communications.

WIN/PC lets IBM and IBM-compatible PCs participate in local- or wide-area networks, the vendor said, and is compatible with Wollongong's WIN/VX for Digital Equipment Corp. VAX minis. WIN/3B, a version to be distributed by AT&T for its 3B microcomputer customers, was also announced. Wollongong said the products share file transfer and virtual terminal capabilities. The file transfer feature allows the sharing of data across a network with any other machine, and the virtual terminal facility allows a PC or other computer to log onto another machine in a net.

WIN/PC costs $895 and quantity discounts are available. WIN/VX is priced at $15,000. Further information is available from The Wollongong Group, 1129 San Antonio Road, Palo Alto, Calif. 94303-4374.

WAKEFIELD, Mass. — **Applitek Corp.** recently announced Lantest, software that reportedly enables current Applitek users and those considering an Applitek local-area network to evaluate response time and throughput as the network load is increased from zero to 100%. According to the vendor, the software will also show the effect of running the network under various access methods such as CMSA/CD, token passing or Applitek's Unilink.

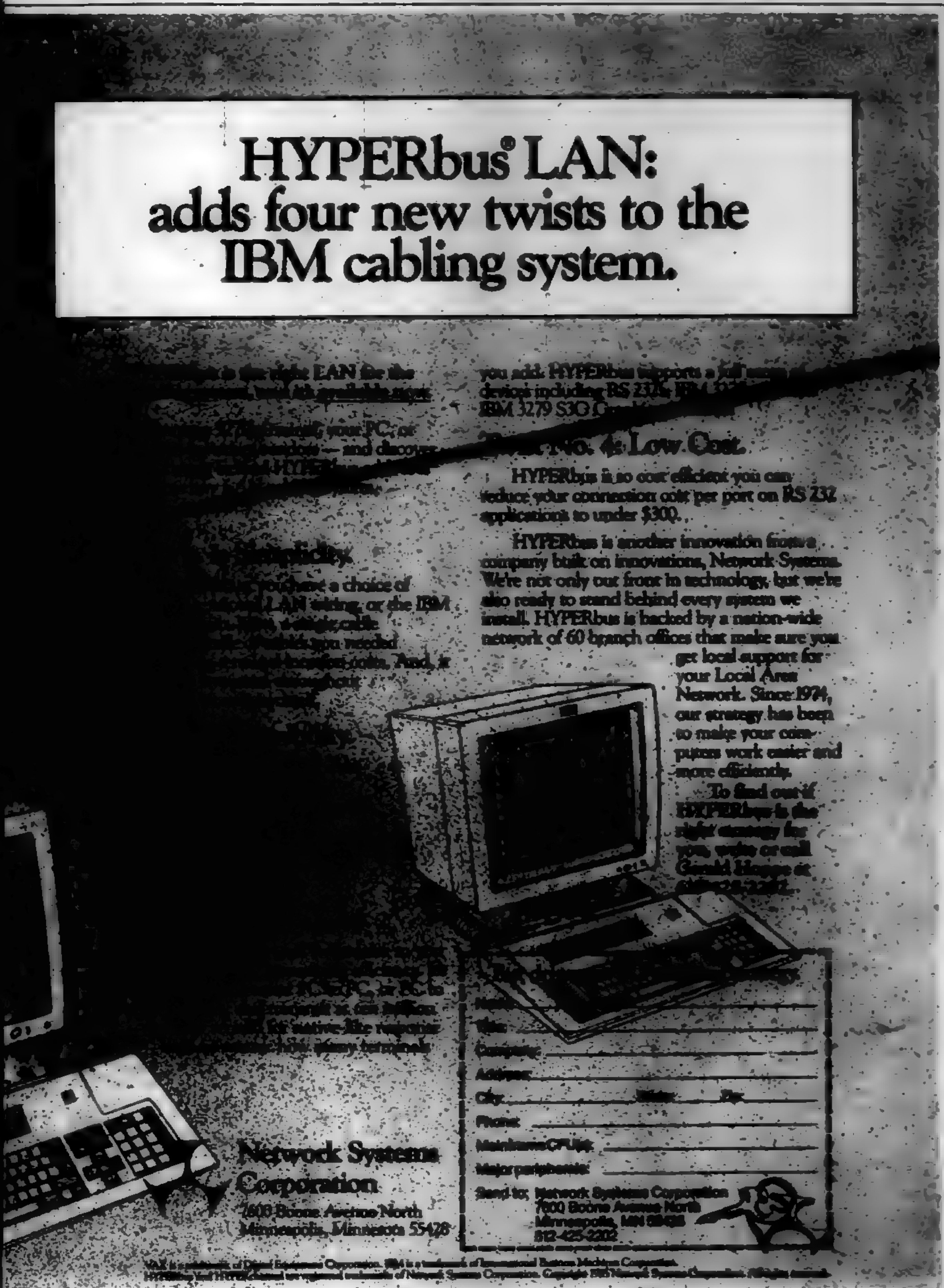
In addition to the software, Lantest includes four Applitek network interface units and a baseband, broadband or fiber-optic cable. Lantest will run on an IBM Personal Computer or compatible computer with at least 128K bytes of memory and a serial RS-232 port. Available immediately, the package costs $2,000.

Applitek is at 107 Audubon Road, Wakefield, Mass. 01880.

MILPITAS, Calif. — **Racal-Vadic, Inc.** has introduced the Multiple Data Set (MDS) II system, which the vendor said allows users to manage modems in a corporate dial-up network from a local or remote site.

MDS II consists of the VA1690 chassis, VA990 control card, VA2190 power supply card, VA4491E triple modem (2,400/1,200/300 bit/sec) and VA9000 system controller.

The VA1690 chassis is a front-loading, rack-mountable assembly with 16 slots for modems or other data communications products, one slot for the VA990 controller and one spare slot. Each of the 16 slots can accommodate two modems. The VA4491E is a V.22 bis-, Bell 212A- and Bell 103-compatible modem that can be configured



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Products

for either the switched-telephone network or two-wire leased lines, according to the vendor. It provides full-duplex asynchronous and synchronous operation at 2,400 and 1,200 bit/sec and asynchronous operation from zero to 300 bit/sec. The VA9000 system controller is a personal computer-based option that reportedly allows supervision, monitoring, configuration and testing of a network from a single central site and can control up to 256 MDS II chassis and more than 8,000 modems.

The VA1690 chassis, equipped with a VA990 controller card and two VA2190 power supplies, is priced at $3,260. The VA4491E modem costs $1,095, and the VA9000 System Controller with interface board for an IBM Personal Computer or compatible computer and proprietary software is priced at $3,500.

For more information, write to Racal-Vadic, 1525 McCarthy Blvd., Milpitas, Calif. 95035.

MERRIMACK, N.H. — **Digital Equipment Corp.** recently announced All-in-1 Office and Information System software for the Microvax family of computers. In addition, the company also announced that through DEC's PC connection capabilities, IBM Personal Computers can tie in to VAX and Microvax environments.

The Microvax All-in-1 includes WPS-Plus word processing, electronic mail, desk management, time management and other office functions, as well as full Help functions and computer-based instruction. According to the vendor, the system can utilize Decnet and Ethernet communications for networking with other computer systems. Microvax All-in-1 also supports the Decmate Office Workstation, the Rainbow Office Workstation and the PRO Office workstation. The cost for the system is $4,023 per subscriber on a 30-subscriber system.

DEC's PC connection capabilities include a series of software products that enable IBM Personal Computers to communicate and transfer files with Microvax II and other VAX systems. With Decnet-DOS, IBM Personal Computer users can share data and files across a network, develop distributed applications and participate in other network functions. Vterm II allows the IBM Personal Computer to emulate a DEC VT-100 terminal and Poly-COM 220 and 240 enable IBM Personal Computer systems to perform file transfers and emulate DEC VT-200 terminals, the vendor said. Decnet-DOS sells for $495, Vterm II is priced at $160 and Poly-COM 220 and 240 cost $200 and $300, respectively.

DEC also announced enhancements to its VAX VTX videotex software and Rainbow/North American Presentation-Level Protocal Syntax (Naplps), which extends videotex capabilities to the Rainbow personal computer.

For more information, write to Digital Equipment Corp., Maynard, Mass. 01754.

PALO ALTO, Calif. — **Hewlett-Packard Co.** has introduced Systems Network Architecture (SNA) analysis software for its field-portable HP 4951A and the HP 4953A protocol analyzers.

Using both the HP 18186A and the HP 18153A SNA analysis packages, Hewlett-Packard protocol analyzers extract the upper-level information field by field from Synchronous Data Link Control (SDLC) I-frames and display it in high-level, easy-to-read SNA terms, HP said.

The HP 18186A/4951 is a portable SNA testing tool and provides the information needed to locate problems, particularly between cluster controllers and the SNA network, the vendor said. The HP 18153A SNA analysis application for the HP 4953A protocol analyzer allows the user to monitor, capture and analyze data traffic anywhere on the SNA network, even complex host-to-host communications, the vendor said. Both packages support simulation by allowing the user to define menus designed to trigger and send specific SNA messages. In addition,

Products

the packages can be employed anywhere SNA data flows over an SDLC link that uses any of the physical interfaces supported by Hewlett-Packard, such as RS-232C, V.35 and RS-449.

The prices for the software are $500 for the HP 18186A and $750 for the HP 18153A. HP is at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

DALLAS — An enhanced version of the NCS70 Series Network Control System was recently announced by **Emcom Corp.** Among the enhancements is a real-time error and status message report, which allows the operator to scan the record of alarm conditions to identify recurring problems on a specific line or device. In addition, performance statistics can be transferred from the NCS70/30 to a host-resident data base, supported by Emcom's software, Network Communications Performance Analyzer.

The basic NCS70/30 system includes one rack-mountable performance measurement unit, an IBM Personal Computer color terminal and a four-color printer. Prices for the NCS70/30 begin at $75,000 for a 16-line system. For more information, write to Emcom Corp., Suite 901, 101 E. Park Blvd., Plano, Texas 75074.

CHELMSFORD, Mass. — **Apollo Computer, Inc.** has introduced its Open Architecture Program with a set of network products designed to integrate Apollo's Domain networking architecture with IBM's SNA, Digital Equipment Corp.'s VAX/VMS operating system and IBM PCs, PC ATs and compatibles.

The Domain/SNA package is aimed at distributing SNA resources across Apollo; Domain/Vaccess-1 downloads files from DEC VAX/VMS applications to the same applications on the Domain system. Domain/Vaccess-1 uses the Ethernet 802.3 transport standard and TCP/IP for data conversion. Domain/PCI is designed to allow certain personal computers to connect with Apollo workstations and share files. Domain /SNA is licensed at $1,700 per node, $7,000 per site; Domain Vaccess-1 at $5,000 per site; and Domain/PCI at $500 per node.

Apollo also introduced Domain/Bridge, a hardware and software communications package, which the company said provides the means to link up to five Domain networks and make them function like a single net. Apollo spokesmen said users have two Domain/Bridge link options: Domain/Bridge-A, a T1 class carrier link intended to extend the Domain single-system image across long distances; and Domain/Bridge-B, a coaxial cable link intended to partition large networks and make them more manageable. Domain Bridge A costs $8,400, one-time purchase; Bridge B, $8,900.

More information is available from Apollo Computer, Inc., 330 Billerica Road, Chelmsford, Mass. 01824.

SAN ANTONIO — **Datapoint Corp.** has introduced multimedia information network exchange (Minx) an office system that integrates data, voice and full-motion color video communications, the company said.

Minx consists of desktop workstations and one or more central controllers or servers. Each cluster server supports up to eight Minx workstations. The Minx workstation incorporates a color monitor, color camera, viewfinder and full-duplex speakerphone. The workstation is controlled by a mode selector and an attached keypad, which resembles a pushbutton telephone. The Minx workstation can be attached to its Arcnet local-area network through a Datapoint-supplied IBM PC interface card, the vendor said.

Minx workstations are priced at $11,100 each for quantities up to three and are discounted to $8,880 each for quantities of fifty and over. The cluster server is priced at $9,020, and the Minx to Vista-PC and IBM PC interface cards are $295 each.

For further information, contact Datapoint Corp., 9725 Datapoint Drive, San Antonio, Texas 78284.

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All versions of PC-DOS are supported by Port. They can even operate concurrently within your network. And Port provides up to 640K for DOS and its applications.

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Port combines these sophisticated network capabilities with an icon-based user interface that's responsive and easy-to-learn.

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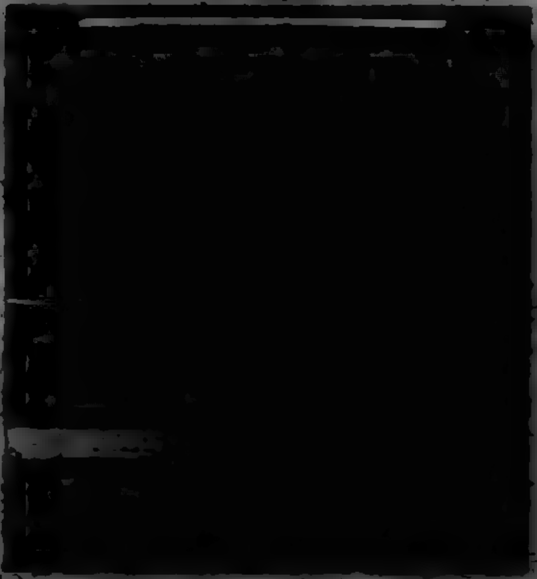

personalized office containing icons (e.g. Browse, Mail, Back-up). An activity is initiated by simply selecting the appropriate icon. Icons can even start PC-DOS applications. A mouse can be used to further simplify the procedure.

Multi-tasking/Windowing
With Port, up to 12 activities can operate simultaneously at each workstation. For example, you can run your favourite DOS program, print a document, browse a file system, and send electronic mail – all at the same time. Each activity has its own window which you can display or hide while the activity continues.

A design for the future

Port's design is the result of ten years of research at the University of Waterloo. Port solves the problems of PC LANs. That's why corporations such as IBM Canada, Cromtek and Computer Corporation of America sell products based on Port.

Continuing research and product development will ensure that your Port network always keeps pace with the future. Product enhancements are provided through Port's Software Update Service.

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Calendar

September 3-6, Bloomington, Minn. — **The Integrated Office — How Soon?** Contact: Office Automation Society International, Suite B, 15269 Mimosa Trail, Dumfries, Va. 22026.

September 4-6, New York — **Data Communications System Components.** Also, September 9-11, San Francisco. Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

September 5-7, San Francisco — **3rd PC Faire.** Contact: Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

September 8-11, Cambridge, Mass. — **1985 SME World Congress on the Human Aspects of Automation.** Contact: Technical Activities Department, Society of Manufacturing Engineers, P.O. Box 930, 1 SME Drive, Dearborn, Mich. 48121.

September 9-11, Washington, D.C. — **X.25 and Packet Switching Networks.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

September 9-11, New York — **Local-Area Network.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

September 10, New York — **Microforum Luncheon and Conference.** Contact: Microcomputer Managers Association International, Suite 359, 80 Boylston St., Boston, Mass. 02116.

September 12-13, San Jose, Calif. — **Microfocus Conference.** Contact: International Data Corp., 5 Speen St., Framingham, Mass. 01701.

September 12-13, Bethesda, Md. — **Planning and Implementing the Next Generation of Telecommunications Networks.** Also, September 26-27, Chicago. Contact: International Data Corp., Washington Division, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102.

September 17-18, San Francisco — **Computers in Finance - Datamart.** Contact: Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

September 17-19, Dallas — **1985 Software/Expo.** Contact: Software/Expo, Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

September 18-20, Las Vegas, Nev. — **Apics Fall Seminar.** Contact: American Production and Inventory Control Society, Inc., 500 W. Annandale Road, Falls Church, Va. 22046-4274.

September 18-20, New York — **Unix Expo.** Contact: National Expositions Co., Inc., 14 W. 40th St., New York, N.Y. 10018.

September 18-20, New Brunswick/Somerset, N.J. — **Local-Area Networks.** Also, September 30-October 2, Boston. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

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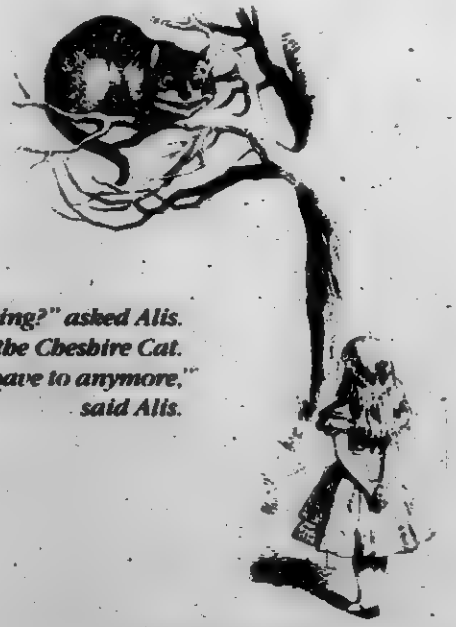

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Sierra on-line in Texas

By James Connolly
CW Staff

BELLAIRE, Texas — A 10% faster response time, speedier repairs and savings on space, air-conditioning and power use: These are among the expected benefits when one of the first IBM 3090 mainframes goes into full commercial operation at a data processing center here tomorrow.

The installation of the 3090 Model 200 processor at Texaco, Inc.'s DP center was completed in just seven hours on Aug. 25. Following a week of diagnostic work and operator training, Texaco planned to use the Labor Day weekend for tying the new IBM 3090 to the $47 billion oil and gas giant's 9,000-user Interactive Computing System.

"We've got it powered up and scheduled to kick in over the weekend," said Ed McDonald, Texaco's division manager for information processing, in a telephone interview last week. "We're putting it into our interactive computing environment, where we run 24 hours a day. But with the three-day weekend, use should be light; so it will be in full operation on Tuesday."

McDonald said his first impression of the high-end IBM system was positive and that it was a state-of-the-art machine that addresses all of his realistic hopes. He said his unrealistic dreams are of futuristic features such as voice controls that replace operator keyboards.

"The major gains that I see, particularly with us becoming more and more on-line oriented, are the addition of extended memory, which will mean increased efficiency in computing power, the reduced

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TOP OF THE NEWS

Discount shopping. Lotus is planning discounts for volume buyers of upgrades to an enhanced version of 1-2-3. **Page 2.**

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NAS upgraded its high end with microcode assist features and expanded memory and channel capacity. **Page 4.**

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As it unveiled a mid-range mini, HP set an early '86 debut date for its next-generation Spectrum line. **Page 5.**

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AT&T Communications chief Randall Tobias, in an exclusive *Computerworld* interview, talks about market share, the Second Computer Inquiry, IBM and "people-oriented downsizing." **Page 8.**

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Two-way street. A close look at Gold Hill and Arity, two new players taking different approaches to artificial intelligence on micros. **Page 10.**

Javelin bucks software trend

Information base vs. spreadsheets

By Edward Warner
CW Staff

CAMBRIDGE, Mass. — Replace the electronic spreadsheet? For most corporate personal computer users, you might as well talk about replacing the coffee machine. Yet a start-up software company here, located a few blocks from Lotus Development Corp., plans this fall to launch a $695 product that it hopes will do nothing less than set a new software standard for computerized financial analysis.

Javelin Software Corp., founded two years ago by two veteran business graph-

See JAVELIN page 4

ADR unveils enhanced DBMS tool

Datacom/DB upgrade may boost speed 30%

By John Desmond
CW Staff

PRINCETON, N.J. — A leading relational data base management system, Datacom/DB from Applied Data Research, Inc., received a series of performance enhancements aimed at speeding execution in production environments. Last week's announcement is viewed as central to ADR's strategy to have the product accepted in mainstream IBM shops.

The improvements, which the company said can boost performance by up to 30%, include the use of main memory buffers to save a series of updates for writing simultaneously to a disk. This "pipelining" improves performance by updating the data base with fewer I/O events, according to Ken Sloan, vice-president of research and development for the Datacom/DB system. "The announcement is significant because, up to this point, the flexibility and ease of use of relational systems had not been available to large users. This system solves that problem," Sloan said.

Early users of the enhanced product contacted by *Computerworld* faulted it for minor glitches but praised it for performing better and being easier to use. (See story page 6.)

Robert Cancilla, data base administrator for the Fremont Indemnity Co. of Los Angeles, obtained Release 7.4 of Datacom/DB late last year. The enhancements yielded performance improvements of 10% to 15%, he said. "While not as dramatic as we had hoped, it generally is a substantial improvement, especially in the ease-of-use

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ANALYSIS

Data liberation: Dama on the barricades

By Jeffry Beeler
CW West Coast Bureau

The value a company attaches to a particular scrap of data depends to a great extent on where the data resides.

Store a piece of data in a corporate computing center, and everyone in the organization immediately recognizes the morsel as a strategic resource worthy of extraordinary care. But stick the very same data in a personal computer on some anonymous end user's desk, and its perceived importance instantly depreciates to almost nothing.

The unfortunate tendency to regard decentralized data as trivial is disturbingly widespread and can exact a heavy toll in the form of management headaches, needlessly high overhead and information redundancies or inconsistencies.

But disregard for user-held data is by no means universal. In fact, the indifference has lately spawned opposition that proponents usually refer to as "data administration."

If the cause's standard bearers were political activists instead of technologists, they would probably describe themselves as "data liberationists." In the eyes of data administration's supporters, all corporate information is equally entitled to treatment as a strategic resource, regardless of its physical location.

"Data administration focuses on corporate information [in its totality], not just on the portion that happens to reside in a central mainframe system," according to independent consultant David Schryver, one of the infant movement's most vocal advocates.

With the proliferation of professional microcomputing and the attendant dispersal of corporate information, interest in data administration has grown steadily. One manifestation of this heightened concern is the recent birth and development of the Data Administration Management Association, according to Don Luchsinger, current president of the group's Los Angeles chapter.

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NEWSPAPER

Lotus to offer 1-2-3 discount

Renewal of volume discounts follows pressure from buyers

By Edward Warner
CW Staff

Lotus Development Corp. reportedly plans to sell upgrade copies of its forthcoming new release of 1-2-3 directly to large-volume users — at a discount of $50 off the $150 standard upgrade price for each package.

The plan would mark Lotus' return, under growing pressure from large corporate users, to bulk purchase discounts, at least for upgrades. The distribution plan also exempts large-volume 1-2-3 users from having to return their old 1-2-3 system diskettes as they upgrade, a first for Lotus.

The distribution plan was detailed in a meeting and subsequent telephone conversation between Robert Corr, president of an association of microcomputer managers from 30 Fortune 500-size companies, and Steve Crummey, Lotus vice-president for sales and service, Corr said.

The plan would only affect existing users of 1,000 or more copies of the top-selling Lotus spreadsheet, said Corr, president of Technology Advancement through Strategic Cooperation.

Corr, an office automation director with General Motors Corp.'s Electronic Data Systems Corp. subsidiary, said that Crummey also assured him that users of 1,000 or more copies of 1-2-3 will not need to return their system diskettes to Lotus when they order an upgrade to Release 2, which is expected to ship this month.

Instead, he said, these users will be able to destroy their old system diskettes at their locations as they upgrade.

Crummey could not be reached for comment. Ellen Hoffman, 1-2-3 product marketing manager, said Lotus would not comment publicly on the existence of discounts or special upgrade arrangements for its large-volume users.

Although only existing users of 1,000 or more copies of 1-2-3 would be affected by the discount plan, they would not need to order all of their upgrade copies at once, Corr said. Instead, he explained, such large-volume users could commit to ordering at least 1,000 copies of the upgrade package and receive the discount for initial minimum orders of 250 copies.

Corr said he first learned of the 1-2-3 upgrade plan at a recent meeting he attended with Crummey and 17 members of Technology Advancement through Strategic Advancement. Corr said that Crummey told those at the meeting about Lotus' original plan for a mail-in exchange program and that the attendees requested that Lotus "give us instructions to destroy the [old] system diskettes in the field."

McDonnell Douglas cuts work force

By Clinton Wilder
CW Staff

ST. LOUIS — Four units of McDonnell Douglas Corp.'s Information Systems Group trimmed their payrolls by a total of approximately 340 employees last week in a cost-cutting move. The company also acknowledged a work force reduction of approximately 200 additional positions through attrition and performance-related dismissals since July 1.

The division hardest hit by last week's layoff was McDonnell Douglas Communications Industry Systems Co. in Denver, which trimmed 18% of its 500 employees. Three other larger units cut their staffs by 5% to 6%.

Information Systems Group spokesman Ford Phillips said that the four units affected by last week's cuts were running operating losses and were forced to cut costs to remain on track in the company's long-range plan.

Seven other Information Systems Group units have met or exceeded their target revenues so far this year, Phillips said. The 200-employee attrition cut was spread over all 11 units and affected less than 1% of positions in most units, according to the spokesman.

Phillips said last week's cuts affected employees across the board, including managers in each of the four units and 11 other managers in St. Louis-area divisions. The businesses affected by the layoffs are as follows:

■ McDonnell Douglas Communications Industry Systems. The unit dismissed 90 employees, citing slow sales of its information systems to the divested Bell operating companies in the wake of the AT&T breakup.

■ McDonnell Douglas Business and Network Systems Co., Cupertino, Calif. The vendor of computer network services issued 100 pink slips, a work force cut of 6%.

■ McDonnell Douglas Computer Systems Co., Irvine, Calif. The vendor of minicomputer and mainframe hardware dismissed 85 employees, or 6% of its work force.

■ McDonnell Douglas Field Service Co., Irvine, Calif. A 5% cut, totaling 60 positions, was announced at the provider of field service support to McDonnell Douglas and other companies.

"The layoff was a business unit by business unit decision," Phillips said. "These units had business slowdowns, the same as everyone else in the industry, and it was impossible for them to make their target numbers without a work force reduction."

Dismissed employees will be provided with a minimum of two weeks' and a maximum of 13 weeks' severance pay, according to Phillips.

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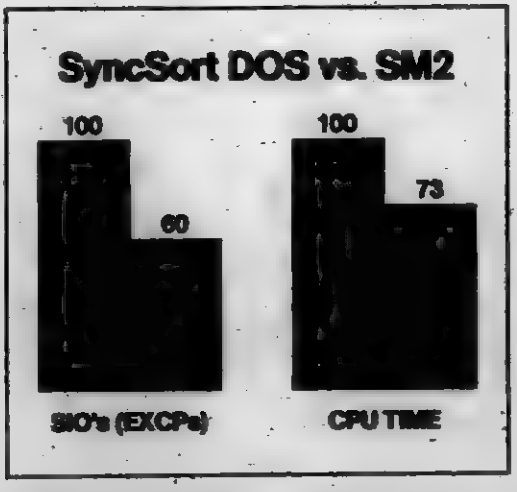

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NAS enhances high-end processor family

By Jeffry Beeler
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — Responding to user demand for increased system performance, National Advanced Systems Corp. (NAS) last week enhanced its high-end processors with the addition of assorted microcode assist features and expanded main memory and channel capacity.

In the wake of the enhancements, company spokesmen here said that NAS has quadrupled to 128M bytes the maximum central storage capacity for the most powerful member of its Advanced System/8000 mainframe family — the AS/8083. As part of the same announcement, the supplier of large IBM-compatible CPUs has also doubled to 64M bytes the top main memory capacity for the 8000 line's other four members — the 8023, 8043, 8053 and 8063.

In addition, NAS has expanded the maximum channel configuration for its AS/9070 and AS/9080 processors from 32 to 48 channels and enlarged the central storage for its 9040 and 9050 from 48M bytes to 64M bytes, the source said. All four mainframe models belong to the vendor's AS/9000 line, which competes with IBM's 3081-series machines.

In a related development, the firm has made the Preferred Machine Assist (PMA) available as a standard feature on its 8000 family, according to Mitch Schoch, director of NAS' North American systems marketing. PMA, which minimizes overhead for systems that run a guest control program under VM, had previously been provided with the 8000 series solely as an option.

NAS has also enhanced the 8000 line to support for the first time Extended Control Program Support:VM (ECPS:VM), which improves mainframe performance under VM by transferring four assist functions from machine instructions to microcode, Schoch said.

The functions, which form ECPS:VM's constituent parts, include Expanded Virtual Machine Assist, Control Program Assist, Virtual Interval Timer Assist and Shadow Table Bypass Assist.

In the past, each of the four microcode features, which Schoch described as "performance kickers," was typically restricted to IBM 4381s or comparable intermediate-scale processors running interactive applications under VM. So when users outgrew their existing 4381-class machines and upgraded to IBM 3083-level processors to increase their capacity, they were forced to abandon their familiar ECPS assist functions and convenience features.

'Best of both worlds'

But now users "can have the best of both worlds," Schoch said. "They can retain the price/performance and the convenience functions of their 4381s" even as they take advantage of the expanded performance of the 8000-series processors, which correspond mainly to IBM's 3083 family of large-scale CPUs.

"Our goal in offering [the four microcode assist functions] on the 8000," Schoch added, "is to position the machines as a true growth path for intermediate systems users."

Each of ECPS:VM's four assist functions is available to 8000 series users without charge. An 8M-byte main memory enhancement for both the 8000 and 9000, however, costs $96,000, compared with $123,000 for an increment of eight channels for the 9070 and 9080.

DATA from page 1

Dama, which seeks to advance the field of data administration, first arrived on the scene about five years ago with the formation of the organization that Luchsinger now heads. Among the association's charter members is Schryver, who preceded Luchsinger as Los Angeles chapter president.

Two or three years later, Dama's original chapter was joined by a second such local group based in San Francisco.

The association is again widening its geographic scope by establishing two more chapters, one in Minneapolis-St. Paul and the other in Seattle. During its roughly six months of existence, the Twin Cities group has averaged more than 60 attendees per meeting, Schryver said.

The Seattle chapter is an even more recent addition to the Dama family of players. It apparently has existed only long enough to meet once or twice, Luchsinger said.

Dama's expansions have swollen its nationwide ranks to about 800 members, Schryver said, and the growth shows every indication of continuing. Luchsinger has received reports about the possible emergence of yet another local Dama chapter, this one in New York, and Schryver speaks optimistically of someday "taking the association national."

Although Luchsinger shares Schryver's aspirations for a nationwide organization, he seems perfectly willing, for the moment, to bide his time. "I think we need to establish a stronger footing locally in some of our chapters before we try to form a group that would operate nationally," he said.

To Luchsinger, Dama's steady growth in both membership and geographic coverage signals an increasing awareness of the acute need to manage data like cash or any other strategic resource. "Many people already have a firm grasp of the issue," he said, "but have done very little to address it because it's so hard to turn things around."

Without divulging any names, Luchsinger cited several large user organizations that have tried repeatedly to establish internal data administration efforts, only to fail miserably because of a lack of commitment by upper management.

To succeed, any attempt to introduce a corporation to data administration requires a champion with plenty of executive clout, he said. "Ideally, the individual should be an IRM [information resource management] vice-president who reports directly to the company's president."

JAVELIN from page 1

ics system developers, plans to achieve this seemingly herculean task by basing its new product, also called Javelin, on what it calls an information base, a structure much like a data base.

Because data entered into Javelin is stored in a data base and not in the rows and columns of a spreadsheet, most of the problems inherent in the use of spreadsheets are avoided, according to Dick Bonzagni, Javelin's vice-president of marketing, who demonstrated the Javelin product recently to *Computerworld*.

Javelin, he said, sidesteps traditional spreadsheet problems, such as the need for all spreadsheet grids to match when their data is combined. The information base, he explained, links numbers with cross-referencing words, such as names or terms, and dates. The words can be from any language, and the dates can be drawn from a built-in calendar. Together, they act as tags to the data, permitting users to call up all data associated with a word, say "expenses," or a particular date.

Just as important, he noted, the words that make up the Javelin information base can be automatically linked and displayed in a flowchart that shows their relationship. Such a diagram could show that a Javelin spreadsheet's underlying logic was for various "operating expenses" of several "divisions" to be combined into "total expenses" and then subtracted from "total revenue."

A spreadsheet, by contrast, gives no overall picture of the train of logic on which it is built. To understand a spreadsheet's logic, the user must backtrack through each of the formulas that form the basis for each of the spreadsheet's rows.

Although Javelin hopes to replace the spreadsheet method of data management, it does not purport to replace the spreadsheet method of business analysis, Bonzagni said. Javelin, he explained, lets users draw data from its information base to create a row-and-column spreadsheet that looks much like that produced by Lotus' 1-2-3 package.

As with 1-2-3, users can do a "what-if" analysis of a Javelin spreadsheet, as well as create line, bar and pie charts. Users can also import files, either directly from 1-2-3 or as Ascii files from such software as Ashton-Tate's Dbase line, Bonzagni said. Ascii files are imported into Javelin as they would be into 1-2-3 in order to permit users to continue to use the download routines they have already written for use with 1-2-3, he added.

Javelin runs on the IBM Personal Computer with at least 512K bytes of memory and two diskette drives.

The company plans to begin shipments of Javelin this fall when there will also be a formal introduction of the product. In the interim, Javelin officials are demonstrating the program for individual members of the press. Though he declined to discuss distribution details, Bonzagni said the product will be directed at end users and MIS departments.

Javelin's biggest shortcoming is expected to be its requirement that all of its users adopt the same names for the same data if they expect to share data or combine their spreadsheets into one.

Bonzagni, however, maintained that this feature actually represents a potential asset to MIS management in that it can be the basis on which standard names are set for the data manipulated by all of the firm's personal computer users.

Straitjacketing standardization

Spreadsheets, Bonzagni maintained, require an even more straitjacketing standardization — the use of the same grid by every user. If one of several spreadsheet users departs from the standard spreadsheet grid — eliminating the row where, say, sales for a certain date are recorded — the error will invalidate the spreadsheet that results when the several spreadsheets are combined.

That, Bonzagni said, is one of the spreadsheet faults prevented by Javelin's information base.

Those with little or no spreadsheet experience can use Javelin more easily than a traditional spreadsheet, like Lotus' 1-2-3, he said. Unfamiliar users, he explained, could choose to enter data to the information base by drawing a chart or graph, a twist on the usual spreadsheet formula in which graphs are used with output.

Bonzagni also pointed out a feature called The Speller, which he said memorizes all of the commands, file names and terms entered by the user.

A dictionary of those terms and commands is available in a pull-down window from which users can cut and paste words for use as spreadsheet labels. They can also invoke commands from that dictionary, as they would using macros.

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HP commits to Spectrum, boosts 3000

PALO ALTO, Calif. — The next generation of Hewlett-Packard Co. minicomputers, high-end systems based on the company's Spectrum architecture, will be introduced in early 1986, according to company President John A. Young, who also promised a smooth software migration to the new systems.

Young last week made his first public commitment to a time frame for Spectrum while announcing a mid-range system and upgrades for the HP 3000 family of business computers. The mid-range system is the HP 3000 Series 58. The upgrades are from the previous mid-range system, the HP 3000 Series 48, to the Series 58; and from the HP 3000 low-end systems to the HP 3000 Series 42XP.

"Our commitment to protecting customer software investments remains a central goal of the Spectrum program, not only for future HP 3000 products but also for future high-end HP 1000 real-time systems and HP 9000 design systems. With hardware development and testing virtually completed for the first products of the Spectrum program, our attention is fully focused on making software migration as smooth as possible," Young said.

The Series 58 is said to feature 50% higher performance than the existing Series 48 with the help of a 32K-byte memory cache and double the maximum main memory at 8M bytes.

The other upgrade announcement was that existing HP 3000 Series 39, Series 39HP, Series 40 and Series 42 systems can be upgraded to the new Series 42XP to achieve performance gains of 25% to 40%, according to the company. The Series 58 costs $94,500. Field upgrades for the Series 42 and Series 48 cost $37,500. Upgrades for the Series 39, Series 39HP and Series 40 cost $40,000.

CDC to offer office automation software

Century Analysis fits product to NOS/VE

MINNEAPOLIS — Another mainframe hardware vendor is seeking to protect its turf by offering its users office automation software. Control Data Corp. last week announced an agreement with Century Analysis, Inc. to port that firm's OA software to CDC processors.

The CDC entry will run under the company's NOS/VE operating system on the full range of CDC systems, from the entry-level Model 180 to the high-end Model 990.

CDC spokesmen said the resulting package is intended to offer functions equivalent to those of Digital Equipment Corp.'s All-In-One, IBM's Professional Office System and Data General Corp.'s CEO office automation software.

The CDC software is scheduled to be available sometime in 1986, a spokesman said.

The development agreement appears to be CDC's attempt to stem the loss of users to competitors due to a lack of OA software, rather than an effort to win new customers. CDC has made its mark in the industry selling number-crunching processors for scientific applications.

Because of the company's mainframe orientation, Century Analysis was chosen to port its Officeware OA software to run under NOS/VE, a CDC spokesman said.

The Officeware packages include word processing, spreadsheets, business graphics and record management applications.

Officeware Applications for networking include electronic messaging and document transfer, shared scheduling and shared printing and archiving.

The Cyber 180 version of Officeware may include a distributed processing environment, enabling users to access word processing and spreadsheet applications locally on personal computers or by tying into the Cyber 180 mainframe.

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ADR

from page 1

features and the reduction in manpower required to operate the system," Cancilla said. "It's closer to a 24-hour environment, but it's still not there," he said, noting he still has to shut down his on-line system when he needs to perform certain maintenance tasks.

Datacom/DB's enhanced Data Query interactive relational query facility "has a long way to go to be a real user-friendly tool," Cancilla said. Data Query needs to be more closely integrated with the data dictionary to give users a good explanation of the data they have retrieved, he said.

Haydon Gaines, manager of data administration at Equitable Life Leasing Corp. of San Diego, a company that leases computer equipment mostly to Fortune 500 firms, began using Release 7.4 of Datacom/DB a month ago.

"We've had pretty good response" with the enhanced Datacom/DB, Gaines said. "Users notice the difference. Their screens come back faster, and the file size is the same. The file accesses and queries are much faster."

Some jobs that previously took one hour to execute now take 15 minutes, he said. "The pipelining and clustering features really increase performance on the large sequential-type files," such as accounts receivable and fixed-assets applications from Management Science of America, Inc., he said.

Several analysts observed that the announcements were made with an eye toward the No. 1 player in the DBMS market — IBM, which earned $600 million from DBMS-related sales in 1984 — and its DB2 relational DBMS.

Shaku Atre, president of Atre International Consultants, Inc. of Rye, N.Y., said the Datacom/DB enhancements are intended to exploit the Achilles' heel of ADR's biggest competitor. "They are trying to make the best of the weakness of their opponent," Atre said, noting that IBM's DB2 has been criticized by some of its users for being too slow. "ADR is being very creative in trying to come up with features to compete with DB2. The main thing they needed was performance improvements."

One analyst said the Datacom/DB enhancements appear to deliver on the promise of a unified solution fulfilling both user and production requirements. According to Damian Rinaldi of International Data Corp., a Framingham, Mass.-based market research firm that recently ranked Datacom/DB as the No. 3 independent DBMS, "Current relational models can't provide the support users need. Most represent compromises that provide a subset of ease-of-use features without sacrificing performance. What ADR is doing here is [addressing] the trade-off of meeting users' needs without sacrificing performance."

Peter Lowber, of the Boston-based Yankee Group, added, "Performance has been an issue. This will help ADR compete more directly with [Cullinet Software, Inc.] in high-performance transaction processing environments."

■

Enhanced Datacom/DB version includes storage management

Highlights of the Applied Data Research, Inc. (ADR) data base management system announcement included the following:

■ Datacom/DB 7.4, succeeding 7.3, offers storage management options, including clustering, in which related data is physically stored together to optimize the relational Join command and to speed the processing of related records. Other space management options permit Datacom/DB to be tuned for the processing pattern of applications.

The enhancements allow tasks to be processed in priority when multiple tasks are available for servicing. With user-specified parameters specifying the detail, accounting information is provided using ADR's Ideal fourth-generation applications development system and Data Query interactive relational query system.

■ Ideal 1.2, succeeding 1.1, features enhancements to the data manipulation language that take advantage of the extended Compound Boolean Selection Facilities in Datacom/DB. Early support site users of the product spoke highly of the extended facilities. The Boolean feature simplifies the task of building files from data stored in different physical data bases, a spokesman said.

New screen processing options in Ideal include support for the IBM 3279 color terminal, extended highlighting, increased print and Help command processing and enhanced cursor control. Data transmission overhead has been reduced by shortening the length of IBM 3270 data streams. Release 1.2 also reduces the CPU overhead required to generate data streams and streamlines the user sign-on and virtual storage requirements of screen definition panels.

Ideal's printing services have been extended to printers networked under control of IBM's CICS.

■ D-Net 1.2, succeeding 1.1, enhances Datacom/DB's distributed data network manager for organizations with multiple IBM mainframes at one location. D-Net now provides high-speed channel-to-channel coupling for stand-alone IBM MVS and MVS/XA host systems loosely coupled with IBM's Multisystem Channel Communication Unit. The channel-to-channel support is said to allow organizations to distribute and share data base processing among multiple CPUs more easily.

The updated D-Net also provides full concurrent update protection and restart and recovery and transaction back-out services. System maintenance and changing of the data base can be performed without interrupting on-line processing.

■ ADR/DL 2.1, succeeding 2, more closely integrates the company's high-level Cobol language facility for Datacom/DB with ADR's active Data Dictionary. The enhancement is said to give data base administrators tighter control of the use of data views, especially in large MIS shops.

The updated ADR/DL release provides for relational operations on Datacom/DB using the Boolean facility. ADR/DL's relational data base management language is now modeled after Ideal's, to provide consistent methods for developing applications, a spokesman said.

■ Vsam Transparency 2, succeeding 1.1, allows users to restructure Vsam records into Datacom/DB to get more use of its relational capabilities and to allow non-ADR software to be migrated to the data base. Data can be transferred from Vsam to Datacom/DB and can be restructured automatically. The updated release eliminates relinking of batch programs previously needed to activate the Vsam Transparency, lessening the demand for computer resources.

■ CICS Service Facility 2.3, succeeding 2.2, has been enhanced for sites running MVS/XA. The facility can now accept calls from CICS application programs that are running above or below the 16M-byte line.

■ Data Query 3.1, succeeding 3, has been updated to support the Japanese Kanji language. The product also supports English, French and German. Enhancements to Data Query are aimed at improving on-line and batch sort functions.

The price for the enhanced ADR/Datacom System, provided free to users with maintenance agreements, is $116,000 for users in IBM DOS environments and $145,900 for IBM OS/VS1, MVS and MVS/XA users.

— John Desmond

■

Users cite performance gains, glitches in early Release 7.4

It had some glitches, but it did improve performance, said three users of an early version of Applied Data Research, Inc.'s (ADR) enhanced Datacom/DB relational data base management system.

Robert Cancilla, data base administrator for the Fremont Indemnity Co. of Los Angeles, obtained Release 7.4 of Datacom/DB late last year. His shop runs an IBM 4381 Group 2 with 8M bytes of main memory, the DOS/VSE 3.5 operating system running under VM and CICS 1.6.

He was an early suport customer of the enhanced Datacom/DB, ADR/DL Cobol language facility, Data Query interactive relational query system and CICS Service Facility.

His shop processes, in an average eight-hour period, 135,000 CICS transactions and 1.5 million data base service requests, Cancilla said. In 24 hours, he said, the shop processes some 5 million data base service requests.

Performance improved from 10% to 15% in his shop with the enhanced Datacom/DB, Cancilla said. While performance was impressive, enhancements to make the data base available for 24-hour updating came up slightly short for Cancilla.

"They claim you don't have to shut the software down to make changes. But realistically, you have to disable one or more tables or files to maintain the system. We can't shut down one piece and continue running. [ADR] still can't make maintenance changes on the fly while the world is still operating," Cancilla said.

The Data Query facility is used by 40 end users in Cancilla's shop. Those users, many of them in management, retrieve up to 40,000 records in a single query. With the enhanced Datacom/DB, "the overhead is not that noticeable. It does not degradate processing at all." Cancilla said he would like to see Data Query more closely integrated with ADR's data dictionary.

ADR's pipelining enhancement, whereby a series of data base updates are held in a main memory buffer for updating all at once, initially caused a problem for Fremont Indemnity. "Their pipeline had a leak in it. When we first got it, it had a gaping hole that poured data out of the machine. It just disappeared," Cancilla said. The company has since fixed the glitch to Cancilla's satisfaction.

The Compound Boolean Selection Facilities of Datacom/DB 7.4 were well received by Cancilla's programmers.

Robert Burkhalter, data base administrator at the Independent Life Insurance Co. in Jacksonville, Fla., began using Release 7.4 of Datacom/DB in April. The company's two IBM 3033 mainframes were at the saturation point, so the DP shop agreed to become an early user in the hope the performance improvements would forestall the need for replacement hardware. The Independent Life DP shop has heavy on-line transaction processing and batch processing demands.

While the enhanced Datacom/DB has extended the useful life of the company's mainframes, Burkhalter said, "we'll still need a machine at the same time. The difference is we'll have more being processed at that time."

The Boolean facilities feature was praised by Burkhalter, who said it significantly reduces I/O and thereby improves performance.

Haydon Gaines, manager of data administration at Equitable Life Leasing Corp. of San Diego, a company that leases computer equipment mostly to Fortune 500 firms, began using Release 7.4 of Datacom/DB a month ago. The company has an IBM 4341 Group 2 with 8M bytes of main memory. The DP center is transferring its processing to the mainframe from Honeywell, Inc. and Digital Equipment Corp. processors that belong to two firms that were merged two years ago to form Equitable Life Leasing.

The company has 25 terminals on-line in the production environment, with plans for another 100 to go on-line from the home office and sales offices and another 29 eventually from branch offices.

All applications are now being written in Ideal, a total of 800 so far, Gaines said. "In one year, we put together a system with 15 programmers that would have taken 100 programmers two years to do in Cobol," Gaines said.

Equitable Life Leasing has had only one problem with the updated Datacom/DB since having it installed. "If we read a file three times, and it didn't find what it wanted, it locked up the data base." ADR technicians responded quickly and fixed the bug within two days, he said.

One suggestion for further improving Ideal would be to offer more than three pages of help information per screen, Gaines said. To provide for its own sophisticated Help system, Equitable Life has written its own code to provide the maximum number of Help screens users require, he said.

On the whole, Gaines is happy with the Datacom/DB enhancements. "There's a few little quirks to work around, but the nucleus is pretty solid," he said.

— John Desmond

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Columbus	Oct 8
Dallas	Oct. 8, Nov 13
Dayton	Oct 9
Denver	Oct 29, Nov 20
Detroit	Oct 22, Nov 12
Houston	Oct 31, Nov 21
Kansas City	Nov 6
Los Angeles	Oct 22, Nov 19
Minneapolis	Oct 10
New Orleans	Nov 19
New York City	Oct 10, 25, Nov 6, Dec 12
Newport Beach	Oct 17
Oklahoma City	Nov 7
Omaha	Oct 24
Orlando	Oct 15
Phoenix	Oct 9
Portland	Oct 10
Rochester	Oct 10, Dec 5
Sacramento	Oct 8
St. Louis	Nov 14
Salt Lake City	Nov [illegible]
San Antonio	Oct 23
San Diego	Nov 7
San Francisco	Nov 5
San Jose	Oct 24
Seattle	Oct 2, Nov 26
Syracuse	Nov 7
Tulsa	Oct 29
Washington	Oct 10,24, Nov 7, Dec 10
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Randall L. Tobias

CW PHOTOS BY GODFREY O'CONNELL

AT&T is feeling the growing pains of divestiture everywhere, most recently in last month's announcement to eliminate 24,000 jobs in the Information Systems division. AT&T Communications, the company's long-distance services arm, has been plagued by delays in its private-line installation, by increasingly competitive players like MCI Communications Corp. and by its perpetual lobbying against the remaining shackles of government regulation.

In the center of the AT&T Communications storm is Chairman and Chief Executive Officer Randall L. Tobias, at 43, the youngest member of AT&T's top management team. A 21-year Bell system veteran, Tobias was promoted to his current position from senior vice-president of AT&T, where he specialized in regulatory and legislative policy issues.

Interviewed by Computerworld staff writer Clinton Wilder recently in his office at AT&T Communications headquarters in Basking Ridge, N.J., Tobias shared his views on the Federal Communications Commission, the partnership between IBM and MCI, equal access and competition for the business and residential long-distance market.

You have been quoted as saying that the long-distance marketplace is now a competitive one. But your competitors insist that it is not, since AT&T still has an enormous market share. In long-distance market share figures, [GTE Sprint Communications Corp. President] Don Prigmore in a recently published forum on deregulation charged that AT&T had a 90% market share, while you maintained that it was only 64%.

Market share isn't even relevant. Market share suggests that you have the ability to do certain things, whereas it is really market power that is significant. Regardless of our market share, we don't have the market power that would permit us to do the kind of things that people in some corners accuse us of.

But people, including yourself, still use those numbers.

Our number, the 64% figure, is based on the traditional definition of long-distance service.

Yet Prigmore and others like to ignore that definition and say, "No, that's not what we're talking about; we're going to define the long-distance market differently."

My parents live in rural Indiana. For all I know, we have 100% of the market there because nobody else is willing or interested in serving those markets.

If you look at certain high-profit segments of the market, then our market share is much lower where there is particular price sensitivity. What's the relationship between lower market share and competitors passing along only part of subsidy? That's not because our [lower priced] competitors are passing along real savings. They are passing along only part of the subsidy that they get because of the discount in access charges. But they are siphoning off some of that subsidy and keeping it for themselves. It is the American public that's getting gouged as a result of all that.

If you were truly deregulated, what assurance would there be that rural Indiana would still have complete long-distance service, if it's not a profitable enough market to be in?

Oh, I think it's profitable enough to be in. The issue of abandonment of markets is an issue that I think a lot of people in rural communities used to be concerned about, but I don't think they are concerned about it particularly any more. A lot of the [digital, fiber-optic] technology kind of makes that problem go away. We just established telephone service to Pitcairn Island in the Pacific. That is a very good example of something that did not cost much to do because of the nature of the technology that is already there. We hooked some links together, and it was no big deal.

There is also the perceived threat of price deaveraging. I don't know where prices are likely to go, but one thing I am pretty certain about is that whatever changes are made, they are going to be made on the basis of volume, not geography, because that's where the real cost trade-offs are.

I recently asked [MCI Communications Corp. Chairman] Bill McGowan to respond to your published comments about deregulation in light of the IBM-MCI hookup. His response was that IBM owned all of Satellite Business Systems [SBS] before the deal and now has only 16% of MCI, so he was trying to downplay it. How do you respond to that?

I think the facts are self-evident. First of all, you have a company, in IBM, that . . . is not a newcomer to the information business or the telecommunications business. Here is a company that has looked around at the opportunities and decided to build a relationship with MCI. With that, it can take its traditional business, the [Rolm Corp. private branch exchange] business that it's purchased, and what they had in SBS, plus MCI now, and leverage all of that in the marketplace.

Here's a company that's bigger than AT&T, that's got all of these strengths. It is just ludicrous to me that somebody would say that because we didn't change our name — because when we were the Bell system we were called AT&T — that we ought to continue to be fettered with the regulations that may have been appropriate for the Bell system when it was called AT&T. [Regulation] clearly no longer makes any sense for a company that isn't even the biggest company in this whole information movement and management business.

In terms of the technical directions that you would like to move in the data communications market, how is [the Federal Communications Commission's] Second Computer Inquiry keeping you from doing what you would like?

In code and protocol conversion, [Computer Decision II] addresses something called enhanced services, and nobody knows what that is. It is based on a premise that says you can divide the world up and put it in nice, neat, little packages — data processing is here and communications is here — and, therefore, you can't do certain things under the provisions of [Computer Decision II].

As a result of those prohibitions, the marketplace and the consuming public are kept from the benefits of things that we know about . . . and from the benefits of things that we don't even know about because there has been no way for those synergies to be developed. I don't think we even know what we are missing.

[Computer Decision II] was established at a time when there was concern about the Bell system and its ownership of local dial tone and the alleged bottleneck associated with it. Then the divestiture came along and solved the problem more permanently than [Computer Decision II] did.

I am often asked if I am pleased that the FCC appears on the verge of doing something about [Computer Decision II]. [The answer is] "yes," except it is hard to be excited about something that should have been eliminated on Jan. 1, 1984, if not before.

What do you think about the speed at which FCC Chairman Mark Fowler is bringing about deregulation?

I understand the political problems, and I understand the realities and all of that, but when you're bleeding to death, it's hard to have a lot of patience with problems that should have been resolved a long, long time ago.

We are trying, for example, to introduce a service called Proamerica [targeted at] small businesses. Anybody else in the marketplace that wants to introduce their version of Proamerica could decide this afternoon they wanted to do it and have it in the marketplace tomorrow. We introduced it in April, filed the petition with the FCC and we still don't have permission to put it in.

I don't understand how that is possibly in anybody's interests, other than perhaps some competitors whose interest is served by keeping prices artificially high in the marketplace.

Do you think the current equal access plan will work?

I think it will work because all the players are going to work hard to make it work, at least speaking for us. But do I think it's a good idea? That's a different question.

A very large percentage of our customers understood the rules to mean that if you are happy with what you have, you don't have to do anything.

So for the government to come along and say that it is now going to make that decision for you, and after the public's been jerked around so much in all this transition . . . I am disappointed

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TEXACO

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air-conditioning and power load requirements, without which we would have had to do some major building improvements, the physical space itself — the footprint — and the increased level of error handling and recovery," McDonald reported.

More than 12 mainframes

Texaco, which was one of several companies to receive the dual-processor Model 200s last week, has more than a dozen mainframes dispersed throughout two major data centers here and in Tulsa, Okla. The company plans to add at least two, and possibly three, Model 200s by the end of 1985 and plans to upgrade the Model 200s to quadratic processor Model 400s when those systems become available in late 1986 or early 1987. Texaco's first 3090, acquired under a third-party lease, was ordered in February when the 3090 line, also known by its development code name Sierra, was announced. McDonald said the 3090s will gradually replace combinations of IBM 3080-type systems.

"In an interactive environment," he added, "there are a couple of things going for the 3090, including the extended storage. We are hoping for a lot faster response, although we haven't figured it out exactly. There are always a large number of potential bottlenecks standing by making sure you don't get the response rate you hope for in the early going. It may be channel paths, communications lines or anything. We do anticipate a 10% improvement over the main CPU ability in the 3080s. It will probably take us two weeks to adjust our parameters and get full performance, which will be just about the time that the next 3090 rolls in the door."

The first Texaco machine contains an extended memory of 128K bytes, rather than the standard 64K bytes, and runs under IBM MVS/XA. It is being placed in an IBM JES3 multi-CPU environment using IBM TSO. That environment, supporting the Interactive Computing Center, is in use at both data centers, as is a second environment, IBM's JES3 IMS, which supports transaction processing such as payroll, personnel and financial applications.

The Interactive Computing Center is an information center-based concept under which Texaco provides decision support to managers and technicians through its multiple 3090 and 3080 mainframes running a variety of data base management systems and connected by an IBM Systems Network Architecture network.

According to McDonald, the only software changes required to prepare for the 3090's arrival involved upgrading two components of MVA/XA — an error recovery routine and the XA nucleus itself — to a higher release level.

He said that the autodial facility, in which the 3090 "does like E. T. and phones home when something goes wrong," allows the system to notify automatically the operator and telephone an IBM service center when the computer has a technical malfunction.

McDonald said that feature does not present a security problem because the feature provides no access to the data path.

McDonald noted that the specifications for the Model 200 list its footprint as 452 sq ft and weight as 13,000 lb, compared with 657 sq ft of floor space required for the 20,000-lb IBM 3084.

He reported that space for his 3090 was cleared over the course of several months as Texaco upgraded its banks of disk drives.

TOBIAS

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in that from a public policy view.

Is the Integrated Services Digital Network [ISDN] really a key goal for AT&T, or will communications technology eventually evolve to all-digital anyway?

No, I think our strategy is fundamentally one that accommodates ISDN, and I think that it's very important. I think that we've got to have connectivity that finds the world as it is and makes it as transparent as possible.

If AT&T Communications faces the same type of competition and profitability pressures as AT&T Information Systems, what assurances are there that you might not have to undergo the same kind of job cut?

We've got to be, in my judgment, the low-cost supplier in the marketplace. That means we have to be constantly reexamining the cost structure to determine how we get this job done better with less cost.

Having said that, we do not foresee, either now or in the future, a need for the kind of people-oriented downsizing across the board in the organization in communications that we're all dealing with now in AT&T Information Systems.

That is not to say that we won't have pockets of surplus here and there around the organization. We have 120,000 people here, and I think it would be foolish to think that there won't be places in which we will find ways to do things more efficiently, and there will be people impacts.

In conclusion, I obviously wouldn't ask you to assess your chances, but would you like to replace [AT&T Chairman of the Board] Charles Brown someday?

That is not one [area that] I spend a lot of time thinking about. We have the good fortune here of having a very capable senior management team, and I have a lot of confidence in all of those people. I think one of the strengths of this organization is that we do not spend any time worrying about that kind of an issue.

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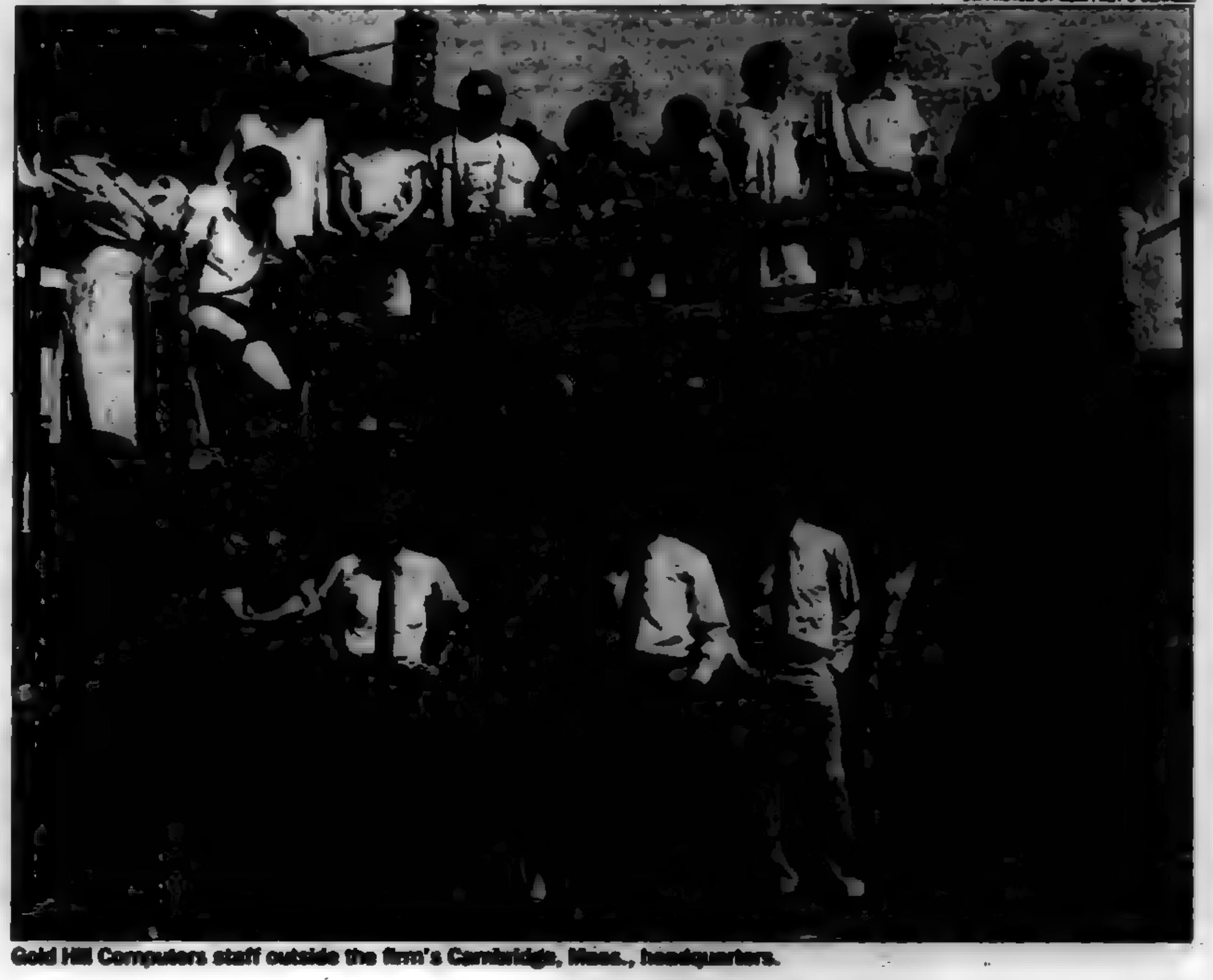
AI firms outgrow seat-of-the-pants style

Professional style ascendant as tools come to marketplace

CW PHOTOS BY GEOFFREY O'CONNELL



Gold Hill Computers staff outside the firm's Cambridge, Mass., headquarters.

By Eric Bender
CW Staff

The offer to join Gold Hill Computers, Inc. as president was tempting, but Carl Wolf came up with one nonnegotiable demand: the bomber flights must end.

Like many other members of the East Coast artificial intelligence community, Gold Hill's vice-president for research and development, Gerald Barber, liked to fly around in a colleague's World War II bomber. As one passenger later joked, if that plane crashed, it would take the U.S. fifth-generation computing effort with it.

Risking prime technical talent this way did not appeal at all to Wolf last spring as he considered the risks of leaving the presidency of Interactive Data Corp. He joined the small AI micro software firm, but he asked that Barber be grounded.

In a small way, Wolf's request demonstrates the way the firms now vying to supply micro-based AI tools are following in the footsteps of earlier entrants in the AI arena, making the transition from seat-of-the-pants to professional management.

And, again like the AI pioneers, they must stay tightly focused on practical uses of the technology. For the moment, "there's a lack of demonstrable, successful applications," Wolf acknowledged, although he and many others predict that the situation will change by early next year.

Gold Hill and Arity Corp., another supplier concentrating on the IBM Personal Computer family that shipped its first products last year, highlight the promise and current status of AI tools on micros.

Wolf

The founders of Gold Hill — Barber, Stanley Curtis (vice-president for consulting and training) and John Teeter (vice-president for engineering) — met as students at the University of Idaho. After holding various jobs in industry and academia, the three started Gold Hill in 1982 to develop AI products for personal computers. Based a few blocks from MIT in Cambridge, Mass., the company is named for Teeter's Idaho farm.

Gold Hill took its technical points of departure for its current products from the Intel Corp. 8086 family, with prime emphasis on the 80286 chip, and Common Lisp, a Lisp dialect then beginning to emerge as a standard under the sponsorship of the U.S. Department of Defense Advanced Research Projects Agency.

Along the way, Gold Hill joined forces with Carl Hewitt and Patrick Winston, two AI gurus at MIT who continue to serve on the company's board. The firm also worked jointly with Symbolics, Inc. last year on a well-publicized knowledge system venture for Shearson Lehman Brothers, Inc., a subsidiary of American Express Co.

The company began shipping Golden Common Lisp, the first Personal Computer implementation of Common Lisp, last November. The package has been sold to approximately 3,000 customers, primarily large corporations, Wolf said.

Gold Hill's initial marketing plan targeted end-user applications as well as development tools. But Wolf, who pointed out that few software firms have prospered by offering both languages and applications, drastically redefined the plan. The main thrust now is to establish Golden Common Lisp as a micro AI standard. The firm will then extend the product line with additional development tools and service offerings.

"The business community is waiting for a [Cullinet Software, Inc.] to come along and help them into AI," Wolf suggested. "We want to be the Cullinet of this industry."

The company currently employs 18 people and has a monthly run rate of about $200,000, Wolf said. "With people like Carl Hewitt and Gerry Barber, we could make a lot more money than this in consulting," he remarked, but the strategy should pay off down the road. Gold Hill's revenue goals are $2 million this year, $9 million next year and $17 million in 1987, he added.

Barber

One key offering, scheduled for commercial availability by year end, is a large-memory version of Golden Common Lisp designed for the Personal Computer AT, which will directly address up to 16M bytes of internal memory.

While the standard Personal Computer offers "acceptable performance for many applications, "the big problem is memory, and I think the [AT] solves that," Barber said. "The AT will be where the action is in AI in a few years — it certainly has the power, and it's going to be everywhere."

Barber predicts a turn toward networked development environments, with ATs hooked to dedicated Lisp machines, as at Gold Hill. "Symbolics is never going to build a workstation as cheaply as IBM," he commented. A network supporting Common Lisp on all nodes will permit developers to do much of their work on the AT, then send it over to the dedicated machine for compiling and other CPU-intensive tasks, he said.

In another major step, during first-half 1986, Gold Hill will move into the expert systems shell arena. "Our market research tells us there are two to 10 times the number of people willing to program at this level as are willing to program in Lisp," Wolf commented. "It's a much, much bigger ball game."

Here, Gold Hill will compete with AI software pioneers such as Intellicorp, the Carnegie Group, Inc. and Teknowledge, Inc.

The approach will be to offer products that are not as powerful but that are easier to develop and maintain, Wolf said.

While many firms are offering AI languages on personal computers, Wolf listed three main competitors: Lucid, Inc., Expertelligence, Inc. and Arity. Among those, only Arity has targeted IBM micros.

Located in Concord, Mass., about 20 miles west of Gold Hill's headquarters, Arity was started by Lotus Development Corp. alumni. President Peter Gabel, who has also flown on that bomber, was an early Lotus employee and subsequently ran Lotus'

Advanced Development group. Arity R&D Vice-President Paul Weiss was a member of the group.

The two formed Arity in the spring of 1984. The company's first commercial products, a Prolog interpreter and a compiler/interpreter package, shipped last April.

Gabel, left, and Arity Vice-President for R&D Paul Weiss

Arity adhered to the Prolog core defined by a standard computer science textbook while modifying it for the Personal Computer, Weiss said. The firm also put in a series of extensions for tasks that traditional Prolog does not do well, including the handling of text strings.

The Arity packages also offer hooks to C and assembly languages for the 8086 family. "This distinguishes us from a lot of [personal computer] companies," Gabel pointed out. Another difference is that Arity will not charge royalties on runtime versions. "If Prolog is to become more successful, it must be more commodity-like," he maintained.

While software vendors represent the largest group of Arity customers, classic DP shops run a close second, according to Gabel. Particularly in insurance firms and banks, these shops are building micro packages designed to provide intelligent interfaces to mainframe data. "Prolog happens to be a perfect kind of language to do this," Gabel said. "Prolog has a natural connection to data bases."

One customer — whom Gabel declined to identify — is a leading mainframe data base management system vendor,

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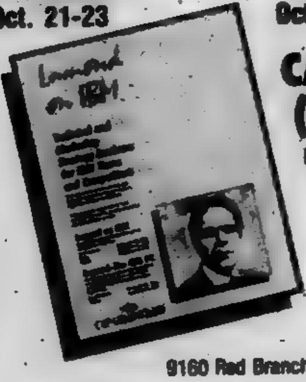

Plug low-cost ASCII printers into your IBM 3274 with [illegible]

Experts beat out expert systems at financial firms

Insurance official cites harder implementation

By Charles Babcock
CW New York Bureau

NEW YORK — Despite frequent announcements of expert systems, there are few available that can help a financial institution improve its business, said a Metropolitan Life Insurance Co. technical planning official.

Roger J. Jones, planning manager in Metropolitan Life's corporate systems planning division, recently told the members of the Association for Women in Computing that human experts are harder to duplicate than expert system advocates admit. In many cases, it is so expensive to encode the thinking of an expert that a bank or insurance company prefers training its own experts.

"What if the expert lies to you? What if the expert is wrong and just lucked out? What do you do when the business the expert told you about changes?" Jones asked.

These uncertainties are what expert system advocates label "research questions," he said. Some experts are so possessive of their special knowledge or threatened by the prospect of having their skill put into a computer that they covertly sabotage the expert system building process, he noted.

Jones said Metropolitan Life constructed an expert system to perform the underwriting function on personal insurance policies. Underwriters typically evaluate a mass of information about a client to determine the degree of risk he represents to an insurer.

Metropolitan Life's expert system evaluates the information to see if it is sufficient to determine risk, then it decides whether the prospect represents a standard or substandard risk to the company.

The giant insurance company found that it cost more to have someone transcribe 20 to 30 pages of medical information from doctors into the system than it did to have an underwriter evaluate the information the way it came into the office.

In addition, insurance companies are under pressure to use larger pools of cases in determining actuarial tables, which makes an expert system based on today's risk conceptions out of date. Insurers, for example, are shifting away from relying on pools that separate men from women in the actuarial tables.

Jones said the underwriting system was "built as a technical proof. It was never intended to be installed," and isn't currently working as a production model. Metropolitan Life simply made it a corporate objective to

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which used the Prolog tools to build an expert system that consults on installation of its software. Nearly 100 users have benefited from the expert system, which significantly reduces installation time and errors, Gabel said.

Products from Arity customers will begin surfacing next year, Gabel said. "The leaders are out of evaluation mode. . . . Everyone's fighting to get into development mode."

Unlike the case with Gold Hill, Arity will not design its own method to address directly up to 16M bytes on the AT. Instead it will wait for another release of MS-DOS to overcome the direct-address barrier.

Weiss downplayed the value of a networked development environment, saying that the requirement to port between various machines raises unnecessary problems.

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understand expert systems and commissioned a group under Jones to look for ways to apply them.

After two years of looking, his group concluded: "Nobody's written anything in 10 years that's done anything. All the successes that you read about have been around for a long time."

He cited as examples Prospector, an ore-hunting system developed by SRI International, Inc.; and Dendral, a system developed 20 years ago at Stanford University to identify the molecular structure of compounds from samples.

"The reason they were successful is that they mapped a very broad knowledge base of very simple facts," he said.

Human beings tend to lack the computer's capacity to search huge data bases looking for one pattern or set of facts, he noted.

Even when an expert system does this, the rules or knowledge at the core of it tend to be small, he added.

Jones said MIS administrators should continue to look for ways to employ expert systems at their institutions in addition to improving data processing productivity. If expertise were viewed in a broader sense of a collection of experts knowledgeable about more than one aspect of the business, expert systems might be built that could serve long-range needs, he said.

But until then, most financial institutions are finding it cheaper to simply train human experts, he said.

Police recover hijacked DEC VAXs

By Peter Bartolik
CW Staff

WATERTOWN, Mass. — Two top-of-the-line Digital Equipment Corp. systems were recovered in this metropolitan Boston area community Wednesday after being hijacked two days earlier. A contract driver who reported the theft turned himself into police here Thursday after a warrant was issued for his arrest.

The stolen VAX 8600 and VAX-11/785, both fully configured and valued in excess of $1 million, were discovered in a warehouse here after police received calls from two citizens who said they saw DEC packages being unloaded.

The prime suspect in the case, Robert Dickerson, 48, of Malden, Mass., turned himself in to Watertown police midday Thursday after a warrant for his arrest was issued by the Middlesex County District Attorney's office. Dickerson was a driver for Camel Trucking, Inc. of Chelsea, Mass., a company contracted by DEC to transport the equipment to Logan International Airport outside Boston for air shipment to Nihon Digital Equipment Corp., DEC's Japanese subsidiary. DEC spokesman Jeff Gibson said the company has its own trucking fleet, but often contracts out when its own fleet is being fully utilized.

According to police, Dickerson picked up the truck at DEC's Northboro, Mass., shipping facility early Monday afternoon. He told police he pulled into a nearby truck stop on the Massachusetts Turnpike after experiencing mechanical problems. He reportedly was approached by a man with a gun after he got out and lifted up the hood of the truck. Dickerson told investigators he had been pushed into a van, handcuffed and transported to an out-of-the-way area in Wilmington, Mass., some 20 miles away.

The truck, which did not bear any DEC markings, was recovered in Somerville, Mass., Wednesday morning.

Watertown detectives alleged that Dickerson rented the warehouse space for a short period of time some weeks earlier. Watertown Police Sgt. William Chase told *Computerworld* that the circumstances indicated planning on the part of an undetermined number of thieves and that Dickerson certainly knew the contents of the shipment.

Chase said he was not aware of how the thieves intended to dispose of the sophisticated equipment. "There are people who would take a hot stove if the price was right," he said.

John J. Cloherty Jr., a spokesman for the Boston office of the Federal Bureau of Investigation, which joined in the investigation, discounted early media speculation that the equipment was destined for a Soviet bloc country embargoed by the U.S. from receiving such equipment. Cloherty told *Computerworld* the FBI was "treating the case strictly as the theft of an interstate shipment."

DEC's Gibson said he could not conceive of any manner in which the equipment could be disposed of. "If it was a personal computer or a [DEC] Rainbow I could see it, but how do you get rid of a Venus?" he said. Venus was the code name for the 8600 while in the development stage.

'Gray market is huge'

A criminal investigator specializing in industrial security, who asked not to be identified, told *Computerworld* that, "As far as I'm concerned, the gray market is huge and can gobble up anything from a [Cray Research, Inc.] Pentagon-size system to an [Apple Computer, Inc.] Apple, with a VAX someplace in between."

The investigator asserted that Soviet bloc agents "are too sophisticated" to be involved in a case of this type, and, "More likely, it was set up for a domestic buyer."

A company possessing a stolen computer could obtain peripherals, software and services on the gray market or through legitimate non-DEC suppliers, the investigator said. "There have been several cases that I've seen where even banks have ended up with stuff from the gray market only because somebody approached them and said, 'I can get it for you wholesale.'"

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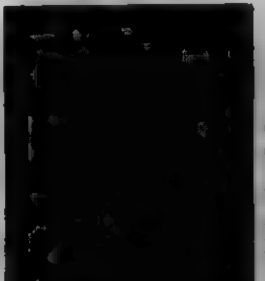

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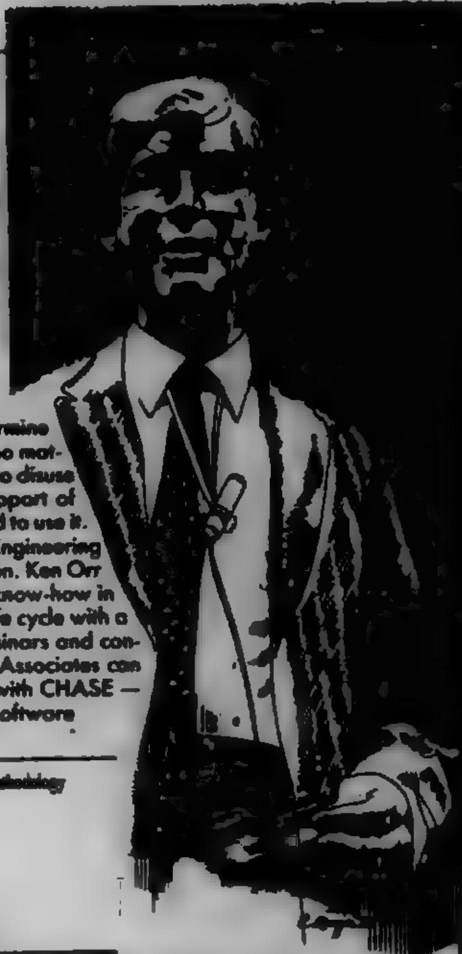

WASHINGTON UPDATE
CW Washington Bureau

DOT plans electronic system for tariffs

WASHINGTON, D.C. — The U.S. Department of Transportation (DOT) recently announced that it plans to develop an electronic filing system for international airline tariffs to replace "an antiquated paper filing and review system that dates back to 1938."

In an advance notice published in the "Federal Register," a daily government bulletin, the DOT said a computerized system would save money for both the airlines and the department, which is faced with an "avalanche" of paper inherited from the defunct Civil Aeronautics Board.

Although the major airlines and tariff filing agents have computerized their tariff data systems, the DOT has not. "As a result, airlines are often in the position of converting computerized fare and rate data into printed form for the sole purpose of meeting the statutory filing requirements," the DOT announcement said.

"The industry is now spending at least $5 million a year to produce, file and distribute paper tariff documents. [The] DOT is spending more than half a million dollars a year just to process the paper," the statement continued.

The DOT said it envisions a system where airlines or their agents would send the data via telecommunications to a central data base. Public comments on the proposal are due Nov. 18.

GSA office markets software, OA services

ARLINGTON, Va. — Tucked away in the U.S. General Services Administration building is an office that acts so much like a private business that it even has a director of marketing to promote its services and distribute slick brochures.

The unit is the Office of Software Development and Information Technology (OIT), which recently held its second annual Client/Vendor Conference here. Much of the conference was devoted to describing the OIT's services to an audience of potential customers — DP professionals at federal agencies.

"We take a business-like approach rather than a bureaucratic approach," commented Rick Dillon, the new OIT director of marketing. The services for government agencies include technical assistance for software management including conversion, maintenance, improvement and quality assurance; developing and managing office automation projects; and systematic planning for information resources management.

The OIT staff is reimbursed for its services by the agency customer, and the goal of the OIT is to produce enough revenue to break even at the end of the fiscal year. Frequently, the OIT helps the agency obtain well-qualified contractors for the job and manages the contract.

Officials were sensitive to criticism from some vendors that the OIT competes with the private sector for government business, a practice that would contradict Reagan administration policy. "We don't compete with the private sector, we create more business for the private sector," Dillon said, explaining that the office is a conduit for vendors seeking agency contracts.

SSA plans Cobol quality control

By Mitch Betts
CW Washington Bureau

ARLINGTON, Va. — The Social Security Administration (SSA), in the midst of its $500-million hardware modernization program, is taking aggressive steps to upgrade the quality of its huge inventory of Cobol software as well, according to Ralph DeAngelus, director of the SSA's Office of Programmatic Systems.

In a recent speech here, DeAngelus outlined several software improvement projects, including the following:

- The SSA held a series of seminars on software improvement for 600 DP professionals.
- The SSA recently ran its Cobol programs through a software alignment tool to standardize alignment. Programmers are now using this tool for new programs, and soon the SSA will not allow a program to migrate to the production library unless it has been run through the alignment tool.
- The SSA initiated a pilot project to acquire and implement a series of integrated tools for upgrading all Cobol software, including tools for converting code to Cobol 74, structuring and testing Cobol code and eliminating dead and obsolete code.

"Our goal is to have a Cobol programmer's workbench installed and in use by the end of next summer," DeAngelus said.

Required to use tools

He added that programmers will be required to use the quality-control tools.

The development and enforcement of quality-control standards is crucial, DeAngelus emphasized. "Without enforcement mechanisms in place, as soon as we started to modify the improved software we would be starting the software degradation process all over again," he explained.

"Once we establish a standard and install a tool to enforce that standard, it will be applied against new software development as well as existing software [maintenance]," he said.

DeAngelus said the agency decided not to have this work done by private contractors. "We need to institutionalize the process in SSA with SSA people.

"We want to avoid another $500-million systems modernization program 20 years from now," he said.

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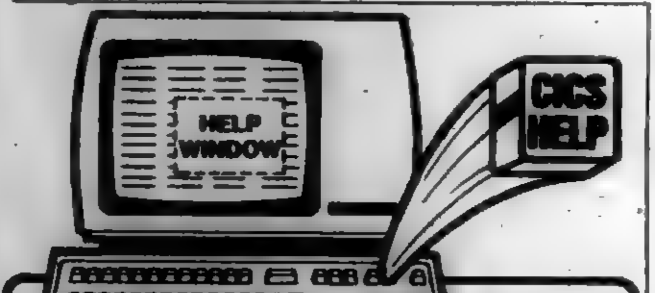

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Dartmouth offers Ph.D.

HANOVER, N.H. — Dartmouth College is instituting a doctoral program in computer science.

Ten students each year will be admitted to the program, beginning in September 1986. Students will need four to six years to complete the requirements, which include course work, research, certifying exams and a thesis.

The graduate program will range from hardware and computer architecture concentrations to theoretical studies of algorithms and formal languages. Dartmouth will also offer an M.S. degree in computer science.

The doctoral program's faculty will be drawn from the Department of Mathematics and Computer Science and the Thayer School of Engineering at Dartmouth.

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So we approached Lattice, Inc. and asked if we could implement a version of the Lattice C compiler for IBM mainframes. With Lattice, Inc.'s agreement, development began and progressed rapidly.

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Our efforts are complete—we have a first-rate IBM 370 C compiler. And we are pleased to offer this development tool to you. Now you can write in a single language that is source code compatible with your IBM mainframe and your IBM PC. We have faithfully implemented not only the language, but also the supporting library and environment.

Features of the Lattice C compiler for the 370 include:

- **Generation of reentrant object code.** Reentrancy allows many users to share the same code. Reentrancy is not an easy feature to achieve on the 370, especially if you use non-constant external variables, but we did it.
- **Optimization of the generated code.** We know the 370 instruction set and the various 370 operating environments. We have over 100 staff years of assembler language systems experience on our development team.
- **Generated code executable in both 24-bit and 31-bit addressing modes.** You can run compiled programs above the 16 megabyte line in MVS/XA.
- **Generated code identical for OS and CMS operating systems.** You can move modules between MVS and CMS without even recompiling.
- **Complete libraries.** We have implemented all the library routines described by Kernighan and Ritchie (the informal C standard), and all the library routines supported by Lattice (except operating system dependent routines), plus extensions for dealing with 370 operating environments directly. Especially significant is our byte-addressable Unix®-style I/O access method.
- **Built-in functions.** Many of the traditional string handling functions are available as built-in functions, generating in-line machine code rather than function calls. Your call to move a string can result in just one MVC instruction rather than a function call and a loop.

In addition to mainframe software development, you can also use our new cross-compiler to develop PC software on your IBM mainframe. With our cross-compiler, you can compile Lattice C programs on your mainframe and generate object code ready to download to your PC.

With the cross-compiler, we also offer PLINK86™ and PLIB86™ by Phoenix Software Associates Ltd. The Phoenix link-editor and library management facility can bind several compiled programs on the mainframe and download immediately executable modules to your PC.

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WORLD DIGEST

CW International News Network

TOKYO — Hitachi Ltd. has announced that it received orders for its Model S-810 supercomputer from the Meteorological Agency and Okazaki Kokuritsu Kyodou Kenkyu Kikou Bunshi Kagaku Laboratory, which is a national Japanese molecular research laboratory.

Increased use of supercomputers is evident this year, and the Japanese market is becoming more competitive among Fujitsu Ltd., Hitachi, NEC Corp. and Cray Research Corp.

Hitachi only shipped its first supercomputer in October to Tokyo University. Since then, six of the company's supercomputers have been ordered for installation in Japan.

DAQING, China — The Ministry of Petroleum here has recently ordered five Control Data Corp. Cyber 180 computer systems and supporting software. The systems will be used for reservoir simulation, computer-aided design and manufacturing surface construction and oil field management in Zhongyuan, China, and Daqing, where more than half of China's petroleum is produced.

Included in the sale is CDC's Geomaster software program for petroleum exploration and seismic data processing. The new systems are valued at $30 million and are scheduled to be installed by December, according to CDC.

SYDNEY, Australia — A $6 million order for point-of-sale equipment has been placed by Burns Philp and Co. in an initial move to link 71 stores here. The contract called for the Handi 25 system from ICL Australia Pty. Ltd. The system consists of Handi 25 systems with 320K bytes of memory and 130M bytes of disk storage. Each store will link about four cash registers and two office systems. ICL pricing printers and standard printers will also be installed.

TOKYO — AT&T Unix Pacific Co., a subsidiary of AT&T of the U.S., has recently signed an agreement here with Nippon Unisoft to develop bilingual capability on AT&T's Unix System V operating system. The product would enable Japanese users to interface with Unix System V, using either Roman characters or Kata-Kana, a phonetic alphabet commonly used in Japan.

The software will be developed in Japan on AT&T 3B2/400 supermicrocomputers and will be made available with Japanese documentation. Plans are under way to license the software worldwide on AT&T's 3B computer line through Japanese distributors.

SYDNEY, Australia — International Data Base Management Association (IDBMA) and *Computerworld Australia* have announced an agreement whereby *Computerworld* will represent IDBMA's computer-based "Pick Spectrum" trade shows in Hong Kong, Singapore and Japan. *Computerworld Australia* is the Sydney-based sister publication of *Computerworld* of the U.S. Show dates have not been set, but it is expected that the first will be held in Hong Kong in 1986.

[illegible], England — Applied Computer Techniques Ltd., maker of the Apricot microcomputer, revealed financial results for the 1984 fiscal year: pretax profits increased 129%, from $6.6 million in 1983 to $12.9 million in 1984. During that period, sales rose 82%. Insiders said exports were up, and production on the Apricot has increased from 4,500 to 6,500 systems per month.

CALENDAR

WEEK OF SEPT. 29

SEPTEMBER 29-OCTOBER 2, CHICAGO — **American Bankers Association (ABA) National Bank Card Conference.** Contact: ABA, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

SEPTEMBER 30-OCTOBER 1, CHICAGO — **Financial Futures, Options and Swaps.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

SEPTEMBER 30-OCTOBER 1, NEW YORK — **Sixth Annual Computer Law Institute.** Contact: Law & Business, Inc., Harcourt Brace Jovanovich Publishers, 855 Valley Road, Clifton, N.J. 07013.

SEPTEMBER 30-OCTOBER 2, BOSTON — **Index '85.** Contact: Independent Expositions, Inc., 786 Rockrimmon Road, Stamford, Conn. 06903.

SEPTEMBER 30-OCTOBER 2, BOSTON — **Information Systems Architecture.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

SEPTEMBER 30-OCTOBER 2, NEW YORK — **Comlease — The Computer Leasing Conference and Exposition.** Contact: Comlease, 3825-1 S. George Mason Drive, Falls Church, Va. 22041.

SEPTEMBER 30-OCTOBER 3, WASHINGTON, D.C. — **The Fifth Annual Conference on Control, Audit and Security of IBM Systems.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

SEPTEMBER 30-OCTOBER 3, WASHINGTON, D.C. — **Using Microcomputers in Government.** Contact: U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

SEPTEMBER 30-OCTOBER 4, HOUSTON — **Structured Analysis & Design Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

SEPTEMBER 30-OCTOBER 4, WASHINGTON, D.C. — **Computer Capacity Planning.** Contact: Computmetrics Training Institute, P.O. Box 58383, Houston, Texas 77258.

OCTOBER 1, DALLAS — **T-1 Carrier Strategies.** Contact: The DMW Group, Inc., Seminar Division, 2020 Hogback Road, Ann Arbor, Mich. 48104. Also being held Oct. 2 in Washington, D.C., Nov. 12 in New York, Nov. 20 in Boston and Dec. 3 in Los Angeles.

OCTOBER 1-3, NEW YORK — **Data Base: A Manager's Guide.** Contact: Technology Transfer Institute, 741 Tenth Ave., Santa Monica, Calif. 90402. Also being held Oct. 15-17 in Washington, D.C.

OCTOBER 1-4, LOS ANGELES — **CICS Application Design.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 2-4, BOSTON — **Developing Careers: Issues for Engineers and Employers.** Contact: Institute of Electrical and Electronics Engineers, Inc., Suite 608, 1111 19th St. N.W., Washington, D.C. 20036.

OCTOBER 2-4, BOSTON — **User Workshop.** Contact: Judy Trelogan, Arthur Young & Co., 1950 Roland Clarke Place, Reston, Va. 22091.

OCTOBER 2-4, NEW ORLEANS — **Intelligent Buildings Conference and Exposition.** Contact: BCR Enterprises, Inc., 950 York Road, Hinsdale, Ill. 60521.

OCTOBER 2-4, TOKYO — **Japanese Computer Software: Management, Quality, Productivity, Strategy and Market.** Contact: Hideaki Hashizume, Technology Transfer Institute, Suite 1411, One Penn Plaza, 250 W. 34th St., New York, N.Y. 10119.

OCTOBER 3-4, ST. LOUIS — **Federal ADP and Telecommunications Procurement.** Contact: International Data Corp., Washington Division, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102. Also being held Oct. 17-18 in Denver, Oct. 31 to Nov. 1 in San Antonio and Nov. 14-15 in McLean, Va.

OCTOBER 3-4, SAN ANTONIO — **Southwest Computer Measurement Group Fall Meeting.** Contact: Ellen Robertson, Texas Utilities Services, Inc., 2001 Bryan Tower, Dallas, Texas 75201.

OCTOBER 3-4, SEATTLE — **Rapid Prototyping Workshop.** Contact: Infosci, Inc., Box 7117, Menlo Park, Calif. 94026.

WEEK OF OCTOBER 6

OCTOBER 6-8, SAN FRANCISCO — **Solid Modeling '85: Making CAD/CAM Pay Back.** Contact: Jacquelin Cooper, "CAD/CIM Alert," 824 Boylston St., Chestnut Hill, Mass. 02167.

OCTOBER 7-9, NEW YORK — **VM for Systems Programmers.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 7-10, LOS ANGELES — **CICS Command-Level Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 7-11, BELLEVUE, WASH. — **C Programming Workshop.** Contact: David Cheyette, Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

OCTOBER 7-11, KING OF PRUSSIA, PA. — **CICS/VS Command-Level Programming.** Contact: Ned Frey, Computer Assistance, Inc., Suite 480, 1150 First Ave., King of Prussia, Pa. 19406.

OCTOBER 7-11, LOS ANGELES — **Basic Systems Analysis.** Contact: Thomas J. Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Oct. 7-11 in Calgary, Alta.

OCTOBER 7-11, LOS ANGELES — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 7-11, NEW YORK — **CICS Macro-Level Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 8-9, MINNEAPOLIS — **Tenth Conference on Local Computer Networks.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

OCTOBER 8-10, TOPEKA, KAN. — **DSSD Users' Conference — Feedback '85.** Contact: Ken Orr & Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

OCTOBER 8-12, NANJING — **Asiainfo China '85.** Contact: American Export Group International Services, Inc., Watergate 2600, 2600 Virginia Ave. N.W., Washington, D.C. 20037.

OCTOBER 9-10, CHICAGO — **The Financial Supermarket: New Fee Income Opportunities for Banks & Thrifts.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

OCTOBER 10, NEW YORK — **Vtam Operations Workshop.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

WEEK OF OCTOBER 13

OCTOBER 13-16, WASHINGTON, D.C. — **Information Science Inc.'s 10th International Users Conference on Human Resource Management.** Contact: Information Science, Inc., 95 Chestnut Ridge Road, Montvale, N.J. 07645.

OCTOBER 14-15, SAN FRANCISCO — **Direct Response Marketing for Financial Institutions: Telemarketing, Direct Mail & Sales Training.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925. Also being held October 21-22 in Los Angeles.

OCTOBER 14-16, PHILADELPHIA — **Managing Application Software Support Workshop.** Contact: Infosci Inc., Box 7117, Menlo Park, Calif. 94026.

OCTOBER 14-17, NEW YORK — **Info '85 — Information Management Exposition & Conference.** Contact: Cahners Exposition Group, Client Services, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

OCTOBER 14-18, BOSTON — **Management Workshop.** Contact: Judy Trelogan, Arthur Young & Co. 1950 Roland Clarke Place, Reston, Va. 22091.

OCTOBER 14-18, NEW YORK — **Structured Systems Analysis Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 15, CHICAGO — **Transacting Business Electronically: Insights Into a Rapidly Changing Field.** Contact: Chi/Cor Information Management, Inc., 10 Riverside Plaza, Chicago, Ill. 60606.

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EDITORIAL

Artificial? Or intelligent?

One of those magical moments that we all eagerly await in the diurnal continuum of modern technology is the point at which a buzzword becomes a reality. So it is that we watch the steady progress of the concept of artificial intelligence, so far a buzzword, soon . . .

Artificial intelligence, or AI as buzzword users worth their salt refer to it, was last year's hot button, a subject that flitted through the ether and caught the fancy of technical users and the public alike — especially the public, and especially that segment of it that works for media similar to, uhm, *this* one. People dearly wanted to believe that all of their *2001* fantasies could come true and that machines could be made to think and act like humans and to relieve humanity of whatever odious routine it cared to slough off. And certain quarters of the computer industry, seeing boom times turn disturbingly bust-like, were not averse to holding out the promise of hardware and software that could — and *would* — do just that, in just a matter of months.

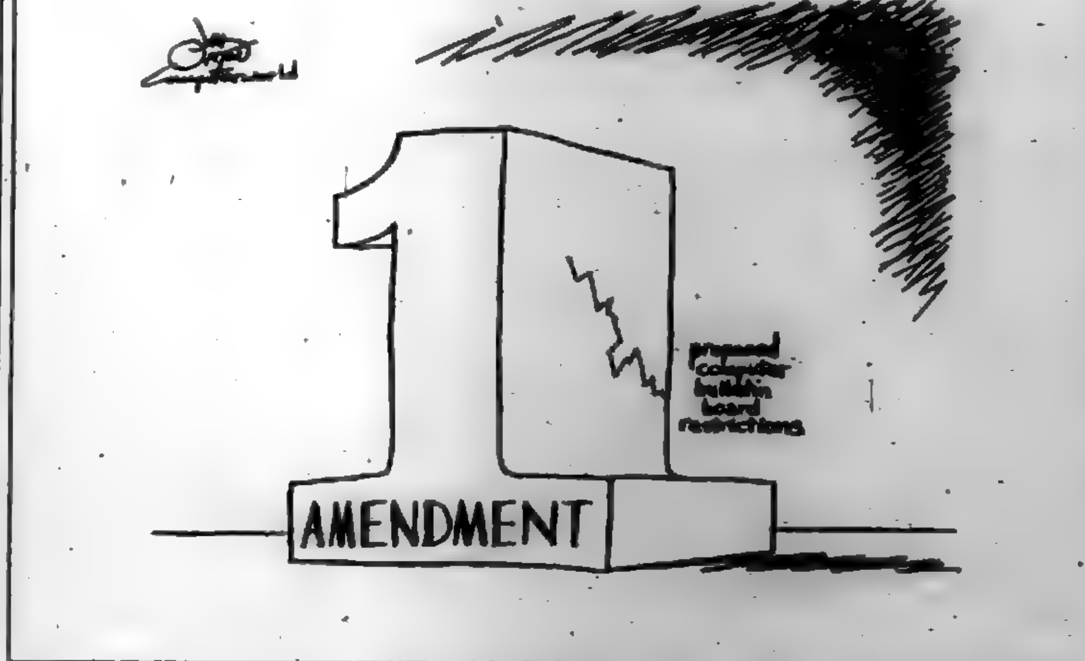
Too much was said, and written, too soon. The reality is that artificial intelligence will always be whatever new computer technology is down the road, just out of reach, barely in sight. Twenty years ago, for example, spelling checkers were considered artificial intelligence. Ten years ago, icon-based interfaces were exotic stuff. What *is* important is that users, and the media, sort through the welter of AI-type developments at any given time and focus attention on those that seem most promising in terms of use and practicality.

Sorting through these developments, some key highlights are the dramatic price/performance improvements in dedicated AI workstations, moves toward language standards and the emergence of better links to traditional computer functions. The most tangible near-term developments likely to emerge from this activity, the ones that will appear to move computer applications forward most dramatically, are expert systems: software tools that draw upon human experience to expedite certain sophisticated, yet routine, job functions.

Users have a great interest in — and, more important, a genuine need for — expert system programs to capture the expertise of retiring professionals, to compensate for talent shortages and to help meet emergency production situations. Such systems also could improve business efficiency as friendly front ends to corporate data bases and as spreadsheet templates. Expert systems fill a critical need, and vendor concentration of development tools for business use is to be applauded.

Demand for these products, however, must come from the corporate users. DP staffs can't, of course, turn their attention away from their critical day-to-day functions to focus exclusively on new AI technology, however intriguing that may be. But DP executives do need to keep a close eye on the technology, which promises tremendous payoffs somewhere down the road.

The road will be a long one. As AI gurus often note, in many ways AI can be viewed as a weak technology, often very difficult to apply to problems that seem fairly straightforward. For many systems, successful commercial implementation will take years of work. But at the end of that long road, DP must be there to help merge the new systems into the corporation's overall information management structure. Managers can begin today, by investigating the products that are available or under development, by steering clear of the buzzwords and nurturing the reality.


AMENDMENT
proposed computer bulletin board restrictions

LETTERS

Smart building research misleading

In reference to the article, "Demand low for smart buildings" [CW, June 17], it is always interesting to read market research reports. You often wonder if they want a particular answer before they start or whether they asked the wrong question. In this case, they asked the wrong question.

When many people are asked about the need for computers, they answer negatively. Does that mean that the demand for computers is low? Quite the contrary. Asking tenants and developers if they want shared services is like asking people if they want shared bathrooms or shared socks. The answer is obvious.

However, if you ask if tenants want their telecommunications systems to be capable of growing from a few lines to thousands, if they want little capital expense, enhanced services, better training and telecommunications management support, on-site technical maintenance and better control of long-distance calls, the answer is an overwhelming "yes." If you ask developers if they want better leasability, revenue potential and lower operating costs, they also answer "yes."

The bottom line is that these technologically enhanced buildings are here. In fact, the question is not if or when but how fast. Currently, professionally managed and marketed intelligent buildings are achieving 90% leasability in high-vacancy markets. This reflects the true definition of an intelligent building — one that is fully leased.

Thomas B. Cross
Boulder, Colo.

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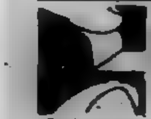
VIEWPOINT

For every slump, there's a silver lining



WOHL STREET
[illegible]
Amy Wohl

Everyone knows the computer industry is in a slump. Each day brings more bad news. The biggest and the best report that profits are down. The telephone industry boys who were all set to challenge IBM for the information systems vendor crown cut 24,000 staff positions.

Everyone blames the slump for everything. Customers don't buy your products? Blame the slump and not your development department's failure to predict market requirements. Market share changes? Blame the slump (I thought we were all in the same market). Products slip their schedules? Blame the slump (Why?). Can't get venture capital? Blame the slump and not the fact that your bright idea or the management team you propose to run with it aren't worth investing in.

Boring. You're tired of reading articles like that about the computer slump, and I'm tired of writing them. Isn't there something more creative to do?

It was refreshing to meet an old friend, a seasoned computer industry professional who is currently heading a major minicomputer company. He suggested that slumps are really excellent business opportunities for those who know how to take advantage of them. "We get fat and happy and a little careless when things are going well," he said, "and it's darned hard to fix that when you're making lots of money."

But how do you take advantage of a slump? "Well," he continued, "it's a great opportunity to get rid of people and projects you never should have taken on in the first place." No need to say anything unpleasant; just blame it on the slump.

Fascinated, I asked him to continue. He described his current plan of action:

- Get rid of anything that isn't making money now and probably won't any time soon. Look particularly for projects that were started as someone's pet, projects that have a huge staff and no results and projects that are significantly behind schedule and may no longer be in their marketing window when and if a product ever emerges.
- Don't start projects that don't make economic sense. Look at projects that are someone's pet, projects that need big budgets and projects that don't seem to have a strong basis in customer needs or a strong fit with what your firm does best. The slump and your firm's need to husband any existing surplus will be an adequate, impersonal explanation of your inability to approve the project.
- Use the slump as a way of revitalizing your employees. Change them back into the lean, mean and successful team that started your company. Everyone can understand the importance of team effort and working hard when times are tough.

By using a slump creatively, you can come out of the slump at top speed, ready to take advantage of the business growth that will surely follow.

Note that a significant feature of this slump is the number of computer companies now in the industry, and adversely affected by the slump, that haven't lived through this problem before. Maybe they managed to escape the last computer industry downturn, or maybe they're so young that they've never lived through one before. If you've known only good times, you can't be experienced in wise behavior for the bad times. So a great deal of the howling and screaming is simply because of inexperience.

Experienced companies are following my friend's example:

- Cut back as soon as you recognize the need to. Don't wait; it will only make things worse.
- Make the initial cutbacks bigger than you think you'll need. No one will ultimately remember that you cut the work force by 18% instead of 16%, but everyone will remember that you had two layoffs instead of one. You can always announce that you're rehiring — that's good news.
- Get rid of all the deadwood. You won't have another chance. If you fail to do so, it may mortally wound your company; if you fail to do so and live through the slump anyway, you'll never get rid of deadwood when things are going well.
- Make everyone share the burden. You can't ask the administrative staff to work extra hard and count the paper clips while you continue to call for management meetings in Hawaii.
- Don't cut back on the very things that will build your future. Try to hold on to the money for research and development, product planning and management and anything that supports your customer relationships, such as service, support, users groups and market research.

And how should a user organization make hay during bad times? By using the downturn as a filter, measuring how its current or prospective vendors behave. If they act like grown-ups, clean up their mistakes and look to the future rather than crying about the past, you'll like them; if not, you will have learned something useful. It is also a good test of their financial viability: Good vendors should have a backlog and some contingency plans to get them through bad times.

Of course, user organizations will want to see exactly what vendors are chopping off. It might just be the very product you were interested in, in which case you may need to change vendor plans.

And you'll want to take advantage of bargains. Vendors that are trying to build a better bottom line for the current quarter turn into real deal makers. Users should be able to get better discounts, additional support or better guarantees and better information about future plans. Vendors really need users in a downturn — sometimes they forget this when times are good. This is the users' turn to get what they want and need. Caution: Do remember that if you cut deals too sharply, you will simply contribute to the nonprofitability of your vendor — and nonprofitable vendors become nonvendors.

So consider the computer slump to be a hidden opportunity for vendors, a chance to get things in hand, a time to keep what's good, to throw out what's not and to prepare for a bright future. For users, it's a golden opportunity to measure the vendors' mettle, to look for new relationships on terms you select and to get an occasional bargain from a temporarily distressed, but sound, supplier.

Who said dark clouds don't have silver linings?

Wohl is president of Wohl Associates in Bala-Cynwyd, Pa., and editor of the "The Wohl Report on End-User Computing" newsletter.

Pitting U.S. hackers against Japanese technology

READER'S PLATFORM
Jon R. David

The economy of this country is being severely strained by a large and ever-growing negative balance of trade. Recent figures gave an imbalance of minus $7 billion last year in the electronics industry. When I see how many of my own purchases of TVs, hi-fi systems, videocassette recorders and the like are Japanese, I wonder how long it will be before Japan is the major computer force in the world.

If the Japanese computer industry offers products that are equivalent in price and quality to Japanese electronics equipment, how can the U.S. computer industry remain the international leader?

Although it seems we cannot compete with Japanese manufacturing, the same writings that laud Japanese production point out that the Japanese do not create, they very efficiently copy, and programming is truly creative.

Some of us are not particularly adept at programming. Others, however, are naturals at this contemporary art form; their achievements are astounding, and their potential is beyond comprehension. Some of these gifted few are known as hackers and are stirring up quite a bit of trouble and attention.

These troublemakers fool around with supposedly secure data bases, use computer and telecommunications resources of public and private businesses and services without paying for them and the like. Although there are very few reports of any actual damage being done, the horror of what these hackers might do has inspired legislative acts directed against hackers, typically making their actions criminal.

Now, although I really don't want some teenager messing around with my bank accounts, I recognize the talent and ability requisite for doing so. Not only do I admire that talent, I want to put it to use, for me, not [inadvertently] against me. Moreover, I think that hackers show the creativity that will enable U.S. computer systems to maintain our country's position as world leader in the computer industry. We have to find these unique talents and get them working for us.

Seek out hackers

Over the years I've worked with a few of these computer freaks. Most of them best like interacting and working with others of their ilk. Rather than shutting down these gifted individuals or putting them into hiding, we should seek them out and get them working together on things that are worthwhile. This, however, is not the easiest thing to do.

Possibly the best way to do this would be to create test systems, networks, data bases and the like. These, created by government agencies, computer manufacturers or whomever, would contain the most sophisticated security devices available. As part of a national test, awards could be given as higher levels of security are breached. These awards could be financial but could also be months of free computer use, a certificate or a plaque.

Additional awards could be given to security breachers who can come up with better security at the levels they breach. The important thing is to give these people a challenge in an environment in which they cannot cause damage to exhibit the talents our industry so sorely needs. Once we identify them, the problem becomes one of harnessing all that ability.

Next, we need a work methodology to keep these people happy and productive. How we do it doesn't matter and will vary greatly, depending on the individual and the situation, but the important thing is to keep these people interested and productive.

Rather than legislating away these hackers, we must recognize their abilities and potential and direct our attention to fostering them and getting them to work in ways to maintain our creative edge in the computer industry. Since we can't seem to compete in equipment manufacturing, these people are the best hope of the U.S. computer industry.

David is a telecommunications consultant based in Tappan, N.Y.

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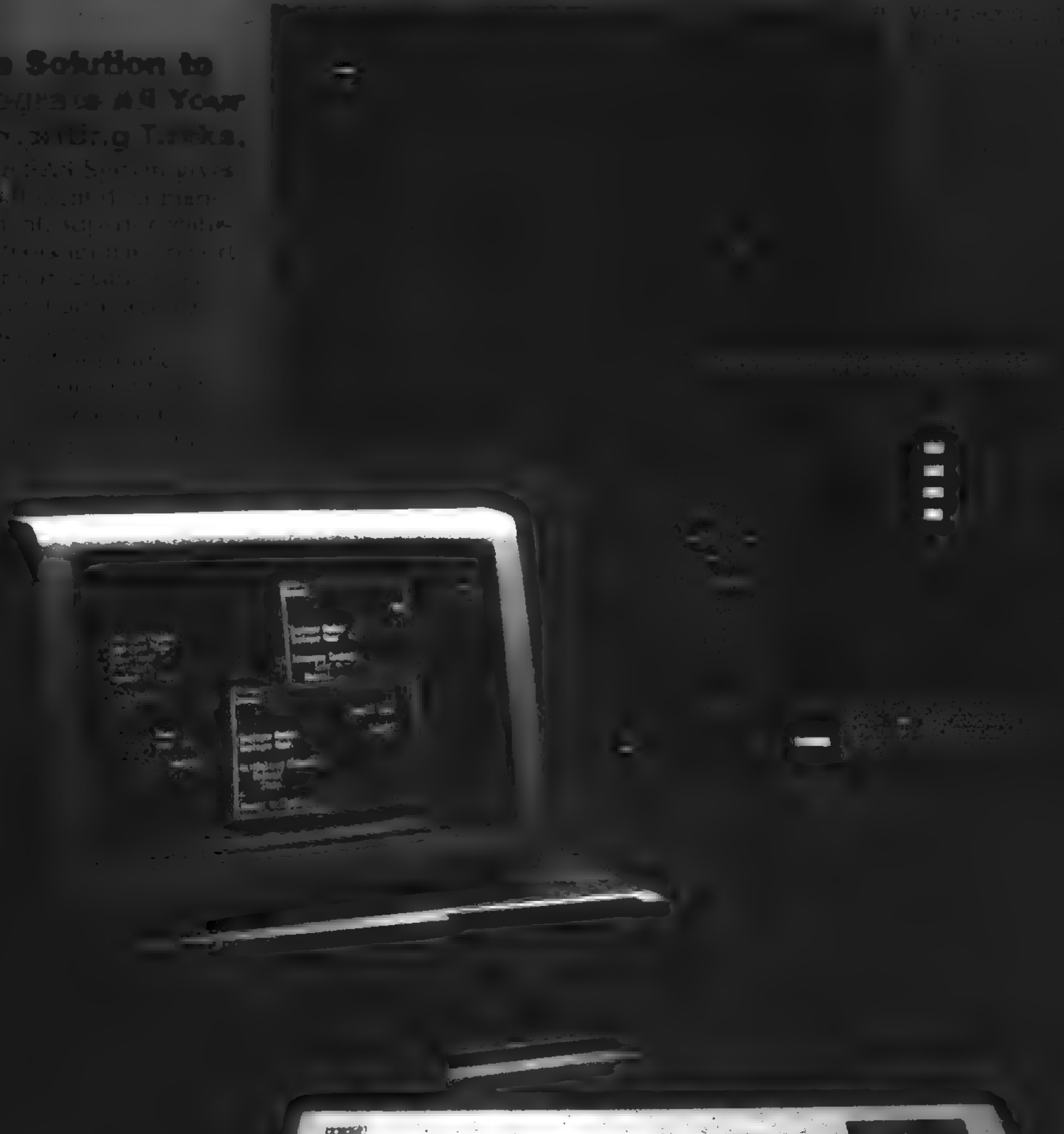

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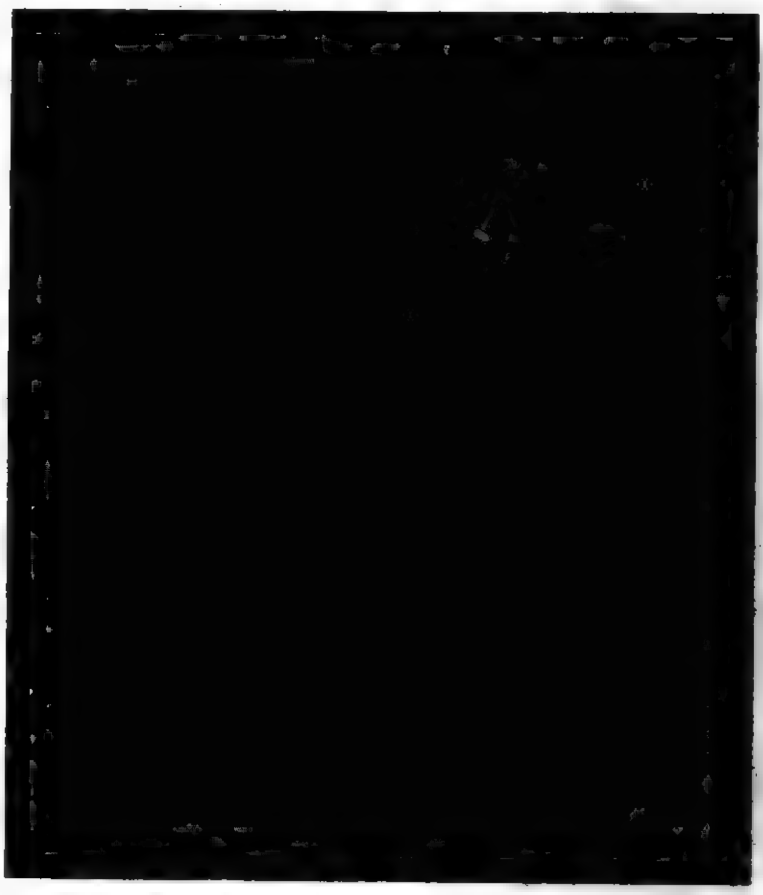

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Hardware Roundup

By Ed Warner CW Staff

A look at 91 systems from 14 vendors

As technology blurs the old definitions, a major change from previous years is evident in this year's *Computerworld* Hardware Roundup of small systems.

Along with personal computers, 16-bit minicomputers have been included this year, both because the majority of minicomputers have incorporated 32-bit processors and because, at the other end of the spectrum, personal computers are exhibiting processing power and multiuser capability that once only minis could provide.

Other changes taking place in the computer industry are reflected in this week's roundup of 91 systems from 14 vendors. Most notably, fewer vendors of either type of machine are in the listing — yet the listing has grown larger. This reflects the shakeout occurring in the industry.

While many of the vendors who didn't make this year's list are still in business, their presence has diminished relative to the major players, according to market analysts. This is particularly true in the large-corporation market for personal computers. Many vendors are redirecting their pitch to small businesses or other market niches.

Overall, however, the number of models shown has grown about 20%, because the major personal computer vendors are keeping their older products alive while debuting new ones.

Vendors such as Zenith Data Systems Corp. apparently have taken a lesson from the Big Three automakers, offering a variety of models designed to fit every need, from high-speed processing to portability. Zenith's entries in the personal computer market now include a laptop portable, a "luggable" portable, an entry-level desktop computer and a high-performance model based on the Intel Corp. 80286 microprocessor — all introduced in the 12 months since the last Hardware Roundup was published.

> ”
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> ***While diversity has come to mark the personal computer market, one touchstone has remained — IBM compatibility. The IBM-compatible Microsoft Corp. MS-DOS operating system is the one most often supported by non-IBM hardware.***

This emphasis on product diversity reflects the maturity coming to the personal computer market. As in the early days of the U.S. auto industry, a consolidation of manufacturers has taken place, but products remain diverse. Now, though, those products come from under one roof, which bodes well for the user who wants the support of a vendor that will still be in business in years to come.

While diversity has come to mark the personal computer market, one touchstone has remained — IBM compatibility. A quick overview of this year's roundup reveals the predominance of the IBM-compatible Microsoft Corp. MS-DOS operating system as the operating system most often supported by the non-IBM hardware.

An equally impressive bow to the IBM world comes from the 16-bit minicomputer side of the roundup, where about a half-dozen more machines have included Systems Network Architecture support among their communications protocols.

A problem, however, has come to dog the 16-bit mini — newer, more sophisticated software will only run on 32-bit machines. The 16-bit processors simply can't handle the volume of code quickly enough. For that reason, market analysts now predict the coming sunset of the 16-bit mini, caught, like the 8-bit personal computer, between the increasing inexpensiveness of more powerful hardware and the growing sophistication of software.

Another change from last year that has affected both minicomputer and personal computer purchasers is just how much more computer a dollar buys. In one example, an IBM Personal Computer model selling for more than $4,000 when it was introduced four years ago now can be acquired for about $2,200.

When last year's Hardware Roundup was published, the only entry from a major vendor running the Intel 80286 was the IBM Personal Computer AT, a machine then only a month old. Now nearly every major non-IBM personal computer vendor has an 80286-based machine, with Compaq Computer Corp. offering not one but two portable versions.

Another sign of greater sophistication in the personal computer arena is not evident from the charts, though. That is the increasing number of personal computers that incorporate a hard-disk storage unit.

And, where a Winchester disk of 10M bytes — as in the IBM Personal Computer XT — was once a thing to marvel at, most of the new hard disks provide 20M bytes or more.

Though the distinction between the personal computer and the 16-bit mini has become blurred, the mini still supports multiple users at a relatively low cost and will be with us for some time to come.

The Hardware Roundup is intended only to be a sampling of offerings on the market. The listings are not intended to be either a buyer's guide or an endorsement of any product.

Microcomputers and minicomputers

Texas Instruments, Inc.

Address Space	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit
Memory Size in Bytes (Minimum-Maximum)	256K-768K	128K-768K	128K-768K	512K-15M	512K-1.75M	512K-2M	512K-2M
Operating Systems	MS-DOS	MS-DOS	MS-DOS	MS-DOS, Xenix	DXIO, Dnos	DXIO, Dnos	DXIO, Dnos
I/O Channel Speed (Bit/Sec.)	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 6M	To 6M	To 6M

Apple Computer, Inc.

Address Space	8-bit	8-bit	32-bit
Memory Size in Bytes (Minimum-Maximum)	128K	64K-128K	128K-512K
Operating Systems	Apple DOS, Apple Prodos	Apple DOS, Apple Prodos	Macintosh operating system
I/O Channel Speed (Bit/Sec.)	To 19.2K	To 19.2K	To 230K

Kaypro Corp.

Address Space	8-bit	8-bit	16-bit	16-bit	16-bit
Memory Size in Bytes (Minimum-Maximum)	64K	64K	256K-640K	512K-640K	256K-640K
Operating Systems	CP/M	CP/M	MS-DOS	MS-DOS	MS-DOS
I/O Channel Speed (Bit/Sec.)	Not available	Not available	Not available	Not available	Not available

Digital Equipment Corp.

Address Space	8- or 16-bit	8- or 16-bit	12-bit	12-bit	16-bit	16-bit	16-bit
Memory Size in Bytes (Minimum-Maximum)	128K-896K	640K-896K	96K	96K	512K	512K-1M	512K-2M
Operating Systems	CP/M 86/80, MS-DOS	CP/M 86/80, MS-DOS	WPS, COS 310, MS-DOS, OS/278, CP/M	WPS, COS 310, OS/278, CP/M	UCSD Pascal, P/OS, CP/M 80, RT-11, Venix, Standard Micromumps	UCSD Pascal, P/OS, CP/M 80, RT-11, Venix, Standard Micromumps	UCSD Pascal, P/OS, CP/M 80, RT-11, Venix, Standard Micromumps
I/O Channel Speed (Bit/Sec.)	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 19.2K

Zenith Data Systems Corp.

Address Space	8- or 16-bit	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit
Memory Size in Bytes (Minimum-Maximum)	192K-768K	256K-640K	128K-640K	128K-720K	320K-720K	256K-640K	512K-16M
Operating Systems	Z-DOS, CP/M 86	MS-DOS	MS-DOS	MS-DOS	MS-DOS	MS-DOS	MS-DOS, Xenix
I/O Channel Speed (Bit/Sec.)	To 384K	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 19.2K

IBM

Address Space	16-bit	16-bit	16-bit	16-bit
Memory Size in Bytes (Minimum-Maximum)	256K-512K	256K-640K	256K-640K	256K-3M
Operating Systems	PC-DOS, CP/M, UCSD Pascal	PC-DOS, CP/M 86, UCSD Pascal	PC-DOS, CP/M, UCSD Pascal	PC-DOS, PC Xenix
I/O Channel Speed (Bit/Sec.)	To 9.6K	To 9.6K	To 9.6K	To 9.6K

Hewlett-Packard Co.

Address Space	16-bit	16-bit	16-bit	8-bit	8-bit
Memory Size in Bytes (Minimum-Maximum)	272K	128K-896K	256K-640K	16K-32K	64K-640K
Operating Systems	MS-DOS	MS-DOS	MS-DOS	Integrated into system	HP, CP/M
I/O Channel Speed (Bit/Sec.)	To 5K	To 5K	To 9.6K	176	176

Compaq Computer Corp.

Address Space	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit
Memory Size in Bytes (Minimum-Maximum)	128K-640K	128K-640K	128K-640K	256K-640K	256K-640K	640K	256K-2.6M	640K-2.6M	256K-8.2M	512K-8.2M
Operating Systems	MS-DOS	MS-DOS	MS-DOS	MS-DOS	MS-DOS	MS-DOS	MS-DOS	MS-DOS	MS-DOS	MS-DOS
I/O Channel Speed (Bit/Sec.)	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 19.2K	To 19.2K

Supermicros and minicomputers

Honeywell Inc.

Address Space	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit
Memory Size in Bytes (Minimum-Maximum)	512K-1M	512K-1.8M	512K-2M	1M-2M	512K-2M	2M	1M-2M
Operating Systems	Gcos 6	Gcos 6	Gcos 6	Gcos 6	Gcos 6	Gcos 6	Gcos 6
I/O Channel Speed (Bit/Sec.)	1.2M	1.2M	1.2M	1.2M	1.2M	1.2M	1.2M

Altos Computer Systems, Inc.

Address Space	16-bit	8-bit	16-bit	16-bit	16- or 32-bit
Memory Size in Bytes (Minimum-Maximum)	512K	192K	512K-1M	1M	2M
Operating Systems	Xenix	MPM II	Xenix, MPM 86	Xenix, MPM 86	Xenix
I/O Channel Speed (Bit/Sec.)	19.2K	Not available	19.2K	Not available	19.2K

Hewlett-Packard Co.

Address Space	16-bit	16-bit
Memory Size in Bytes (Minimum-Maximum)	256K-896K	128K-4M
Operating Systems	OS/6	RTE-L, RTE-XL
I/O Channel Speed (Bit/Sec.)	To 9.6K	Not available

Nixdorf Computer Corp.

Address Space	16-bit	16-bit	16-bit	16-bit
Memory Size in Bytes (Minimum-Maximum)	128K	128K	512K-2M	256K-1M
Operating Systems	Dpex	Dpex	Dipos	Niros
I/O Channel Speed (Bit/Sec.)	Not available	Not available	Not available	9.6K

NCR Corp.

Address Space	16-bit	16-bit
Memory Size in Bytes (Minimum-Maximum)	512K-2M	512K-8M
Operating Systems	Unix	Unix
I/O Channel Speed (Bit/Sec.)	5M	5M

Digital Equipment Corp.

Address Space	16-bit	16-bit	16-bit	16-bit	16-bit	16-bit	32-bit	32-bit
Memory Size in Bytes (Minimum-Maximum)	256K-4M	256K-4M	256K-4M	1M-4M	1M-4M	1M-4M	512K-1.5M	2M-6M
Operating Systems	RT-11, RSTS/E, RSX-11M, RSX-11M+, Ultrix-11, RSX-11, RSX-11S	RT-11, RSTS/E, RSX-11M, RSX-11M+, Ultrix-11, RSX-11, RSX-11S	RT-11, RSTS/E, RSX-11M, RSX-11M+, Ultrix-11, RSX-11, RSX-11S	RT-11, RSTS/E, RSX-11M, RSX-11M+, Ultrix-11, RSX-11, RSX-11S	RT-11, RSTS/E, RSX-11M, RSX-11M+, Ultrix-11, RSX-11, RSX-11S	RT-11, RSTS/E, RSX-11M, RSX-11M+, Ultrix-11, RSX-11, RSX-11S	MicroVMS, Microvax Ultrix 32, ELN	MicroVMS, Microvax Ultrix 32, ELN
I/O Channel Speed (Bit/Sec.)	1.3M	1.3M	1.3M	1.3M	1.3M	1.3M	Not available	Not available

IBM

Address Space	16-bit	16- or 24-bit[1]
Memory Size in Bytes (Minimum-Maximum)	32K-1M	128K-1.75M
Operating Systems	RPS, EDX, CPS	SSP
I/O Channel Speed (Bit/Sec.)	Not available	Not available

NEC Information Systems, Inc.

Address Space	16-bit	16-bit	32-bit	32-bit	32-bit
Memory Size in Bytes (Minimum-Maximum)	384K-512K	384K-512K	1M-1.5M	1M-2M	1M-4M
Operating Systems	Itos	Itos	Itos, VS	Itos, VS	Itos, VS
I/O Channel Speed (Bit/Sec.)	To 8M	Not available	Not available	Not available	Not available

Motorola Four Phase Systems, Inc.

Address Space	24-bit	24-bit	24-bit	24-bit	24-bit	24-bit	24-bit	24-bit
Memory Size in Bytes (Minimum-Maximum)	24K-96K	24K-96K	240K-768K	288K-768K	48K-96K	288K-1.5M	96K-768K	480K-1.5M
Operating Systems	Idos	Idos	MFE	MFE	Idos	MFE	MFE	MFE
I/O Channel Speed (Bit/Sec.)	Not available	Not available	Not available	Not available	Not available	Not available	Not available	Not available

“Everybody I talk to offers
that fit their products,

solutions
instead of my needs."

"Better talk to

AT&T.”

AT&T knows the
What you've already
as what you will buy.

Today, buying any computer product means thinking about where you've been—and where you're going.

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AT&T computer products conform to accepted industry standards. From minicomputers to modems, they're designed to fit in beautifully with your current IBM or compatible system.

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Our recently enhanced 3B Computers offer the performance advantage of UNIX™ System V in a departmental system, yet can be networked with existing MS-DOS*-based PCs.

Built on the principle of non-obsolescence, the DATAPHONE® II System is a full line of high-performance modems, multiplexers, data service units, and diagnostic control devices. These combine data transmission and sophisticated network management capabilities, thereby maximizing uptime of either simple or complex networks.

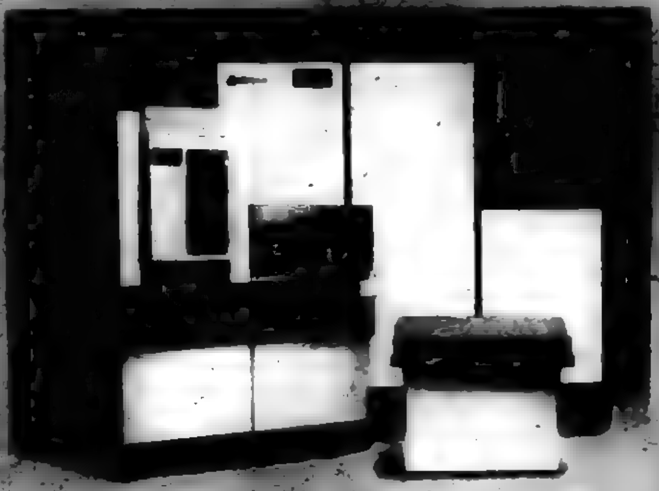
2. Will these products deliver the capabilities I need today? Am I getting my money's worth in terms of price and performance?

AT&T can answer "yes" to both questions.

reality of your computer needs. bought is just as important

Our line of high-performance computer products can be linked together to cost effectively deliver end-to-end communication and information management—from desktop to department, and from department to mainframe.

Our MS-DOS-based AT&T PC 6300 is twice as fast as the IBM PC, and has built-in color graphics capabilities and an easy-to-expand design.



THE COMPUTERS WITH THE FUTURE BUILT IN

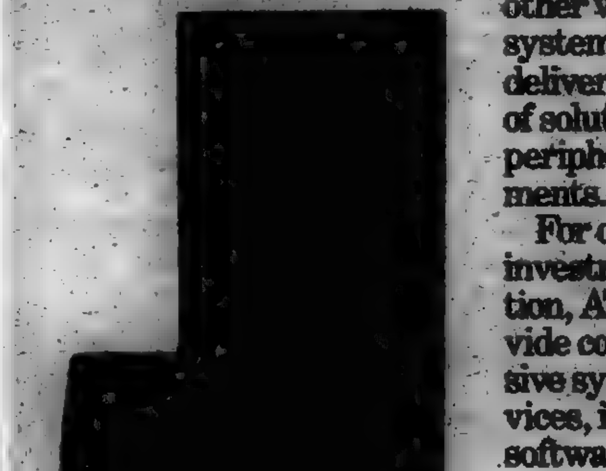
AT&T 3B2, AT&T 3B5 and AT&T 3B20 Computers

Taking advantage of the UNIX System's multi-tasking, multi-user features, the AT&T UNIX PC offers a unique combination of power, ease of use and communications capabilities.

Our UNIX System V-based 3B Computers—five new or enhanced supermicro and minicomputers—provide distributed and departmental computing at a competitive cost per user.

We also offer full-featured, reliable peripherals—synchronous and asynchronous terminals, printers and plotters. Compatible with AT&T Computers and other vendors' systems, they deliver a full range of solutions to your peripheral requirements.

For ongoing investment protection, AT&T can provide comprehensive system services, including software development, system design, implementation, and training. A 24-hour technical hotline is available for hardware and software support.



AT&T DATAPHONE II System

3. What about tomorrow? Will these products keep my growth path open to accommodate future needs, especially in terms of networking capabilities?

No need to worry about the future when you start with The Computers With The Future Built In from AT&T.

As technology advances, AT&T will enhance and support its products, increase performance, and maintain compatibility with industry standards.

Our commitment to an open architecture and support of industry standards—MS-DOS, UNIX System V and SNA/3270 and BSC/3270 protocols—gives you the flexibility to satisfy your applications needs.

The power of the AT&T 3B Computer family can be networked in a variety of ways. Because they run UNIX System V, the 3B Computers offer an opportunity to build an open system with hardware independence and software portability.

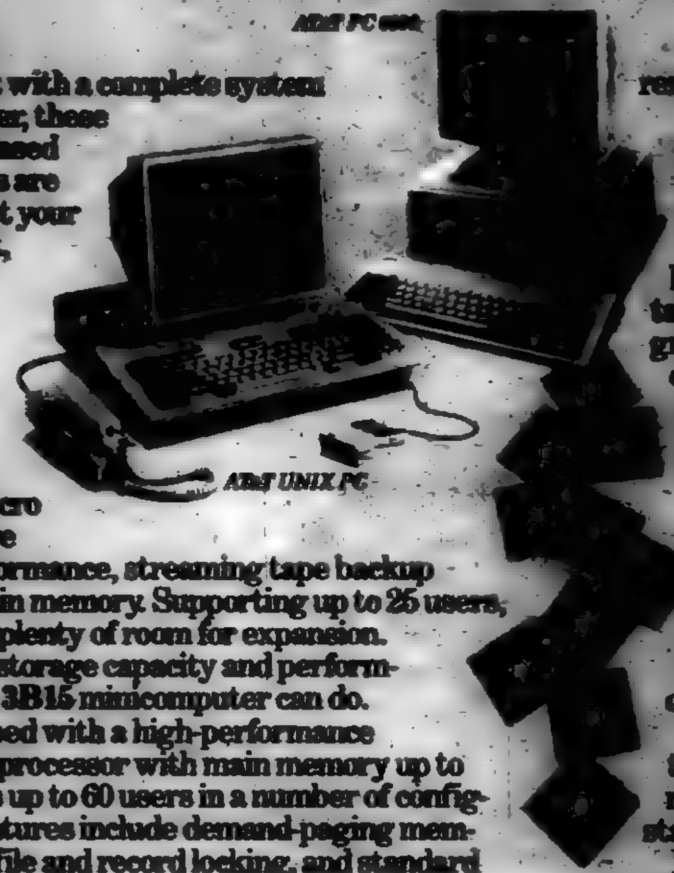
What's more, our UNIX System V software base is growing by volumes.

AT&T's Information Systems Network links your equipment in a single corporate-wide network. The AT&T STARLAN NETWORK is our low-cost local-area network that uses existing phone wiring to tie your PCs together.

However your needs change, one thing won't change: Your investment is protected with AT&T Computers.

For a more detailed look at what AT&T computer products can do for you, just turn the page.

See what makes AT&T computer products a sound investment.


AT&T PC 6300

AT&T UNIX PC

Whether you start with a complete system or a single computer, these communications-based computer products are designed to protect your investments—past, present and future.

Our new AT&T 3B2/400 Computer takes full advantage of UNIX System V. This true 32-bit micro offers full hardware floating point performance, streaming tape backup and up to 4 MB main memory. Supporting up to 25 users, the 3B2/400 offers plenty of room for expansion.

For even higher storage capacity and performance, see what our 3B15 minicomputer can do. The 3B15 is equipped with a high-performance WE™ 32100 microprocessor with main memory up to 16 MB. It supports up to 60 users in a number of configurations. Other features include demand-paging memory management, file and record locking, and standard floating point performance.

For those looking for the next step forward in personal computers, the AT&T UNIX PC offers a unique combination of computer capabilities. You'll have the power of UNIX System V to support multiple tasks and multi-users. The 512 RAM is expandable to 2 MB. There's also a 20 MB hard disk. This outstanding business tool also features a built-in modem and communications features to easily access remote processors and departmental file servers.

AT&T 3B15 Computer
AT&T 4418 and 4425 Terminals

The DATAPHONE II System is a family of digital and analog modems, multiplexers, data service units, and diagnostic control devices for multilevel network management and control. We have added the DATAPHONE II 2500 and 2600 Series Digital Data Service Units to the family. An integrated DSU and channel service unit in one compact, easy-to-operate unit. It features a graphic LCD display for instant recognition of test results and is compatible with DATAPHONE II equipment.

The AT&T 4540 family offers true 3270 compatibility, and a choice of keyboards, controllers and screen colors. With Asynchronous Host Adapter option, you'll be able to switch back and forth easily between synchronous and asynchronous applications.

Our connectivity products conform to industry standards to insure that AT&T 3B departmental computers as well as desktop workstations can access your mainframe applications. For example, SNA/3270 Emulator + software provides fully configured SNA IBM 3274 controller emulation; BSC/3270 Emulator + software emulates the BSC IBM 3274 cluster controller.

AT&T 4540 Terminal
AT&T Dot Matrix Printer

AT&T Application Program Interface access routines allow C language programmers to communicate directly to host computers in 3270 mode.

There's much more to tell you about AT&T computer products, and how they can help solve your business problems.

So before you invest your computer dollars, invest a few minutes of your time with an AT&T Information Systems Account Executive, an authorized AT&T supplier, or call 1 800 247-1212.

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AT&T
The right choice.

Update

September 2, 1985

Consultants: Getting your money's worth

Update

Choosing and using consultants

By Glenn Rifkin
Update Editor

Good counselors lack no clients.
— William Shakespeare

Frank Allen has to think a minute to come up with a success story. It isn't that the vice-president of information systems practice for Arthur D. Little, Inc. (ADL) lacks a bountiful supply of happy endings. But illustrating perfectly the full benefits of an outside consultant — that takes some thought. Allen then describes a client, a large chemical company, that had come to recognize that the computer support in its major research laboratory was second rate. An engineer within the company was asked to investigate the problem and quickly realized he needed outside help. He set up a formal committee to tackle the problem and brought in Allen as well as a representative from IBM.

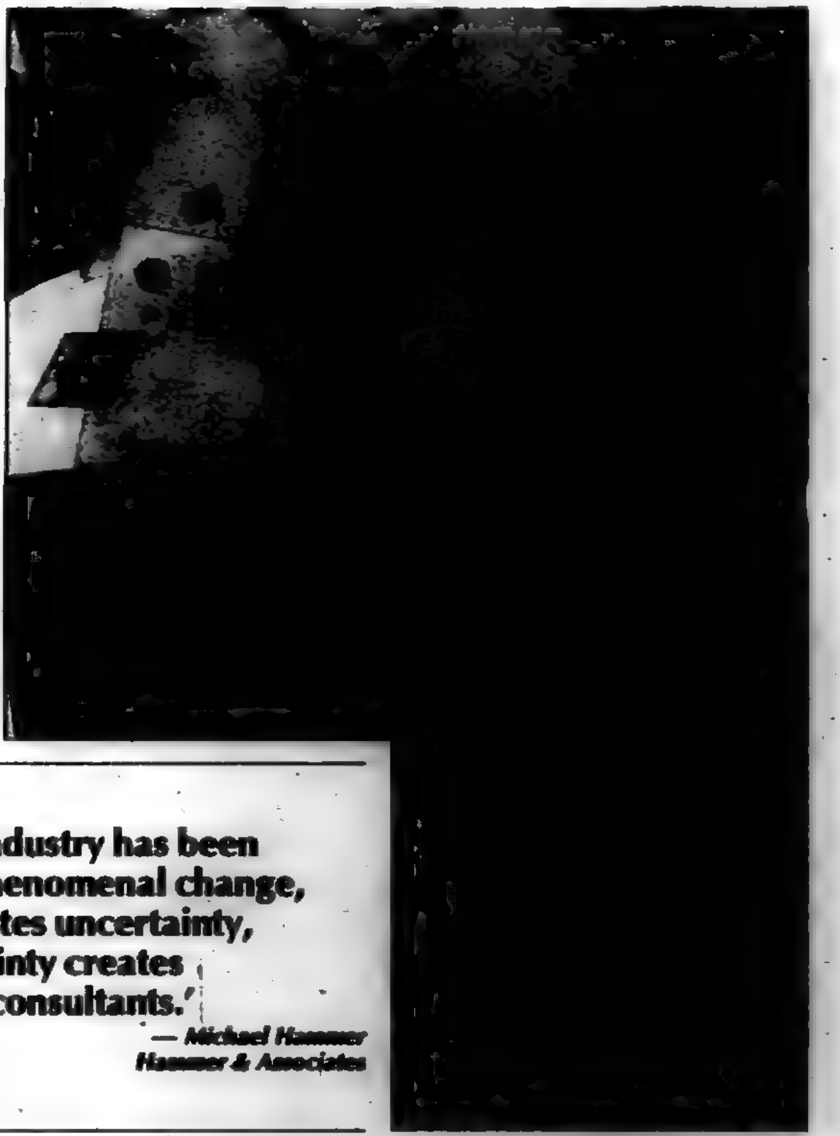
"We worked as a team," Allen says, "and spent six intensive weeks of 10-hour days attacking the problem. We realized that the lab, which was a Digital Equipment Corp. shop, needed to be a two-vendor shop, at least for a while."

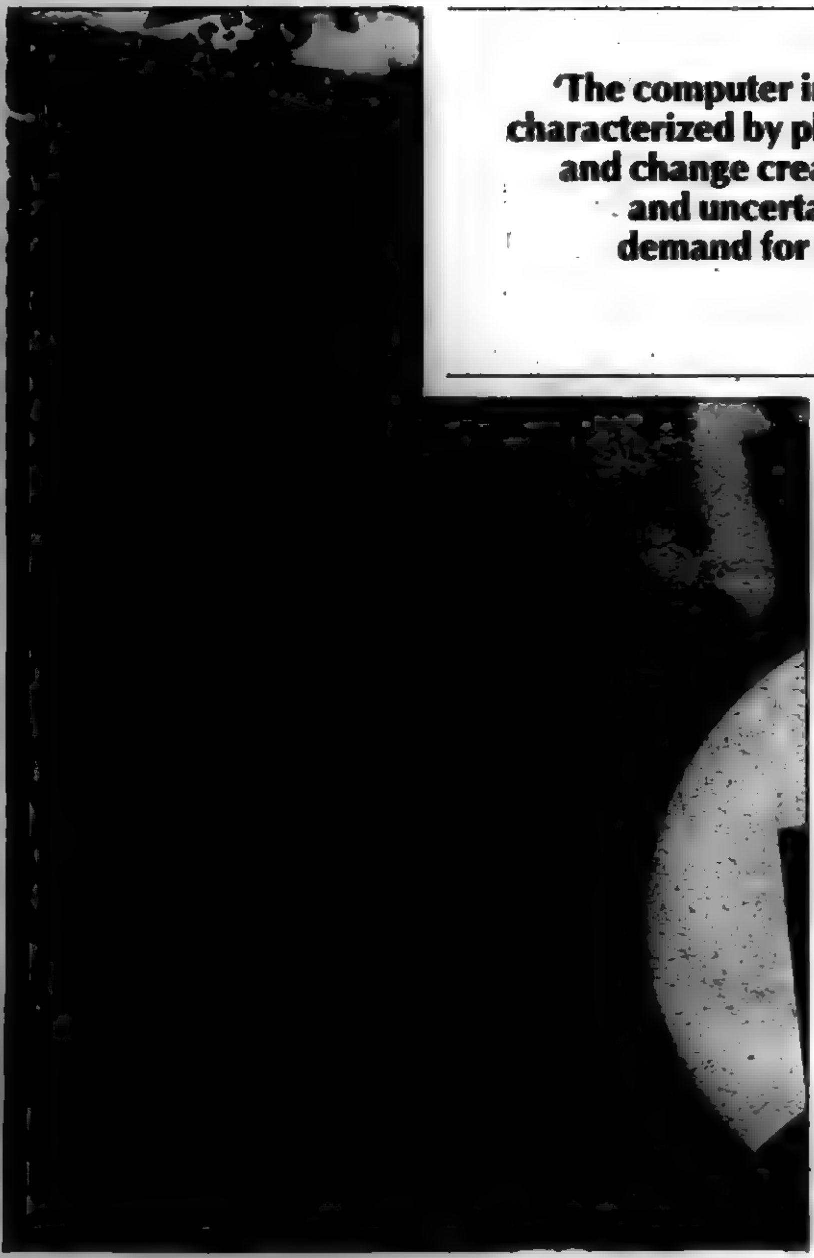
Based on the team's recommendations, a new IBM mainframe was installed, and, according to Allen, the lab's computer support is now top rate. "It was a very satisfying assignment," Allen notes, "except that my lawn died."

For the Bobst Corp., a printing machine manufacturer in Roseland, N.J., about to convert to a new manufacturing resource planning (MRP) system, the decision to use an outside consultant came from above the data processing shop. Top management directed that a consultant be brought in to ensure a smooth switch over.

According to Gary Gittleson, Bobst's MIS director, "Top management wanted a safety net. MRP is a big system, and they felt DP couldn't handle it alone. MRP is a new concept, and there are no standards yet. You can't go to a book for an answer."

Despite the dictum, Gittleson insists there is no resentment from the DP staff. "There are the usual interface problems between DP and users, but MRP is clearly so different from what we do here that there is no resentment. The consultant earns his money."





'The computer industry has been characterized by phenomenal change, and change creates uncertainty, and uncertainty creates demand for consultants.'

— Michael Hammer
Hammer & Associates

In Tulsa, Okla., Gary Stice recalls the displeasure he felt at his data processing job when an outside consultant was brought in. "I didn't want a consultant coming in the door, sitting next to me asking a lot of questions and getting paid three times what I was making," Stice says. "It can certainly cause conflict."

Stice is now an independent software consultant.

Some people swear by them; some swear at them. But one thing is clear: Independent computer consultants and large consulting firms both have more work than they can handle, despite the computer industry sales slump. It is impossible, because of the shapes and flavors consultants come in, to number precisely the profession. But a few of the following figures may be illustrative:

- According to the *U.S. Census of Service Industries*, the demand for information systems consulting has more than quadrupled since 1978.
- The Independent Computer Consultants Association in St. Louis currently carries a listing of more than 1,600 member firms representing more than 4,000 independent computer consultants.
- Arthur Andersen & Co., the Chicago-based international accounting and audit firm, plans to hire nearly 2,000 recent college graduates for its management information consultant division before the end of the year, bringing its total manpower in this group to more than 7,000 worldwide. Arthur Andersen estimates that it was involved in 4,000 DP/MIS engagements last year alone.
- The second largest computer maker, DEC, spent more than $25 million on outside consulting in 1984.

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COVER ILLUSTRATION BY KAREN WATSON

Update

Abundantly clear is this: Find a DP/MIS-related question, and there will be a long line of outside consultants ready to answer it. Consulting, a burgeoning business across many industries, has found a warm bed in high technology, and the explosive growth both in consultants and in consulting dollars appears to have no end in sight.

According to Michael Hammer, president of Hammer & Associates, a Cambridge, Mass.-based consulting firm, consulting has become institutionalized in the MIS world. It is standard, he points out, to retain consultants in MIS while in many other functional business areas, consultants are rarities.

"The computer industry has been characterized by phenomenal change, and change creates uncertainty, and uncertainty creates demand for consultants," Hammer says.

Virtually every DP/MIS manager uses outside consultants at some point, whether reluctantly or enthusiastically. Consultants and clients alike agree that successful relationships require great care and feeding. This *Computerworld* Update explores the ways users can get the most out of the consultants they hire.

When to look outside

The term "consultant" has become overused to the point of abuse in recent years. Virtually anyone can — and it seems does — print up business cards and letterhead and consult. Contract programmers, once considered simply hired hands, are now calling themselves consultants. Everyone from strategic planners to management specialists has hooked on the tag (see story Update/15).

This confusion has created a minefield for DP/MIS managers, not to mention a plethora of potential legal hassles for consultants. California, for example, is trying to ban independents, arguing that they are simply employees seeking to avoid certain tax obligations by calling themselves consultants. Congressional hearings are under way to determine whether Big Eight accounting firms should be allowed to handle DP consulting for firms they audit.

Before deciding how to choose a consultant, the DP manager must decide when it is appropriate to look outside. It is often a more complex decision then it appears, especially for large corporations with vast, in-house DP/MIS resources.

A consultant can provide as many headaches as solutions. Internal politics and morale are a constant worry for the DP manager. With their high hourly salaries, consultants can cause loud grumbling among DP staff members who think they could have handled the task themselves — and at considerably less cost.

Consultants are expensive. James Martin, the noted data processing author and lecturer, earns a reported $25,000 per day, while other well-known consultants command $5,000 to $10,000 per day plus expenses. The large firms often charge upwards of $200 per hour, while the technical specialists generally run in the $100 per hour range.

Most Fortune 1,000 corporations, says Harvey Poppel, a consultant with Broadview Associates in Fort Lee, N.J., "have reached a point where the things that were done in the past are changing. The DP manager is becoming an anachronism. If they don't adapt, they will become dinosaurs. This makes DP a fertile field for consultants."

For technical issues such as micro-to-mainframe links, local-area networks, managing microcomputers, office automation, telecommunications, information systems architectures, artificial intelligence and general systems integration, the know-how may not be available from an internal staff that is struggling to fill backlogged demands of the daily business.

"You can read about these things," says William Inmon, a consultant with Coopers & Lybrand in Denver, "but it's like golf and sex; until you do it, it's all theory. There's no replacement for experience."

Internal staff may also not have the time and experience to follow vendor trends in both hardware and software. The technology changes so quickly that outside expertise, devoted to just such a task, may become essential.

In addition, as information systems have begun to change the nature of many industries, the DP/MIS shop is making the transition from simply a service organization to a strategic part of the company's business. This difficult repositioning often dictates the need for outside advice, and DP management consultants are reaping the benefits of this change.

"The expertise required goes far beyond technical talent," Poppel declares. "You need a range of business knowledge, and it is rare for the DP staff to be exposed to that."

"We use consultants for two reasons," says William Harris, director of information services for Coca Cola, U.S.A. in Atlanta. "There are times when we are looking for an independent viewpoint and other times when we just don't have the experience in-house."

"The consultant isn't there to run your business but to supplement your internal skill," adds Ian Scott, vice-president of information systems for Dart & Kraft, Inc. in Northbrook, Ill. "They've seen the same situation over and over and been through the problem before. It's the first time for us, and they provide added value."

For many clients, the outside consultant serves as a mediator and a sparkplug who cuts through internal politics and territorial bickering to get projects moving.

"We brought in a consultant mainly to solve internal arguments, bring about a group consensus and get things moving forward," says Clay Snyder, assistant department head of technical information at General Motors Corp.'s Research Laboratories in Warren, Mich.

"We had Nolan Norton in here to do a study on how the MIS resource should assist in making the company run," adds Herman Cordes, MIS manager for Raymond Kaiser Engineers, Inc. in San Francisco. "Some of their recommendations were enacted, and others were shelved. But the biggest thing they did was act as a catalyst for bringing people together. People from all departments had to make time to discuss their problems, and it really made a difference."

For the leading management consulting firms, such as Nolan Norton, Booz Allen & Hamilton, Inc. and ADL, the questions are beginning to emanate more from corporate management than the DP shop.

Poppel

According to Robert Howe, vice-president in Booz Allen's Chicago office, clients generally come to them with several business questions:

- Is the company getting the proper information technology support to remain competitive with the business across the street? Howe points out that this question is particularly crucial in the banking and financial industries, in which the recent deregulation of banking has dictated the need for the highest level of information technologies.
- The cost/value relationship. Companies are spending millions on information technology, and the costs keep going up. Is the company spending enough or too much, and is it getting value for what it is spending? How can the chief executive officer measure the value of what he is receiving?
- The transition in information technology. Most large companies have basic mainframe operating systems in place, but how can DP structure itself to pursue the next opportunities that tend to be more in the end-user and decision support realms than in traditional applications?
- How does the DP/MIS manager execute all of these changes? Howe describes this as a "return to basics." The DP manager understands he needs these systems and is ready to have them, but how can they be delivered?

"DP is really catching a tremendous amount of pressure now," Howe says.

"Backlogs are through the roof, and everyone is demanding answers.

Managers are asking, 'How do I get the resources and set my priorities to execute the needed changes?' "

Where to find them

Finding the answers to these questions, and many others, is the job of the consultant. From the one-man operation to the larger Big Eight firms, there are literally thousands of consulting options from which the DP manager can choose. That choice is dictated by factors such as cost, reputation, experience, area of expertise and need (see story page Update/4).

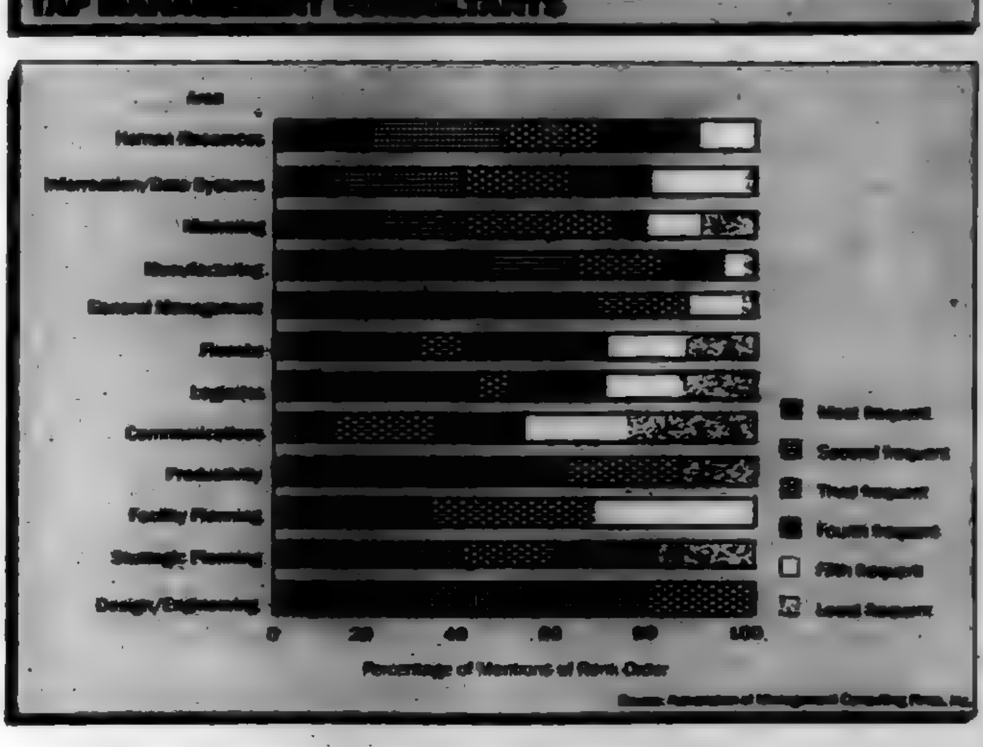
Though many Fortune 500 DP shops have already established long-term relationships with one or more consulting firms, smaller data centers, seeking outside advice for the first time, are advised to do some shopping.

Dart & Kraft's Scott says, "A structured evaluation in choosing the consultant will avoid problems down the road." He advises measuring four or five consultants by the following criteria:

- Can they clearly demonstrate the capability to

See CONSULT UPDATE/5

AREAS IN WHICH USERS TAP MANAGEMENT CONSULTANTS



Source: Association of Management Consulting Firms, Inc.

Update

Consultants: Recognizing your need for one, picking a suitable candidate

By Robin F. Goldsmith
Special to CW‡

Consultants can be intimidating. They always seem to have been hired by your boss' boss' boss. They generally show up only when your project is in trouble. They second-guess you a lot.

After a consultant has spoken behind closed doors, you may find yourself being blamed for the problem itself and also for being a lousy manager. Worst of all, the company listens to a consultant when it wouldn't pay any attention to you saying the same things.

What can you do about consultants? One approach is to get your own consultant before one gets you.

Like many systems managers, you may think you can do everything yourself. Obviously you cannot. You may not always recognize when you need assistance, or you may be afraid to admit you need help. In either case, you can be faulted for not getting the assistance.

Hiring your own consultant at least shows that you are using business judgment and doing what you can to make the project succeed. Besides, the right consultant should help provide the assistance you need to avoid the types of problems that usually attract someone else's consultant.

Even if troubles still occur, you probably will fare better. You are more likely to be considered a responsible manager who has recognized and acted upon a need for assistance. Moreover, if you have done all you can, your bosses may realize problems were caused by factors beyond your control.

Furthermore, the higher-ups are accustomed to getting assistance from consultants. By hiring your own consultant, you are beginning to exhibit management skills with which they can identify.

Here are some guidelines on how to find the right consultant to help you meet your objectives.

First, define the consultant's role. Knowing the role helps you find a suitable consultant. Moreover, it is essential for telling the consultant what needs to be done and determining whether the consultant has performed adequately.

The consultant's role should involve assisting in those areas that cause your problems. Accurately identifying these areas can be exceedingly difficult because we frequently are unaware of our real weaknesses.

Instead of addressing areas that others think are important, we tend to concentrate on our own strengths and interests. For example, systems managers have a reputation for thinking too much in terms of technology. This tendency is widely recognized as a major source of our frustration with and inability to satisfy users.

Thus, if asked to anticipate areas in need of assistance, the typical systems manager probably would stress technology — more computer power, tools and data bases, more test time, more programmers and maybe a few more technical heavyweights. You may be able to benefit from consulting assistance in technical areas, but do not overlook other areas that may still cause trouble.

How can you anticipate other true needs when they only become apparent in hindsight? The key is to put yourself in the place of people who will judge you. Try to appreciate the perspectives of your boss' boss, your user's boss and their bosses. They will judge you with respect to their areas of strength and interest.

These are the areas where you may be out of your element, where the right consultant can really help. Typical areas that seem to cause problems for systems managers may involve business strategy, systems planning, project management, financial accountability, competitive factors and the application itself.

In defining the consultant's role, you must identify not only the content area but also the specific work product you need. The consultant's product could be a review of the present system, an analysis of the feasibility of implementing various alternative systems, design of a new system, recommendations for selecting hardware and software, training staff, recruiting personnel, developing a system, installing a system or even managing a data center facility.

"I think I'm going to need a consultant to make this decision."

Once you have defined the role the consultant is to play, you need to start looking for suitable candidates. Even though consultants seem to be everywhere, it may not be easy to find one who fits your role requirements.

Goldsmith

The most direct approach is to advertise in newspapers and trade publications. Governmental bodies generally are required to advertise publicly for goods and services, including consulting. Advertising has its drawbacks — you may get more responses than you can handle, and you may not want to publicize what you are doing.

Some capable consultants avoid open bids because the costs of proposing tend to be high in comparison to the chances of being selected.

Most people rely on word of mouth to find a consultant. Be prepared to do some legwork to find candidates. Contact business people who are likely to know of consultants to fill your role: hardware and software vendors, other companies in your line of business, bankers, accountants, other consultants, professors and professional organizations.

You are going to rely upon your consultant, so choose carefully. Meet them and check on them. You must have confidence that your consultant can fill the role you have defined. Your consultant must have credibility, which comes from a combination of independence, expertise and style.

Independence means that the consultant has no stake in having any particular outcome, including the one you advocate. A vendor cannot give independent advice about a product the vendor is trying to sell you. The distinction can become blurred when some other sale may hinge upon the outcome. Can a consultant design a system and then review it impartially? Occasionally, consultants are accused of recommending a particular course of action because it will give them follow-on business.

Such abuses may occur. The best protection is close monitoring of the consulting engagement. Each assignment should stand on its own, without undue expectations for follow-on work. On the other hand, it is pointless to have a policy of refusing to give follow-on work to a consultant who has performed satisfactorily.

Remember, a truly independent consultant gives advice which not everyone likes from time to time. Do not put too much emphasis on bad references from clients who did not like the consultant's advice.

Most people think consultants should have all the answers. That is unrealistic. Besides, why bother hiring a consultant whose recommendation you already know? A consultant whose mind is already made up is no more independent than a vendor. It is far more important that the consultant knows what questions to ask.

If you are engaging a consulting firm, rather than an individual, remain conscious of the fact that consulting assignments are performed by individual workers, not by firms and not by salesmen. Be aware, too, that some firms think they can fill any consulting role just because of who they are. They cannot. Good planners often are poor implementers. Good reviewers often are poor designers.

A firm's experience with consulting projects performed by other employees of a consulting group has little relevance for you. What counts are the skills and experience of the individuals who actually will do the consulting work. Make sure you know who they will be.

Because consulting is very personalized, your consultant's style is important. You have to feel comfortable with the consultant, as does anyone who you expect the consultant to influence.

Ironically, this sometimes may mean you are hiring a firm rather than its individuals. For example, the fact that a report is from a big-name consultant may be even more important than its contents.

You pay for a big name. Often the price is not worth it. In some cases, only the big-name firms can provide the specific expertise you need. Surprisingly, though, even a big-name firm may consist mainly of experienced sales people and relatively inexperienced consulting staff members.

You may get better service and lower prices from these people after they have left the big-name organizations.

Once you have decided to select a consultant, make sure up front that both of you know exactly what is expected of each other. Don't nickel and dime over price; you will end up paying more or getting less.

Put your agreement in writing, incorporating the proposal and being sure to define deliverables, client participation, schedules, project reporting and payment as specifically as possible.

Then manage that project to make sure it happens. ■

Goldsmith is president of Go Pro Management, Inc. and senior associate with Chasby Associates, Inc. in Needham, Mass.

Update

CONSULT

from UPDATE/3

handle the problem quickly?

- What do their references have to say?
- Have you met the specific team members who will handle your assignment?
- Do they have the technical and interpersonal skills required to work with your group?

Before choosing a consultant, the client must have an idea of the options. Here are a few:

Big Eight accounting and audit firms. From specializing in handling corporate finances, firms such as Arthur Andersen, Coopers & Lybrand and Peat, Marwick, Mitchell & Co. found a natural segue into the data processing and information systems consulting business. Today, this market has become substantial for accounting firms, making up about 30% of billings in Arthur Andersen's case.

What these large, international firms offer is an abundance of resources. They boast that when hired, they are not just providing a single consultant but access to the massive experience and research capabilities of the entire firm. Although the lead consultant will interface with the client, he might be supervising a team of several consultants involved with the project. In addition, should a client require further expertise, the firm can call on specialists from any of the branch offices and fly them in for the project.

While independent consultants tend to specialize in certain technical areas, the bigger firms have expertise in a range of disciplines. Big Eight consultants point out that, although a client may only see one or two faces during an engagement, those consultants are spending hours discussing the problem with other experts back at the home office.

These large, established companies also provide stability. Edward Bruckstein, senior consultant with Peat Marwick in New York, points out that, unlike the case with an independent consultant, "a client knows we will be around tomorrow. The client is paying a premium for us, no doubt about it. But they are getting improved quality. Sure, we've messed up some jobs, but we stood by the client. It might have cost us twice as much to correct our mistakes, but we did it."

The accounting firms tend to be more than advisors. "We're in the design *and* installation business," notes Simon Moughamian Jr., managing partner of Arthur Andersen in Chicago. "We've always prided ourselves on the fact that we didn't just tell a client what to do; we helped them do it."

Management consulting firms with specialization in information systems. Management consulting in information systems is hot. According to the Association of Management Consulting Firms, Inc. (Acme), 62% of its member firms now offer information systems consulting, an area Acme considers among the hottest of all management consulting disciplines.

Though the Big Eight firms also take on management consulting, they generally find themselves working in concert with, rather than competing against, the management consulting companies. For Booz Allen, ADL, McKinsey & Co. and others of that type, the mandate is to match the understanding of technology with the insight into managing varied and specialized businesses.

At Booz Allen, for example, Howe points out that there is a large staff devoted to drawing up business strategies for banks, insurance companies and other financial service organizations. The technology consultants can and do draw heavily on that business expertise in their own work. The average full-time staff member at Booz Allen, he says, has three to five years of significant systems experience and most likely a master's degree from Harvard, Stanford or a comparable school.

"The client is paying for the combination of business and technology expertise," Howe says. "The challenge is to stay up on both those issues in order to help the client to a competitive advantage." According to Frank Allen, ADL "can put together a team that can understand complicated interdisciplinary problems."

The top management consulting firms also pride themselves on being at the very cutting edge of their business.

"Our people tend to have lived the problem themselves," Howe declares. "We're expensive, and we think we're good. We don't get called in to solve yesterday's set of issues."

Independent consultants. True to their name, this growing group of consultants cites the independence of working alone as the No. 1 motivator to going this route. According to

See CONSULT UPDATE/8

Gershon

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Inside, outside: Where do consultants fit in?

Two of the nation's largest banks, Chase Manhattan Bank NA in New York and Security Pacific National Bank in Los Angeles, have vast computing needs and extensive DP/MIS staffs to service those needs. Over the years, both banks have made extensive use of outside consultants for everything from contract programming to strategic planning. The use of external consultants has resulted in outstanding successes

Interview

What are the key reasons for bringing in outside consultants rather than sticking with your own in-house expertise?
Singleton: There are two reasons. [One is that] you already know what you want to do, but you need that objective third party to confirm it for top management and take you off the hook.

The second reason is that you really don't know what to do. You don't have the technical expertise or the experience inside to make that decision, and you truly need the outside expert to come in, look at various alternatives and make some recommendations.

What are your recommendations for ways to make the consultant relationship a positive rather than a negative one?
Singleton: You have to manage consultants just like you would a project for your own organization. The reason consultants don't work out is often that the objective or mission is not clearly defined.

What happens is they start out with what they think is their premise for being there. You think you've given them a charter, and you don't meet weekly to confirm how well they're doing on that charter. As a result, they start to generate paper, they stir up your staff, they stir up the users, and the whole thing becomes almost counterproductive.

We spend almost as much time launching the consulting study as we do managing it because we find if we don't, it gets off to the wrong start.

Have you seen examples where people feel consultants are treading on their territory?
Singleton: Yes, no question about it. You have to sell the use of consultants. For example, you can say, 'If you don't need a consultant, what I suggest is you do that study in 90 days, which is what the consultant would have done, and, by the way, he says he can save between $2 million and $3 million, so I would expect you can save the same.'

Now, he's got a choice. Did he put his foot in his mouth by saying 'I don't need a consultant' because he now has got to deliver what the consultant would have? And if he does, you're a winner all around. If he doesn't, he may come back and say, 'I'm finding this a little harder than I thought. Let's talk about this. Let me control him, but let's bring him in.' Either way you're not forcing it.

What about ways to pay for consultants?
Singleton: I do not go for time and materials. That's like giving someone a checkbook, signing all the checks, and he puts the amounts in. I like to operate on fixed price. If it's fixed price, we are both focused in much more sharply on what I want and what he is going to give to me. If it's time and materials, the $100,000 study becomes a $300,000 study, and his comment is, 'I need another [$50,000] to finish it.' You're at his mercy.

John Singleton

> 'If you hire a consultant to write your strategic plan, you are making a mistake.'

How do you cost-justify a consultant?
Singleton: We looked in one particular case at what a planning staff cost us, and a consultant would be about 30% of what the planning staff cost. Plus, the consultant is going to deliver the product that the planning staff never delivered.

The other thing we tried to do is work out a joint venture with consultants. What I've said to them is, 'You identify the savings and you charge me time and materials for the actual cost of your people but no profit on it. What we will do is work out a sharing basis on the cost savings, and we will give you X%. If you hit the $3 million or $4 million goal, for example, it will generate [revenue] to you far in excess of what your profits would have been.'

Have consultants accepted this pay structure?
Singleton: Yes, we've had two or three of our last major consulting firms [take on] that. One identified about $10 million in savings in one area and will be sharing in that and will be making over $1 million in additional fees. But we'll be saving $10 million. Another identified about $5 million in operating costs and will get a percentage of that.

We negotiated on the percentage they'd get of the cost savings. The cost savings had to be validated by the financial controller of our corporation. So they were hard dollar savings and not soft dollars.

What are some of the key technical areas for which you recommend using consultants?
Singleton: Let me tell you an area I wouldn't recommend. Consultants are always coming by and saying 'let us do your strategic planning for you.' In our use of consultants, they didn't do the plan, we did the plan. All the line managers wrote the plan. The consultants acted as facilitators and consensus developers at the meetings, taking us all through the same logical steps — mission statement, strategy, goals, projects and critical constraints that might stop us from getting there.

We did all the work. Many consultants will come in and say, 'We will write the plan for you.' They are not qualified to write your plan, and if you hire a consultant to write your strategic plan, you are making a terrible mistake. It's a waste of money and time.

Where would you use them?
Singleton: An area where they are effective is in telecommunications. The deregulation of AT&T has created a nightmare for most DP people. With all the changes, it is appropriate to find a person who is truly an expert in that area and can come in and show you how to take advantage of the integration of voice and data.

In the area of artificial intelligence, where there are not a lot of systems in existence and you've got somebody who has done it — not someone who talks about doing it but who has actually done it — I'd bring them in.

How do you check the credentials of a potential consultant?
Singleton: In the case of the telecom consultant, we went to the telecom companies that this particular consultant had worked with and asked how effective he was. They complained about him, how he had nitpicked and drove them nuts. And that made us feel pretty good because they meant he was hard-nosed in writing [specifications] and making telecommunications companies address those issues. The more complaints I got, the better I felt about him.

What is the best reporting mechanism?
Singleton: They should report to the line manager who is going to have to implement the recommendations. I'd manage a consultant on a daily basis if it [was] a short-term assignment, certainly no less than weekly. Reports should be made in person by the way; I don't like mailed reports. I like them to bring it in and walk through it. And I like them to have all the members of their team there so you can ask questions. I always ask if there is a minority opinion on this. If not, I ask why it isn't there. I'm a little concerned if they all think the same way.

I force the minority opinion out and then ask them to defend why they didn't select the minority opinion. That is seldom done.

How much autonomy should a consultant have?
Singleton: You can have access to my whole organization, but I want to know where and why you are going in those areas. Don't forget, the meter is running. ■

ILLUSTRATIONS BY ALAN [illegible]

Update

as well as dismal failures. Both banks continue to depend on contributions from outsiders.

As the cumulative experiences with outside consultants have added up, both Security Pacific and Chase Manhattan have developed internal strategies for engaging and managing consultants.

The banks have taken divergent paths, however.

Security Pacific has one of the most successful DP operations in the U.S. and has done so well in servicing its users that the bank recently unveiled the Security Pacific Automation Co., a division servicing other DP users. John P. Singleton is president of the new division.

At Security Pacific, there continues to be unabated enthusiasm for using outside consultants, although with strong management and direction.

Chase Manhattan, on the other hand, has taken steps to cut down on its use of external consultants by creating an internal consulting group to handle many of the chores formerly delegated to outsiders.

Stan Schrager, vice-president and division executive of Systems Management Support, directs the internal group of 38 consultants.

According to Schrager, the group provides resources and support throughout the bank for computing needs and actually competes with outside consulting firms for work. The group has no set budget; expenses are covered by charging back costs.

Computerworld Update Editor Glenn Rifkin interviewed both Schrager and Singleton to get their respective views on when to look for outside consultants and when to stay inside.

Stan Schrager

'It is instinct for [consultants] to turn around and use their experience with your competition.'

[illegible]

Update

CONSULT from UPDATE/5

Gary Stice, independent consultants generally come from one of two sources — large consulting firms and data processing or MIS shops.

After 20 years in DP, Robert Gershon, an independent consultant in Deerfield, Ill., decided to go it alone. "This is the only way to be," he says. "I'm far happier than I ever was before." Thomas O'Flaherty, principal of Information Service Strategies, Inc. of Woodridge, N.J., agrees. "I didn't want to be an MIS director all my life," he says. "I was typecast as a techie, and I didn't want to be a technical gypsy."

Although a majority of independent consultants have substantially increased their income, it comes at high price — long hours and tireless marketing. DP staff members grumble that consultants are making $75 per hour and calculate that rate out to 40-hour weeks. But few independents bill out more than 20 hours per week, and they must pay all overhead costs, including insurance. When they are sick or on vacation, no money comes in, and they must constantly market themselves.

"Financially, it is more lucrative, but you can't do it just for the money," Gershon says. "It is long hours and hard work. If you are in it just for the money, you're better off with a full-time job." Becoming an independent has other considerations. "There aren't any test paths," O'Flaherty explains. "If you can get enough customers to agree with you, you're a consultant."

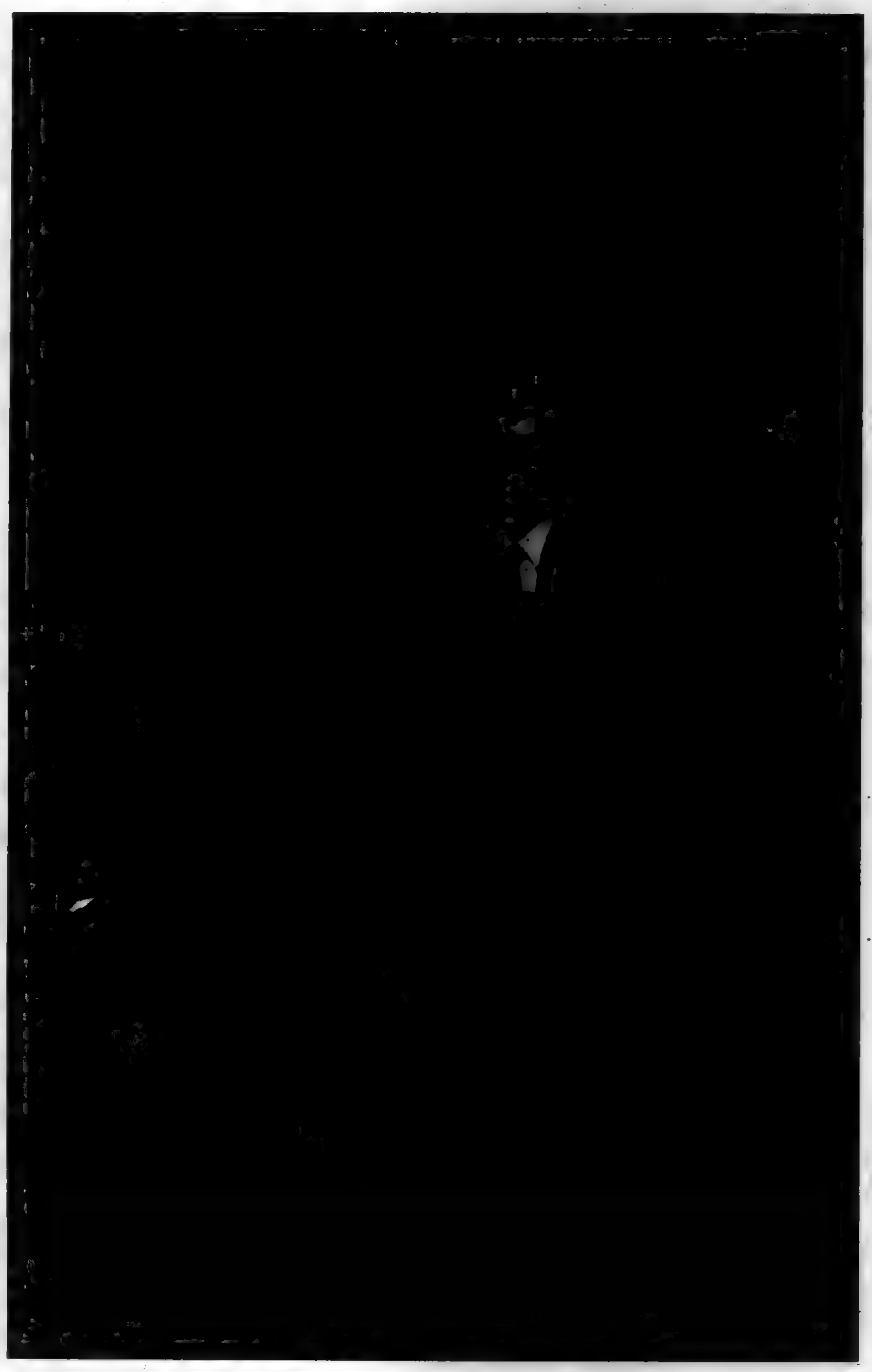
Getting enough customers, of course, is the tough part. Independent consultants tend to spend nearly half their time marketing their services. The advantage they offer a client is the kind of personalized attention a large firm might lack. "We find that we compete with the Big Eight firms," Stice says. "We go in behind them to a client who is disappointed with the work they've done. It happens often."

Another advantage of the independent is price. "A Big Eight firm has to charge at least three times what we do just to break even," says O'Flaherty.

Although some independents have found lucrative niches within large Fortune 500 companies, the majority devote their energies to the small to medium-size businesses that want less expensive, more personal service. The most successful independents have focused on a specific, technical or managerial need and have built reputations around that capability.

Dean Hiller, president of D. L. Hiller & Associates in Sterling Heights, Mich., specializes in implementing office systems in small manufacturing businesses. He is heavily involved in networking and systems integration using personal computers and finds that, despite working 60- and 70-hour weeks, he still needs additional help.

For Hiller and other independents, a key function of the business is to refer work to other sources if they feel either unsuited or too overburdened to undertake it. Networks of consultants, usually connected via organizations such as the Independent Computer Consultants Association, help spread the work and the wealth around.



Research firms. These firms — International Data Corp. (IDC), Yankee Group, Dataquest, Inc. and the Gartner Group, Inc. among them — are perhaps the most visible of all consulting organizations. Pure consultants — those who do hands-on project consulting — will take umbrage at these research organizations calling themselves consultants, however. In the press, they are often identified as industry analysts, and that is perhaps a more accurate term.

These firms generally serve as vast information resources, gathering and analyzing data for clients rather than directing specific technical DP or MIS projects. According to Tim Caffrey, director of strategies for microcomputers and office systems at IDC, the difference between the research firms and the consulting firms is the way information is delivered. IDC, for example, uses its continuous information service — a telephone hotline for customers — newsletters, reports and seminars to deliver its message.

IDC customers are generally served by these options rather than by on-sight presentations, and they pay anywhere from $15,000 to

Update

$20,000 per year for their subscriptions. "We get calls about anything you can imagine — software evaluation, optical disks, micro networks, technical assessments, vendor viability and particularly what other users are doing," Caffrey says.

Despite the distinction between the research firms and other consulting outlets, the bottom line is generally the same. "We help people maximize the return on their investment in technology," Caffrey says.

Aside from all of these consulting options, the DP or MIS manager has still more from which to choose. The vendors themselves offer both hardware and software consulting on their specific products, and data processing service houses provide contract programming for firms seeking impermanent solutions to their staffing problems.

Organizations serving as consulting middlemen are also springing up as the need for high-tech consultants proliferates. Technology Transfer Institute of Santa Monica, Calif., is a seminar bureau representing such top names as James Martin, Amy Wohl, John McQuillan and Harry Newton. The firm recently began offering consulting services, matching its noted speakers with clients seeking specific strategic advice.

Many large DP shops find themselves bringing in former employees who have become consultants. Cordes of Raymond Kaiser Engineers has done so with success. "We've had no problems bringing someone back in. We know their true talent, and they can get the job done without being hired permanently," he says.

At DEC, former full-time employees regularly return as consultants to work on a contract basis. As a vendor, DEC has unique problems in both hardware and software development and finds it beneficial to bring in ex-employees who understand the problems. "We have employees who quit on Friday and come back as a consultant on Monday," says Noel Negroni, manager of software and consulting acquisition. "It's a way to retain highly qualified people who would rather not work full-time at one company."

Setting the rules

"When the client doesn't manage the consultant, the consultant ends up managing the client," Hammer warns. It is a tenet upon which consultants and savvy users agree. Finding the consultant is just the first step. Establishing a set of ground rules both parties agree to is the next essential directive.

Though clients generally understand that they have a problem that needs to be solved, consultants are often surprised to find that no clear definition or direction has been established to do the job. "It has been my experience that the value a client receives from a project is very strongly correlated with how effectively they manage the project," Hammer says.

It becomes incumbent upon the consultant, therefore, to do serious preplanning with the client to avoid misunderstandings and disasters down the road. "Most projects fail either because of incompetence on the part of the consultant or not doing enough client interface work prior to starting," according to Dean Hiller. Hiller says that the absolute prerequisites for any consulting job include the following:

Hammer

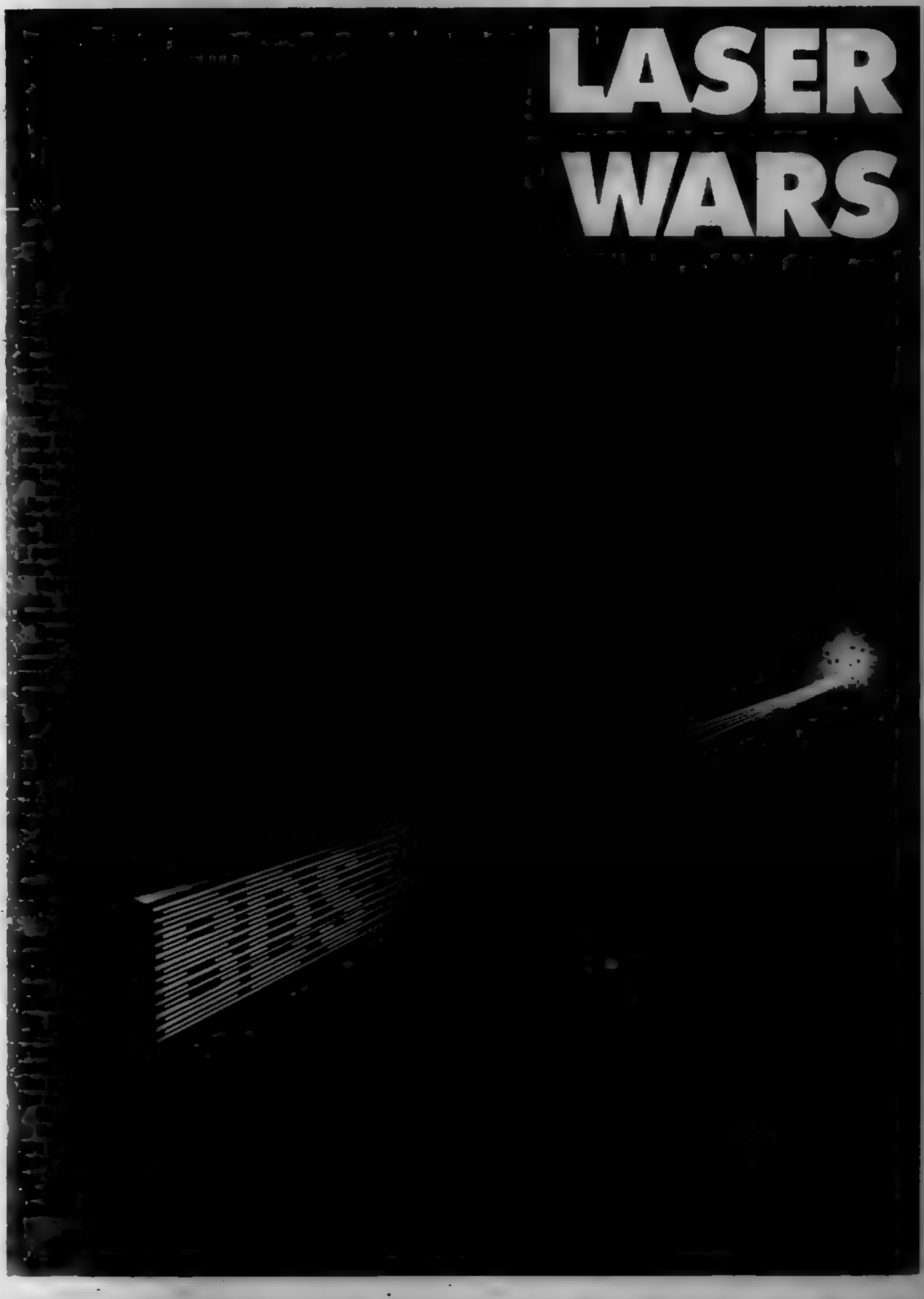
- A good proposal with clearly stated objectives — in other words, what are the deliverables?
- A definitive work plan.
- Enough preproposal work with clients to ensure that they are properly oriented to the time frame and cost of the project.

The large accounting firms tend to formalize the procedure to a greater degree than independents, although all successful consultants insist on clear, up-front guidelines. Allen Sneider, a partner at the Boston office of Laventhol & Horwath, explains that for extensive projects, his group creates an engagement letter. This letter defines the services, explains the charges and provides an estimate of fees. The project is done in phases with an initial feasibility study followed by implementation and maintenance procedures.

"When you are dealing with microcomputers, the consulting fees could cost more than the system," Sneider points out. "Therefore the service must be superefficient. Consulting has a high value, but it may be intangible, and some clients may wonder if it's worth it. That requires a lot of education."

As the price of hardware drops and consultants' salaries rise, it will not be unusual for consulting to cost as much, if not more, than systems, according to Sneider. "You have 32-

See CONSULT UPDATE/11



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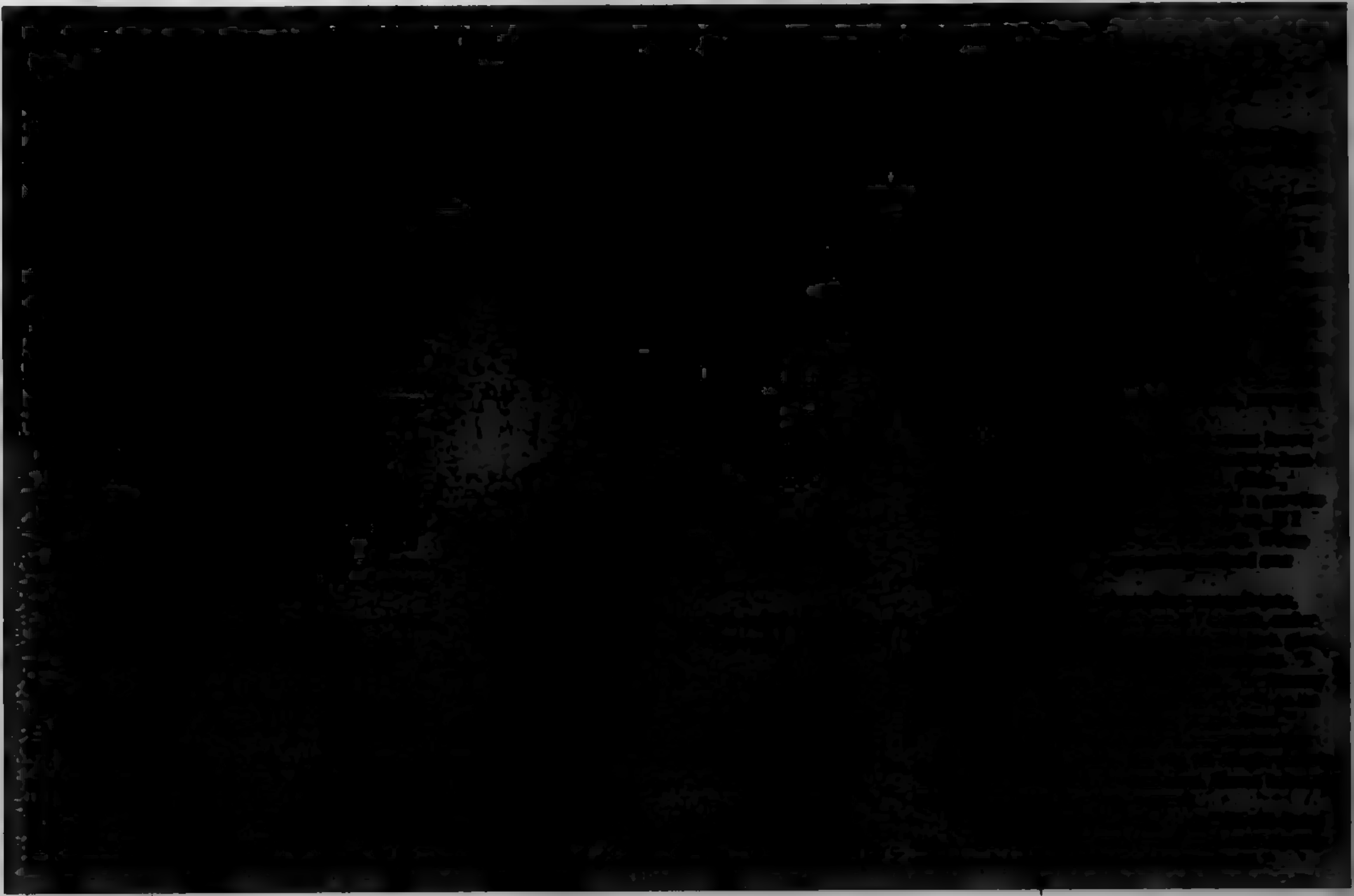

CONSULT from UPDATE/9

bit machines with powerful programs sitting on the desktop and they have the same capabilities as a supermini," he says. "It can be pretty dangerous to put a 32-bit supermicro on your desk unless you have some competent consulting along with it."

Consultants traditionally charge by the hour for time, and materials and rates vary. Lesser known independents generally charge anywhere from $40 to $150 per hour while the superstars can command fees up to $5,000 per day. The big firms generally charge an hourly rate — usually from $75 to $200 per hour — based on the experience of the consultant assigned to the task. Generally, the more inexperienced the consultant, the cheaper the rate.

At Peat Marwick, work is done on a fixed-fee basis. "An hourly charge makes the client feel uncomfortable," according to Bruckstein of Peat Marwick. "Whenever they call or stop you in the hall, they feel the clock is ticking." Clients rarely specify a price level when contracting with companies that charge by the hour. At Arthur Andersen, a client with an ongoing relationship might request a specific consultant to be assigned to the task, but generally the firm decides who to send based on the needs of the project. "Very seldom does anyone say, 'Give me a $125-per-hour person or [a] $175-per-hour person,' " Arthur Andersen's Moughamian notes. "We're delivering a product, a service, to them.

Adds Michael E. Simon, managing director of planning at Arthur Andersen, "There are two kinds of buyers. There are buyers who are really body shopping. They need a systems programmer and they go out and get one based on hourly rate and qualifications.

"The other kind of buyer is seeking risk aversion. If [he] selects the right consultant, there is a much higher chance of getting a system that really meets their needs. That person is buying project management and generally won't question what we feel is the right mix of people."

Some large firms that use consultants extensively have set up consulting acquisition centers to act as brokers between consultants and clients. At DEC, Negroni points out that thousands of consultants are under contract at any one time and all must be approved by his office.

In acting as a broker between the consultant and the DEC manager, Negroni can facilitate a smoother interaction for both sides. "By brokering these issues, we can reveal a lot of the problems that otherwise would stop us from getting the most out of the engagement," Negroni says.

Though cost may well be a crucial issue for smaller organizations, most medium to large users are less concerned with the final bill than they are with solving the problem. "Price is not even discussed," according to David Geary, director of corporate MIS for Kaiser Aluminum & Chemical Corp. in San Francisco. "Expertise is the issue."

"Trying to manage consultants by cost won't work," Negroni adds. "Once you need a consultant, you need him now."

Communications

Nonetheless, clients want to feel that they are getting their money's worth. Once a project is under way, constant communication is essential. "Communication with the client is critical," says Roger Birks, an independent software consultant in Phoenix. "You should bring screens and reports, prototypes of what you are doing, to regular meetings. It gives the client a chance to see and touch the project as it is going along. When the people managing the project are involved, you tend to get a more successful implementation."

Status reports, weekly or monthly meetings and constant two-way communication serves more than just a single purpose. For the client, it is a way to monitor progress and value. According to Scott of Dart & Kraft, the good consultants are often stretched to the limit keeping up with all their clients.

"Consultants tend to try to balance jobs, and you must make sure your job gets the attention it deserves," Scott declares. "By making sure they get to meetings and make deadlines, you will get their full attention. Also, it's a good way for irritating problems to surface. Consultants are always happy to respond because you might end up as [a] reference for them later."

For the consultant, it provides not only a chance to command client interaction, but an opportunity to disagree. Booz Allen's Howe points out that when asked for their best judg-

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> ***Independent consultant***

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from UPDATE/11

ment, consultants many times will disagree with their clients on fundamental issues. "On every assignment there are going to be three kinds of issues: those in which the client agrees with us, those in which we disagree but over time come to an agreement and those we just agree to disagree on."

The forum of regular meetings allows those issues to surface throughout the project rather than lurking beneath the surface until it is too late to address them.

"Communicating means not only keeping up to date on absolute progress but also where you are on issues and viewpoints. It's an absolute disaster to go into the final meeting and surprise the client with a series of recommendations or conclusions that he hasn't had any insight into before," Howe says.

Pitfalls

Despite the best intentions, consulting engagements occasionally can and do run into problems. Successful consultants limit the number of pitfalls encountered by up-front planning. But even the most carefully outlined plan can run into snags.

Internal politics are often a major stumbling block to successful engagements. A consultant may be brought in by a manager who does not have high enough ranking to set plans in motion. Conversely, the consultant may find that the best people to provide input into a project may not have access to it simply because they are too low on the totem pole.

"It's frustrating when people who need to be involved in the decision-making process can't be due to the political realities," consultant Stice explains. "The best person to explain a problem may be a third-shift machine operator, but he may never get access to management."

"You need to interface with those who will use the system and get input as to what really happens in that setting," adds Richard Jacobsen, an independent consultant from Bloomington, Minn.

As mentioned earlier, there is often resentment from internal staff members as to what they perceive as the intrusion of a consultant. Top management will often ignore advice from internal staff members and welcome the same advice if it comes from an outside authority. They believe, as Hammer says, that an outsider is not subject to the same conflicts and political issues that color the thinking of the internal staff.

This prejudice puts consultants in an awkward position. The in-house staff may become uncooperative and resist consultants, making their job difficult if not impossible. "It's a very delicate situation," Stice says. "It's not your job to be a personnel administrator, but a lot of times you have to do that. The best way is to have one person to report to. You can't make six people happy."

Users have recognized this pitfall and have looked for creative ways to circumvent it. Coca Cola's Harris says that the DP/MIS director must try to explain to the staff candidly that the proper level of expertise is not available within the staff.

Others suggest bringing key personnel in on the engagement and letting a lower level supervisor oversee the consultant's work.

Consultants all have felt the frustration of reaching what they feel is the perfect solution only to have the client reject it. At the other extreme, consultants must avoid overdesigning a system that clients are unable to run once left alone. Some of the Big Eight accounting firms have been accused of this practice by government clients. They will reportedly design a system and then send their own high-priced talent to run it.

"It's one thing to be correct and another to be correct and impractical," Booz Allen's Howe states.

Although it has not become a common occurrence, clients must also watch to make sure consultants are

not sharing proprietary information with others. Many corporations require consultants to sign nondisclosure contracts to legally bind them. Elaine Bond, director of DP at Chase Manhattan Bank, has seen instances of a consultant taking knowledge to a competitor. "You can try to bind them legally, but it is a difficult administrative problem. It causes you the extra burden of managing proprietary information."

Sharing secrets, however, is self-defeating for a consultant. "Once they do it, they won't work again," DEC's Negroni says. "My impression is they don't share information."

Clients should also watch for consultants with packaged software solutions to sell. Users such as William F. Monteith, MIS director at Armco, Inc. in Middletown, Ohio, have seen consultants proceed through an entire engagement, only to unveil a packaged solution that could have been offered at the outset.

"These people have software packages on the shelf, and their recommendations are biased by that material," Monteith says. "We tend to exclude consultants with a package to sell." DP/MIS managers are cautioned to question a potential consultant up front about biases toward packaged solutions.

And finally, finding consultants who know as much as they claim to know is no simple task. In the complicated, unresolved disciplines such as telecommunications, systems integration and micro-to-mainframe links, "There are very few people who know what's going on," Raymond Kaiser Engineers' Cordes says.

"We needed help with a computer-integrated manufacturing system [CIM], and we've talked to a few consultants who claimed to know CIM," adds Geary of Kaiser Aluminum. "During the interviewing process, it was clear they didn't know any more than we did."

The difference between true and imagined expertise is also apparent in strategic consulting. Management consulting firms boast of helping create a competitive edge through information systems, but that is easier said than done.

"There aren't too many consulting firms that are very good at providing a competitive edge," Harris says. "They may say they are doing that, but most aren't. With the exception of the financial services industry, very few businesses are making any significant use of computer systems to gain a competitive edge."

Users, therefore, must seek out organizations similar to their own and find instances of successful consulting engagements. These samples and resulting references can make a substantial difference between satisfaction and frustration.

Future trends

Consultants agree that in the next few years, the technical issues will become less important as organizations focus on gaining a competitive edge using technology. Clients, ADL's Allen points out, are becoming more self-sufficient.

"In 20 years, you won't hire a consultant to help implement a decision support system," Allen says. "That will be a commodity item. Consultants will be called upon to educate people on how to manage information-intensive corporations."

In the near future, however, consultants face a stiff challenge. They must stay abreast of changing technology while facing increased and tougher competition. As the consulting ranks continue to expand, the good jobs will be harder to find.

Though the large firms continue to enjoy plenty of engagements, the field has changed subtly in recent years. Marketing has become critical to both large firms and independents as users grow more savvy about their needs.

"In the early days, marketing was sitting one foot closer to the phone than the other guy," Broadview Associates' Poppel says. "But the days of waiting for the phone to ring are well past. Marketing is not just getting yourself chosen from a group of competitors; it is often getting the prospect to understand they have a need."

According to Moughamian of Arthur Andersen, the business is getting more complicated. Now that sophisticated customers have installed personal computers, local-area networks, operating software and telecommunications equipment, they want not only to tie it all together but also a single vendor to do that for them.

"It's a complicated world," Moughamian says. "Your competitor one day may be your partner the next."

Consultants also believe that there will be no letup in technological change, and, therefore, work should continue to be plentiful.

"If the rapid pace of change keeps up, I expect the consulting business to thrive," Hammer says. "Personally, I see no end to the change in sight. All the reports of a slowdown in the computer industry are temporary and do not reflect the end of the party.

"If you look at the the world from 40,000 feet, the impact of information technology on U.S. business has been almost insignificant thus far," Hammer continues. The impact has been minor compared to what we are going to see. Companies don't do business in a markedly different way than before computers because of computers. But that's about to change. And consultants who do a good job will continue to have important markets."

Perspective, as Howe of Booz Allen points out, is crucial to any consultant-client relationship. "A consultant can shed light on issues, provide objectivity, expertise, analysis, be a catalyst and motivator," he says. "But consulting is not a panacea to all problems." ■

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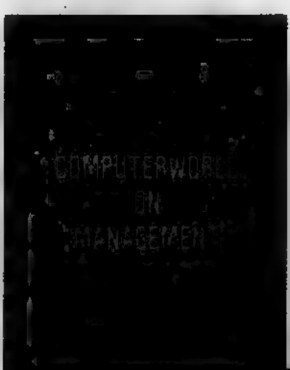

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White-collar computing: The professional as artist

By David Stevens

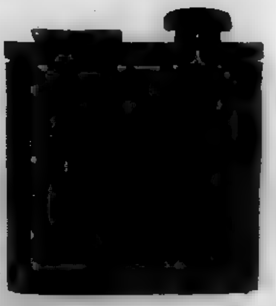
In the long run, the dramatic change brought on by office automation won't be in worker productivity but rather will be in working style — the "artistification" of the white-collar professional.

Most articles exploring the effects of automation on white-collar work fall into one of two classes: paeans to productivity or bleak visions of the physical and mental consequences of various forms of "technostress." So far, scant attention has been given to how the computer-assisted personal workstation can be expected to change the fundamental nature of white-collar work.

There are two kinds of change that computers can effect in the professional workplace. They can speed the processing of work in the traditional style, and they can enable fundamentally new styles of work to emerge.

One of the primary traditional office tasks is the transcription of a professional's ideas and preliminary drafts from one medium onto another. Much of the discussion of the increased productivity of the automated office centers on the ease and speed with which these transcriptions can be accomplished with the aid of a computer. Impressive as these improvements are, they are almost certain in the long run to be less dramatic than the changes in working style that can collectively be called the "artistification" of the professional.

The artistic nature of the pure programmer has an honored place in the folklore of the sociology of computing. This artistic make-up is supported by the nocturnal habits, eccentric behavior and declasse attire and coiffure of the stereotypical specimen of *homo programmaticus*, even if



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it is not always evident in the beauty of his work product.

Computing work is generally assumed to attract such people. While this observation is true, it is not the whole story; there is also a sense in which it can be said that computing work creates such people.

A treasure chest of skills

The artistic urge has remained latent in many of us because we have lacked the skills necessary to express it. The personal computer is putting a treasure chest of those skills, and thus the ability to express ourselves, onto every professional desktop.

With the ability to express ourselves more freely will come the desire to create; with the desire (and a little secret practice) will come the exercise of this new capability. And with its exercise will come some elements of the artistic temperament.

As a result, the regular use of a personal computer-assisted workstation will convert the professional work force into a quasi-artistic work force. To some extent, this change will be the rather obvious result of the professionalization of certain design-oriented functions. To a greater extent, however, the change will be the result of the largely unanticipated artistification of the hitherto routine and pedestrian aspects of professional life.

Changing techniques

It used to be, for instance, that a professional would dictate or hand-scrawl the text of a document in preparation, describe any artwork to be included with the text and hand the resulting bundle off to a set of artisans for conversion into a readable whole.

This same professional, with the assistance of a computer, can now do his own document layout, including type fonts, faces and sizes. He can also execute his own artwork, ranging from simple line drawings through sophisticated graphs and charts to bit-mapped halftones of considerable complexity, all of which can be enhanced by automatic curve smoothing, line straightening, shading and texturing and other handwork-enhancing utilities.

This new breed of artistic professional will need as much management as did his preartistic predecessors. But because of his burgeoning artistic temperament, he will tend differently to conventional management practices and techniques. These changes should make the next few years interesting.

Freedom of expression vs. consistency of format. One characteristic of the artist is his desire to express his own individuality. In the professional workplace, this tendency will surface as an inability to leave any document alone.

In the old days, the difficulty of the mechanics often served to govern the urge to change things. Suggested alterations were generally local and limited in scope; sweeping changes were rare. Technology has made total reorganizations of large documents quite manageable and has provided every professional with the means to play with the appearance of a document.

The forms explosion that follows the introduction of the personal computer into almost any office is a wonderful example of this effect at work. Almost the first thing that the professional now does to demonstrate his newfound prowess is to create a new form, even though the old form is adequate and there are plenty of them left.

The precomputer professional developed the content of a document but generally left the establishment of its form and appearance to his administrative and clerical staff.

One result of this arrangement was that the semiliterate phrases penned by the brillant but grammarless professional could be turned into polished prose before being released. Another was that all documents originating from an office exhibited a common look, regardless of the personal idiosyncracies of the several professionals served.

In some cases, this common look extended beyond the department to encompass the whole organization, providing a central part of the corporate culture and personality. A person receiving such a document could tell at a glance its place of origin and, in the case of a long document, could quickly develop a fairly accurate feeling for how it would be organized.

Professionals are now free to indulge their own whimsies as to how their letters and memos should be formatted. They can create their own letterheads and forms, even incorporating their own logos should they so desire.

What the individual gains in freedom of expression, the organization loses in consistency of output appearance and style. For those situations in which flair, panache and a touch of poetry are appropriate, the organization's loss is the writer's gain; where regularity and uniformity are important, the writer's artistic license can generate confusion for the reader.

Total control vs. lost thoughts. One of the most frustrating things a writer can experience is dropped thought: He begins a sentence or paragraph, knowing the point he wishes to make, only to have it fade out of existence before he has captured it on paper. Sometimes he can recapture the mental context and the thought, sometimes not. In either case, the flow of thought is disrupted and the compositional task does not go smoothly.

In the precomputer days, the professional used the pencil as his primary recording device. With all its limitations, the pencil provided a comfortable and fairly rapid means of converting thoughts to text, so that relatively little thought had to

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be devoted to the mechanics of the process.

The "artistified" professional, on the other hand, has assumed total responsibility for the appearance as well as the content of his document and can access a substantial armory of sophisticated tools that enable him to achieve the effects he desires.

He now has more options than in the pencil days — for example, he can use italics, boldface or underlining for emphasis instead of only underlining. However, the mechanics for invoking them are necessarily more complicated. Involvement with complicated mechanics is a substantial barrier to continuity of thought.

Immersion vs. insulation. The precomputer professional was insulated from the tedious mechanics of refining his work into publishable form. His handwritten drafts were transformed into type by the clerical staff. His hastily plotted graphs were redrawn neatly and to scale by the drafting department. His sketches blossomed into finished artwork under the hands of the technical illustrators. His cost distributions and spreadsheets were prepared by the accounting department.

When all of the pieces were satisfactorily assembled, he had only to review them for accuracy and then send them off for photocomposition. All of this happened out of his sight and, although people-intensive, appeared to happen automatically.

The people who did these things were specialists. They generally did their work quickly and well and did not require detailed direction from the professional. Direction was possible, of course, but it was discouraged. The goal was to free the professional of these petty concerns so that he could get on with his own more exalted work. And because more direct involvement was difficult and time-consuming, most professionals did, in fact, leave these details in the hands of specialists.

The computer-assisted professional, however, has a rather different set of assistants. Instead of a clerical staff, he has word processing and document preparation systems. Instead of a drafting department, he has charting programs that prepare bar, line and pie charts directly from tables. Instead of technical illustrators, he has picture-making systems that can take his own hand drawings and integrate them with standard modules extracted from a library or developed from scanning other illustrations. Instead of the accounting department, he has electronic spreadsheets to do his cost distributions and tabulations automatically.

In many cases, the final product is of publication quality when it comes off the terminal. The process is now truly automatic; it is done by a personal workstation instead of by people. It no longer happens out of the professional's sight or without his direct control, however. He must learn to shape the output of each process to his purposes and how to fit the collected results into a coherent whole. He must become directly involved in all steps of the process.

Of course, the professional could provide the specialists with access to his files and operate very much as before, but he will choose not to do this. A modern, hands-on personal computer with a reasonable number of features exerts an attraction as seductive as Lorelei. It is very rewarding to watch one's own creation take shape under one's own hands.

> ”
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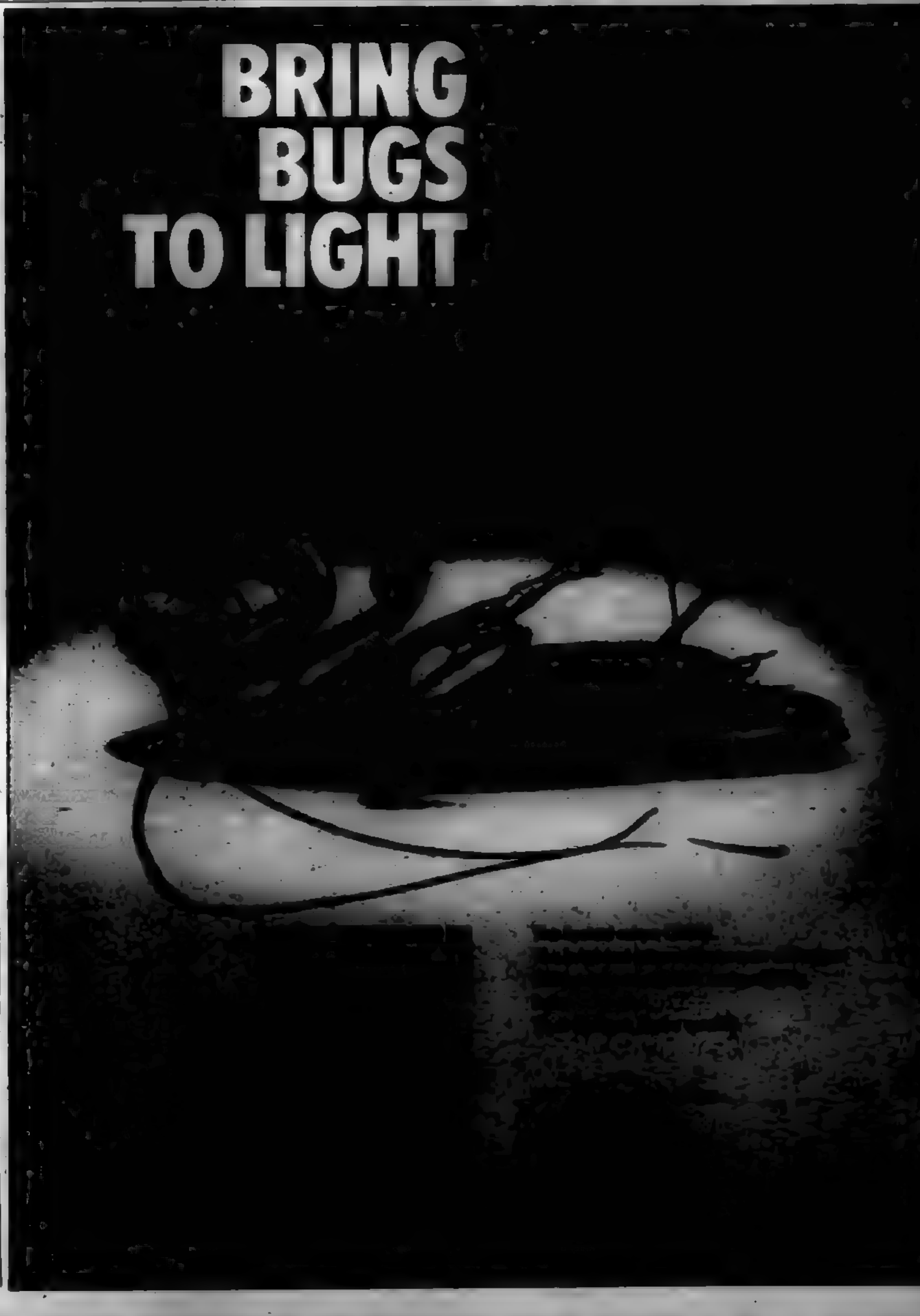
> *In the old days, the difficulty of the mechanics often served to govern the urge to change things. . . . Technology has made total reorganizations of large documents quite manageable and has provided every professional with the means to play with the appearance of a document.*

The computer assistance allows the professional to try out what otherwise he might have been reluctant to try, in public or through other people, in the precomputer days. He will make more modifications; he will change and change back. He will be more adventuresome than he would have been, for he no longer has to worry about the risk of appearing indecisive or the irritation that often accompanies the redoing of an apparently finished product.

The fascination of direct control accompanied by immediate feedback is immense, and it generates a desire to continue the cycle. The immediate feedback of the system seems to demand immediate feedback from the professional; the result is total immersion for long periods of time.

Play vs. work. The play aspect of the personal computer is closely related to the total immersion just described, for immersion tends to accompany enjoyment. One source of enjoyment is the sense of fulfillment that accompanies use of a computer-assisted workstation. This is, to some extent, a result of newfound competence, and perhaps it will disappear in time. For at least the next several years, however, the introduction of new products and capabilities will preserve the playful nature of personal computing.

Play is not necessarily bad; well-designed play can be instructive. Most likely, however, professional play on the personal computer will



take much the same form as did programmer play on the first couple of generations of mainframes. That is, there will be much limit testing and experimentation with the undocumented aspects of the systems available.

Nonproductive play does interfere with work. One side effect of the total immersion syndrome is the possibility that use of the personal computer can become so rewarding that it becomes an end in itself instead of a means to accomplish more constructive ends.

Instant response vs. lack of reflection. Not all minds work alike, but many of us find that much of our productive work is done off-line. When we wrestle with a problem awhile, then put it aside and come back to it, we often find that our subconscious was working on the problem during the interim and has discovered a way around a barrier or through a maze.

One of the joys of computer-assisted professional work is in the instant response of the system to the commands of the artist. No sooner does a professional think of something than it can take shape before his eyes. Carrying a document through from conception to final hard-copy form in one session is becoming increasingly common. While this mode of operation allows some amazing bursts of productivity, it also provides scant chance for reflection.

The subconscious mechanism also operates when any thought process is pushed into the background to make room for more immediate concerns. Thus, it is not unusual for the subconscious to take advantage of whatever dead time occurs between the successive steps of a traditionally organized project to suggest a modified approach that is preferable to the one originally in mind. In providing a computer assist that allows a professional to move from concept to camera-ready copy in one sitting, we are also depriving his subconscious of a chance to work on that task.

Avoidance of translation vs. incidental independent review. As noted above, the computer assist allows a professional to take a document from concept to camera-ready copy without the intermediation of specialists. One obvious benefit of this procedure is a reduction in the number of translating filters through which the product must pass. The result will be much closer to the original concept than was formerly the case and will be achieved with much less of the frustration attendant upon miscommunication.

A less obvious and less beneficial result of this procedure is the elimination of the several independent reviews that occur as each piece of the product passes through its specialists' hands. To begin with, the originating professional finds it necessary to express his intent clearly in order to ensure understanding on the part of the specialists. The specialists tend to read his work more carefully, for the material is unfamiliar, and they do not have the author's advantage of knowing his ultimate purpose; they have to make do with what he has written. As a result, they do not allow for the author's unexpressed intentions.

By contrast, it is extremely difficult for an author to proofread his own work competently, especially when he has been the typist as well. Traditional processing results in a document with fewer errors than is usual in a one-person process.

Faster results vs. more errors. The usual productivity claim for a computer-assisted system is that a person can produce more in less time. The rub comes when one asks, "Produce more what?" One answer — more errors — is implied by the loss of independent review noted previously. Another, similar answer is to be found in Parkinson's Law as applied to paperwork systems.

> *The usual claim for a computer-assisted system is that a person can produce more in less time. The rub comes when one asks, "Produce more what?"*

Parkinson's fundamental law is that work expands to fill the time available for its completion. When applied to paperwork systems, it becomes, "Reporting requirements expand until the most competent system in the field can no longer keep up with them."

In other words, as soon as the computer-assisted professional is capable of generating *n* pages a year, the reporting system will demand 1.5*n* pages. The result is that the professional is always behind and so is always eager to shorten the time from concept to product. He continues to expand his use of his personal computer system in order to avoid using specialists.

Professional as author vs. professional as secretary. The advantages of a computer assist for individual authorship have been amply described. There are also significant additional advantages for multiple authorship. Not only does each author enjoy the individual advantages, but the team is also enhanced by the ease with which text can be shared, edited, combined and moved, whether the several authors are colocated or separated by the width of a continent or an ocean. These amenities make it much easier to achieve an effective division of labor, a consistent style and a smoother blend.

On the other hand, a necessary consequence is that the professional becomes his own secretary. This situation is not necessarily bad, but whatever time the professional spends at secretarial work he does not spend at professional work. Moreover, the secretarial work in question is done more slowly than if it were done by a secretary, and it is done at professional, rather than at secretarial, wages.

Appearance of product vs. content of product. Very little of the discussion of productivity one sees in trade journals is concerned with what is probably the greatest advance provided by the computer-assisted workstation: the appearance of the product.

In the precomputer days, preliminary copies of documents-in-progress were rather ratty looking. Such appearance resulted not only from the fixed-pitch machines on which they were composed but also from less-than-adequate resolution, mimeo smudge and other artifacts of the precomputer office.

Today, however, the personal workstation can have an individual hard-copy device of virtually arbitrary quality, capable of printing anything his VDT can show. One suspects that the brave show made by these printers is responsible for much of the hyperbole surrounding computer-assisted workstations: It is not that more work is being done or is done better, but that the work looks better, regardless of content.

Programs that spell vs. people who spell. The decline in reading that has accompanied the growth of television has, as a side effect, contributed to the atrophy of spelling skills, at least in the U.S. An inability to spell a large portion of his technical vocabulary is a common failing of the young professional. This spelling deficiency is compounded by a similar inability to write coherently, much less cogently

There are two fundamental approaches to a problem of this nature: Teach the professionals the necessary skills or eliminate the need for them. The second alternative receives the most emphasis in the computing community. There are spelling programs, hyphenation programs, stylistic analysis programs, even some grammatical analysis programs.

As programs of this sort become more able, more of the proofreading burden will be shifted to them, and people will become less willing to do careful proofreading. These people may also become less able to do so, for the errors made by programs may be so different from those made by people that they are more difficult to detect. The result may be a serious decline in the overall quality of the finished product.

Friendly systems vs. friendly people. As the personal computer system becomes friendlier, the professional will be willing to spend more time with it. Until recently, spending a full day at a workstation VDT was impossible because of poor resolution and jitter; staring into a screen with such defects would produce eyestrain, headaches and, in extreme cases, disorientation. Friendly terminals feature rock-solid displays, extremely high resolution, nonfatiguing contrast and clear, precise graphics.

Friendly systems eliminate frustration as effectively as friendly terminals eliminate fatigue. As the barriers to extended use fall, the attractions for the personal computer systems will be more strongly felt, and the professional may spend more time communing with the system instead of communicating with people.

About the author

David Stevens is a staff senior scientist in the Office of Computing Resources at the Lawrence Berkeley Laboratory in Berkeley, Calif. The preceding article is based upon work done under U.S. Department of Energy contract DE-AC03-76SF00098 and does not imply endorsement of any product.

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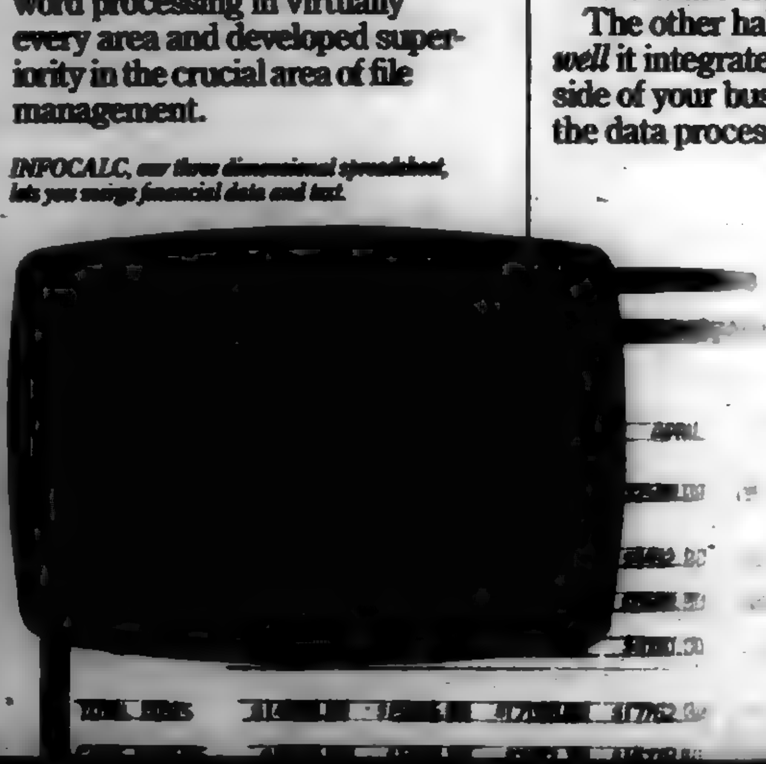

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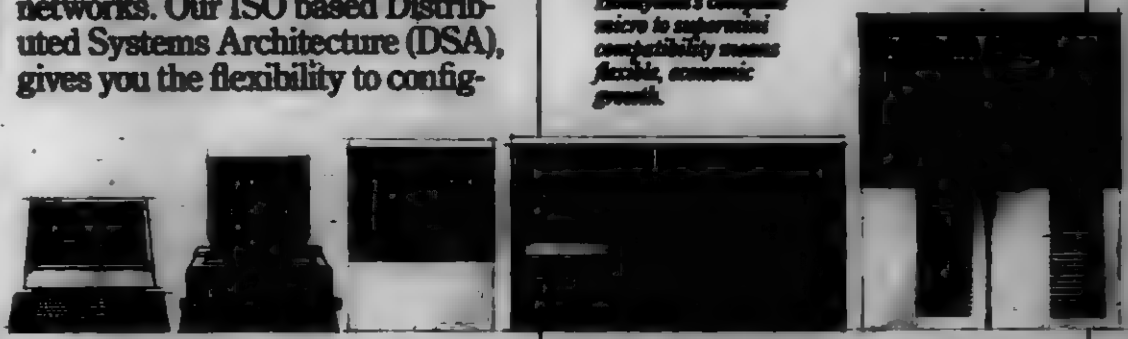

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SOFTWARE & SERVICES

Tool vendors need tie to DBMS

SOFTALK
By John Desmond
CW Senior Writer

"Hitch your wagon to a star."
Ralph Waldo Emerson, *Civilization*

If you're an applications software vendor without your own data base management system, you must hitch your wagon to somebody else's DBMS or risk being done in by the gods of software market misfortune.

McCormack & Dodge Corp. is pursuing this strategy in a big way by offering mainframe software not only for IDMS, Cullinet Software, Inc.'s leading independent DBMS, and IBM's IMS but also eventually for Applied Data Research, Inc.'s (ADR) Datacom/DB and IBM's DB2.

"The DBMS is the variable we can change," said Robert Kelley, vice-president of product strategy for M&D.

Hitching M&D's Millennium series of applications to the stars in the DBMS galaxy is the company's current focus. William J. Fitzpatrick, new product development manager, describes Millennium as a "bubble" that works inside various DBMS systems.

"It's an environment to develop applications independent of the file access system. Millennium is a bubble in which the application sits. You move it into the different environments you want it in," according to Fitzpatrick

The strategy differs markedly from Cullinet's approach. Cullinet executives argue that only users of Cullinet software can take advantage of all the resources of IDMS. Cullinet also maintains that true integration can only be achieved by writing applications in a fourth-generation language with links to a specific DBMS. They argue that their company offers a total solution.

Two slightly contradictory directions

See WAGON page 46

Info system gives execs quick data

By John Gallant
CW Staff

NASHVILLE — An executive information system is a little like a doctor. Senior executives may not consult it often, but it has to be there when they need it.

"The executive information system has to be at hand and ready when your top people need it," said James Hardwick Jr. at the recent Information Center Conference & Exposition here. "It gives them a chance to get into the bowels of the company's data when they need information quickly."

Hardwick spoke from experience. In his role as budget manager with R.J. Reynolds Industries, Inc. in Winston-Salem, N.C., Hardwick managed a development team of six people that built an executive information system for Reynolds' key management personnel. (In addition to its domestic and international tobacco operations, R.J. Reynolds owns Del Monte Corp., Nabisco Brands, Inc., Heublein, Inc. and Kentucky Fried Chicken.) The impetus behind the development project, Hardwick said, was a mandate from the chairman of the board.

According to Hardwick, the microcomputer-based system gives Reynolds executives rapid and flexible access to summaries of vital operational data and information from a variety of outside sources. It is geared to non-DP professionals and provides easy-to-understand menus that guide an executive to the information needed to monitor the company's performance against its competitors and its own plans.

The Reynolds executive information system, which took shape during a six-month span from conception to pilot phase, consists of IBM Personal Computer XT workstations linked via Digital Communications Associates, Inc. Irma boards to an IBM mainframe under TSO. A Hayes Microcomputer Products, Inc. Smartmodem gives users access to a Digital Equipment Corp. VAX-11/780 under VMS and

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INSIDE

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Bank counts on portable package

SCS provides fail-safe emergency check sorting

By Mitch Betts
CW Washington Bureau

FLINT, Mich. — It was 8 p.m. on Feb. 14 when the IBM 3890 magnetic ink character recognition reader/sorter went down at Genesee Merchants Bank & Trust Co. here, which depended on the equipment for managing its daily flow of checks. Light smoke was spotted in the computer room, probably from a melted circuit.

Daniel Overland, disaster recovery administrator at the bank, which has since been acquired by the National Bank of Detroit, said it took 47 hours of around-the-clock work by IBM service technicians and other specialists to bring the unit back to life.

But this disaster did relatively little harm to the bank's check processing operations, Overland said. While the repair crews worked, the Genesee staff took its checks and special disaster recovery software a few blocks down the street to Citizens Commercial & Savings Bank, where the processing was done on that bank's IBM 3890.

Working from 2 a.m. to 6 a.m. the next day, Genesee was able to capture one day's worth of checks — more than 100,000 items — in four hours, Overland said.

"What could have been a disaster in customer relations turned out to be not so bad," he said.

The portable software was the Survival Check System (SCS), a utility check processing package that enables banks to process their checks on another bank's IBM 3890 under emergency conditions. It is marketed by Vips, Inc. of Hunt Valley, Md.

SCS users said the key to the software is

See BACKUP page 47

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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis, and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from mainframes to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

■ Why not Cullinet, ADR or Focus? There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as the standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language - each one painting the user into its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few shops nowadays run only IBM mainframes. Why, then, even consider a database solution that runs *only on IBM mainframes?* Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE *are* identical.

FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

■ Why not just go with DB2 or SQL/DS? A relational DBMS simplifies but does not by itself eliminate application programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are somewhat unlikely ever to run on another vendor's systems). ORACLE runs on more IBM hardware and operating systems than do IBM's relational products.

■ What about Goldengate, dBase III, Symphony or Framework? PCs need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload.

ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350.

Generator version out

WALTHAM, Mass. — Cortex Corp. has released Version 3 of the Cortex Application Factory for Digital Equipment Corp.'s VAX/VMS environment.

The Application Factory applications generator now includes a graphics option and a report generator. With the graphics capability, application developers can prespecify data extraction criteria and design custom plotting templates for end users. Users can select graphics options from the application menu, name the data and plotting template and generate the graph.

Users can select from 18 different templates. The graphics option provides a custom-controlled floating text capability to position labels or comments anywhere on the graph, the vendor said.

The report generator allows users to develop custom layouts of multipage reports. Reports are specified through an interactive screen painting process at the terminal.

Application Factory Version 3 costs from $40,500 to $89,000, depending on the VAX model. The graphics option costs from $4,500 to $10,500.

Cortex is located at 128 Roberts Road, Waltham, Mass. 02254.

SAS beefs up System 2000 DBMS

Cross Memory Services support added to line

CARY, N.C. — SAS Institute, Inc. has announced Release 11.5 of its System 2000 data base management system (DBMS) with enhancements for IBM's MVS and CMS operating environments.

Cross Memory Services support for the System 2000 multiuser product has been added in Release 11.5, a spokesman said.

The enhancement reduces the common storage area and offers increased accountability and data security. The multiuser product also offers accounting log and data recovery facilities.

The enhanced System 2000 offers a security exit that allows users to log six types of security violations. The data base administrator password offers a new level of authority between the master password and secondary passwords.

In addition, the enhanced DBMS offers users the ability to store data as well as time in the diagnostic log and to set format options in the same manner as the print command. A CICS interface enables users to obtain 132-column teleprocessing output.

The release is available to current customers for no additional charge. New sites can license the System 2000 DBMS for $12,000.

In addition to MVS and CMS environments, System 2000 runs under TSO, DOS/VSE and CICS on IBM 370, 3030, 3090 and 4300 series processors. It also runs on Sperry Corp.'s Series 1100 under OS 1100 and the Control Data Corp. 6000 and Cyber series mainframes under NOS and NOS/BE.

SAS Institute is located at SAS Circle, Cary, N.C. 27511.

PC/Com software gets enhancement

ATLANTA — Mom Corp. introduced an upgraded version of its PC/Com host communications interface software.

Version 3.8 gives users an optional virtual diskette capability that allows them to store microcomputer files on the mainframe.

The link provides for bidirectional file transfers, including data, text and binary files, in an IBM 3270 network.

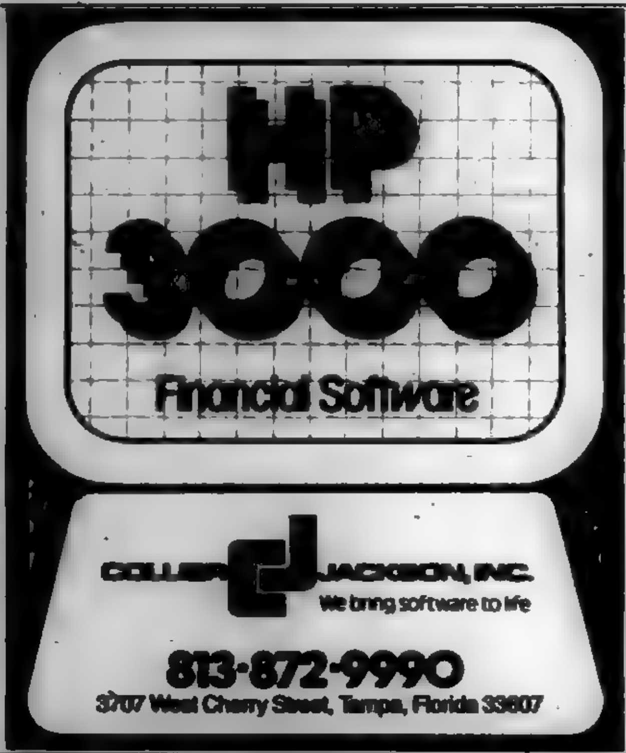
It supports IBM's CMS, TSO and CICS and runs on the IBM Personal Computer, Personal Computer XT and Personal Computer AT, AT&T Information Systems' PC 6300 and other compatibles.

Prices for components

The link costs $395 for the micro component, $400 for the TSO and CMS components and $2,000 for the CICS component.

The virtual diskette option costs $50.

The company is located at Two Northside 75, Atlanta, Ga. 30318.



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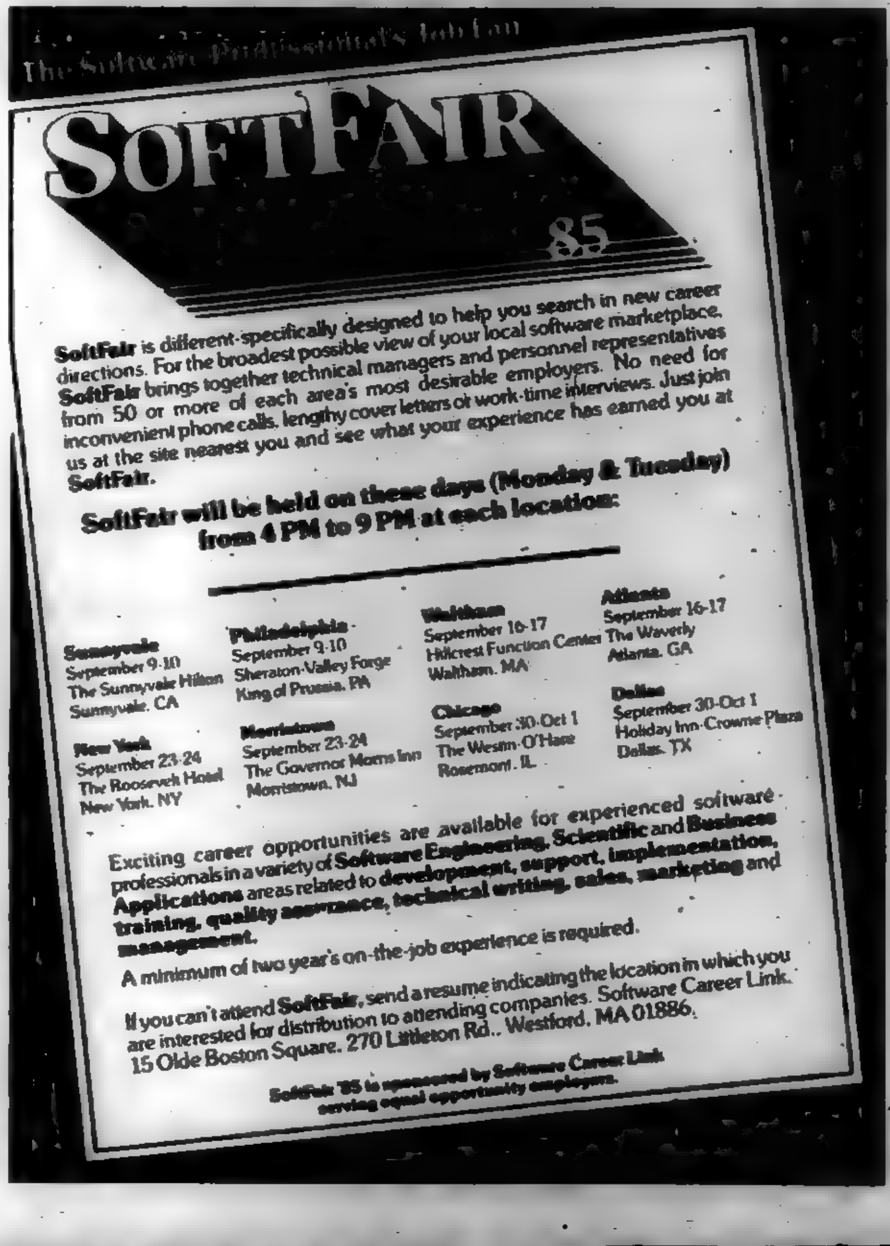

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PRODUCTIVITY AIDS

■ Advanced Systems Concepts, Inc. has introduced a reverse compiling service that can retrieve lost source codes from compiled IBM RPG programs running on IBM's System/38.

The service uses System/38 assembly-level machine interface programming to decode and analyze the program, the vendor said. Information contained in the program template, symbol table and break offset mapping tables associated with the program is referenced in order to retrieve the source.

The reverse compiling service costs 90 cents per line of code retrieved.

Advanced Systems Concepts, Suite S, 1350 Remington Road, Schaumburg, Ill. 60195.

APPLICATION PACKAGES

■ Intersoft Systems, Inc. has announced a communications package that transfers data between Burroughs Corp. minis running its CMS operating system and its B20 micros.

Datalink 100 consists of a file transfer program, terminal emulation software and data format conversion programs. The product works with micro packages that support IBM's Data Interchange Format and the Symbolic Link data format. Unformatted data from a minicomputer can be loaded into a micro word processing package.

The package can print reports with devices that work with the B20 or IBM Personal Computers.

Datalink 100 has an initial site licensing fee of $1,400 and an annual maintenance fee of $200.

Intersoft Systems, Suite 114, 10550 S.W. Allen Blvd., Beaverton, Ore. 97005.

■ Computer Management Dynamics, Inc. (CMD) has announced a report generator for Wang Laboratories, Inc. VS minicomputers.

Command reportedly enables users to create up to 15 files with any combination of fields and multiple criteria for record selection. The software uses standard Wang utilities such as Control File Utility.

Other features include multiple sort capability, subtotaling and user-defined calculated field capability, the vendor said.

Command for the Wang VS is priced between $5,000 and $10,000, depending on CPU size.

Computer Management Dynamics, 29 Riverside Drive, Nashua, N.H. 03062.

■ PDA, Inc. has announced three applications packages for insurance companies using the IBM System/38.

The Life Reinsurance Management system is designed for the administration of assumed, ceded and retroceded business. Modules include cession administration, billing, premium receivables and payables, reserve reporting, pool tracking, underwriting processing, claims reporting and client analysis. The product costs $140,000.

PDA's Accident and Health and Life Management system includes modules for policy administration, premium and reserve accounting, agency accounting, claims processing, financial and management reporting. The system is priced at $40,000.

The Stock and Bond Portfolio Management System for the IBM System/36 or System/38 assists users with management of an investment portfolio. It costs $10,000 for the System/36 and $15,000 for the System/38.

PDA, 11600 College Blvd., Overland Park, Kan. 66210.

■ Computer-Aided Design Services, Inc. has announced software that reportedly allows drawing files to be transferred between a Computervision Corp. Cadds 4 or 4X Designer V system and an IBM PC-DOS-based microcomputer running Autodesk, Inc. Autocad drafting software.

The Graphics Data Translator (GDX) consists of two software modules, the Autocad translation module residing on the Computervision mini and the communications features module on the micro. Users may develop drawing files on the Autocad-based workstation and upload them to the host or download host-generated files to the workstation.

Prices for the GDX are

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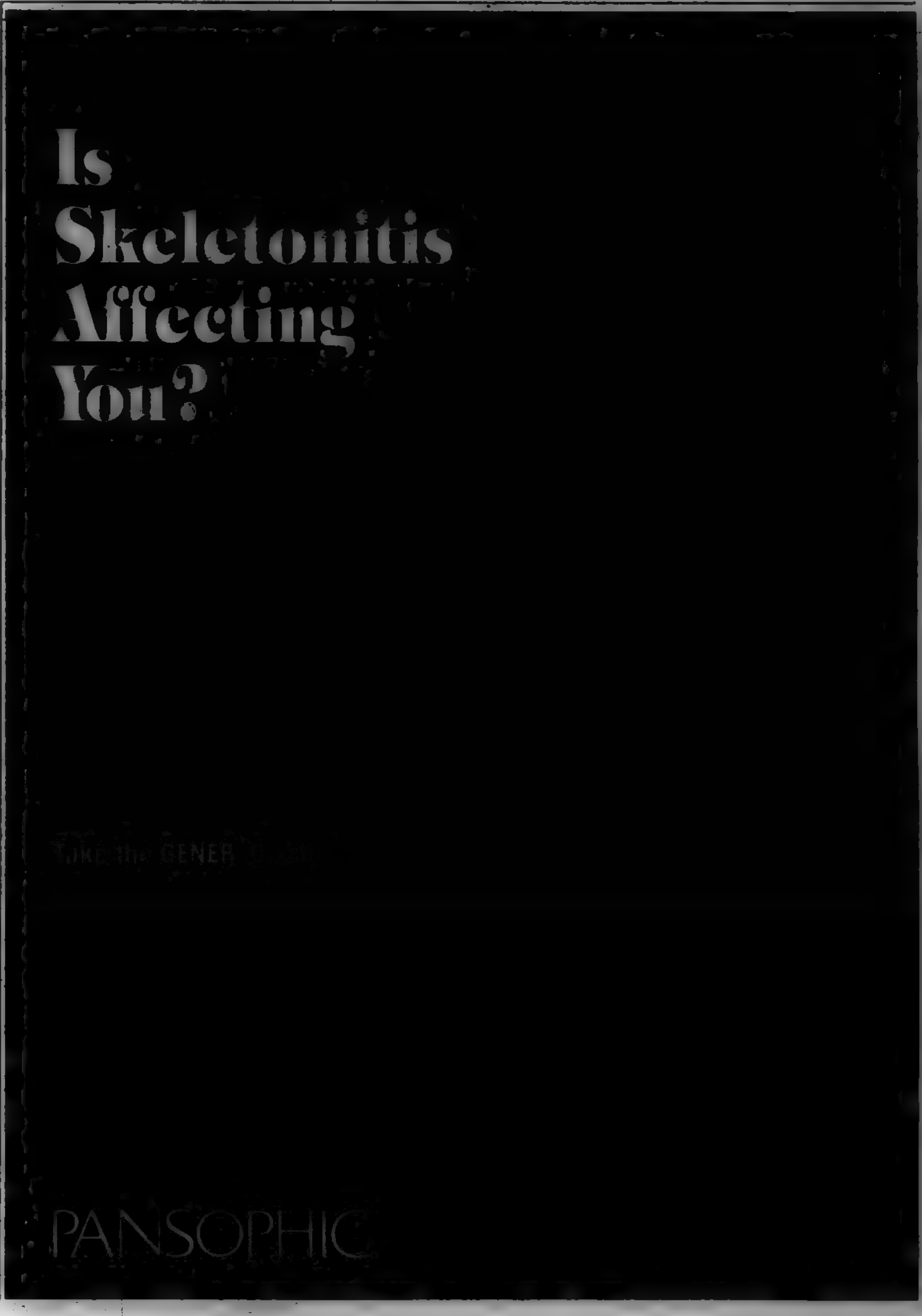

Continued from page 46

$9,950 for the first Computervision system, $5,000 for each additional on-site CPU, $200 for each additional communications module and $125 for each additional communications software module to be used on a file serving network.

Computer-Aided Design Services, 1717 S. Orange Ave., Orlando, Fla. 32806.

■ Larry Miller Associates, Inc. has announced Market Manager, an on-line marketing system for the IBM System/36.

Market Manager can maintain mailing lists, assist with target marketing and telemarketing and store mailer, envelope and label information, the vendor said. The product allows users to define edit criteria and choose between sort or select functions using any sequence of criteria. It can also maintain parallel but separate files.

Market Manager is priced at $1,200.

Larry Miller Associates, 81 E. Queenwood Road, Morton, Ill. 61550.

■ ADP Network Services, Inc. has added graphics capabilities to its Apecs/8000 project evaluation and control system for the Unix operating system.

Apecs/8000 Version 1.8, which runs under Unix System V on Digital Equipment Corp. VAX and AT&T 3B processors, now allows users to produce bar charts, pie charts and line graphs.

Apecs/8000 is priced from $15,000 for supermicros, including DEC's Microvax II, to $150,000 on the DEC VAX.

ADP Network Services, 175 Jackson Plaza, Ann Arbor, Mich. 48106.

■ Software International Corp. has introduced Release 5.5 of its accounts payable package for Hewlett-Packard Co.'s HP 3000 minicomputer.

Enhancements include the elimination of all record numbers and the replacement of all sequential batch files with an HP Image data base of batch files. Also included are menu navigation capabilities that allow users to move from one function or screen to another, the vendor said.

Release 5.5 of the accounts payable package will be available in September and is priced at $19,000.

Software International, 1 Tech Drive, Andover, Mass. 01810.

■ Computerized Forms Management, Inc. introduced Formanager, a form generation package for AT&T Unix-based machines.

Formanager includes a resident data base of production standards listed by product code. Standards can be modified by the user, the vendor said. Users can also sort forms information from any combination of codes. The product allows users to detect duplication of forms and consolidate different forms.

Formanager is available for AT&T's Unix System 3 or 5.2 and for the IBM Personal Computer AT running Microsoft Corp.'s Xenix.

Base price of Formanager is $9,800 for a three-user system.

Computerized Forms Management, 880 N. York, Elmhurst, Ill. 60126.

■ Leland Computer Services, Inc. has announced an additional component for its Purchasing System for IBM's CICS and IMS.

The Leland Requisition Control System is said to manage the generation of a requisition and its resulting purchase order. Users may group requisitions into existing purchase orders and create a purchase order while assigning requisitions. The system's batch programs automatically generate requisitions for IBM's MRP and inventory accounting, allowing the Purchasing System to support those modules without modification.

The Requisition Control System is priced at $10,000 for a perpetual license.

Leland Computer Services, Suite 146, 3601 Dunwoody Place, Atlanta, Ga. 30338.

■ Catalyst USA, Inc. has announced the Optimizer system for computerized control of stockroom operations, inventory and personnel. The packages runs on the IBM Series/1 minicomputer.

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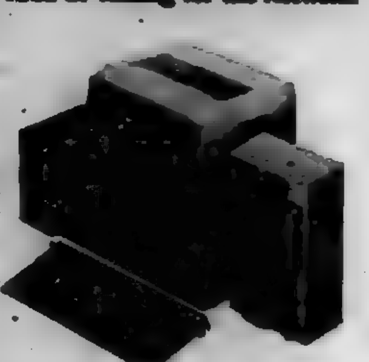

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This member of the IBM PC Family is a powerful stand-alone computer that can also be both the primary file server and a station on your network. With the IBM PC Network (which is so easy to connect you can do it yourself), the IBM Personal Computer AT can share information with IBM PCs, PC/XTs and IBM *Portable* PCs.

IBM Personal Computer AT Specifications

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Microprocessor
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Real and protected modes*
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41.2MB maximum auxiliary memory*
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Diagnostics
Power-on self-testing*
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Languages
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Printers
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For more information contact your authorized IBM PC dealer, IBM Product Center or IBM marketing representative. For a store near you call 1-800-447-4700. In Alaska or Hawaii call 1-800-447-0890.

According to a spokesman, the system determines the most efficient routes for batch or single-order retrieval when processing previously scheduled work queues or operator-entered issue orders.

The Optimizer system is priced at approximately $100,000.

Catalyst USA, 220 Oak St., Grafton, Wis. 53024.

■ **McDonnell Douglas Computer Systems Co. has introduced a Municipal Management System for Microdata Corp. business computers.**

Designed by Creative Computer Solutions, Inc., the Municipal Management System (MMS) consists of 16 modules including financial, inventory, equipment, payroll/personnel, purchasing, utility information system, licensing, parks and recreation and permits. In addition to the Microdata 4700, 600 and 9000, MMS works with McDonnell Douglas' relational data base management system.

Modules are priced from $1,500 to $8,000.

McDonnell Douglas Computer Systems, 17481 Redhill Ave., Irvine, Calif. 92714.

■ **SDK Healthcare Information Systems has announced a financial management system for health care organizations. The product runs on a variety of computers using the Mumps operating system.**

The SDK Financial Management system incorporates a query language, spreadsheet loader, report writer and downloading capabilities for transferring data to a micro.

SDK's Financial Management system software costs $20,000 to $40,000, depending on configuration.

SDK Healthcare Information Systems, 1550 Soldiers Field Road, Boston, Mass. 02135.

DATA BASE MANAGEMENT SYSTEMS

■ **Database Utility Group has unveiled Version 2 of Adabas Performance Analysis System (Apas) for Software AG of North America, Inc.'s Adabas data base management system on IBM CPUs running under MVS, DOS, CMS and VM.**

Apas Version 2 now allows users to gather Adabas command log statistics without writing them out on tape. It costs $8,750.

Database Utility Group, P.O. Box 4912 Federal Way, Des Moines, Wash. 98063.

■ **Datasolutions International, Inc. has released a data base utility for the Hewlett-Packard Co. HP 3000 system with HP's Image data base management system.**

The Command/3000 DBStatus reportedly checks Image data base capacities to help prevent the filling of Image files. DBStatus shows the capacities, current record count, space available, percentage full and warning messages for Image data bases.

The software requires a 1,600 bit/in. tape drive for installation.

The DBStatus package costs $200.

Datasolutions International, 55 Jefferson Blvd., Warwick, R.I. 02888.

BACKUP

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its two-part structure: the driver component is tailored to the installation's hardware and operating system and is installed at the backup site; the second component is a portable bank control file that contains such information as the stricken bank's account number structure and sort patterns.

That second component, the tape record of bank-dependent information, is transported to the backup site and installed when an emergency occurs.

'Would have been three days behind'

"Without the Vips software, we would have been three days behind in our processing," Overland said. "Instead we were one day behind. The money saved in float more than paid for the Vips package," he said.

Overland said his disaster recovery agreement with Citizens also allows that bank to use his IBM 3890 on an emergency basis.

This form of mutual assistance — one bank helping another in a crisis — started in May 1980, when a group of banks in the Washington, D.C., area formed a nonprofit organization called Bancon, Inc. to provide disaster recovery services for its members [CW, Aug. 9, 1982]. One of its first acts was to contract with Vips to develop the software that became known as SCS.

Currently 10 member banks

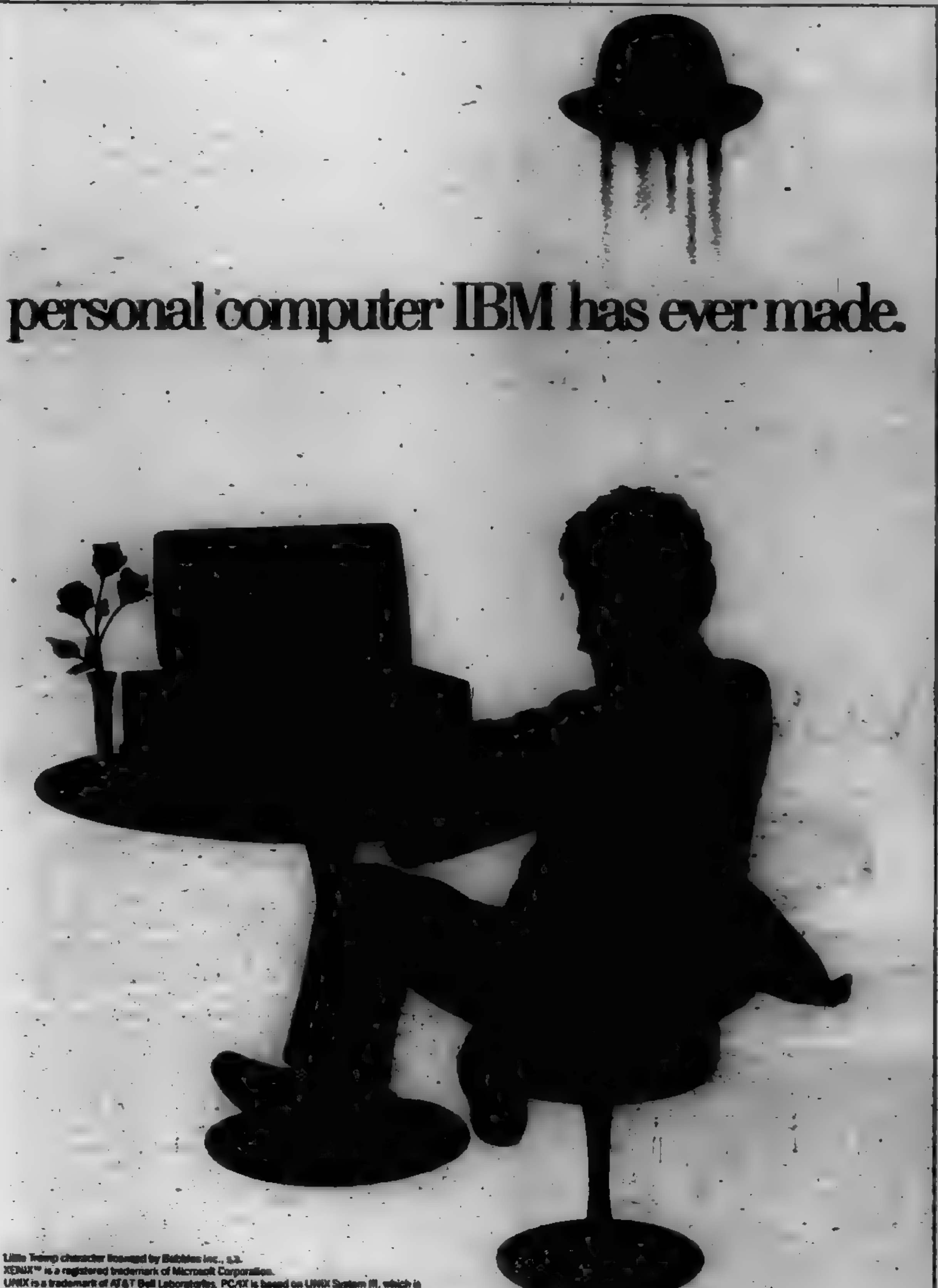
Bancon now has 10 member banks in the District of Columbia and nearby Maryland and Virginia counties, and four other area banks have submitted applications to join, according to one of Bancon's directors, Michael R. Longo, vice-president and data center manager at the National Bank of Washington.

"Our basic objective is to provide contingency planning for check processing . . . which is the one data processing function that is unique to banks," Longo said.

"We agreed in principle to help each other in a disaster, no matter how small or large," he continued.

Given the increasing competition in the banking industry, Longo said, he is "amazed" at the cooperative spirit among Bancon members.

"I don't know what's going to happen when we have full deregulation and the competition gets keener, but right now it is a very cooperative attitude that all of us share," Longo said.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REYNOLDS

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remote public data bases.

The link to the mainframe lets executives tap into summary operational and financial data, while the VAX link provides users with messaging capabilities and access to other administrative functions, Hardwick explained.

Housed in special cabinets

The micros are housed in special cabinets that also contain printers. They offer a consistent set of commands, menus and interfaces, regardless of which host is being tapped, according to Hardwick.

Through the executive information system, Reynolds' key players can quickly review the latest news and detailed information on what Hardwick labeled "peer" companies from remote data bases, summary financial forecasts, unit volume and market share data, "subunit-level" data and specially tailored reports, Hardwick said.

Strategic statistics, such as operating performance vs. forecast, are also available through simple commands. Each of the executives receives one-on-one instruction and works with Hardwick's staff to modify the executive information system to their own needs.

On-line fact book

For example, developers put a special "fact book" containing vital information on-line for Reynolds' president, as well as a variety of financial modeling capabilities for the treasurer.

That type of tailoring, which Hardwick said represented about 80% of the development life cycle, is an ongoing process.

In addition, executives enjoy private hot line support when problems arise.

Most of the data that Reynolds' executives access is maintained in Thorn EMI Computer Software's FCS-EPS decision support system, which the company had in place for several years before the executive information system was conceived.

Data is not simply "dumped" into the executive information system data base, Hardwick said.

Rather it is carefully reviewed and then validated by managers responsible for its accuracy, Hardwick explained.

Depending on its nature, data is updated weekly, daily or throughout the day.

"We provide them with blessed data, not just information that has been randomly grabbed from throughout the company," Hardwick said.

'Someone to beat on'

"The executives need someone to beat on if the data is wrong. They need someone to take responsibility for its accuracy."

What was the biggest obstacle to the development of the executive information system? Tying together the very different worlds of data processing, office automation and personal computing, Hardwick said.

Although he would not divulge the total cost of the development project, Hardwick said each workstation cost approximately $9,000.

How can he tell the project was a success? According to Hardwick, "They use what they asked for."

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RESIDENCE INN

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WAGON

from page 43

emerged at McCormack & Dodge's recent World '85 users conference in Boston. On the one hand, M&D President Frank Dodge said he wants his 16-year-old organization to be the No. 1 software company.

On the other hand, M&D's staff — heavily weighted with accountants — currently seems geared toward producing the highest quality financial applications. Dodge called M&D's new accounts receivable package "the best product the company ever produced."

Maybe company presidents are being required by marketing representatives to say they want their companies to be No. 1. Everyone is saying it. But M&D's strategy requires that the DBMS vendors remain healthy themselves.

The experience of Management Science America, Inc. (MSA) may have relevance for M&D. The former No. 1 independent software company has slipped from that position and now touts itself as the No. 1 applications vendor. Could that have happened because MSA has no DBMS?

Users are looking for a total solution; at least, that's what the vendors say. If that is true, can an applications-only company expect to remain one of the world's largest software companies? Some say the day will come when a few megacompanies will meet most of the world's software needs. If so, won't the companies with their own DBMS and a variety of applications software be best positioned to thrive?

Companies like ADR are in a slightly different predicament. ADR has a successful independent DBMS in Datacom/DB but markets few applications. This lack of product line diversity may hurt ADR in competition with a company like Cullinet.

Although 1985 has been a slow year in the DP industry, the mood was upbeat at the M&D user meeting. Dodge said he is glad M&D is privately held, because his time is not taken up talking to Wall Street analysts.

"I don't have to worry about the price of stock," he said. And he wished John Landry, former vice-president of research and development, and Robert Weiler, former senior vice-president of marketing, well in their new venture at a smaller software company.

As long as users find it cost-effective to buy M&D applications to work with another vendor's DBMS, the mood should remain upbeat.

MICROCOMPUTERS

Info centers changing vendor policies

By John Gallant
CW Staff

NASHVILLE — Major changes in the way microcomputer software vendors license and support their products are on the horizon. But only those companies that have implemented personal computing standards and centralized acquisition and service through an information center will have the clout needed to take advantage of those changes.

That was the message Dennis Lunsford offered to attendees at the recent Information Center Conference & Exposition here. Lunsford is chief of the National Security Agency's (NSA) Personal Computing Information Center (PCIC) headquartered at Ft. George G. Meade in Maryland. With fewer than 20 staff members, Lunsford's PCIC is the focal point for all micro hardware and software evaluation, acquisition and support for the far-flung offices of the NSA.

For security reasons, Lunsford said, he could not divulge the number of users, machines or remote locations supported, but the PCIC is responsible for a geographically scattered population of personal computers numbering in the thousands.

Lunsford described the PCIC as a second-generation information center, one that provides no mainframe support but controls all microcomputer operations within the massive government agency. The PCIC maintains an inventory of nearly 70 standard software products and represents users on agency procurement boards.

Vendors forced to rethink policies

According to Lunsford, the emergence of powerful information centers, which draft and enforce personal computing policies in large companies, is forcing micro software vendors to rethink their policies on licensing and support.

"The large buyer is a new factor in the industry," he said. "The large buyer is the software market now, and we need a new architecture. There are a lot of practices in this industry that are based on one-copy sales. The major companies have to change their views. Large buyers and new technologies like local-area networks and software downloading are challenging current licensing and support arrangements."

But Lunsford cautioned that information center managers will not be able to take advantage of upcoming opportunities unless they have established standards and are controlling acquisition and user support.

"You need to establish a positive, long-term relationship with a vendor, become a key customer," Lunsford said. "But all of that is absolutely tied to the fact that you must have standardized products and have centralized service, support and acquisition. Only in that way can you maximize

See CHANGE page 56

- Micro Data Base Systems enhanced its Knowledgeman integrated software package with a host of new features/50
- Corporate Software released an updated version of its guide to microcomputer software for business users/52

INSIDE

Software/52
Communications/52

SMALL TALK
Eric Bender
CW Senior Editor

Lively discussions highlight AI meet

The International Joint Conference on Artificial Intelligence (IJCAI), held two weeks ago at the University of California at Los Angeles, was a cut above most computer meetings. The location was pleasant, the technology was full of intriguing twists, and the AI developers allowed to roam freely in public seemed to be cheerful types. Some quotes from AI gurus and others:

- "AI is a weak technology," said Beau Sheil, manager of product marketing at Xerox Artificial Intelligence Systems. "It works best with a lot of information that can be manipulated at a shallow level.

See AI page 56

Mac business products bow

Macworld exhibitors target corporate mart

By Edward Warner
CW Staff

BOSTON — Though few members of the three-piece-suit set attended Macworld, a show of products for the Apple Computer, Inc. Macintosh here last month, those who did found several new products directed specifically at business users' needs. Among those products were the following:

- A 20M-byte hard-disk storage unit. Introduced by General Computer Co., the Hyperdrive 20 is said to be the first internal hard disk of such capacity for the Macintosh.
- Business Filevision from Telos Software Products, a program for filing graphics with text. This product, a business users' version of Telos' Filevision, reportedly can create larger files than Filevision and import digitized clip-art and Ascii files from other programs.
- Sidekick, from Borland International, Inc., a desktop manager program long available in the IBM Personal Computer world.
- Tempo, a program for creating macros for such Macintosh software as Lotus Development Corp.'s Jazz. Jazz and many other Macintosh programs do not support macros, the strings of commands that a program such as Tempo can memorize and make available at the touch of a key.
- Colormate, a hardware and software package for color printing of Macintosh output. This NEC Information Systems, Inc. product is being sold for use exclusively with the NEC Color Pinwriter printer.

Most notable among the new offerings for business, though, is the $2,795 Hyperdrive 20. While internal storage units of such capacity have been available for some time for IBM Personal

See APPLE page 54

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Knowledgeman gets version with menu-driven interface

By Charles Babcock
CW New York Bureau

NEW YORK — A menu system and a natural-language query facility have been added to the Knowledgeman software package to produce Knowledgeman/2, Micro Data Base Systems, Inc. (MDBS) announced last month.

The package offers a number of additional options, including K-Comm for remote, asynchronous communications; K-Report for custom report generating; K-Text for text processing; and K-Paint for forms management. All the options work with a relational data base manager that was part of the original Knowledgeman issued in 1983, said Gary Koehler, president and chief executive.

Knowledgeman/2, to be shipped this week, will retail for $595. Existing Knowledgeman users can receive the updated version for $295, Koehler said.

Prices for multiuser versions

Multiuser versions are also available for $1,795 for up to 10 users on a local-area network and $3,325 for up to 32 users. Knowledgeman/2 works with Novell, Inc. Netware nets, 3Com Corp.'s Ethershare nets and IBM's PC Network. Knowledgeman/2 also works on systems running under AT&T Unix, PC-DOS, MS-DOS, CP/M-86 and up to Digital Equipment Corp. VAX systems.

The menu system is meant to overcome a criticism of the original Knowledgeman that it was difficult for a novice computer user to use, company officials said. Knowledgeman/2 will offer a user 400 pages of Help screens with menus offering selections into environment setup, computation, data management, spreadsheet, graphics, text processing and a gateway to the operating system.

After proceeding through a sequence of menu choices, users will have specified a command, which appears on the screen to teach the user the command language and to provide a shortcut to where they wish to go, the vendor said.

The natural-language query system, dubbed K-Chat, uses simple English words to query the system. Ambiguous queries can be clarified through an English conversation sequence. K-Chat has a vocabulary of 500 words and the ability to incorporate new words and phrases defined by the user, company officials said.

The spreadsheet component can extract data from independent records, spreadsheets, reports or data base tables and can use up to 65,525 cells per table, company officials said.

Prize of $800,000

MDBS is attempting to compete with other micro data base management systems vendors by offering an $800,000 prize to the user who submits the best 500-word essay on the reason for switching to Knowledgeman/2 from a competing product.

The entries will be judged on the basis of their "accuracy and originality," said Stephen Recobs, MDBS executive vice-president. The company did not indicate who would judge the essays.

MDBS can be reached through P.O. Box 248, Lafayette, Ind. 47902.

DRI to offer Summamouse with GEM line

FAIRFIELD, Conn. — Digital Research, Inc. (DRI) will offer the Summagraphics Corp. Summamouse as an option in specially priced packages of its GEM Collection software line under an agreement announced by the two vendors.

Summagraphics, located here, said the venture marked its first product offering for micros. DRI's GEM Collection runs on the IBM Personal Computer and compatible machines. It includes GEM Desktop, said to permit the user to manipulate files and operating system commands using a mouse interface, as well as GEM Paint, a 16-color electronic paintbrush program and GEM Write, a word processor.

The Summagraphics Summasketch electronic drawing tablet, meanwhile, will be offered as an option by DRI in specially priced versions of its GEM Draw package, which includes GEM Desktop and GEM Paint, Summagraphics said.

With the Summamouse, the GEM Collection costs $295. GEM Draw with the Summasketch option costs $649.

Summagraphics is located at 777 State St. Extention, Fairfield, Conn. 06430. DRI is located at 60 Garden Court, Monterey, Calif. 93942.

"Oh, he's in a really good mood today — someone asked him for a raise and he's been laughing ever since."

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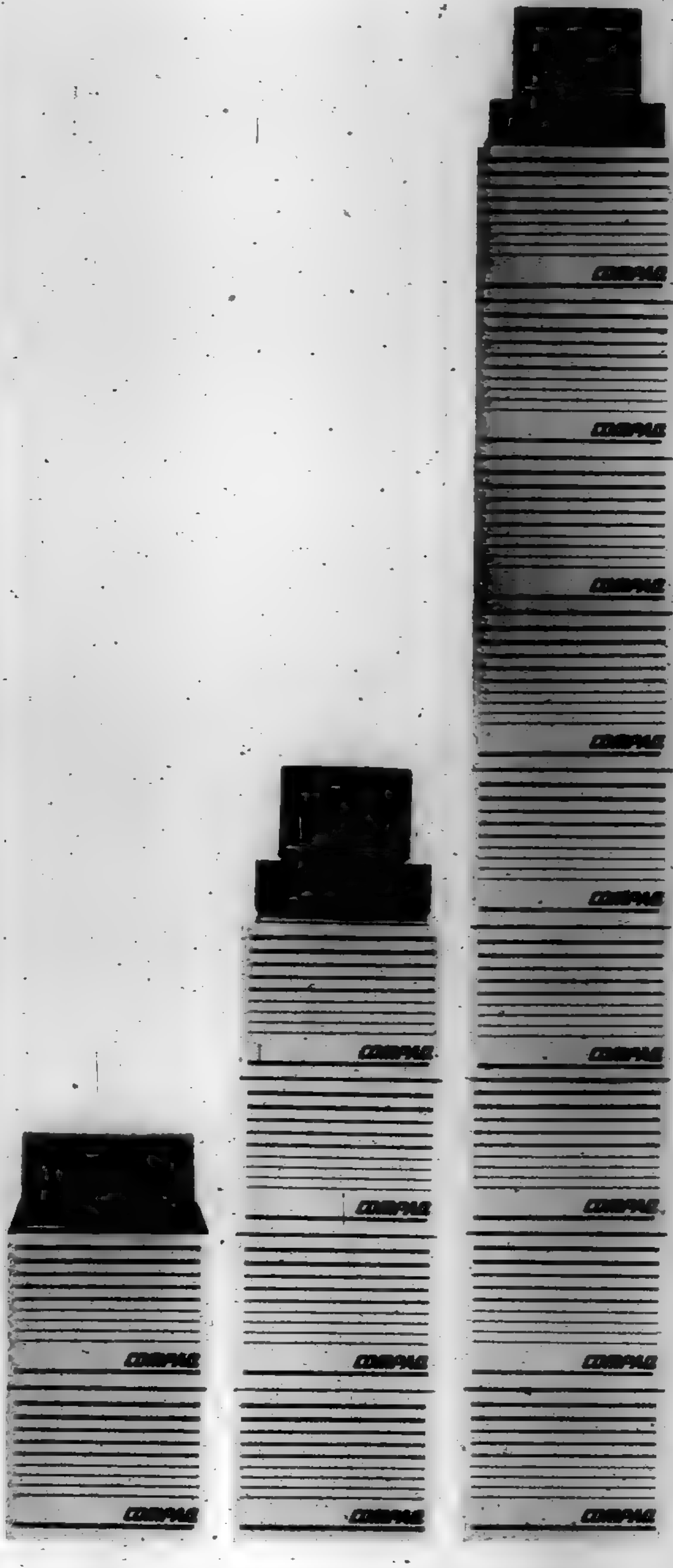

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Source: Datamation Magazine, June 1, 1985.

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Directory evaluates micro wares

CANTON, Mass. — Corporate Software, Inc. has introduced "The Corporate Software Guide," a directory of 360 personal computer software and hardware products from 125 vendors.

The guide reportedly contains in-depth evaluations and comparisons of the products, which are divided into 18 categories. Each product category includes an overview of the products and likely applications in that category.

The 300-page guide costs $19.95, plus $5 for shipping. It is free to personal computer hardware or software buyers in Fortune 1,000 companies who request the guide in a letter written on company stationery. Orders and requests should be sent to Corporate Software, 770 Dedham St., Canton, Mass. 02021.

SOFTWARE

■ STSC, Inc. has announced that its APL Plus PC System, an applications development system, now supports IBM's high-resolution Enhanced Graphics Adapter (EGA) and Enhanced Color Display Monitor.

The EGA provides 16-color, 640- by 350-pixel bit-mapped graphics for the IBM Personal Computer and compatible color or monochrome displays. The APL Plus PC System fully supports all modes of resolution on the EGA, the vendor said.

The product implements the APL programming language and includes a full screen editor for programs and data, report formatting, filing and high-resolution color graphics.

The APL Plus PC System sells for $595.

STSC, 2115 E. Jefferson St., Rockville, Md. 20852.

COMMUNICATIONS

■ Emerald Technology Group, Inc. has enhanced its program that supports file transfer between the IBM Personal Computer line and IBM System/34, 36 or 38.

Enhancements to the Emulator Transfer Utility reportedly include local emulation support with packages such as IBM's 5250 emulation kit and Ideassociates, Inc.'s Ideacomm 5251 and print spooling capability.

The product now supports copy library members, such as procedure and source li-

Continued on page 53

Decision modeling software out for Macintosh

BOSTON — Softstyle, Inc. has introduced its Decisionmap decision modeling software for Apple Computer, Inc.'s Macintosh. The unveiling came last month here at the Macworld conference.

The $145 Decisionmap reportedly permits users to experiment with different weightings of decision factors and various rankings of alternative decisions in the manner of a spreadsheet. Unlike a spreadsheet, however, Decisionmap is said to work with qualitative data.

Decisionmap users reportedly can produce a diagram or map of the factors involved in a decision and adjust the weighting of those factors at any level.

Decisionmap users begin by entering the key factors in a decision. Up to five factors can be entered at any level, and the factors can be broken down into any number of subfactors. A tree-like map results, with a main trunk representing the decision and the various factors and subfactors represented as arms of the tree.

The various factors are then weighted, and a bar chart can be produced to compare how each alternative stacks up. If the weighting or ranking is changed, a "what-if" analysis can be done on the alternatives.

Softstyle is located in Suite 205 of the Hawaii Kai Office Building, 7192 Kalanianaole Highway, Hawaii 96825.

Continued from page 52

braries between the micro and the larger system, Emerald said. Data formats such as Ascii fixed, Ascii variable and Ascii text can be mapped to larger system formats and vice versa.

The package costs $400 for a System/34, $500 for a System/36 and $800 for a System/38.

Emerald Technology Group, Suite 102, 1601 116th Ave. N.E., Bellevue, Wash. 98004.

■ **Softronics, Inc. has announced an enhanced version of its Softerm PC communications and terminal emulation software for the IBM Personal Computer, Personal Computer XT and AT.**

Softerm PC Version 1.02 reportedly includes a built-in text editor, logon security and access restrictions, new commands for use in automatic batch command files and a terminal emulation hotkey that provides access to communications and terminal emulation while using other programs.

The software reportedly emulates more than 30 terminals, including the IBM 3101 Model 10 and 3101 Model 20; Digital Equipment Corp. VT52, VT102 and VT220; Hewlett-Packard Co. 2622A; and Honeywell, Inc. VIP7250, VIP7801 and VIP7803.

The program requires 128K bytes of memory.

The price of Softerm PC Version 1.02 is $195. Upgrade cost for current users is $25.

Softronics, Suite 10, 3639 New Getwell Road, Memphis, Tenn. 38118.

■ **Persoft, Inc. has enhanced Smarterm 400 3.1, a file transfer program operating between IBM Personal Computers and Data General Corp. minicomputers and superminicomputers.**

The enhancements are said to consist of compressed display mode support for terminals with 132-col. video interface boards, the ability to switch between a communications session and an IBM PC-DOS session and additional function key support.

Smarterm 400 supports advanced functions of DG D100, D200 and D400 terminals including multiple display windows, full character display attributes, line drawing, word processing character sets and local printer support.

Smarterm 400 3.1 costs $149. Existing customers can upgrade their packages for $40.

Persoft, 2740 Ski Lane, Madison, Wis. 53713.

■ **4D Software, Inc. has announced a package that permits IBM Personal Computers to emulate NCR Corp. terminals.**

Connection/7900 enables an IBM Personal Computer to mimic the NCR 7900 Model 3 and NCR 796-301 terminals. The package features page and message mode transmission, full status line support, Level 2 diagnostic capabilities, the ability to work with a numeric keypad, cursor control and function key support.

Users reportedly can capture screens of data to perform file or screen transfers.

The software requires 256K bytes of random-access memory and IBM's PC-DOS operating system.

Connection/7900 costs $195.

4D Software, 8759 N.W. 57th St., Tamarac, Fla. 33321.

■ **Atlantic Research Corp. has introduced its Xpert PC Card, an option board for the IBM Personal Computer that reportedly permits users to connect with up to four hosts at a time via an X.25 packet-switched net.**

The Xpert PC Card reportedly provides the Personal Computer with two ports for Ascii devices and permits Personal Computers to share X.25 lines. It emulates the IBM 3270, Digital Equipment Corp. VT100 and other Ascii devices while attached to the X.25 network.

It is priced at $1,795.

Atlantic Research, 5390 Cherokee Ave., Alexandria, Va. 22312.

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APPLE

from page 49

Computers, most disks for the Macintosh held a maximum of 10M bytes, including General Computer's original Hyperdrive offering.

Like the Hyperdrive, installation of the Hyperdrive 20 by an authorized General Computer dealer will not void the Macintosh warranty, according to General Computer.

Hyperdrive 20 also reportedly comes with software for partitioning of the disk into 32 file drawers — each with a separate icon on the screen — and for scrambling of the contents of the files, the latter being a file security system.

Print spooling software is also included to permit the Macintosh to be put to other uses while output is printing.

Hyperdrive 20 costs $2,795 and will be available in early October. Hyperdrive users will be able to upgrade to 20M bytes of storage for $895 after Dec. 6.

The $395 Business Filevision reportedly offers other features that exceed the capabilities of Filevision itself, including a drawing area that is 8 in. by 10 in. rather than only the size of the Macintosh screen.

Users are able to move the drawing area about on their screens to get full access to it.

Another Business Filevision enhancement is the ability to work with files as large as 4M bytes and to exchange Ascii, Data Interchange Format and Sylk files with programs using those file formats. Business Filevision will be available in November and requires a 512K-byte Macintosh.

Borland's version of Sidekick for the Macintosh reportedly offers several enhancements over Borland's version for IBM Personal Computers, including a limited form of concurrency under which users reportedly can print or telecommunicate in the background while using such Sidekick features as its notepad in the foreground.

Another advantage of Sidekick in its Macintosh version is its telecommunications capability. Reportedly available are such functions as a phone log for incoming and outgoing call logging and instant area code lookup.

The communications function is said to be compatible with Hayes Microcomputer Products, Inc. offerings and to support file transfer at 300, 1,200 or 2,400 bit/sec. using either the computer's modem or printer port.

Standard Sidekick features such as an on-screen calculator and a daily appointment calendar are reportedly also included.

Affinity Microsystems Ltd.'s Tempo permits users to edit a macro so that it will pause for data entry while it executes.

Macros created by Tempo can also branch on a logical command or transfer information between unrelated programs.

The program works with nearly all software for the Macintosh, Affinity said.

Colormate is said to make color printing available for Macintosh users for the first time. It permits up to eight colors to be used in printing text or graphics from such applications as Apple's Macdraw and Macproject and Microsoft Corp.'s Microsoft Word and Microsoft Chart.

It also supports one-color printing. Colormate is $125 and can be purchased with the NEC CP2-6 and CP3-6 Color Pinwriter dot matrix printers for $1,210 and $1,610, respectively.

General Computer is located at 215 First St., Cambridge, Mass. 02141.

Telos Software Products is located at 3420 Ocean Park Blvd., Santa Monica, Calif. 90405.

Borland International is located at 4585 Scotts Valley Drive, Scotts Valley, Calif. 95066.

Affinity Microsystems is located at 745 LaFarge Ave., Louisville, Colo. 80027.

NEC Information Systems is located at 1414 Massachusetts Ave., Boxboro, Mass. 01719.

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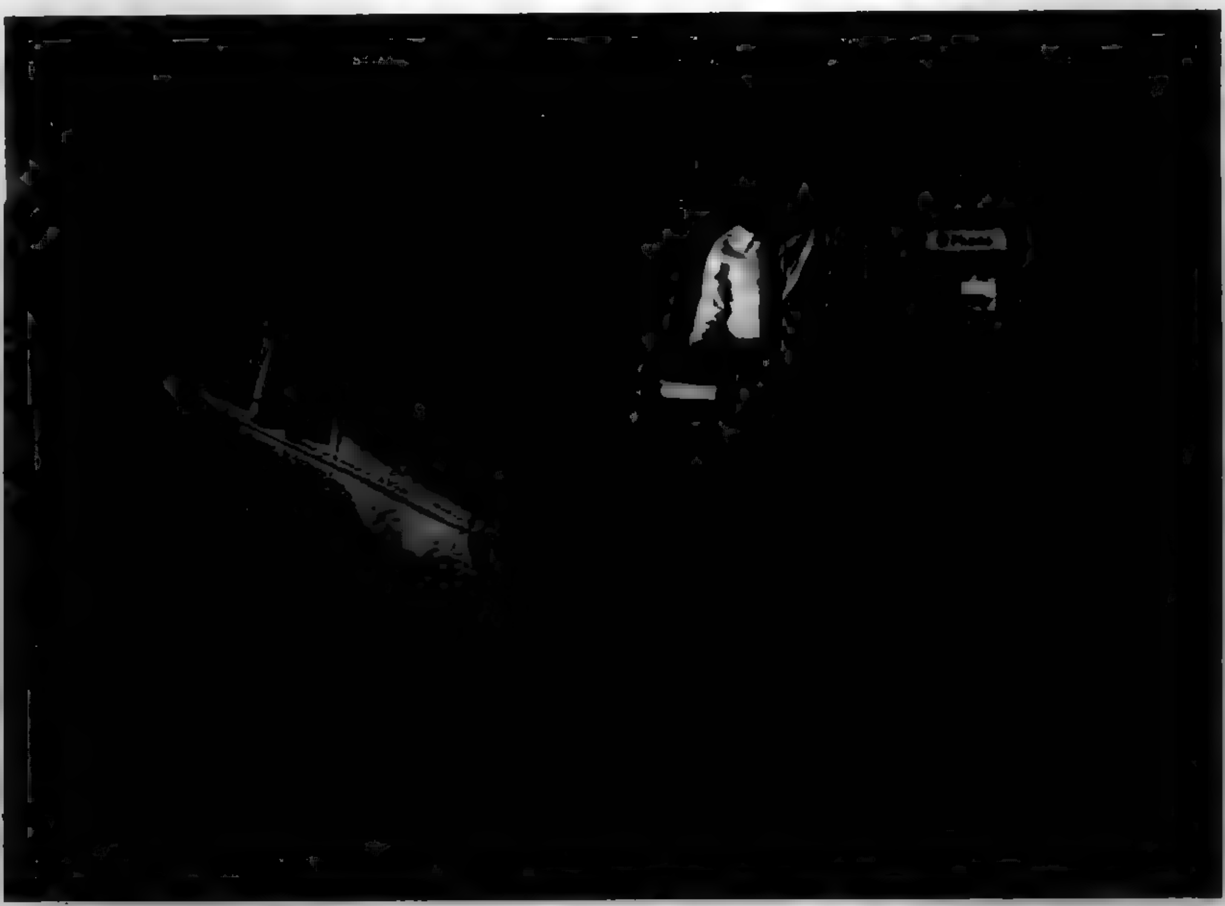

TI announces the portable sales tool for General Electric Plastics' field communications.

Instant access with their technical data base and 24-hour communications with headquarters. That's what the SILENT 700™ Model 707 with its easy access module means to GE Company's Plastics Sales Division. Regardless of time zones and sheer distance from the home office, GE Senior Sales Representative Ray Forester can get the latest product data and cost analysis information he needs to prepare for and close a sale. All he needs is his TI 707 portable data terminal and a telephone.

"With the terminal, I can tap into GE Plastics' data base. When ERIS (Engineering Resins Information System) is accessed by my TI 707, I can provide a customer with technical information and product specifications on the spot and leave him with a printout to review.

"The terminal also acts as my message center when I'm in the field. I transfer messages through the GE Crossfile (electronic mail), and the individuals receive them in written format when they pick up their messages. They seem to respond more promptly with accurate, hard copy in front of them. And since I can receive messages anytime, anywhere, the TI 707 all but eliminates 'telephone tag.'"

Ray Forester believes that the TI 707 is ideal for the salesman on the go. It's lightweight and rugged, takes up approximately one half of a briefcase, and is quiet even at peak operation. "It's exactly the productivity tool we needed for our division's field communications," he concluded.

Find out about the Model 707 SILENT 700 Portable Data Terminal from TI and how it can solve your communications problems. Call 1-800-527-3500, ext. 709; in Canada, 416-884-9181. For more information write TI, P.O. Box 809063, Dept. DTB 1930W, Dallas, Texas 75380-9063.

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Few things are changing as fast as the office work place. What with things like word processing and electronic mail and telecommunications, it's tough keeping up with what's available today. Let alone what's coming tomorrow.

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We'll start by taking a look at the needs of the end user. And how today's technologies and MIS/DP departments are—or aren't—handling the problems.

Then we'll discuss today's trends and where they seem to be taking us. Trends like top-to-bottom computer architectures. Standardized communications protocols and operating systems. Integrated software. Fiber optics. Cellular radios and phones. Just about every new twist for the office of the future.

So if you've got a product or service that belongs in the automated office, it also belongs here. The **October 16th** issue of *Computerworld Focus*. But hurry, closing is **September 6th** (materials due one week later).

For more information, contact Ed Marecki, Vice President/Sales, *Computerworld Focus*, 375 Cochituate Rd., Framingham, MA 01701 at (617) 879-0700. Or call your local sales office.

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AI from page 49

"What you see on the show floor is very technically sophisticated and very demanding, but commercial customers want stability," he pointed out. Developers and customers are split into two camps: "One group wants to rush out with all this steaming software, and the other says, '3-year-old software is just fine.' "

Most of the demand for AI-based technology comes from someone outside of information systems management trying to solve a problem, Sheil noted. "The technical community tends to be conservative," he said, but sooner or later it will have to make peace with the early adapters to artificial intelligence.

Some firms that support AI research groups "have no intention to pay attention to what the groups will do," he added, mentioning IBM in particular.

■ Sheil's boss, General Manager Alan Moskovitz, said Xerox has received an order for 1,000 of its new 1185 workstations. These will end up "on the desks of professionals providing end-user services to consumers." Xerox is "flooded with requests" for other purchases at that volume, he claimed.

■ "AI is different than it was 20 years ago," said Alan Kay, an Apple Computer, Inc. Apple Fellow. "First, people are making money on it." Quoting Henry David Thoreau's advice to "beware of all enterprises that require new clothes," he drew laughter and applause from hundreds of listeners in the crowded ballroom.

"Instead of doing problem solving, we need to do problem finding, and I think that's where AI has really fallen down in the past few years," he remarked.

Kay also pointed to limitations in logic-based programming ("logic is a very, very weak way to go about solving problems") and parallel processing ("if the [Intel Corp. 80286] is a computer with a terrible architecture, what is it when you have 16 of them?").

■ Verbally, at least, we're seeing "intelligence inflation," joked Ronald Brachman, an AT&T Bell Laboratories researcher. "We had intelligent terminals 15 years ago, so what do we have now? Hyperintelligence?"

Brachman also stated that "the things we know as expert systems are very fragile." An expert system's performance falls off drastically at its outer bounds, and "it's almost impossible to characterize what those bounds are," he said.

Additionally, those using an expert system may have no idea of its limitations. "Expert systems that do diagnosis usually don't know that people have two arms and two legs," he said.

■ Hector Levesque of the University of Toronto neatly summed up a similar point: "You certainly wouldn't want an expert system to control the landing of jumbo jets."

■ "This technology is really immature," said Larry Geisel, president of Carnegie Group, Inc. "We've been in it for seven years, and we know how little we know." He described most of the artificial intelligence products on display as "absolute toys" and said that "AI solutions don't scale up."

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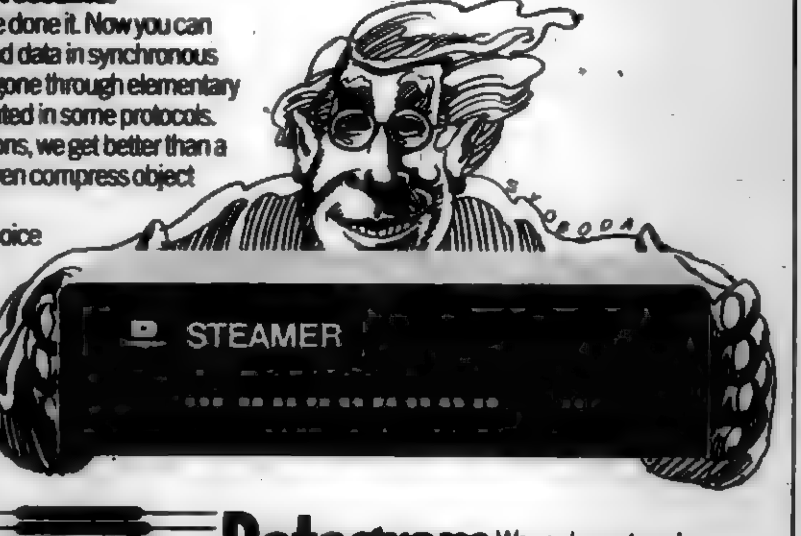

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[illegible]

CHANGE from page 49

your leverage."

Because the PCIC has taken responsibility for all software acquisition, Lunsford said, it recently purchased 600 units of a popular micro software package, which retailed for $650, for only $122 a copy — even though the federal General Services Administration had worked out a "best price" of $470 with the vendor.

"Bulk acquisition opens up a new door — a most important door for information centers. Don't leave acquisition to users, vendors or attorneys. Take the lead," he said. "Because we have standardized, we can predict demand and buy in bulk."

Lunsford said the information center manager can work with vendors to overcome some nagging issues. Those issues involve the handling of warranties, distribution of backup diskettes and updates or fixes, and authorized copying of software.

"You should not have to fill out 500 warranty cards when you buy 500 packages," he said. "Also, the vendor cannot tell you the software can't be moved. You can't agree to run it on only one machine. In addition, you should not have to distribute 500 backups after you have already installed the originals. The original and backup should come in one package. The vendor will meet your needs in these areas, but only if you communicate them."

Special support consideration

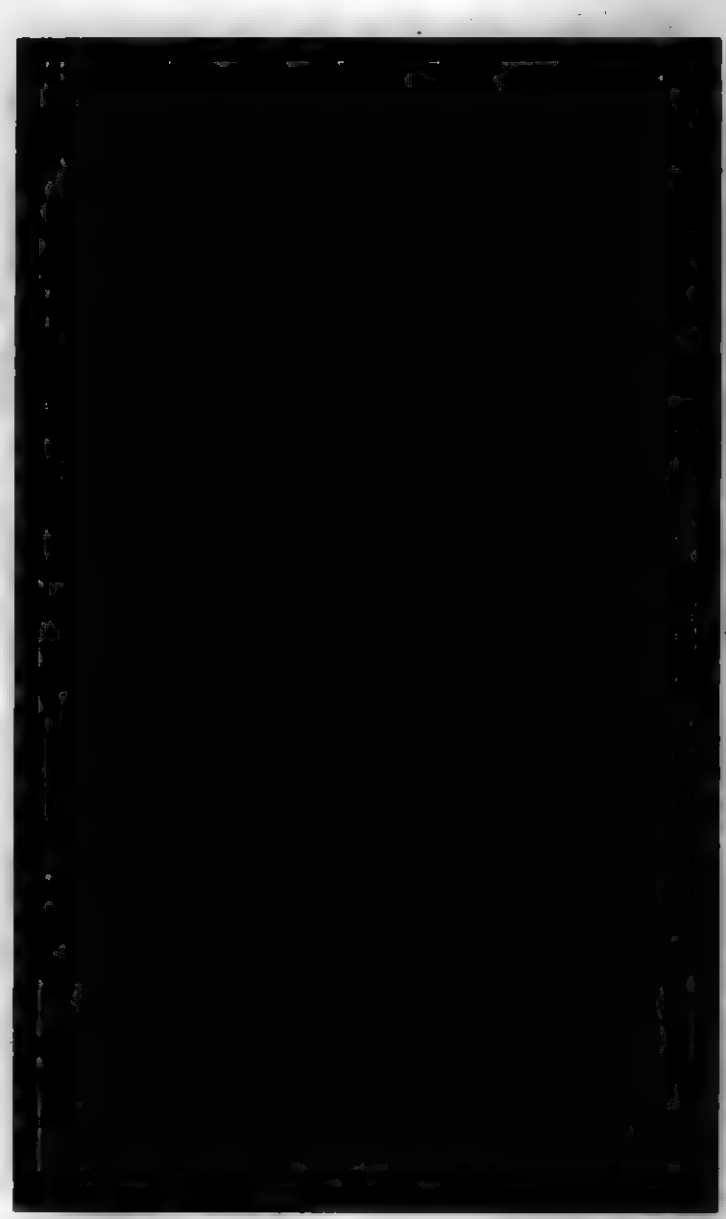
By handling the majority of user problems with software — reducing the vendor's work load — the information center should also get special support consideration. "You are stopping 99% of user calls. But when you have to make that one hot line call to the vendor, you get put on hold for an hour. Vendors should serve you better. They should set up a special information-center-oriented hot line. You can only arrange that kind of relationship contractually and only if you request it."

Lunsford said information center managers must also communicate to vendors their concerns about so-called lock-and-key protection schemes and shrink-wrap licenses, both of which pose problems for large organizations.

"Vendors are looking to keys, and information centers can't deal with that. It can't be managed. Shrink-wrap laws are also a problem because a national organization could face as many as 50 different laws."

Straight talk about application software packages.

"Most application software packages are functionally rich. The problem is, that's simply not enough."



While everyone agrees that packaged applications possess great potential to save time and money, you'll hear a lot of people—from MIS directors to operations managers—tell you the ones their companies have implemented fall somewhere short of satisfactory.

Typical limitations include the fact that the packages require such extensive modification that the savings they seemed to offer totally disappear. Another common complaint is that one application package fails to integrate with another. A third shortcoming, and perhaps the most common, is that packaged applications cannot be easily adapted to reflect the changing nature of the business.

You have only to look at the architecture of most of the applications currently in use to understand why these problems exist.

Many companies today depend on applications designed with technology from the 60's and 70's. Some are 2nd generation applications built without any reliance on database architecture. Others are 3rd generation applications that provide only a generalized *interface* to a database management system; in addition, many application vendors provide a common front end user interface to mask inefficient architecture. The result is that these 3rd generation applications realize only about 10% of the power of a DBMS. *And that's simply not enough.*

Without full use of the facilities of a superior DBMS, users of application software find it extremely difficult to adapt and extend an application package to their current as well as to their future business needs. And *only* when an application is built with advanced database technology can it provide the sharing of data that leads to functional integration between different application modules.

Ultimately, what's required is software that goes beyond the conventional packaged applications approach.

What's required is 4th generation applications software—software that's rich in functionality, and whose underlying architecture is built on, and takes full advantage of, advanced database technology.

Fourth generation application software is created using a comprehensive application development facility combining a fourth generation language and end user query and reporting facilities with an integrated data dictionary. Furthermore, fourth generation application packages are functionally integrated, sharing common data between independent modules. This creates an environment to easily adapt and extend an application package, and provides realtime access to all information.

Only fourth generation application software packages enable a company to realize the full potential of packaged applications.

It is clear, therefore, that all application packages of the future will be built using this technology... because it doesn't make sense any other way.

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2. Functionally Integrated

Businesses today demand applications to do more than address individual functions. Businesses today need applications that recognize the interdependencies within an organization—in short, applications that can share data. For example, efficient real-time, four-way matching of invoices with receiving, purchase and inspection documents can only be achieved through true sharing of data, and this sharing of data can only be achieved with an advanced database technology which delivers that integration. Redundancies are eliminated and productivity is increased when all applications dynamically reflect the operations of the organization. By sharing an architecture that provides for optimum use of an organization's information, Cullinet's manufacturing, financial, human resources and banking applications fulfill this need.

3. Easy to Tailor

Although many businesses appear on the surface to operate in a common fashion, each, in fact, is unique. Applications must therefore be built with an optimized set of tools that permits them to be adapted to a company's way of doing business, rather than having the company have to adapt to accommodate the software. Cullinet applications are designed to accommodate change. They provide the means to personalize screen layouts, capture new information, reformat reports, resequence transactions, and change messages without impacting the entire environment. Only Cullinet's applications can provide this environment for adaptability through their integration with advanced database technology. In this way, Cullinet applications give users the independence to adapt them—quickly and efficiently—to meet the unique requirements of the business.

4. Easy to Extend

As a business changes and grows, so do its needs and requirements. Cullinet provides easy to use, menu-driven facilities that permit functional extension of an application while preserving integration. An end user can quickly react to new requirements by prototyping an application functionally, developing new reports and performing ad hoc queries immediately. MIS can efficiently develop new, associated applications sharing common data and built utilizing the existing architecture. The Cullinet architecture segments the program logic, edit and validation criteria, as well as the security and recovery process, and therefore the complexity of creating new application functionality is significantly reduced.

5. Easy Access to Information

Access to all corporate information is key to any application. Because all pertinent data must be available to the analyst and decision maker, easy access to that data, *no matter where it resides*, is mandatory. Your need for information naturally crosses applications boundaries. The ability to associate detailed information about sales orders, finished goods status, and customer credit processing before release of shipments is a prime example. Only by means of Cullinet's applications, which are completely integrated with our Information Center Management System are you provided the opportunity to create an information center that is functionally complete, meeting the information needs of the company as a whole and meeting the specific needs of the operational units of the organization. Each center of functional activity within your organization is served by the system through your mainframe or PC with GOLDENGATE software. Each has access to all corporate information. Accessibility to all information—whether it's in your mainframe, in a departmental minicomputer system, or in your personal computer—makes it readily available to you for analysis through Cullinet's complete information environment.

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COMMUNICATIONS

WIRETAP
Daniel Minoli

Defining budget terminology

SECOND IN A THREE-PART SERIES

A few years ago the processing resources of a typical corporation might have included a multimillion dollar computer and a few thousand dollars worth of communications equipment. Today that CPU complex is often augmented by a multimillion dollar communications network.

When the total expense for data communications was a few thousand dollars, the data communications manager could get away with simple and intuitive financial decisions. Now, due to the figures involved, the communications manager must become increasingly knowledgeable about financial theory.

Some basic terms needed to formulate decision models for comparing alternative strategies are defined below. These concepts, together with those defined in last week's column, will be employed next week for two specific buy/lease examples. Terms required to make such formulations include the following:

- Present value. This is the value of money at the present time, even if the money is due at some future point. Because of inflation, the opportunity to invest the money and earn interest and the uncertainty of the future, money in hand is more valuable than the promise of cash a year down the road.

For example, the present value of a pension is very small. Participants in a pension pool do not know if they will live long enough to collect, if they will quit before they are vested or if the company will go out of business before they are vested; thus money in hand today is more valuable and sure. The same concept applies to business cash flows. Hence a network enhancement that promises to return $1 million in one year is better than an alternative that promises to return $1.06 million in two years.

- Future value. This is the value of money at some future point. For example, $1 invested at a compound rate of 10% would be worth $2.59 in 10 years. However, the future purchasing power of that dollar will be the same as it is today unless the rate of interest earned exceeds the rate of inflation.

- Lease. A lease is a contract between a lessor and a lessee, whereby the lessee pays a fee for the use of a resource owned by the lessor. The fee is usually paid monthly and involves a fixed prenegotiated charge.

- Net lease. This is a lease under which the lessee pays for all maintenance and upkeep of the asset.

- Third-party lease. Also called a leveraged lease, a third-party lease is an ar-

See FINANCE page 62

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

DATA STREAM

AT&T, offshoots trim the fat

By John Dix
CW Staff

Monopolies are fat. Particularly government-regulated monopolies.

It comes as no surprise that AT&T has had to pare roughly 20% of its work force. Before divestiture, AT&T had more employees than the population of Louisville, Ky. Its revenue was roughly the size of Norway's gross national product. It had more assets than the combined top three U.S. industrial companies.

Now splintered, each of the resultant eight fragments foraging in new and often competitive markets, AT&T and the seven regional Bell holding companies have to slim down to survive.

While no one predicted it, divestiture has been hardest on AT&T. Facing dismal first-year earnings that fell far below expectations, AT&T cut 11,000 jobs in 1984. The latest round of cuts — roughly 24,000 jobs — brings this year's list of casualties close to 26,000.

The divested Bell operating companies have, conversely, fared well financially. This has stemmed the need for personnel cutbacks but not obviated the need to trim fat.

A maintenance supervisor for one divested Bell operating company recently admitted that cost control has become so stringent that employees have to sign for pens. The consciousness has spread throughout the company.

Inventories of equipment have been cut. Before divestiture the maintenance division this supervisor worked for used to keep 60 days' worth of cable and wire in its yard. That is, it would take the operating company crew 60 days to lay all the cable it had on hand at any one time. Now the company's crews keep eight and 10 days' worth of cable inventory on hand.

Management is being spread thinner. While supervisors at this employee's company once managed seven or eight people, those same individuals now oversee twice as many employees.

Truck fleets are being reassessed. This supervisor's company keeps a fleet of maintenance trucks that is 6,000 strong. Many of these trucks get only 10 miles per gallon of gasoline. New trucks the company is studying could get 17 miles per gallon.

These cost-cutting measures, coupled with sound financial results, have spared the employee cutbacks that are plaguing AT&T. But former Bell operating company personnel aren't dillydallying under the impression that job security is what it used to be. "One of the reasons people used to join the phone

See FAT page 62

> ”
>
> *A maintenance supervisor for one divested Bell operating company recently admitted that cost control has become so stringent that employees have to sign for pens.*

- Crosby Lyhus has introduced a personal computer software package that works with Rolm private branch exchanges/62
- Data Switch's switching and control products now support IBM and IBM-compatible diagnostic modems/62
- Dataprobe has announced an addition to its Fallbacker II family of dial back-up equipment/62

INSIDE

Voice/Data Communications/62
Multiplexers/Modems/62

Barcode Industries introduces scanner

GREAT NECK, N.Y. — Barcode Industries, Inc. has announced a bar code scanning system that supports up to 16 readers and connects them to a single RS-232C computer port.

The master MR-Net unit supports readers on a single RS-422 data communications line. The master unit can be supported on any RS-232C computer interface. The MR-Net master unit is preprogrammed to poll the slave readers, which have switch selectable addresses.

The reader units can be either light pens or hand-held laser scanners, Barcode reported. Both of the units are available with or without displays. Reader units with displays can receive and display messages from the computer. Maximum distance between the master and the last reader on the RS-422 line is approximately 3,000 feet.

MR-M master costs $720, as does the MR-3 slave equipped with a Barpen light pen without display. The MR-2 Barpen with display costs $920. Either of the former costs $1,500 more with an SP hand-held laser scanner.

The products are available immediately after the receipt of order.

Barcode is located at 17 Barstow Road, Great Neck, N.Y. 11021.

DG's intelligent controller out

WESTBORO, Mass. — Data General Corp. recently announced an interface that enables its Eclipse MV family of minicomputers to connect to Net/One broadband local-area networks produced by Ungermann-Bass, Inc.

The intelligent broadband controller is a 15-in. board that mounts internally in MV series processors. It has 256K bytes of random-access memory, a Microeclipse processor, a serial I/O section and a data channel interface. The board connects to IEEE 802.3-compatible broadband Net/One through an Ungermann-Bass broadband modem.

According to the company, the intelligent broadband controller completes a marketing agreement between the two companies that was reached in January.

Under the terms of that agreement, Ungermann-Bass sells to DG customers an array of components for use with its Net/One network, including the cable, head end and modems.

The intelligent broadband controller is available 90 days after receipt of order for $6,500.

Net/One is available from Ungermann-Bass, which is located at 2560 Mission College Blvd., Santa Clara, Calif. 95050. DG can be reached at 4400 Computer Drive, Westboro, Mass. 01581.

VOICE/DATA COMMUNICATIONS

■ **Crosby Lybus, Inc. has introduced Comcop, a personal computer software package that enables users to manage Rolm Corp.'s private branch exchanges.**

Comcop runs on the IBM Personal Computer and creates telephone extension profiles by class of service, call forwarding characteristics, pick groups and hunt groups, the vendor said.

Standard reports, which can be printed or generated on-line, include user profiles, move and change orders, problem reporting, extension profiles, organization directories and system speed. The software also provides an on-line attendant directory for use by the switchboard operator.

Comcop VS for use with Rolm CBX II's with fewer than 144 extensions is licensed for $1,500. Comcop for more than 144 extensions is priced at $5,000.

Crosby Lybus, 40 Bedford Road, Armonk, N.Y. 10504.

■ **Data Switch Corp. has announced that its switching and control products now support IBM and IBM-compatible diagnostic modems.**

The Data Switch XY-MAX Model 2840-II and Model 2810 digital matrix switches can now support the transmission signals required by IBM's diagnostic modems to perform problem isolation and correction procedures, the vendor said. No special cabling is required.

The Data Switch XY-MAX Model 2840-II costs $175,000 for support of 256 by 256 RS-232 lines. The Model 2810, which supports 64 digital and 64 analog lines, costs $49,100.

Data Switch, One Enterprise Drive, Shelton, Conn. 06484.

MULTIPLEXERS/ MODEMS

■ **Televell has announced the Dial-Up Port Expander (DPE), an analog device intended to enable a mainframe port and a synchronous modem to support five dial-in lines.**

The DPE sits between a modem and the outside dial-up lines. The product is compatible with IBM 3270 or 5251 protocols and any half-duplex, synchronous dial-up modem up to 9.6K bit/sec., according to the vendor.

Five remote cluster controllers or cluster controller emulators can dial in to the DPE simultaneously, using the 5251 or 3270 protocols, the company said.

The DPE is priced at $4,500.

Televell, Suite 104, 1901 Embarcadero Road, Palo Alto, Calif. 94303.

■ **Dataprobe, Inc. has announced an addition to its Fallbacher II family of dial backup equipment, the Fallbacher II Two-Call Dial Back-Up switch.**

The switch is now available in a high-density rack mount, allowing dial backup of up to 16 leased lines in a 5¼-in. rack space. The initiating switch card allows the transfer of a leased-line modem from the four-wire line to two dial lines.

The price for the LIS-RV model local initiating switch rack-mounted card is $315, and the LIS-R-16 model 16-position card rack costs $325.

Dataprobe, 110 W. Palisades Blvd., Palisades Park, N.J. 07650.

FAT from page 61

company was for job security," the supervisor said. "People are more apprehensive."

This apprehension is well founded. Although AT&T has a virtual monopoly on long-distance services, it faces competition on more fronts than do the divested Bell operating companies. AT&T, for example, is no longer the only game in town for an array of services.

The largest threat the divested Bell companies face, on the other hand, is bypass. Although very real and potentially crippling, bypass is not as well advanced as the competition is in AT&T's markets. Realizing this, the former Bell operating companies are trying to head that threat off at the pass by exploiting new technologies like fiber optics.

Regardless of the measures taken, it is clear that AT&T and the former Bell operating companies still face an uphill climb as they strive to shed the complacency bred from years as a government-controlled and protected monopoly.

FINANCE from page 61

rangement under which the lessor borrows funds to cover part or all of the purchase price of the asset or equipment. A third party owns the equipment. Sometimes a firm buys the equipment, sells it to the third party and then leases it back.

■ Sale and lease back. As described, sale and lease back is an arrangement under which the user of the asset sells the asset and then leases it back from the purchaser.

■ Salvage value. Also called residual value, salvage value is the price that the firm can receive for an asset after it has been used for an extended period of time.

■ Payback period. The interval required for an asset to generate enough cash flow to cover the initial outlay for that asset is its payback period. For example, an asset costing $15,000 that generates an after-tax cash flow of $5,000 has a payback period of three years.

■ Break-even point. This is the level at which inflowing cash equals the cost of the investment, namely, earning a zero profit on a given project or investment.

■ Capital gains or losses. The difference between the original cost of an asset and its selling price is a capital gain or loss. Capital gains or losses are realized only after the asset is sold.

Next week we will apply these and last week's concepts to problems confronting managers faced with the task of evaluating and acquiring data communications equipment.

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SYSTEMS & PERIPHERALS

Scientific processor upgraded

BEAVERTON, Ore. — Floating Point Systems, Inc. has announced the FPS-364, a replacement to its FPS-164 scientific processor.

The FPS-364 reportedly offers the performance of the original scientific-oriented processor at a 60% weight reduction, 50% reduction in noise level and lower power requirements. The FPS-364 is compatible with all levels of FPS-164 applications software and systems software.

The FPS-364 is said to handle the scalar and vector operations typical of large Fortran programs and to relieve a general-purpose mini or mainframe computer of scientific processing tasks. The FPS-364 features high-speed, 64-bit architecture and up to 72M bytes of main memory.

The FPS-364's optimizing compiler works with Fortran 77 programs. Floating-point operations are performed using pipelined 64-bit computational units.

With peak speeds of 11 million floating-point operations per second and 15-digit precision, the FPS-364 reportedly offers high performance on structural analysis, design automation, oil reservoir simulation and computational chemistry applications.

More than 40 applications programs are available on the FPS-364, and it is compatible with IBM, Digital Equipment Corp., Apollo Computer, Inc. and Sperry Corp. environments.

The FPS-364 is priced at $298,000 with 4M bytes of memory, one FD64 controller, an 800M-byte disk drive and the SJE operating system and program development software.

Floating Point Systems is located at 3601 S.W. Murray Road, Beaverton, Ore. 97005.

Minis complement net of systems, report says

By Donna Raimondi
CW Staff

FRAMINGHAM, Mass. — Despite the growth of increasingly powerful microcomputers, minicomputers still garner their share of the departmental end-user market, according to a market research report released recently.

Methods for managing minicomputers involve staff, equipment and data concerns, according to International Data Corp. (IDC), a research firm based here that published the report titled "Minicomputer Applications in End-User Departments."

Companies increasingly are finding that a combination of mainframes, minicomputers and microcomputers help them perform all of their computing needs, the report said.

For small businesses and decentralized corporations, traditional minicomputers have a legacy of business applications that has yet to be equaled by microcomputer software, IDC noted.

Minicomputers in a department can complement a network of microcomputers by serving as a host for departmental data bases and as a gateway to corporate mainframes, according to the research memorandum prepared for IDC's Continuous Information Services Clients.

Minicomputers are small- and medium-scale computer systems, according to IDC's classification system, which lists four categories of processors — large-scale, medium-scale, small-scale and personal computers.

Medium-scale machines are typified by the Digital Equipment Corp. VAX-11 products, Data General Corp. MV products,

See REPORT page 70

Secure Xerox workstation out

EL SEGUNDO, Calif. — Xerox Corp. has announced the 1108-105T artificial intelligence workstation, which meets federal standards for secure installations.

The workstation is compatible with Ethernet local-area network and joins the Xerox line of Secure Information Device print, file and communications servers, a spokesman said.

Secure Information Device accreditation was established by the National Security Agency to prevent classified information from being leaked in the form of electronic signals. The specification sets a limit on the strength of such signals emitted by equipment used for classified applications.

The workstation's 42M-byte rigid disk is transportable. The Xerox 1108-105T includes the company's Interlisp-D programming environment designed for coding AI applications. The 1108-105T with 1.5M bytes of main memory, 8M bytes of virtual memory and a 137-nsec cycle time is priced at $34,950.

Xerox also announced that the 1108 series of AI workstaions can now interface with the IBM Personal Computer, IEEE 488 and Intel Corp.'s Multibus-compatible peripherals with the Busmaster option. The Busmaster option, which includes a workstation card and software, enables workstation users to incorporate a variety

See XEROX page 67

- California Computer Group introduced a 1G-byte disk subsystem and a tape system for the Digital Equipment Microvax/66
- Preston Scientific announced that its PMC analog-to-digital subsystems now can interface with Masscomp MC-500 minicomputers/67
- International Imaging Systems released an image processor for applications ranging from cardiovascular imaging to military surveillance/67

INSIDE
Data Storage/66
Auxiliary Equipment/66

Don't count on IBM to stop the slump

HARD TALK
Tom Henkel
CW Senior Editor

The rumor mill was abuzz the week of Aug. 19. IBM was going to announce something — that seemed to be common knowledge — but what?

The list of possibilities was impressive. Some said IBM was going to unveil an array processor for the 3090 series of mainframes. Others said they believed that IBM would announce new models of its 3090 — the Models 100, 150 and 600, as they were called.

Still others said the time had come for the long-awaited IBM token-ring networking scheme to make its debut.

Aug. 19 arrived, and IBM dutifully made its announcement — two modems and a graphics printer for the Personal Computer, a series of service discounts for the Personal Computer and a nebulous statement that the Watson Research Center is interested in parallel processing. So what?

Big Blue letdown

Hopes were high that IBM would do something to brighten the doldrums of a yawner of a summer. Big Blue let us down. Let's face it, two modems and a printer are not the much-needed spark to blast the computer industry back into a prosperous orbit.

Just as fans look to superheros to rally the home team to a come-from-behind win, the computer industry seems to be depending on IBM to do something to pull the industry out of a nagging slump. But does IBM really have a responsibility to toss a life ring to hurting computer companies?

After all, IBM is probably just as much to blame for the slump as any of the other factors that have been bandied about as the cause of these dismal times.

IBM had the nerve to post two lousy quarters in a row. This was an unimpressive feat that seems to have thrown much of the rest of the computer industry into cardiac arrest.

So to make up for it, why shouldn't IBM announce a series of important, strategic products in the worst part of a "barfo" year just to get the industry back on track?

Be serious. IBM is a multinational corporation, not a pitcher for the New York Mets.

Nowhere in the Big Blue rule book is there any mention of a responsibility to serve as savior to the industry.

IBM is going to plod along doing what it has done so well for the past 50 years — survive, dominate and make a ton of money. IBM is only concerned about one thing: what is best for IBM. The rest of us are on our own.

Apollo cuts service fees

CHELMSFORD, Mass. — Apollo Computer, Inc. has announced a 20% reduction in hardware maintenance service charges for its line of Domain workstations, server processors and peripherals.

The company also announced a 16% reduction in monthly maintenance charges for its DN460 workstation that includes 4M bytes of memory.

Maintenance on the DN460 is now $449.

Monthly service fees for Apollo's DN660 with 4M bytes of main memory have been reduced 15% from $687 to $583.

Apollo has also added a service program that gives customers four-hour, on-site response and optional weekend, holiday and extended weekday coverage for all hardware products.

Apollo Computer is located at 330 Billerica Road, Chelmsford, Mass., 01824.

Save the

Millions of IBM PCs and compatibles are fighting for their lives.

Because users are demanding more and more storage space.

For bigger programs. For more applications. For downloading from the mainframe to the micro.

It's really more than a little PC can cope with.

Which is why a lot of people are replacing their PCs with XTs.

But now you can put an end to this senseless economic waste.

And save your company the massive cost of buying all those XTs.

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A 10 megabyte hard disk drive on a card that makes a PC* function exactly like an XT. In fact, the only difference is that Hardcard has a faster access time than the XT's built-in drive.

It's also faster to install than any other add-on drive. Because everything is compressed onto a single card that quickly plugs into any expansion slot inside the PC. Which means you can rescue hundreds, even thousands of PCs in a day.

And with Hardcard's special installation software, your users can load the operating system and be ready to install their programs in minutes. Which saves your technical staff a lot of support time.

Hardcard also saves all that money you've invested in software. Because it runs all the most popular programs exactly like an XT would. With no extra fuss or modification. And its built-in file directory lets users arrange their files anyway they'd like. So they can boot up any application at the touch of a key.

As for reliability, there's simply less to go wrong. Because Hardcard has fewer parts than other drives. And absolutely no cable connections. Which makes it twice as reliable as the XT's built-in drive.

And Hardcard is the only add-on drive that lets your users keep both their floppies up and running.

But perhaps the most reassuring thing about this revolutionary

PCs.

concept is that it is based on totally non-revolutionary technology: the Winchester hard disk.

In fact, Hardcard was created by some of the same people who pioneered the 8" and 5¼" Winchester drives. And their company has a long history of producing reliable drives for some of the biggest computer manufacturers in the industry.

Because of Hardcard's superior reliability, we can offer you a warranty that goes well beyond the usual 90 days. We give you a full year. Should anything go wrong within the year, take it to your nearby authorized service location, and you'll get a replacement Hardcard. Immediately. Which means little to no down time.

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Hardcard will be available during October at your local computer dealer. In the meantime, write for more information:

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Hardcard
from Plus

DATA STORAGE

■ California Computer Group has released Micro-XP, a series of disk and tape subsystems for Digital Equipment Corp.'s Microvax.

The Micro-XP provides up to 1G byte of disk storage, which can be backed up by an 80M-byte removable disk or a 500M-byte Group Coded Recording cache streamer that operates at 200 in./sec.

The Micro XP-5 dual-drive storage system is said to enhance the storage capability available to Microvax users. The product consists of a 516M-byte, 9-in. disk drive with a 20-msec access time. It also has a second 516M-byte optional disk drive that gives users 1G byte of storage, the vendor said.

The Micro XP-5 drives are contained in a 28-in. enclosure that fits under a desk. It can also be rack mounted in a standard 19-in.-wide cabinet.

The product is priced from $13,450 for the 516M-byte version to $24,950 for the 1G-byte version.

California Computer Group, 3303 Harbor Blvd., G-10, Costa Mesa, Calif. 92626.

AUXILIARY EQUIPMENT

■ Mentor Graphics Corp. has released a general-purpose test fixture for its Hardware Verification System that works with the company's Idea series of engineering workstations.

The fixture is said to provide universal sockets in place of probe leads. It can be used with any device package ,including dual-in-line packages, leadless chip carriers and pin grid arrays with up to 20 by 20 pins.

The unit costs $5,000.

Mentor Graphics, 8500 S.W. Creekside Place, Beaverton, Ore. 97005.

■ Cardamation Co. has unwrapped two punched card peripherals — a card reader and a reader punch — for the IBM System/36 Personal Computer.

The CT300/31 Card Reader includes a 300 card/min. 80-col. reader, an RS-232C asynchronous interface to the IBM Personal Computer workstation and a software handler on diskette for the IBM System/36 Personal Computer connection. It costs $2,645.

The RP8531 Reader Punch includes a 66 card/min. reader or a 200 char./min. reader, an RS-232C interface and software on a diskette. It costs $6,690.

Rental terms for both units are available.

Cardamation, P.O. Box 746, Frazer, Pa. 19355.

■ Test & Measurement Systems, Inc. has released a programmable video signal generator for testing and evaluating color and monochrome video monitors.

The Model VG-804, manufactured by Astro Design, Inc. of Denen-Chosu, Japan, is said to operate at horizontal scan rates up to 99 kHz and dot clock frequencies from 4.38 MHz to 50 MHz. It has both analog and transistor-transistor logic outputs for connection to the monitor under test.

The unit generates vertical and horizontal color bars and gray scales, cross hatch and characters. It costs $5,700.

Test & Measurement Systems, Suite 301, 349 Cobalt Way, Sunnyvale, Calif. 94086.

■ Industrial Vision Systems, Inc. has unwrapped a 400 dot/in. digitizing scanner that is said to scan paper documents up to 36-in. wide by any length and convert them to a digital raster file in compressed or uncompressed format.

The E/Scan Model ES400 is said to be useful for inputting drawings to computer-aided design workstations or image management systems, performing electronic restoration of drawings or faxing large documents.

The unit costs $79,000. Interfaces are available to connect the scanner to an IBM Personal Computer, a Multibus-based system and a Versatec plotter.

Industrial Vision Systems, 452 Chelmsford St., Lowell, Mass. 01851.

■ Acrosystems Corp. has released an I/O module for its Acro-900 Intelligent Data Acquisition and Control System.

Typical applications of the Model 913 include machine on- and off-timing, dig-

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IBM DisplayWrite 3.
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It lets you do all the expected things, like centering and justifying and moving text every which way.

Plus a number of highly unexpected things, such as automatic outlining and footnoting.

You can edit parallel columns of

SYSTEMS & PERIPHERALS

ital control and status checking. The unit is a 60-channel digital I/O module. The 60 bidirectional lines may be used as either digital input or output, and the software is programmable on a per-line basis, the vendor said.

The Model 913 costs $695.

Acrosystems, 66 Cherry Hill Drive, Beverly, Mass. 01915.

■ Hewlett-Packard Co. has released 14 emulation subsystems to expand the processor support capabilities of its HP 64000 Software Design Center.

The subsystems are said to provide a link between the software development environment and the target system. The emulation subsystem models are for processors that include the Fairchild Camera & Instrument Corp. F9450; Motorola, Inc.'s 68000 (both 64 and 68 pin probes), 68008, 68010 (both 64 and 68 pin probes) and 146805E2; Texas Instruments, Inc.'s TMS32010; Zilog, Inc.'s Z80; Intel Corp.'s 8086/8087, 80C86, 8088/8087 and 80C88; Hitachi Ltd.'s 6301/6303 V series; and NEC Corp.'s 70116 and 70108.

Prices range from $4,100 to $8,800.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

■ Preston Scientific has announced that its PMC series of analog-to-digital subsystems is now able to interface to Masscomp's MC-500 computers.

The PMC series will interface Preston's 1-MHz 15-bit GMAD1A multiplexing analog-to-digital converters to Masscomp's MC500 computers via the Masscomp CSP-50006 customized interface package.

The PMC interface package includes a programmable crystal-based clock, output data memory, channel address memory to control up to 4,096 data channels and front panel off-line control modes.

The PMC interface price is dependent upon system configuration, conversion rate and resolution. Prices typically range from $15,500 to $23,100 for 32- to 128-channel 15-bit 1-MHz systems.

The Masscomp CSP-50006 interface kit is available from Masscomp at One Technology Park, Westford, Mass. 01886.

Preston Scientific, 805 E. Cerritos Ave., Anaheim, Calif. 92805.

■ International Imaging Systems, Inc. has released its Model 6700 Image Processor for applications requiring data acquisition and simultaneous real-time processing, such as hardware histogram generation for statistical analysis.

Applications for the unit range from digital angiography and cardiovascular im-

Continued on page 70

XEROX

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of color monitors and printers, tape drives and graphics electronic drawing units.

The IEEE 488 access will enable Xerox workstations to support engineering test equipment, speech synthesizers and a variety of measuring devices.

The Busmaster board can be connected to any Xerox 1108 processor with the CPE Expanded Processor Option, containing expanded 12K-byte control store, floating-point processor and parallel I/O port.

The Busmaster option is priced at $3,995.

In addition, Xerox announced that users of the 1100 series of AI workstations can now directly interface their workstations to the Xerox 4045 Laser CP printer. The printer offers resolution of 300 by 300 dot/in., up to 36 type fonts and printing speeds of up to 10 page/min.

Deliveries of the Xerox 4045 CP printer for Xerox AI workstations are scheduled to begin in the first quarter of 1986. The printer is priced at $4,995.

Xerox Systems Group is located at Xerox Centre, 101 Continental Blvd., El Segundo, Calif. 90245.

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Whether you have an analog or digital network, the DATAPHONE II System offers a full line of microprocessor based private line modems and data service units to provide reliable transmission and sophisticated diagnostics. These modems are the backbone of our system.

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Recent additions to the DATAPHONE II multiplexer line include: The 735 T-Mux, a high-speed, time-division multiplexer for T-1 facilities. The 718 Stat Mux, a statistical multiplexer with unique expansion capabilities. The 719 Networker,

[illegible]

Add on a little more.

Get as big as you want.

a combination of statistical multiplexing and data switching.

We're determined to keep the DATAPHONE II System at the leading edge of technology. That's why we're constantly researching and developing new products and enhancements to keep your information on the move.

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The right choice.

REPORT

from page 63

Hewlett-Packard Co. HP 3000 machines and the IBM 4300 series and range in value from less than $60,000 to approximately $1 million, according to the report.

IDC said that small-scale computers traditionally range from 16-bit multiuser systems to small business machines. Typical systems include the Altos Computer Systems, Inc. ACS 68000; Plexus Computers, Inc.'s P/60, DEC's PDP-11/34 and the IBM System/34.

Minicomputers can be characterized as having either 8-, 16- or 32-bit word lengths, from 0.1M to 32M bytes of main memory, bus architecture and an overlapped processing type — as opposed to parallel processing in a mainframe and serial processing in a microcomputer.

Minicomputers excel in time-sharing and in applications requiring distributed processing, IDC noted. Typical minicomputer uses include data base management, front- and back-end processing, data communications, data collection and validation, materials handling, industrial control, manufacturing and engineering tasks and office automation.

Several disadvantages

Departmental users are finding that microcomputers have several disadvantages when compared with minicomputers, the report said. Personal computers might not have adequate storage for departmental data bases, while most microcomputer-oriented local-area networks have primitive operating systems that do not automatically protect data with record lockout as they are updated, the report said. Microcomputers also lack the ability to back up data with a centralized procedure, the report added.

Data processing is evolving to the point where companies have a mixture of the three kinds of computers — mainframes, minis and micros. As this approach to computing takes hold, organizations must learn to manage and control the resources associated with each system, IDC said.

Staff, equipment and data are the three major resources in a minicomputer environment, the report said. Staff is needed to manage the installation, to develop programs and to operate the equipment. A major staff-related function is training, for DP staff as well as for end users.

Management of equipment demands an evaluation of performance, capacity planning and maintenance of the equipment. Data management requires procedures that guarantee the accuracy and validity of the data, controlled access to the data and backup and recovery procedures for the data.

Auditing minicomputers — being able to reconstruct a transaction — requires documentation of operating procedures and programs and a log for operations and daily transactions, according to the report. Management must specify responsibilities for computer programming, operations, data authorization and output use and should consider separating these functions to protect the organization from computer fraud, the report said.

Physical security of equipment

Another function in minicomputer management is the physical security of the equipment, programs and data. Access should be limited, and changes should never be made to production programs. Data in both read and write modes should be protected from unauthorized access.

Finally, plans must be made to correct mistakes and to repair equipment so that operations can continue despite errors and malfunctions within the system, the report said. The system should be designed so that erroneous data is detected and corrected in a timely fashion. This function includes having proper backup procedures, logs, maintenance contracts and spare parts.

The company should have a disaster recovery plan in the event that everything goes wrong, the report said. There should be a method established to recover data and programs and an alternative arrangement made for processing equipment.

More information can be obtained from IDC, Five Speen St., Framingham, Mass. 01701.

Continued from page 67

aging to military surveillance and radar/infrared imagery.

The Model 6700 is said to accept digitized video at up to 13.5 MHz from various input sources supplying synchronization and data clock signals. The unit offers a 16-bit bidirectional port. It has a maximum capacity of 16M bytes of image memory.

The basic unit — comprised of an interprocessor controller, synchronous controller, I/O matrix switch and video pipeline/graphics processor costs $27,950.

A typical version with 70K bytes of image memory and a high-resolution output unit added to it costs approximately $70,000.

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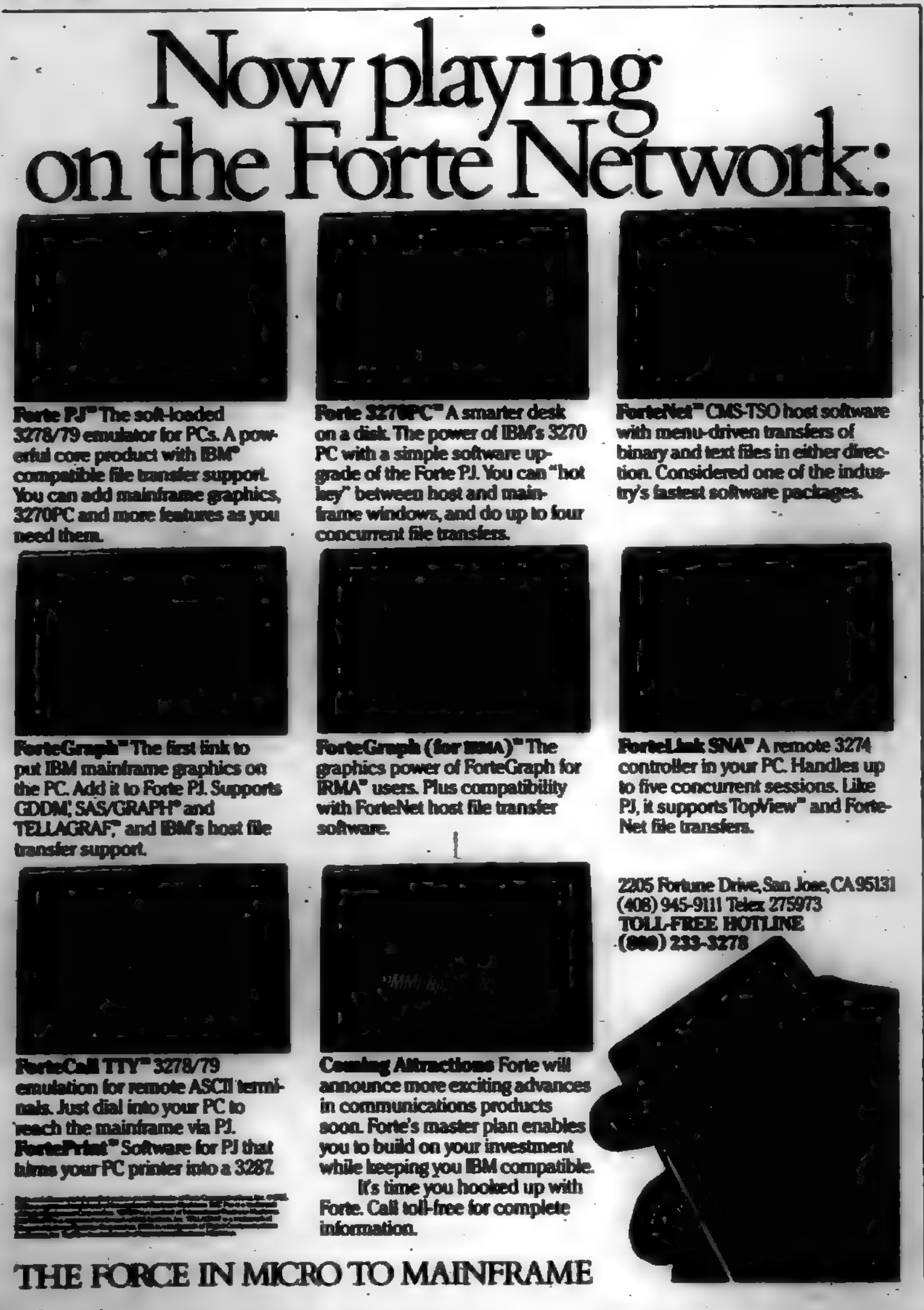

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THE FORCE IN MICRO TO MAINFRAME

COMPUTER INDUSTRY

U.S.-Japan chip dispute heats up

System vendor tensions eased by ending of duties

By Clinton Wilder
CW Staff

WASHINGTON, D.C. — Trade tensions between U.S. and Japanese semiconductor manufacturers heated up last week, while the tensions between computer system makers in both countries showed signs of easing.

At press conferences here and in San Francisco last week, the Japanese chip makers' trade group angrily denied allegations of trade barriers recently made by the U.S. Semiconductor Industry Association (SIA).

A spokesman for the Electronic Industries Association of Japan (EIAJ) called the SIA's allegations a "red herring" and claimed U.S. vendors hold a larger share of the Japanese semiconductor market than the Japanese do in the U.S.

The EIAJ announcement came just three days after Japan and the U.S. announced they would remove import duties on various types of computer hardware. Japan will remove its 4.9% duties on computer systems and parts and its 6% duty on peripherals, while the U.S. will drop its 4.3% duty on parts. The U.S. will retain duties of 4% on peripherals and 4.3% on systems.

"Our companies are most pleased by this agreement," said Oliver Smoot, executive vice-president of the Computer and Business Equipment Manufacturers Association. "We interpret it as reaffirming Japan's commitment to further open its market to foreign competitors."

But the war over semiconductor trade practices appears more intense than ever. In the EIAJ response to the SIA complaint, EIAJ spokesman Tomihiro Matsumura charged that U.S. chip makers are using Japan as a scapegoat for their poor performance during the industry's deep slump.

"A single segment of the U.S. semiconductor industry is exploiting general trade tensions in an attempt to seize a guaranteed share of the Japanese market," according to Matsumura, senior vice-president and director of NEC Corp. "The Japanese semiconductor market has been completely liberalized for trade and investment for over a decade."

The SIA recently filed a complaint with the Office of the U.S. Trade Representative under the Trade Act of 1974, charging the Japanese government with discouraging Japanese firms from making purchases of U.S.-made chips. In conjunction with the EIAJ's formal response filed with the Trade Representative's office last week, Matsumura said the complaint "has no basis in law or reality" and fails to cite any Japanese government acts that could be interpreted as trade barriers.

"SIA simply ignores the historic 'boom-

See TRADE page 76

- Developing and bringing a software product to market involves tremendous human and financial resources. A series beginning this week examines legal steps to protect such investments/72
- Sorbus, the Bell Atlantic third-party maintenance subsidiary, recently attracted an IBM service executive as its new president/73
- Sperry recently named its first national distributor for selling micro products to valued-added resellers/78

Cunningham upbeat after first month at CCI

By Charles Babcock
CW New York Bureau

NEW YORK — Claiming to "have worked harder and more productively than I have in a long time," former Wang Laboratories, Inc. President John F. Cunningham said he has been able within one month to set Computer Consoles, Inc. (CCI) on a new course.

Much of his time has been spent traveling between the Rochester, N.Y., Irvine, Calif., and Reston, Va., operations of the small office automation company. He became chairman and largest shareholder of the firm July 22. Cunningham said he has met most of the company's 1,500 employees individually and sat down with them in groups of 45 to discuss the company's future.

He left Wang, where he was a respected marketing force in a $2 billion company, to assume the top job in a company with revenue of $131 million last year. Cunningham said he likes the small company environment. "If it's broken, you can fix it yourself," he said at a press conference here recently.

Computer Consoles is not broken, but it has been limping through 1985. In the first six months of the year, it lost $10.1 million on revenue of $61 million after earning $6.3 million in 1984.

Cunningham said that when he decided to leave Wang, he had looked for a small company with good technology and the potential for rapid growth but one that needed his marketing skills. After 30 days at Computer Consoles, he said, he realized he had found just what he wanted, "and more."

Like Wang, Computer Consoles has been forced to lay off employees and cut costs since the start of the year. Asked how he would cut costs, Cunningham said most of the savings still to be achieved could be found in discretionary expenses, such as travel and entertainment.

Cunningham was introduced by Herman A. Affel Jr., the man who Cunningham replaced as chairman of Computer Consoles and who is now vice-chairman. Affel said the company had been looking for a strong chief operating officer for several years and thought it had found one in its former president, Vaemond H. Crane. Crane resigned after 18 months, however, to become the chairman of a California start-up company, MIPS.

Affel, 66, said he was happy to step aside for Cunningham and that the board of directors had quickly reached agreement with him on his new post. Cunningham had initiated the discussion by contacting a Computer Consoles board member, he said.

See CHAIRMAN page 76

IBM software pact raises questions

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

One key ingredient was missing from the vague announcement that IBM and Microsoft Corp. had signed a development agreement for work on future operating systems and systems software products — why?

Without access to the actual fine print of the agreement [CW, Aug 26], it is hard to know exactly what is intended and why it was announced. But it would seem that IBM has done little more than formalize an already tightly knit working relationship with the Bellevue, Wash.-based microcomputer software company.

Many in the industry seem to have accepted the agreement as an ironclad declaration that the Blue Behemoth has absolutely no intention of turning its back on Microsoft's MS-DOS operating system standard. That seems like a fair interpretation; but, realistically, for IBM to desert abruptly the standard that has gained it preeminence in the world of micro hardware would have made no sense.

With a lock on the hardware arena that no antitrust whiz kid could ever bust, why on earth should IBM risk the possibility of making it easier for the spawning of an alternative standard. If IBM turned a cold shoulder to third-party applications software vendors, they would have no choice but to adopt and nurture another vendor such as the newly cooperative Apple Computer, Inc.

If we take, for the sake of argument, the view that anything IBM does is to gain a competitive advantage, perhaps analysts and vendors of IBM-compatible systems should not be breathing so easy.

■

If anyone doubted that Wang Laboratories, Inc.'s problems run deep, John Cunningham's recent remarks [see story above] should pro-

See WANG page 75

Apple plant sold to Alps Electric

GARDEN GROVE, Calif. — As part of its move to cut costs by transferring production to third-party manufacturers, Apple Computer, Inc. last week sold its component plant here to supplier Alps Electric USA, Inc., a subsidiary of Japan's Alps Electric Co. Terms of the sale were not disclosed.

Alps will continue to make keyboards and mouse input devices for the Macintosh, Apple IIe and IIc microcomputers at the plant. Until the sale, Apple employees manufactured those products. Alps will also build components and peripherals for other OEMs in the computer, communications and automobile electronics industries.

The automated plant is Alps' first production facility in the U.S.

"Selling the Garden Grove operation is in keeping with our plans to concentrate our efforts on personal computers while relying on third-party vendors to supply us with components and accessories," said Delbert W. Yocam, Apple's executive vice-president of product operations.

Copyright protects software development investment

FIRST IN A SERIES

By Jerome Roberts
and Michael Brownell
Special to CW

Successfully developing and bringing a software product to market involves a substantial investment of human and financial resources. However, the value of the investment may be greatly diminished — or lost altogether — if the proprietary interest in the software product is not adequately protected.

The protection of that proprietary interest depends upon the judicious use of a combination of legal and physical tools designed for such a purpose.

The legal tools to be explored in this series include copyright, trade secret, trademark, patent, contract and semiconductor mask work law. This series is not intended to be exhaustive or to make the reader a legal expert in the area. Rather, it is intended to provide general information to assist the reader in recognizing where attention and a professional opinion, if applicable, may be advisable.

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The owner automatically owns, at the moment it is first fixed in a tangible medium, the exclusive copyright interest in the software created by either the owner or its employees within the scope of their employment, so long as such software has not been copied from an existing source. Under such circumstances, no additional action need be taken to vest copyright ownership in the owner. Ownership of the copyright for software developed by independent contractors under contract with the owner will vest in the independent contractor unless additional steps are taken by the owner to secure ownership. It is noted, however, that the independent contractor context raises many specific issues (most notably, what distinguishes an independent contractor from an employee for U.S. copyright purposes), which will be addressed in a subsequent article.

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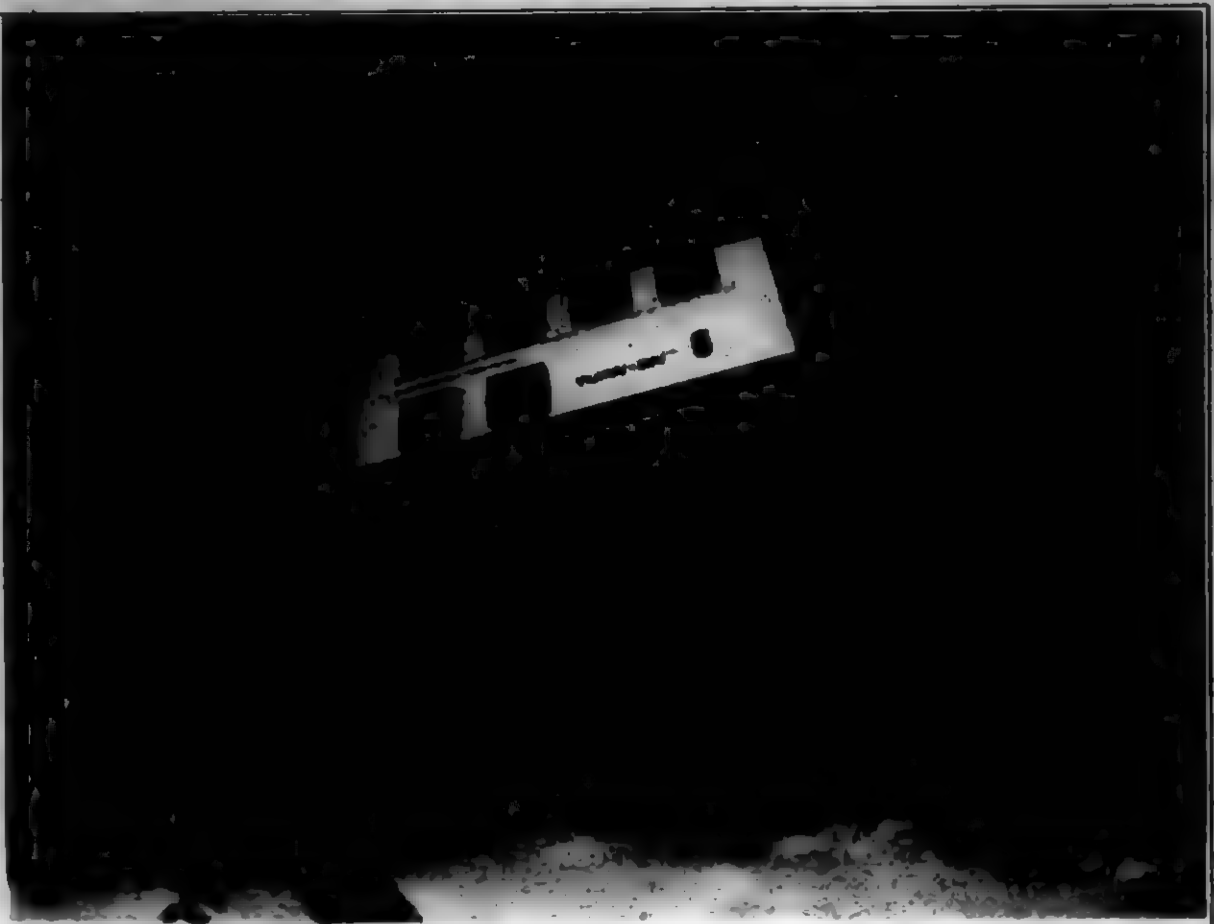
The notice should be placed on all media labels, embedded within the program code as a nonexecutable comment, placed on all documenta-

See PROTECT page 73

Roberts and Brownell are attorneys with the law firm of Berman, Roberts & Kelly in Chicago. This firm's practice deals with legal issues relating to procurement, development, distribution, management and protection of computer resources.



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Computervision appoints chief operating officer

BEDFORD, Mass. — Computervision Corp. recently named a member of its board of directors, Robert L. Gable, to the new position of chief operating officer and vice-chairman.

Gable, who was a vice-president and group executive at Kidde, Inc., will be responsible for all day-to-day operations, company President and Chief Executive Officer James R. Berrett said in a statement.

The financially ailing manufacturer of computer-aided manufacturing and design systems has suffered two consecutive losing quarters, following a record-breaking fiscal year in which revenue grew by 40%.

Berrett said Gable will report to him and "brings to our top management team special added strength to help us meet the complex and demanding challenges of doing business today in our industry and worldwide markets."

Gable was elected to Computervision's board of directors in 1974 and has served as chairman of the audit committee.

Prior to joining Kidde in 1966, he was president and chief executive officer of Craig Systems Corp. of Amesbury, Mass.

Former IBM exec to lead Bell Atlantic's Sorbus arm

FRAZER, Pa. — Sorbus, Inc., the third-party maintenance organization owned by a subsidiary of Bell Atlantic Corp., recently named as its president a 30-year veteran of IBM's field engineering and customer service operations.

Louis J. Ross, former director of quality and organization for the combined field engineering and customer service division of IBM, was named to replace Ronald A. Wallace, who retired.

Sorbus is a subsidiary of Bell Atlantic Enterprises and was acquired last year from Management Assistance, Inc.

Ross joined IBM as a customer engineer in 1957 after service with the U.S. Marine Corps. He held a number of positions in personnel, operations and measurements and field engineering before being assigned international responsibilities in 1967.

In 1980, Ross was appointed director of IBM's quality/field engineering division in the U.S. He was elevated to his most recent post two years later.

The retiring Wallace was affiliated with Sorbus for 17 years and served as president since 1981.

ADP announces record earnings

ROSELAND, N.J. — Automatic Data Processing, Inc. (ADP) recently announced record revenue and profits for the fourth quarter ended June 30 and its first billion-dollar year ever.

The computing services firm said revenue for the quarter was $266.3 million, up 14% from $233.1 million in the fourth quarter a year earlier.

Profits for the quarter just ended were $26.2 million, or 73 cents per share, compared with $21.8 million, or 62 cents per share.

Revenue up 16% for year

For the year, revenue was $1.03 billion, up 16% from year-earlier revenue of $888.9 million. Profits for the year were $87.8 million, or $2.47 per share, up 17% from $75.1 million, or $2.14 per share the previous year.

Josh S. Weston, president and chief executive officer, announced the results in a statement noting it was the company's 36th consecutive year of record revenue and profits. He said that the current fiscal year is expected to be as good. "Earnings per share are projected to grow by close to 20%, and revenue growth should be close to 15%," he said.

PROTECT

from page 72

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Quadrex named Sperry reseller

BLUE BELL, Pa. — Sperry Corp. recently announced that it had signed on its first national distributor to resell Sperry's computer products to value-added resellers.

Quadrex Computer Systems, Inc., a Campbell, Calif.-based subsidiary of Quadrex Corp., was signed on to resell a line of Sperry products — including microcomputers, peripherals, software and minis — based on AT&T's Unix operating system.

The agreement represents Sperry's growing commitment to indirect sales channels, according to Rich Lucia, director of Indirect Sales Marketing for Sperry.

NICKELS AND DIMES

Computer & Communications Technology Corp. announced revenue for its second-quarter period of $25.4 million, compared with $29.6 million for the same quarter of the previous year. Profits were $177,000, or 2 cents per share, compared with $2.9 million, or 37 cents per share, for the same period one year earlier.

■

Integrated Software Systems Corp. announced revenue for the second quarter ended June 30 of $8.7 million, an increase of 24% from $7 million in the same quarter last year. Profits were $613,000, or 11 cents per share, up 22% from $472,000, or 9 cents per share, for the same period one year earlier.

■

Wyse Technology announced that revenue for the first quarter of fiscal 1986 ended June 30 was $29.4 million, an increase of approximately 124% over $13.1 million in the same period last year. Profits were $2.5 million, or 29 cents per share, compared with $1.4 million, or 26 cents per share, in the comparable period last year.

■

Scientific Micro Systems, Inc. announced that revenue for the quarter ended June 30 was $8.5 million, compared with $11.3 million in the same quarter one year ago. The firm posted a net loss of $740,000, or 10 cents per share, compared with a profit of $1.2 million, or 21 cents per share, in the same quarter one year ago.

■

Daisy Systems Corp. announced that revenue for the third fiscal quarter ended June 30 was $32.5 million, an increase of 75% over $18.5 million for the comparable period last year. Profits for the quarter were $6.6 million, or 31 cents per share, compared with $2.8 million, or 19 cents per share, in the same quarter last year.

■

Micom Systems, Inc. reported revenue of $66.4 million for the first period of fiscal 1986, compared with $45.2 million in the corresponding period last year. Profits were $2.4 million, or 14 cents per share, compared with $6.6 million, or 28 cents per share, for the prior year's first quarter.

WANG

from page 71

vide some enlightenment. In his first public appearance after departing the post of president and chief operating officer of Wang to take the top spot at Computer Consoles, Inc., Cunningham said he had never heard of his new company until earlier this year and believed Wang's chairman, An Wang, was at a similar disadvantage.

Granted, Computer Consoles is a relatively small player in the office automation field. But any competitor is a potential challenger and justifies at least examination, if not recognition.

In light of the fact that Computer Consoles has sewn up some impressive international OEM deals for its office products, the ignorance at Wang indicates a lack of attention to the basics.

■

Other than affected unions, nobody seems too surprised by AT&T's decision to ax 20% of its Information Systems group work force.

But don't look for any great turnaround in that corner until AT&T manages either to bring out an impressive state-of-the-art line of computer products or until it hooks up with an experienced challenger to IBM.

The view in this corner is not to hold one's breath for either development.

■

At least one semiconductor manufacturer is seeing a continuation of the yearlong recession that has that industry on the ropes.

In a Securities and Exchange Commission filing related to an offering of convertible shares, National Semiconductor Corp. revealed that sales are off considerably in the current quarter.

From June 1 through July 28, sales were only $175.7 million, compared with $207.1 million for the comparable period in 1984.

Profits headed south, with a loss of $44.3 million for the period, compared with profits of $2.4 million a year earlier.

Qualifying the report, National Semi said the results are not necessarily indicative of what can be expected for the quarter and do not reflect normal adjustments made at the end of each quarter.

But if a pickup in orders does not occur, significant losses are expected for the quarter, according to the company.

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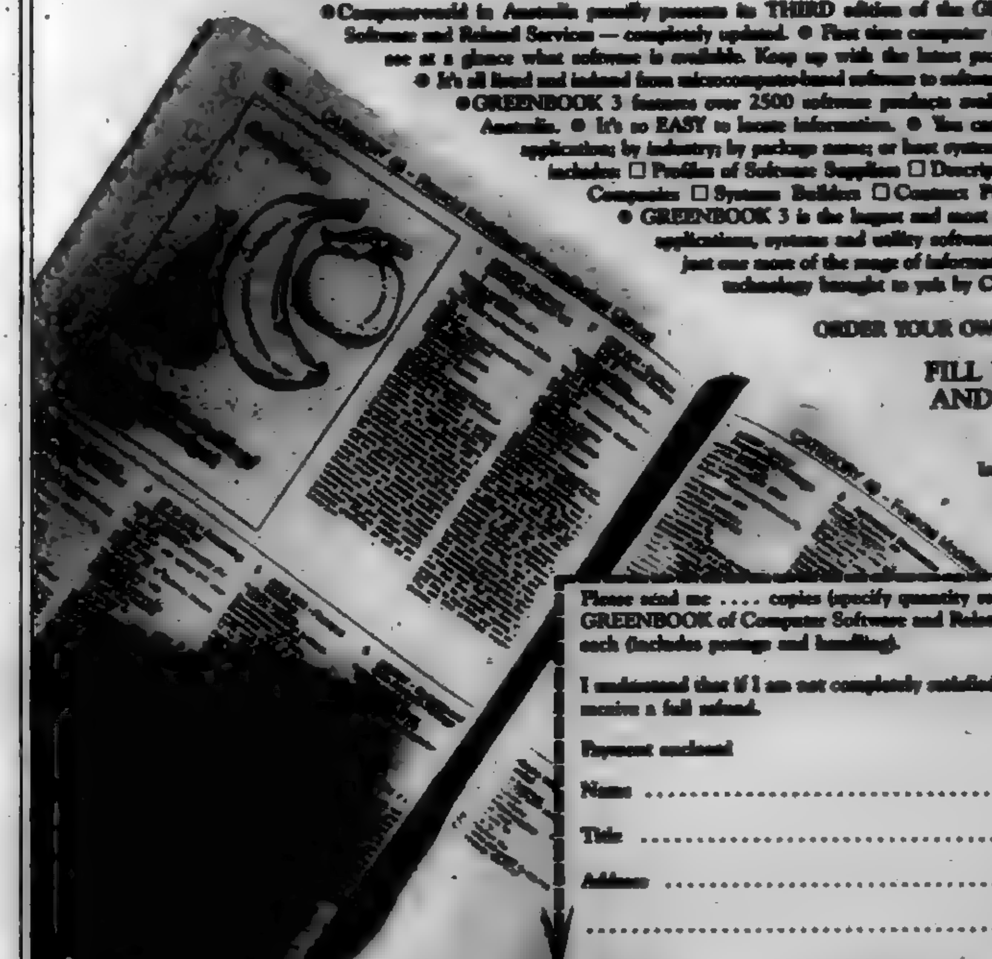

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FRA

CHAIRMAN

from page 71

"An Wang [chairman of Wang] was going to have his son run the company; that's no secret. So John looked around for where he could be the real boss," Affel said.

Cunningham said he had not heard of Computer Consoles until last February, and in discussing his move with Chairman Wang, he realized in July that Wang had never heard of it.

The two companies compete at least indirectly. Both sell office automation systems to small- and medium-size businesses, including legal offices. Computer Consoles sold a major system in Wang's backyard last year when it provided the office automation system to Hale & Dorr, Boston's largest law firm.

Computer Consoles is more of a vertical market manufacturer, however, incorporating special software packages on its Power series of AT&T Unix-based processors.

Cunningham is still a member of the board of directors at Wang. Attorneys at Wang are examining the relationship, and Cunningham said he would probably submit his resignation at an October board meeting.

Cunningham disclosed that he had decided to move Computer Console's headquarters, which have been in Rochester since it was founded in 1968, to Boston. A small planning and administrative staff will work with him there.

Cunningham said he will push Computer Consoles to introduce more low-end products, since its Power 6/32 Unix processor represents too much overhead for a small business. New low-end products will be announced before the start of the Sept. 18 conference on Unix in New York, he said.

Computer Consoles' core business has been selling hardware and software to specialized users such as law offices and financial service firms. Its hopes of selling to larger customers with broader needs would be based on the assumption that these customers would have the in-house technical skills to develop their own applications, Cunningham said.

He said Computer Consoles has overlooked the possibility to date of major sales to OEMs and value-added resellers, and he expects to reorient efforts in that direction over the next few months.

While he anticipates operating in the black in 1986, he said Computer Consoles could not expect to resume its rapid growth path before 18 to 24 months.

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TRADE

from page 71

and-bust' cycles of the semiconductor industry," Matsumura said. "The current slump in the U.S. industry is primarily due to depressed markets for personal computers and video games, as well as the current misalignment in exchange rates."

The EIAJ, an association of 600 Japanese business and consumer electronics manufacturers, claimed that U.S. chip makers hold a 19.1% share of the Japanese market, compared with the Japanese share of 9.6% of the U.S. market. Matsumura charged that SIA statistics showing the opposite imbalance fail to include Japanese sales of chips made by U.S. companies in off-shore plants.

The EIAJ further charged that SIA figures have downplayed U.S. vendors' share of the U.S. market by ignoring sales of chips within so-called captive manufacturers, such as AT&T and IBM.

An EIAJ spokesman claimed that such sales by U.S. companies to themselves account for approximately 32% of domestic semiconductor sales. "The SIA's failure to include those sales accounts for the large disparity between their figures and ours," the spokesman said.

Figures inaccurate, irrelevant

For its part, the SIA accused the EIAJ of juggling numbers from "a variety of nontraditional sources" to discredit the SIA complaint. "Not only are their statistics misleading and inaccurate, they are also irrelevant," according to Daryl Hatano, manager of governmental affairs for San Jose, Calif.-based SIA.

"Our goal is a share of the Japanese market comparable to our worldwide share. If they inflate our Japanese share by using those methods, our worldwide share is inflated by the same amount."

Hatano said the SIA market share figures are based on figures from what he called two "universally accepted sources" — the World Semiconductor Trade Statistics program and the U.S.-Japan High-Technology Working Group.

LSI, Kawasaki Steel to build chip facility

MILPITAS, Calif. — LSI Logic Corp., a semiconductor vendor based here, recently announced a joint venture with a $5 billion Japanese steel company to produce silicon wafers and application-specific, very large-scale integration chips in Japan.

LSI and Kawasaki Steel Corp. announced the formation of Tokyo-based Nihon Semiconductor Corp. to build a $100 million chip manufacturing facility at a site that remains to be announced. The plant is expected to be completed by mid-1987 and employ 250 people by the end of 1988.

LSI currently has another Tokyo-based affiliate, Nihon LSI Logic Corp., to market its Cmos chips in the Far East.

Nihon LSI President Keisake K. Yawata was named president of Nihon Semiconductor.

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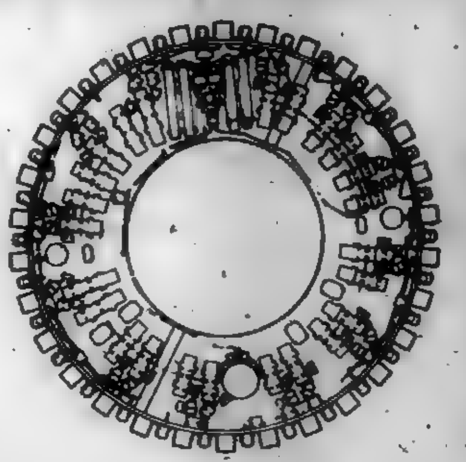

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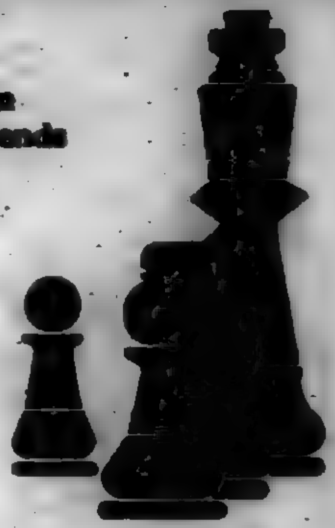

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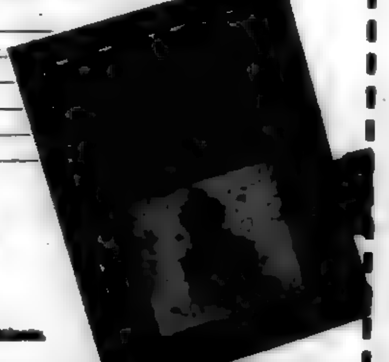

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Southern Connecticut Gas Company seeks a VSE systems Programmer to work in our Software Services Department, Bridgeport division.

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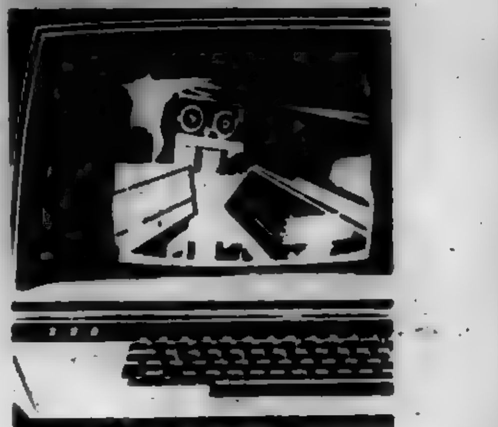

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4321	0.25	1	*4381-3	[illegible]	[illegible] to 32
4331-1	0.25	0.5 to 1	3083E	[illegible]	[illegible] to 32
4331-11	0.38	1 to 2	3033N	4.3	[illegible] to 16
4331-2	0.50	1 to 4	3083EX	4.4	[illegible] to 32
4341-9	0.52	1 to 4	[illegible]	[illegible]	[illegible]
4361-3	0.70	2 to 4	[illegible]	[illegible]	[illegible]
4341-10	0.75	2 to 4	[illegible]	[illegible]	[illegible] to 32
4341-1	0.88	2 to 4	[illegible]	[illegible]	[illegible] to 32
4341-11	1.1	2 to 8	[illegible]	[illegible]	8 to 32
4361-4	1.15	2 to 12	[illegible]	[illegible]	4 to 24
3031	1.2	2 to 8	[illegible]	[illegible]	8 to 32
4361-5	1.45	2 to 12	[illegible]	[illegible]	16 to 32
4341-2	1.5	2 to 16	[illegible]	[illegible]	16 to 48
4341-12	1.85	2 to 16	[illegible]	[illegible]	16 to 64
3031AP	2.0	2 to 8	[illegible]K	14.8	16 to 48
4381-1	2.1	4 to 16	[illegible]KX	15.5	16 to 64
3032	2.5	2 to 8	[illegible]	26.6	32 to 96
4381-2	2.7	4 to 32	3084QX	28.7	32 to 128
3033S	2.8	4 to 16	†3090-200	29.4	64 to 192
*3083CX	3.3	8 to 32	†3090-400	52.9	128 to 384

*First installation 1984. †First installation 1987

AMDAHL

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470V 7A	4.[illegible]	[illegible] to 32
470V/7B	5.5	[illegible]
470V 8	[illegible]	[illegible] to 32
5840	[illegible]	[illegible] to 64
5860	11.[illegible]	16 to 64
5880	14.[illegible]	16 to 64
5867	22.0	24 to 64
5868	[illegible]	32 to 128
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5890	26.8	32 to 128

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AS 9050	9	8 to 48
AS 9060	11.2	16 to 64
AS 9070	16.2	16 to 64
AS 9080	20	16 to 64
†AS XL-60	28	32 to 256
†AS XL-80	50	64 to 256

†First installation 1986

The above information is intended as a guideline for computer users on relative computer system instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However, Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based on hardware/software configurations, and system manufacturers continually modify computer models as design improvements in hardware and software arise.

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- Units are one column wide by one inch deep at a cost of $140.00 per column inch. Although several units may be purchased for one advertisement, there will be no quantity discount.
- All ads are standard in format and typeface. No special typeface, borders or logos are allowed. Copy may be up to 25 words per unit.
- The Bulletin Board ads are listed by manufacturer or by product type under appropriate headlines.
- Ads are set on a six-column page in our classified section under "The Bulletin Board".

How to Place an Ad in the Bulletin Board:

- We suggest you prepare your ad before contacting us. Here are some guidelines:
  The first line is set in larger, bold type and should contain standard equipment identification.
  The body copy should describe the equipment and state the price.
  The closing should supply the seller's name and telephone number.
  This is all the information an interested buyer needs for follow up.
- Ads are accepted by mail, phone or by telecopier.
- Deadline is 7 days in advance of Monday issue.
- If you have never advertised with Computerworld, we request a check with your order.
- The Bulletin Board ads are not agency commissionable nor may they be applied to contract advertisers inch count.
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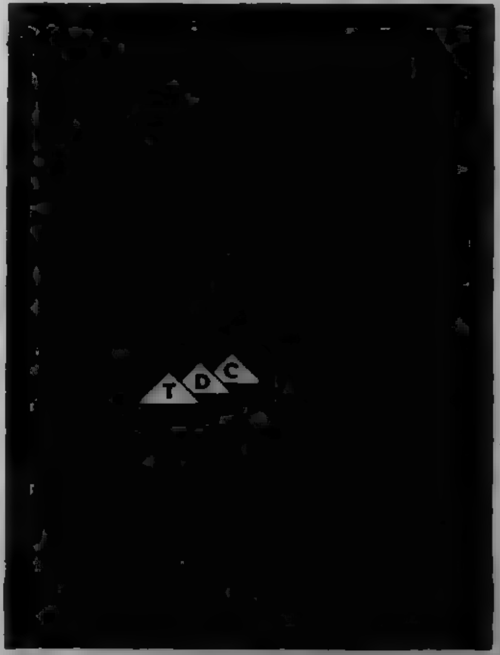

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Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines. Any special artwork should be enclosed with your ad also. Logos must be submitted on white bond paper for best reproduction.

Cost: Our rates are $144.90 per column inch. (Each column is 1 13/16") Minimum size is two column inches (1 13/16" wide by 2" deep) and costs $289.80 per insertion. Extra space is available in half-inch increments and costs $72.45. Box numbers are $15.00 extra per insertion.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE, or a Purchase Order Number. Any extensions on this policy must be made through our Credit Department.

Issue Date(s): ____________________

Section: ____________________

Signature: ____________________

Name: ____________________

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Telephone: ____________________

Send this form to:

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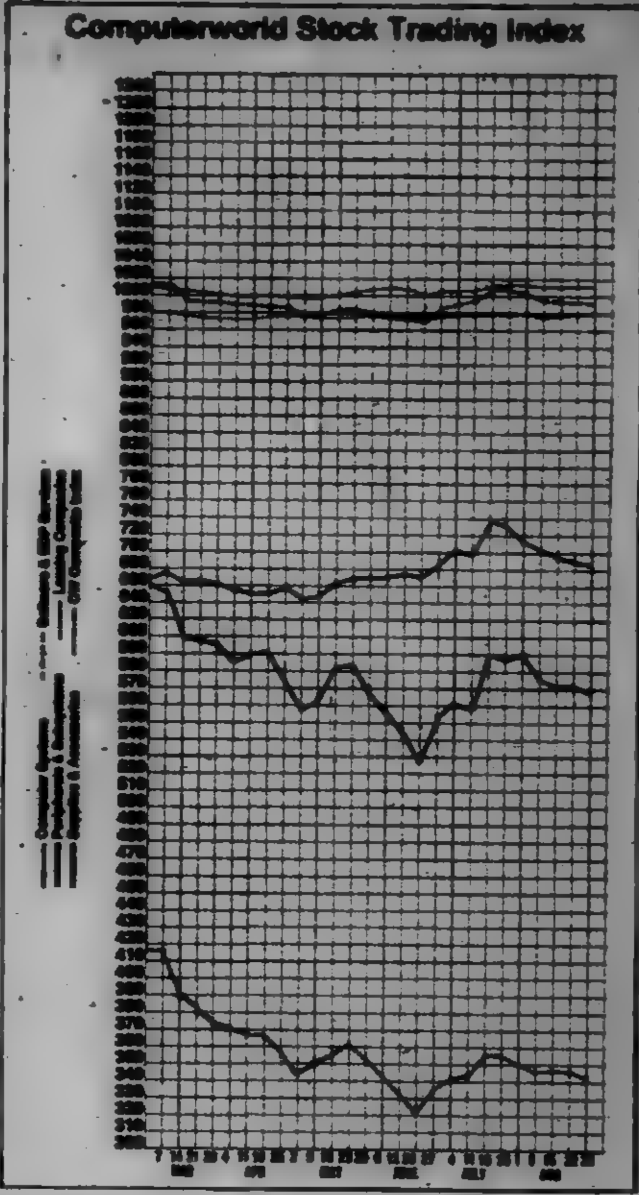
Computerworld Stock Trading Index



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 28, 1985

All statistics compiled
computed and formatted
by
TRADE QUOTES INC
Cambridge Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1985 RANGE (1)	CLOSE AUG 28 1985	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	3- 12	5 5/8	- 1/8	-2.1
O	ALTOS COMPUTER SYST	7- 14	10 1/4	- 1/4	-2.3
A	AMDAHL CORP	10- 18	13 7/8	- 1/8	-0.8
O	APPLE COMPUTER INC	14- 31	15 1/4	0	0.0
N	AT&T	19- 25	22 5/8	- 1/4	-1.1
N	BURROUGHS CORP	51- 66	62 1/4	+ 3/8	+0.6
N	COMPAQ COMPUTER CP	4- 12	11 1/2	0	0.0
O	COMPUTER AUTOMATION	3- 8	7 1/8	0	0.0
A	COMPUTER CONSOLES	3- 20	7 7/8	+ 7/8	+12.5
N	CONTROL DATA CORP	22- 38	24 1/4	+1 3/8	+6.0
O	CONVERGENT TECHNOL.	3- 17	6 5/8	- 3/8	-5.3
O	CPT CORP	3- 12	6 1/8	0	0.0
N	CRAY RESEARCH INC	37- 51	50 3/4	+2	+4.1
O	DAISY SYSTEMS CORP	21- 38	22 1/2	-1 1/8	-5.0
N	DATA GENERAL CORP	38- 76	39 5/8	+ 1/2	+1.3
N	DATAPOINT CORP	3- 23	5 1/8	+ 1/8	+2.1
N	DIGITAL EQUIPMENT	93-128	106 3/8	+1 5/8	+1.5
A	[illegible] INC	12- 16	16 7/8	0	0.0
O	ELECTRONIC ASSOC.	3- 6	4 5/8	- 1/4	-2.1
O	FLOATING POINT SYST	13- 32	30 3/4	+2 1/2	+7.7
N	FOXBORO	30- 38	33 5/8	- 3/8	-1.4
N	GOULD INC	20- 32	27 3/4	+2 3/4	+11.0
N	HARRIS CORP	23- 33	29 5/8	- 1/2	-1.6
N	HEWLETT-PACKARD CO	31- 44	35 1/2	+ 1/2	+1.3
N	HONEYWELL INC	53- 67	61 3/8	-3 1/8	-4.8
N	IBM	119-138	128	- 3/8	-0.2
O	IPL SYSTEMS INC	3- 4	1 5/8	- 3/8	-18.7
N	ITT CORP	24- 37	33 7/8	+1 3/8	+4.2
N	M/A-COM INC	10- 24	10 3/4	- 1/4	-2.2
O	MANAGEMENT ASSIST	2- 20	2 5/8	+ 1/8	+5.0
N	MATSUSHITA ELEC(ADR)	32- 58	51 1/2	-3 3/8	-6.3
A	MODULAR COMPUTER SYS	6- 10	6 7/8	0	0.0
N	MOHAWK DATA SCI	2- 15	2	+ 1/8	+6.6
N	MOTOROLA INC	28- 44	35 5/8	+ 1/8	+0.6
N	NAT'L SEMICONDUCTOR	10- 17	11 7/8	-1 3/4	-12.8
N	NBI INC	13- 21	15 7/8	- 1/8	-0.7
N	NCR	22- 35	30 1/8	- 1/8	-0.2
N	PERKIN-ELMER	22- 30	28 1/8	0	0.0
N	PRIME COMPUTER INC	15- 20	18	0	0.0
N	SPERRY CORP	38- 55	50 3/8	+1	+2.0
O	STRATUS COMPUTER INC	8- 18	17 3/4	+1 1/4	+7.5
N	TANDEM COMPUTERS INC	14- 28	14 1/8	-1 1/8	-7.2
N	TANDY CORP	24- 37	34 1/4	- 3/8	-1.0
O	TELEVIDEO SYSTEMS	2- 7	2 1/4	- 1/8	-5.2
O	TELXON CORP	7- 18	17	0	0.0
N	TEXAS INSTRUMENTS	88-140	86 3/4	0	0.0
O	ULTIMATE CORP	8- 26	13 3/8	- 1/8	-0.9
O	VECTOR GRAPHICS INC	0- 1	3/4	- 3/16	-18.3
A	WANG LABS "B"	15- 32	16 7/8	+ 1/4	+1.5
A	WANG LABS "C"	15- 32	16 3/4	+ 1/8	+0.7
N	XEROX CORP	47- 58	53 3/8	- 1/8	-0.2

LEASING COMPANIES

EXCH		PRICE 1985 RANGE (1)	CLOSE AUG 28 1985	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	8- 20	13 1/8	- 1/2	-2.3
O	CONTINENTAL INFO SYS	8- 12	11 1/2	+ 3/8	+3.3
O	FINALCO GROUP INC	2- 7	3 1/8	0	0.0
O	PHOENIX AMERICAN INC	2- 8	2 1/2	+ 1/4	+11.1
O	SELECTERM INC	6- 14	7 3/4	- 1/8	-1.5
N	U.S. LEASING	33- 40	34 3/8	- 1/2	-1.4

COMPONENTS

EXCH		PRICE 1985 RANGE (1)	CLOSE AUG 28 1985	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	22- 41	27 7/8	-1	-3.4
O	[illegible] SEMICONDUCTOR	8- 23	8 3/4	- 1/4	-2.7
N	ANALOG DEVICES INC	18- 28	22 1/4	+1 1/4	+5.9
O	ANALOGIC CORP	9- 18	16 3/8	- 1/8	-0.8
O	APPLIED MAGNETICS CP	8- 18	14	- 1/8	-0.8
O	HADCO CORP	3- 10	3 5/8	- 3/8	-9.3
O	MICRO MASK INC	3- 14	7 5/8	+ 1/4	+3.4
N	TERADYNE	26- 38	23 1/8	- 1/2	-2.1

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1985 RANGE (1)	CLOSE AUG 28 1985	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	2- 4	3	0	0.0
O	ADVANCED SYSTEMS INC	8- 20	13 1/8	+ 1/8	+1.0
N	AGS COMPUTERS INC	10- 17	10 7/8	- 3/8	-3.3
O	AMERICAN SOFTWARE	7- 15	13	- 1/4	-1.9
N	ANACOMP INC	1- 4	2 3/8	- 1/8	-5.1
O	ANALYSTS INTL CORP	3- 11	8 1/4	0	0.0
O	APPLIED DATA RES	22- 40	23 7/8	- 5/8	-2.5
O	ASHTON TATE	9- 13	12 1/2	- 3/8	-2.9
O	ASK COMPUTER SYSTEMS	11- 24	13 1/2	0	0.0
O	[illegible] CORP INC	1- 7	2 3/4	0	0.0
N	AUTOMATIC DATA PROC	38- 50	51 7/8	+1 1/8	+2.2
O	COMPUTER ASSOC INT'L	10- 30	28	+ 3/4	+2.8
O	COMPUTER HORIZONS	7- 11	11 1/2	+ 1/4	+2.2
O	COMPUTER NETWORK	3- 10	7 1/8	0	0.0
N	COMPUTER SCIENCES	12- 34	23 7/8	+ 3/8	+1.6
O	COMPUTER TASK GROUP	10- 20	18	- 1/2	-2.7
O	COMPUTER USAGE	1- 3	2 1/2	- 1/4	-9.0
O	[illegible] SYSTEMS	4- 11	5 3/4	- 1/8	-2.1
O	COMSERV CORP	1- 8	2 7/8	0	0.0
O	COMSHARE	6- 10	6 3/8	- 1/8	-2.3
O	CULLINET SOFTWARE	17- 28	17 1/8	- 3/8	-2.1
O	CYCARE SYSTEMS INC	18- 27	24 7/8	+ 3/4	+3.0
O	[illegible] SYSTEM INC	4- 15	4 1/2	- 1/8	-2.7
N	GENERAL ELECTRIC CO	50- 66	61 1/2	- 1/8	-0.2
N	GEN. MOTORS E (EDS)	17- 47	38 7/8	-2 3/8	-5.8
N	GTE CORP	38- 45	40 1/4	+ 1/2	+1.2
N	INFORMATICS GENERAL	13- 27	22 7/8	0	0.0
O	INFORMATION SCIENCE	1- 8	2	+ 1/4	+14.2
O	INFOTRON SYSTEMS CP	18- 28	21 1/2	-1	-4.4
O	KEANE ASSOCIATES	8- 18	16	-1	-5.8
N	LOGICON	26- 38	35 7/8	- 3/4	-2.1
O	LOTUS DEVELOPMENT CP	17- 30	22	-3 3/4	-14.5
O	MCI COMMUNICATIONS	7- 11	8	+ 1/8	+1.6
O	MGMT SCI AMER INC	9- 18	14 3/8	+ 1/8	+0.8
O	MATHEMATICAL APP GRP	3- 8	3 1/4	- 1/8	-3.7
O	MICOM SYSTEMS INC	10- 42	10 1/4	- 1/8	-1.2
O	MICROPRO INT'L CP	2- 4	2 3/8	0	0.0
O	NATIONAL DATA CORP	7- 18	12 7/8	- 1/8	-0.9
O	ON-LINE SOFTWARE INT	4- 10	8 1/8	0	0.0
O	PANSOPHIC SYSTEMS	11- 28	20	+ 3/8	+0.3
O	PLANNING RESEARCH	8- 17	15 7/8	+ 1/8	+0.7
O	POLICY MGMT SYSTS CP	19- 28	21 3/4	-1 3/8	-5.7
O	PROGRAMMING & SYS	4- 6	5 7/8	+ 1/4	+4.0
N	REYNOLDS & REYNOLDS	28- 44	38 1/4	-1 1/8	-3.0
O	SEI CORP	11- 18	18 1/4	+ 1/2	+2.8
O	SHARED MEDICAL SYST	24- 34	32 3/8	- 1/8	-0.3
O	SCIENTIFIC COMPUTERS	5- 12	8 1/8	0	0.0
O	SOFTWARE AG	11- 22	19 3/4	+ 3/8	+2.0
O	[illegible] CORP	10- 14	11 3/8	- 1/2	-4.1
O	UCCEL	9- 17	15 3/8	- 1/8	-0.8

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1985 RANGE (1)	CLOSE AUG 28 1985	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	3- 9	3 7/8	+ 1/8	+3.3
O	ANDERSON JACOBSON	3- 11	2 5/8	- 1/8	-4.5
O	AST RESEARCH INC	7- 22	13 3/4	+ 3/4	+5.3
O	AUTO-TROL TECHNOLOGY	6- 13	6 1/8	+ 1/8	+2.0
O	[illegible] COMPUTING	6- 20	8	0	0.0
O	BANCTEC INC	9- 12	9 1/2	- 1/8	-1.3
O	BEEHIVE INT'L	1- 2	1/8	0	0.0
N	BOLT, BERANEK & NEW	18- 30	30 1/4	+1 3/8	+4.1
O	CAMBEX CORP	1- 3	7/8	- 1/8	-12.5
N	CENTRONICS DATA CORP	3- 12	4 3/8	+ 1/2	+13.1
A	CETEC CORP	6- 16	7	- 1/8	-1.7
A	COGNITRONICS	4- 7	5	- 1/8	-2.7
O	COMPUGRAPHIC CORP	20- 37	20 7/8	+ 3/8	+0.3
O	COMPUTER TRANSCEIVER	1- 4	5/8	0	0.0
N	COMPUTERVISION CORP	13- 45	14 1/8	+ 3/8	+2.3
N	CONRAC CORP	12- 16	13 7/8	+ 1/4	+1.8
A	DATAPRODUCTS CORP	11- 28	12 3/4	+ 1/8	+0.9
A	DATARAM CORP	3- 7	5 3/8	0	0.0
O	DATA SWITCH CORP	4- 8	5 3/8	+ 3/8	+7.5
O	DATUM INC	5- 8	5 1/2	- 1/8	-2.2
O	DECISION DATA COMPUT	8- 14	10 5/8	+ 1/8	+1.1
O	DOCUTEL-OLIVETTI	3- 8	5 3/8	0	0.0
O	[illegible] INC	4- 25	7 1/2	- 3/8	-4.8
O	EVANS & SUTHERLAND	8- 38	38 3/8	+1 1/2	+4.3
O	[illegible] TECHNOLOGIES	4- 20	6	- 1/8	-2.0
N	GEN'L DATA COMM IND	13- 28	13 1/8	- 1/2	-3.6
N	HAZELTINE CORP	8- 38	27 5/8	- 3/8	-1.3
O	ICOT CORP	7- 17	7	- 3/8	-5.0
O	INFORMATION DISPL INC	4- 13	10	- 1/2	-5.0
A	[illegible] INC	6- 28	2 7/8	0	0.0
O	INTEL CORP	7- 38	23 7/8	- 3/8	-1.4
A	[illegible] ELECTRONICS	4- 14	12 3/4	0	0.0
O	[illegible] CORP	4- 22	4 3/8	- 1/4	-5.4
A	MSI DATA CORP	8- 30	8 1/8	+1 1/8	+16.0
N	[illegible] CORP	18- 27	23 3/8	+ 1/8	+0.4
O	NETWORK SYSTEMS CORP	20- 40	23 7/8	- 1/2	-4.4
N	NO AMERICAN PHILIPS	38- 47	34 1/2	- 3/8	-1.7
N	NORTHERN TELECOM TD	0- 38	38 3/8	-1	-2.0
O	[illegible]	1- 3	3/8	0	0.0
N	PARADYNE CORP	8- 14	10 1/8	+ 1/8	+1.2
A	[illegible] CORP	8- 28	8 3/4	- 1/4	-2.7
N	PLESSEY CO (ADR)	8- 23	21 1/2	- 3/4	-3.3
O	PRINTRONIX INC	8- 17	12	- 3/8	-3.0
O	QMS INC	3- 11	10 5/8	- 1/8	-1.1
O	[illegible] CORP	4- 13	3 3/8	- 1/8	-3.3
N	RECOGNITION EQUIP	8- 31	8 1/4	- 1/2	-5.1
N	SANDERS ASSOCIATES	31- 38	35 1/2	+ 3/8	+1.4
O	SCAN-TRON CORP	8- 16	16	+ 1/8	+1.3
N	SCIENTIFIC ATLANTA	4- 16	13 7/8	- 1/8	-0.9
O	SEAGATE TECHNOLOGY	2- 12	7 1/4	0	0.0
N	STORAGE TECHNOLOGY	1- 7	2 1/4	0	0.0
O	SYKES DATATRONICS	0- 11	1/8	- 3/16	-60.0
A	T BAR INC	5- 20	8 1/8	+1 1/8	+16.1
A	TAB PRODUCTS CO	4- 18	16 1/8	- 3/8	-2.3
O	TANDON CORP	4- 13	4 1/8	- 3/8	-8.3
A	TEC INC	8- 38	8 5/8	+ 7/8	+2.9
P	TEKTRONIX INC	50- 63	60	-8	-12.0
N	TELEX	1- 48	62 1/8	- 3/4	-1.0
O	[illegible] SYSTEMS CP	1- 20	1	- 1/4	-20.0
N	TIMEPLEX INC	8- 30	10 1/2	- 1/2	-5.0
O	TITAN CORP	3- 9	7	- 1/8	-1.7
O	VISUAL TECHNOLOGY	1- 10	1 3/8	- 1/8	-8.3

SUPPLIES & ACCESSORIES

EXCH		PRICE 1985 RANGE (1)	CLOSE AUG 28 1985	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	21- 30	25 1/8	- 1/4	-1.0
N	BARRY WRIGHT	18- 28	20 3/4	- 1/2	-2.3
A	DUPLEX PRODUCTS INC	13- 18	15 3/8	+ 3/8	+2.5
N	ENNIS BUS. FORMS	10- 20	18 7/8	+ 3/8	+2.0
N	3M COMPANY	70- 88	75 1/8	- 7/8	-1.1
O	MOORE CORP LTD	19- 22	18 1/4	- 3/8	-2.0
O	STANDARD REGISTER	19- 30	32	+ 1/2	+1.6
N	WALLACE COMP SERVICE	20- 40	23 3/8	-1 3/8	-3.9

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NEWSPAPER

Trade bans anger users in S. Africa

DP community fears halt in U.S. computer imports

By John Desmond

The South African community of computer users is fortifying itself for a restriction on the sale of computer hardware and software from the U.S.

This was the consensus gathered from a series of telephone interviews with South African computer users, vendors and observers conducted by *Computerworld* last week.

The U.S. Congress is considering legislation that would ban the sale of computer hardware, software and services to agencies of the South African government that administer apartheid, the policy of racial separation. A vote on the legislation is expected in the U.S. Senate this week.

"Any kind of restrictive or punitive action would be a great disappointment," said Jack van Nunen, DP manager at a Johannesburg insurance company and spokesman for the 220-member Computer Users Council of South Africa.

John Millin, Amdahl Corp.'s manager in South Africa, added, "The action by the U.S. government is just helping to kill U.S.-based companies in South Africa. There will always be vendors prepared to supply equivalent equipment. The U.S. government can't apply its rules to the rest of the world. [The ones that] will suffer are the U.S. corporations [that] are trying to influence the government here to make reforms."

The impact of the restrictions, if passed, would depend on the pressure the U.S. puts on the Japanese and European governments not to sell computer technology to affected agencies of the South African government, Millin said.

The bill being considered by Congress, the Anti-Apartheid Act of 1985, would prevent the sale of computers to the South African military, police, prison system, national security agencies and the Department of Cooperation and Development, which administers the affairs of blacks in the townships [CW, June 17].

The bill would not essentially change restrictions that have been in place since 1978, when President Carter restricted the sale of computer equipment to all the above-named agencies of the South African government. Those restrictions are being honored by U.S. companies, several sources said.

However, approval of the bill by Congress and President Reagan would make South African users more reluctant to do business with U.S. companies, according to Miss van Vuuren, general manager for Burroughs Corp. in South Africa.

"Most South African customers would consider it risky to do business with U.S. suppliers because the embargo might be

Continued on page 10

AT&T, Sun to redo Unix

By John Desmond

AT&T and Mountain View, Calif.-based Sun Microsystems, Inc. said last week that they are working together on a convergence of AT&T's Unix System V with Sun's University of California at Berkeley Unix 4.2-based operating system.

Unix System V is currently an industry standard for commercial users, while Berkeley Unix 4.2 is used widely in the academic and scientific communities.

According to Bill Joy, vice-president of research and development at Sun and a principal designer of Berkeley Unix 4.2, "This is a significant step toward unifying the Unix system license community around a single standard. The joint AT&T and Sun effort will work on evolving the System V standard to accommodate the services offered by [Berkeley 4.2]."

The converged system will continue to run System V applications and will provide advanced networking services that have previously only been available in

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With a leveraged offering, Asher Edelman wants to take Datapoint private. Page 2.

■

Making memories. AT&T starts producing its 1M-bit memory chip. Page 12.

■

Just like the private sector, government DP budgets hit a plateau this year, according to the Office of Management and Budget. Page 14.

■

A new slant. Digital Research is turning to applications packages and away from systems software. Page 116.

Debuts link firm's line of software

Martin Marietta offerings further its master plan

By John Gallant

NEW YORK — Martin Marietta Data Systems last week introduced the first offerings in a projected product line designed to tie together the company's disparate software systems.

The announcement is the latest move in Martin Marietta's two-pronged strategy of internal development and aggressive acquisition, through which the Greenbelt, Md.-based company is becoming one of the largest players in the software industry.

At last week's press conference, held at the trophy-stuffed Explorer's Club in midtown Manhattan, Martin Marietta introduced an on-line applications development facility that allows users to build systems with either a Cobol-based tool, a fourth-generation language or a menu-driven generator.

The company also unveiled IBM Personal Computer-based integrated workstation software that offers micro-to-mainframe communications capabilities, an as-yet-incomplete implementation of its mainframe-based fourth-generation language and gateways to a variety of mainframe data storage systems.

The Consensus applications development system and Unison workstation software are the initial fruits of Martin Marietta's fledgling Natural Selection series of software. Two additional Natural Selection series announcements will be made later this year, Martin Marietta spokesmen said.

Continued on page 6

PROFILE

King without a kingdom

By Edward Warner

Picture the data processing manager of a multinational corporation, and you imagine a person in command of rows of mainframes and a staff of hundreds.

Not at United Technologies Corp.

The data processing manager of this $9.9 billion international conglomerate, ranked 16th among the Fortune 500, presides over a lone minicomputer and a staff averaging 15 people.

United Technologies prefers to let each of its major subsidiaries do its own data processing with only limited oversight from corporate headquarters. As a result, though John Bennett carries the lofty title of United Technologies data processing director, he is a king without a kingdom.

While policy statements with corporatewide impact do come from the firm's headquarters in Hartford, Conn., decisions concerned with data processing are often produced by committees of DP managers and analysts drawn from the various subsidiaries. Bennett said in a recent interview that his responsibility to those committees and to United Technologies' DP managers in general "is to ensure that everybody knows everybody and that everybody knows what everybody is doing."

As the man responsible for setting United Technologies' companywide DP standards, Bennett does issue a few proclamations of his own. A recent mandate,

Continued on page 8

Datapoint head offers buy-out

By Peter Bartolik

Asher B. Edelman's plans to exercise his control of Datapoint Corp. took yet another dramatic and controversial turn last week when he presented a plan to take the company private in a leveraged buy-out.

The San Antonio-based company said Wednesday that Edelman, who is chairman of the board, offered a plan to pay shareholders — other than the members of the buy-out group — $6 per share, for a total value of about $100 million, and take the company private.

In another development the same day, Datapoint's spin-off service division, Intelogic Trace, Inc., said it rejected a $177 million buy-out offer made by TRW, Inc.

Intelogic Trace, of which Edelman is also the chairman, reported the termination of discussions to acquire the service arm of Mohawk Data Sciences Corp., a firm in which Edelman owns stock and that he has previously sought to liquidate.

In a phone interview with *Computerworld*, Edelman said he thinks customers will be encouraged by his bid. "I think in general the customer base, many of whom I've seen in the last few months, will understand there is a commitment both on my part and on management's part to stay in this company and continue to build it; we will be the owners," he said.

Analysts reacted negatively, speculating Edelman would seek to milk Datapoint's assets to recoup his investment and then sell the company as he has done with others. But Edelman pointed out that the first company he bought into is still active, and he serves as its vice-chairman. His strategy varies "according to the company — [at Datapoint] when I got into it I said I wanted to stay there; I've stayed there, I've worked hard, I've visited customers."

Edelman's bid to take Datapoint private marks another departure from his original intent to duplicate the control, divide and sell strategy that worked when he gained control of Management Assistance, Inc. in August 1984 and sold off its operating divisions.

He then turned his eye first to Mohawk Data and then to Datapoint, using the same strategy of acquiring minority interests and presenting well-publicized plans to liquidate the firms.

After gaining the chairmanship and control of half the board of directors of Datapoint in March, Edelman said he was looking to sell the service division for $200 million and the manufacturing division for $100 million. He soon changed direction, however, and said he would continue to operate the manufacturing division, and the service division was spun off as a separate company owned by the shareholders of Datapoint.

Intelogic Trace then said it would acquire the service arm of Mohawk Data for $80 million and loan Mohawk $20 million; that was a controversial plan that analysts interpreted as an attempt to bail out Edelman's 8% holding in Mohawk Data.

Edelman last week presented Datapoint with his plan to take the company private, saying he and some of his affiliates, together with Datapoint board member Charles P. Stevenson Jr. and certain other members of the board and management of the company, would form a corporation with which to merge Datapoint.

Company spokesman Jack Milne told *Computerworld* that all of the other members of the buy-out team have not been identified "but certainly will include the key individuals."

Datapoint said the proposal is dependent upon the ability of the Edelman group to obtain financing and a favorable recommendation of an investment firm. After those conditions are met, the proposal would be subject to a majority vote of shareholders.

Intelogic Trace, in announcing its rejection of TRW's offer of $9.50 per share, said it would offer instead an exchange of securities for up to four million of its 17 million outstanding shares for those shareholders who want to cash in their investment.

NEWS SUMMARY

Storage Technology is offering upgrades for its solid-state storage subsystem, the 4305 Optimizer/4

Electronic messaging makes a push into upper management, stretching the functionality of microcomputers/6

An early user lauded Martin Marietta Data Systems for attempting to link components in its Consensus applications development system/7

Computer Sciences has withdrawn its investment in a South African computer firm, maintaining that the move was motivated by finances, not politics/10

Some legislators want to regulate messages on computer bulletin boards, but the efforts face strong opposition/13

DP expenditures by the U.S. government are flattening out, as they are in the private sector, according to a government report/14

Although they accounted for only 1% of total 1984 computer shipments, large systems garnered more than $1 billion in sales/15

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STC enhances storage tool

By James Connolly

LOUISVILLE, Colo. — The company that claims 90% of the market share for IBM mainframe-oriented, solid-state storage equipment, Storage Technology Corp., has announced enhancements for its 4305 Optimizer Storage Subsystem.

The 4305E Optimizer has four times the storage capacity and twice the number of channels as the existing 4305 Optimizer, according to the announcement made last week. The enhanced system features a capacity of 768M bytes and a maximum of eight channels for connection to up to eight host computers.

"The computer views a solid-state system as a disk drive, except it is faster. The kind of data this product is aimed at is in the ultra-high-performance data sets, of which there are maybe 45 or 50 in a typical IBM system," said Fred Moore, manager of worldwide product marketing for STC.

The product reportedly is intended for use in IBM VM systems handling paging and swapping and is used increasingly for data files with high transaction rates. The latter applications, according to STC, include IBM IMS and CICS load libraries, data base indexes, master catalogs and computer-aided design and manufacturing roll files.

Moore said that STC is offering field upgrades for the 5,500 4305 Optimizers installed since the product was announced in 1979. He said STC has sold more than 90% of the solid-state subsystems installed in IBM and compatible mainframe systems.

The 4305E Optimizer uses 256K-byte random-access memory (RAM) chips rather than the 64K-byte RAM chips used in the earlier, 192M-byte version. Memory expansion is through modules of 12M, 24M, 48M and 96M bytes, according to Moore.

The additional channels may be added through use of a four-channel switch, which allows each director in the 4305E Optimizer to be attached to four channels rather than the two channels previously permitted. Each subsystem can have one or two directors, according to STC. The host connections are provided via block multiplex channels supporting 1M, 1.5M and 3M byte/sec. data transfer rates.

The 4305E Optimizer was designed to emulate an IBM 3380 disk drive or an IBM 2305 fixed-head drum device. Moore said the access time for the solid-state system is 0.3 msec, compared with 16 msec for a disk drive.

A single-director, 12M-byte 4305E Optimizer costs $69,100. A two-director, dual-port, 768M-byte configuration costs $1.33 million. For existing equipment in the maximum configuration, an increase from a two-channel switch to a four-channel switch costs $17,200, and an increase from 192M bytes of storage to 768M bytes costs $720,000, Moore said.

NAS beefs up systems

Add-ons target 6600, 9100 processor lines

By Jeffry Beeler

MOUNTAIN VIEW, Calif. — National Advanced Systems Corp. (NAS), reacting to user demand for increased systems functionality, last week added two hardware enhancements to its mid-range scalar mainframe family and two software improvements to its attached vector processor.

In the wake of NAS' Sept. 4 announcement, the company's 6600 series intermediate-scale CPUs now support IBM's High-Accuracy Arithmetic feature and the Engineering and Scientific Assist, both residing in IBM microcode.

NAS has also enhanced its 9100 vector processor through a recently signed agreement with Quantitative Technology Corp., a Beaverton, Ore.-based software and services supplier. The accord paves the way for the 9100 to support Quantitative Technology's Math Advantage, an algorithm library that helps develop scientific and engineering applications.

In a related development, NAS has further enhanced the 9100 through an agreement with a second business partner — Pacific Sierra Research Corp., developers of the Vector Array Syntax Translator (Vast), which "vectorizes" scalar program code. The contract gives NAS' attached supercomputer access to Pacific Sierra's latest enhancements to Vast.

In addition to streamlining Vast's code and thus speeding its operation, Pacific Sierra has revised the product to support complex numbers and to execute the First-Order Iteration instruction, according to Claude Steinmayer, NAS' manager of scientific marketing.

"The 9100's hardware has always had the ability to support First-Order Iteration, but until Vast was enhanced, [the machine] lacked the software to take advantage of that instruction," Steinmayer said.

Like Vast, Math Advantage is optimized for image and signal processing, seismic analysis, mechanical design and other number-crunching applications that run on systems compatible with the IBM 370 or 370 Extended Architecture.

All the latest enhancements to the 6600 and 9100 are available immediately without charge.

ITC upholds Tandon claim

By Clinton Wilder

WASHINGTON, D.C. — The U.S. International Trade Commission (ITC) last week granted temporary relief to Tandon Corp. in the disk drive vendor's fight to bar imports of Mitsubishi Electronics Corp.'s competing products into the U.S.

Affirming a May 31 ruling by federal Judge Sidney P. Harris [CW, June 10], the ITC required Mitsubishi to post a 25% bond on every double-sided floppy disk drive it sells to its U.S. subsidiary or to U.S. OEMs and end users.

If the ITC grants Tandon permanent relief in a final decision expected later this year, the total of all the posted bonds would go into the U.S. Treasury, and Mitsubishi would be banned from all sales of the named disk drives into the U.S.

Tandon has alleged that the Mitsubishi drives infringe on Tandon patents. In a companion case, Chatsworth, Calif.-based Tandon has also claimed that Mitsubishi has illegally sold the products below cost in the U.S. Harris' initial decision on that claim is expected in October.

Earlier this year, Tandon settled similar patent infringement claims against Japanese disk drive vendors Teac Corp. [CW, Aug. 26] and Sony Corp. [CW, July 15]. Rulings in Tandon's favor helped spur the Japanese companies to settle out of court and become Tandon licensees, but it is unclear whether Mitsubishi will attempt to strike a similar settlement.

"There are no such negotiations currently going on, but who knows what tomorrow may bring?" said Tandon attorney James Hamilton.

Mitsubishi attorneys could not be reached for comment.

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WHODUNIT

Sortland Yard warns against “Raffles-type sort programs.”

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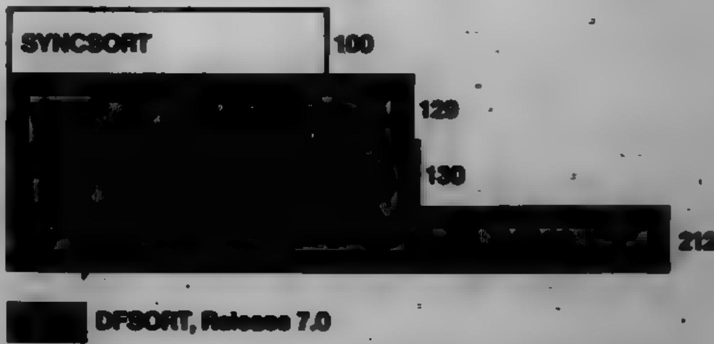
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed “gentleman-bandit sort programs.”

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called “a legend in his own CPU time.”

The inspector said, “One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row.”

EXPERT COMPUTER CRACKERS. “But once the party is underway,” the inspector said, “these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say ‘Hound of the Baskervilles.’”

To indicate “the true cost of this sort of misbehavior,” the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often “take a dreadful toll” of programmers. “They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world.”

Among these the inspector listed:

- **SORTWRITER**
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TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. “The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down.”

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied. “They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!”

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From page 1

Debuts link Martin Marietta's software line

Borrowing from the theory of evolution, the Natural Selection theme is intended to convey the firm's goal of integrating and building on the capabilities of its existing products.

Consensus, for example, combines Martin Marietta's newly developed On-Line Programming Language, Fourth Generation (OPL4) with the UFO menu-driven application development system and its Cobol/XE development tool.

Martin Marietta obtained UFO and Cobol/XE's predecessor, UFO/Cobol, when it acquired Oxford Software Corp. in 1984. A Martin Marietta spokesman said the principal designer of UFO also headed up the development team of the OPL4 fourth-generation transaction processing language.

One beta site user of the Consensus system told *Computerworld* that while the three individual products are not yet fully integrated, he is encouraged that Martin Marietta has outlined a growth strategy for UFO and Cobol/XE, which he said are exceptional development tools.

The user said he is also pleased that the company has offered new application building capabilities — the OPL4 language — and intends to fully integrate the development systems.

In its final form, a spokesman said, Martin Marietta's Unison software will give IBM Personal Computer users the full functionality of the Ramis II fourth-generation language in addition to its other workstation capabilities. In 1983, Martin Marietta acquired Mathematica Products Group, developer of Ramis II.

According to Dan Peterson, vice-president of business development for parent company Martin Marietta Corp., the Natural Selection series is the culmination of the company's master plan, forged in 1982, to become a major software and services vendor.

In addition to the products, the company offers the MAS series of mainframe applications and the IT-Series of microcomputer software. The Natural Selection line is Martin Marietta's approach to integrating its nearly 35 member family of software products.

"Three years ago, we identified information technology, particularly the software market, as a strategic growth area for Martin Marietta," Peterson said. "In order to become a leader, we undertook our own development of products and acquired companies that were leaders in their fields.

"Our goal is to provide products and services that grow and change," he continued. "These announcements are not a break from the past but an outgrowth of our existing offerings to ensure continuing growth and success for us and our users."

■

Martin Marietta tools aim at integrated line

Based on its UFO and Cobol/XE applications building systems and in-

Continued on page 7

Micro use sells messaging to top execs

By Bryan Wilkins

WASHINGTON, D.C. — Electronic mail messaging is pushing its way into the reaches of upper and middle-level management of U.S. business as a practical extension of microcomputer use, according to users of existing systems and vendors that sell the tools.

Typical of this trend is the experience of Citicorp, the country's largest bank, which initially set up a turnkey stand-alone messaging system five years ago. "We started out when the boss said, 'Mail is mail, whether hard copy or electronic. Put it in,' " said Richard Coughenour, Citicorp vice-president for office automation and mail systems.

However, most large U.S. corporations are still setting up internal systems and have not yet begun linking discrete networks to others or venturing outside and establishing links via public carriers, according to the speakers addressing the Electronic Mail Association here last week.

At the U.S. Department of Agriculture (USDA), a nationwide message system gradually evolved after it became necessary to keep field offices posted on late-breaking news that affected different regions.

According to Stanley Prochaska, chief of the USDA's special program division, a one-way delivery system was converted into a two-way communications network, and eventually, a two-way, region-specific information system was put into operation. "This took place over the space of a few years. Looking back, it's hard to see how we existed without it," Prochaska said.

The major benefit of electronic mail is the ability to communicate information to all parts of a company or business without the necessity of establishing voice contact.

Memorandums, letters, pricing changes on products and ordering are the functions that many of the speakers at the three-day session described as the principal uses for electronic mail.

Last year, the worldwide standards-setting body, the Consultative Committee on International Telephony and Telegraphy, published the draft version of a protocol standard, CCITT X.400, that will permit different message-handling systems to communicate if the protocol has been built into the terminal handling messages.

The CCITT X.400 standard is being supported by a number of U.S. vendors as well as by European postal authorities that are responsible for management of the message-handling systems using the public network.

However, there are still a number problems, according to Richard Miller, president of Telematics International, Inc. in Palo Alto, Calif. Miller cited one problem as the lack of certification for vendor products that claim to have implemented the CCITT X.400 standard, pointing to the problem of linking incompatible message-handling systems.

According to Coughenour of Citicorp, the success of a message-handling system depends on establishing user familiarity and comfort. "Let the users drive the enhancements that you want to add on, and be flexible, such as adding bulletin boards and other items," he said.

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From page 6

Martin Marietta tools aim at integrated line

corporating a newly developed fourth-generation language, Martin Marietta Data Systems' Consensus is said to give users a choice of development environments with which to build applications varying in complexity.

UFO, which currently has an installed base of some 1,700 users, allows an IBM CICS applications programmer to develop through menus all modules of an on-line system via an IBM 3270 terminal or Personal Computer/370.

Cobol/XE gives batch Cobol programmers the capability to develop on-line applications, without knowledge of the CICS transaction manager, using standard Cobol verbs and program structure.

The On-line Programming Language, Fourth Generation — known as OPL4 — facilitates modular development of on-line files, screens and programs. What a spokesman labeled "free-format syntax" and built-in functions simplify the coding of operations.

Other facilities include prototyping capabilities, an interactive debugger and a new-copy feature that allows changes to files or screens without recompiling. The language also provides a universal data access command.

The three development systems are said to be integrated with screen painting tools and active data dictionary facilities for maintenance of file descriptions and data validation rules. An optional reporting facility, based on the company's Ramis II Reporter, provides ad hoc and production reporting capabilities.

Consensus supports all standard IBM file access methods and a variety of data base management systems (DBMS), including IBM's SQL/DS, DB2 and DL/1; Cincom Systems, Inc.'s Total; and Applied Data Research, Inc.'s Datacom/DB.

It operates under OS, DOS and VM and is priced from $40,000 to $55,000. Production shipments are slated for October, according to Martin Marietta Data Systems Product Information in Princeton, N.J.

Martin Marietta's Unison workstation software is said to offer five integrated capabilities: transparent micro-to-mainframe communications; gateways to mainframe data storage systems and micro-based data; a workstation-based implementation of the Ramis II fourth-generation language; a manager that provides access to all Unison components and other micro software; and mainframe services that give users access to mainframe Ramis II.

The micro-to-mainframe communications capabilities allow users to choose a mainframe linkage method from a menu. Unison supports dial-up connection and a variety of communications boards.

Unison allows for selective extraction of data from Ramis II, IBM's DB2, IMS, SQL/DS, Vsam and Isam; Software AG's Adabas; Cincom's Total; and Cullinet Software, Inc.'s IDMS. It automatically downloads and converts data for Martin Marietta's Keepit micro software and products supporting standard micro data formats.

Unison also features an interface to IBM's Professional Office System for electronic messaging. Unison's PC/Reporter implements Ramis II reporting capabilities on the IBM Personal Computer. It offers command and menu modes and processes downloaded data or local micro files. A spokesman said the system's capabilities are currently being extended to a full-function implementation of mainframe Ramis II.

Unison's so-called mainframe services let users execute processing on the mainframe or the micro. Requests to be executed on the mainframe can be generated with a micro editor or with PC/Reporter menus, according to the vendor.

Early versions of Unison are being shipped in October, although production shipments are not scheduled until December. Pricing begins at $795.

— John Gallant

■

Consensus user calls for integration ties

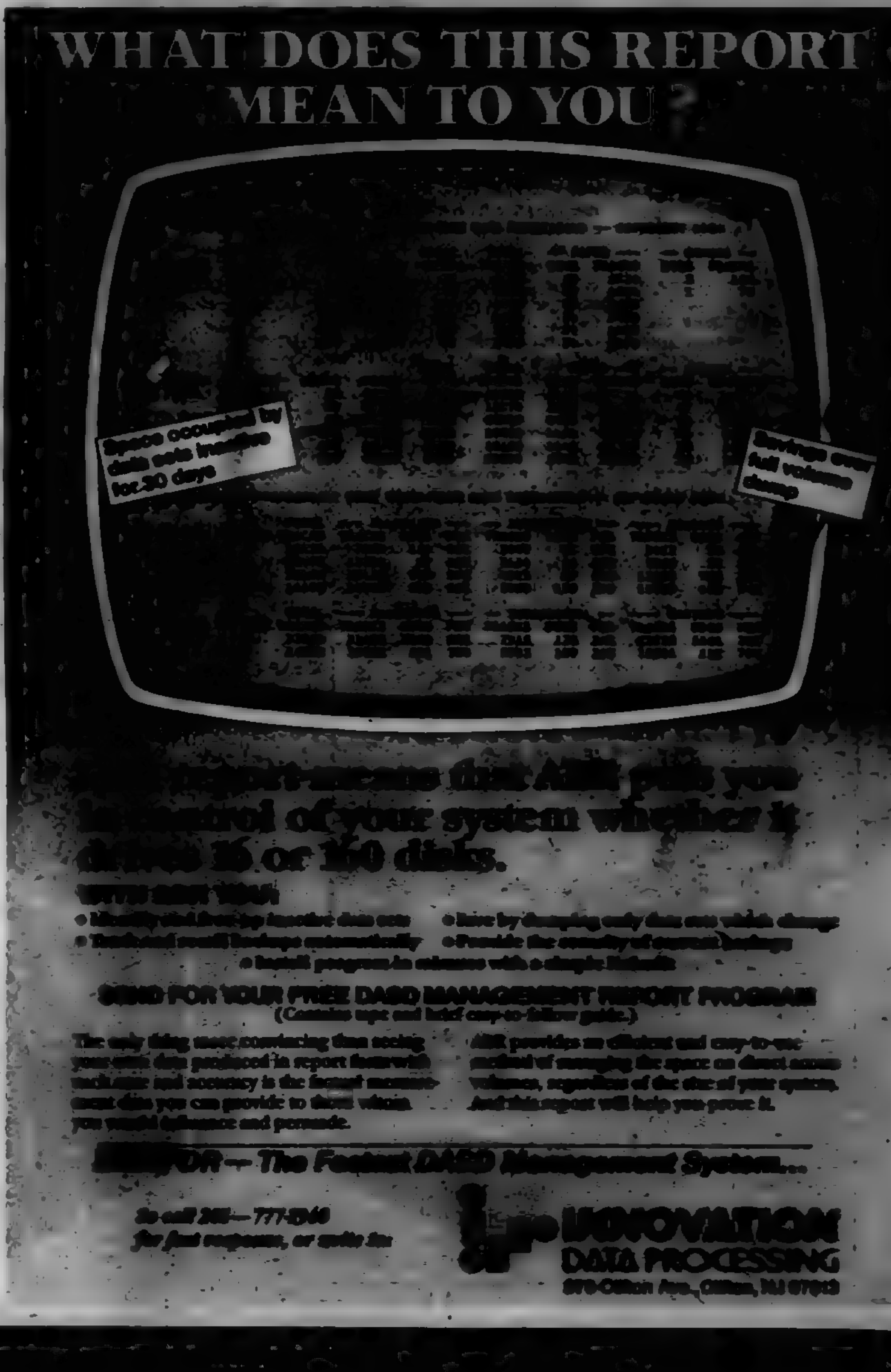
Although one early user of Martin Marietta Data Systems' Consensus applications development system said the product's components more closely resemble stand-alone systems than an integrated development environment, he praised the company's efforts to tie the tools together.

Jerry Tarter, data processing manager for American Business Products, Inc., said his Atlanta-based firm has used the UFO component of Consensus for several years and the Cobol/XE — formerly Oxford Software Corp.'s UFO/Cobol — portion for nearly a year. Tarter said American Business Products, a holding company for several firms that manufacture business forms, only recently installed the OPL4 component and has not yet put that system into production use.

The company runs the products under IBM's DOS/VSE on a 4381, which supports an applications development staff composed of 10 people. Currently, he said, the Consensus components are not fully integrated.

"We are beta testing OPL4 now," Tarter said. "Both UFO and Cobol/XE are outstanding products. But my view is that all three are stand-alone products now, even though they are under one name.

"Martin Marietta's major drive is to tie them all together through a screen painter, data dictionary and report writer common to all the products," he continued. "We are very enthused about that strategy."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From page 1

DP manager Bennett: King without a kingdom

issued in the interest of greater data security, required encryption of all transmitted data. But, he hastened to elaborate, these standards still leave the operating units with considerable freedom.

Such independence can create a maverick or two. Though the firm has been decentralizing data processing since 1971 — even to the point of encouraging the use of personal computers — its Pratt & Whitney subsidiary still relies primarily on mainframes, even for office automation.

Autonomy breeds creativity

Autonomy, however, can also breed creativity, Bennett said. Three years ago, he recalled, the company's corporate leadership decided to implement a program to integrate micros into each operating unit. More than 1,300 top managers from all of the subsidiaries were eventually trained on the IBM Personal Computer at a cost of $8 million.

However, the decision regarding the actual application, if any, for the personal computers was left up to each manager and operating unit. Some managers did eventually ignore the machines, Bennett pointed out, but others, particularly those in financial planning and real estate management, gave up their handheld calculators or mainframe terminals to use the machines.

On the operating unit level, United Technologies' subsidiaries, such as Carrier Corp., the air conditioner maker, have since established companywide electronic mail systems for routing messages from personal computers. Both Carrier and Otis Elevator North American Operations, another subsidiary, have also since developed personal computer programs to sell their products to customers in the building maintenance and contruction industries.

There was at least one down side to the autonomy offered to the personal computer users: Many could not access data on their company mainframe, and, because the subsidiaries are independent, Bennett could do nothing for them. In a conglomerate of independent subsidiaries, mainframe access is "the primary responsibility of the operating unit," he said.

One sector of the corporation in which Bennett will permit no mavericks, however, is in the use of Technet, the 5-year-old United Technologies communications network that his department manages. The network, for corporatewide voice/data communications, routes messages over a variety of paths, including satellite links and both leased and dial-up lines.

Bennett said Technet, one of the few centralized aspects of United Technologies' information management, was placed under his authority because "if [the operating units] aren't under the same management, someone has to keep them talking."

Bennett is not a typical data processing manager, and his office on the 22nd floor of United Technologies' world headquarters reflects the difference. Furnished with a couch and a hardwood desk that would please any vice-president, the office has two glass walls, one of which offers a panoramic view of Hartford and its environs.

Also atypical is Bennett's background. He has a Ph.D. in applied mathematics from Harvard University, and his first management job in data processing came in 1971 when he was promoted from chief of mathematical analysis at the United Technologies Research Center to DP director at the company's Sikorsky Aircraft subsidiary, reportedly the world's largest helicopter maker.

The transition from the research center to the DP shop was "something of a culture shock," he recalled. He soon found, however, that he "probably had something of an advantage coming in from the research center, whose job is also to manage technology." Bennett still runs a DP shop; he oversees the operation of a Digital Equipment Corp.

VAX-11/780 in use at the corporate headquarters for office automation.

Looking back on his 14 years of DP management at United Technologies, Bennett observed, only half in jest, that "the computer has made major inroads in almost every department except the data processing department." This failure to automate, he said, is reflected in the extensive backlog of applications development, and this, he added, is the foremost DP problem facing United Technologies.

To reduce its backlog, Bennett said, the firm will soon "put in place [software development] tools that will do a lot more than one programmer can do." In classic United Technologies fashion, those packages will be chosen by a committee.

Though an advocate of decentralized decision making, Bennett acknowledged that there are times when the key to a project's success is a statement of support from corporate headquarters. Such support was needed when the company began its personal computer training in 1982. To spur enrollment in the training, Bennett obtained a videotape endorsement of personal computing from United Technologies Chairman Harry Gray. The course proved a success but missed its objective of training all top company executives.

Gray, it seems, did not attend. The United Technologies chairman, Bennett said, does not use a personal computer.

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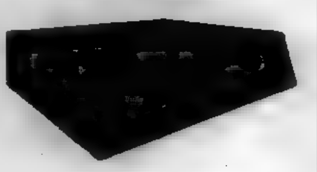

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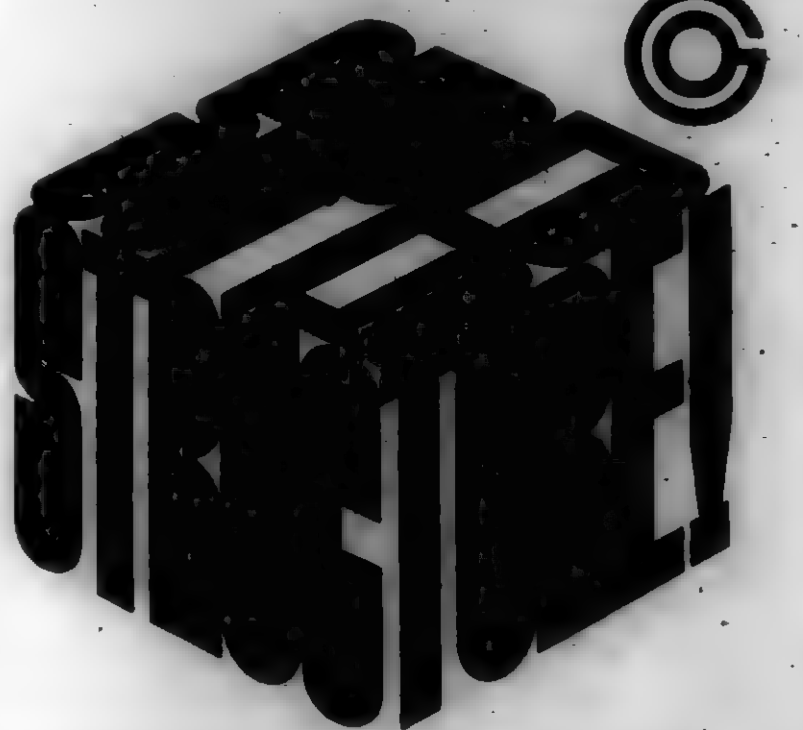
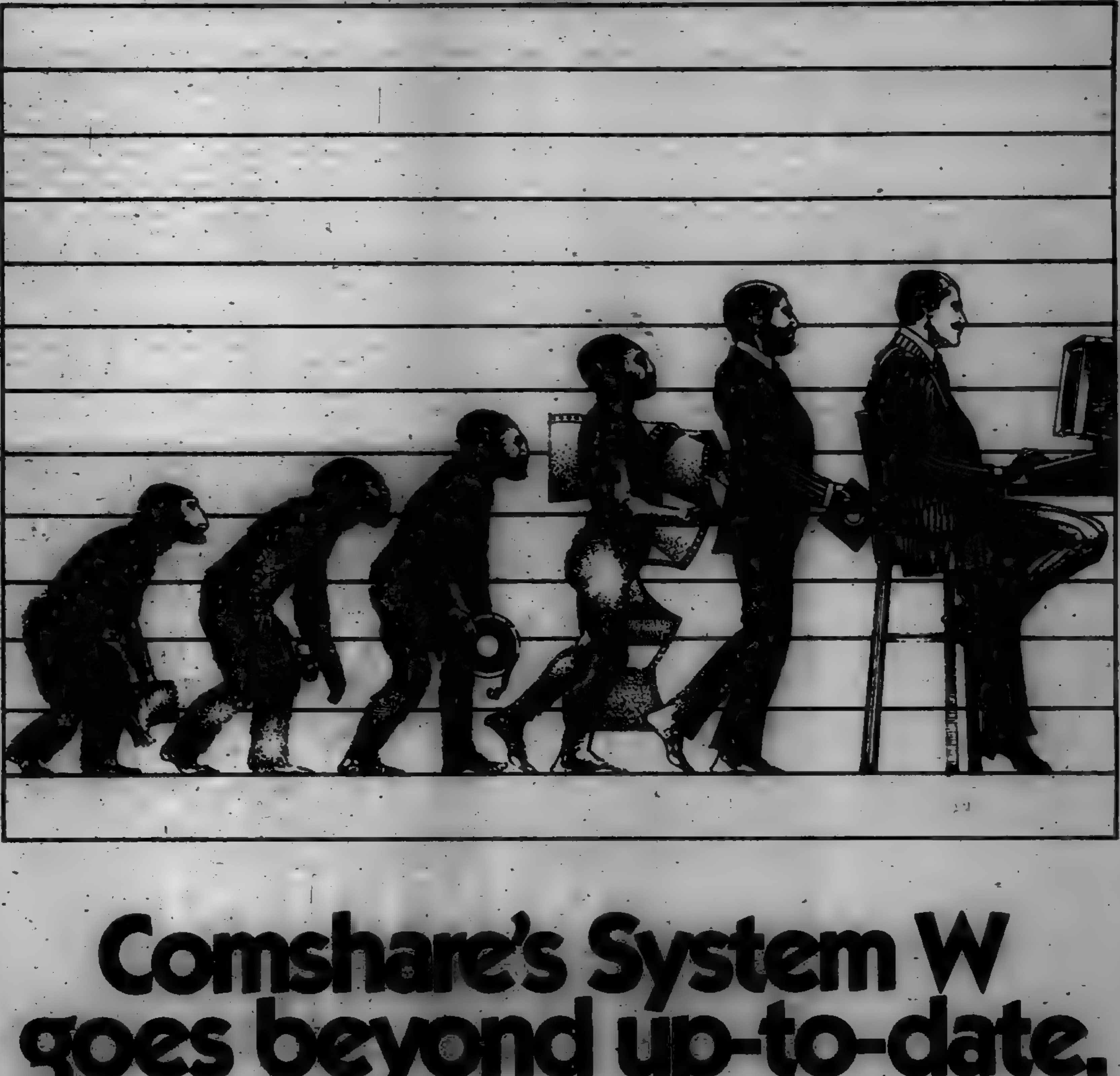


A HISTORY OF DECISION SUPPORT SOFTWARE



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From page 1

South Africans prepare for U.S. DP export ban

extended if the Congress considers insufficient progress is being made to effect change," van Vuuren said. "The South African customers would look to other suppliers."

One of those suppliers is Persetel, Ltd., the South African company that sells Hitachi Ltd. mainframes in South Africa through BASF of West Germany. The same company sells media products in the U.S. as BASF Systems Corp. in Bedford, Mass. "Persetel has made major inroads into IBM's mainframe marketing in this country," said Alan Dawson, editor of *Computer Week*, a publication covering the computer industry in South Africa. "They are positioned to move in and take over if they need to. They are giving IBM a run for their money." IBM is considered the leading vendor in South Africa, Dawson said.

Other companies with a strong presence in South Africa are Siemens AG and Nixdorf Computer AG of West Germany and ICL of England, according to van Vuuren. "The South African marketplace is a cosmos of all the electronic data processing markets in the rest of the world," van Vuuren said.

Estimates of annual computer sales revenues in South Africa range from $500 million to $900 million. The restricted government market may be 20% of the total South African computer market, van Vuuren estimated. "It is a very large sector we have been excluded from," he said.

Exactly what computer equipment the Department of Cooperation in Pretoria is using to administer the pass-book system, in which each of the nation's 24 million blacks is supposedly registered, is a state secret, several sources said.

Van Nunen, the Computer Users Council spokesman, said the U.S. restrictions would not prevent South African users from obtaining needed technology. "If the supply [of computer equipment] were to be restricted, it will not stop technology from coming into South Africa," he said. "The only impact will be that the U.S. will become a supplier looked on with less favor for any future decisions. South Africans will look elsewhere. It will be a great pity."

The Japanese and Europeans would be the most likely to step into the breach, in van Nunen's view.

According to an IBM spokesman specializing in the firm's South African business affairs, who asked not to be identified, the threat of trade restrictions has caused some customers to "hedge their bets and go with foreign competitors." And sales representatives from foreign countries are exploiting the users' fears of losing their computer equipment sources, the spokesman said. Addressing the restrictions, the spokesman said, "We prefer to operate without regulation, but we comply with all U.S. laws and regulations. Our preference is to operate in a free market environment."

Clarifying what he described as a misconception, the IBM spokesman added, "Most people believe we're in South Africa for cheap labor. But we don't manufacture there, and we pay equal pay for equal work."

Whether the Japanese and European computer companies would sympathize with a U.S. restriction on sale of equipment to the government is not yet known, but is considered unlikely. A spokesman for Persetel in Johannesburg, Product Manager Peter Cilliers, said, "Our standpoint is, we comply with all the regulations and principles of the respective countries of companies that supply equipment to us." He said he understood the Japanese "are reviewing the situation," but his company has not formally requested a ruling.

Vendor spokesmen describe the U.S. trade restrictions as a two-edged sword because many U.S. companies doing business in South Africa pay a percentage of their revenues for social programs to benefit the blacks.

Trade restrictions are not the only issues faced by computer users and vendors in South Africa. Financial panic two weeks ago plunged the South African rand to a low of 34 cents to the U.S. dollar. The rand had climbed to 45.5 cents by the middle of

■

CSC withdraws from South African firm

Computer Sciences Corp. (CSC) of El Segundo, Calif., has withdrawn its 20% interest in the South African computer services firm Computer Science, Ltd. (CSL) of Johannesburg.

A spokesman for CSC in the U.S. declined to comment on why the company pulled out. Jim Furlong, manager of corporate communications for the firm, said, "I don't see much difference between this and what other companies are doing."

CSL Managing Director Ian Jones was quoted in the South African press as saying that the company's withdrawal had nothing to do with U.S. pressure for disinvestment. "Anything that happens with a U.S. company in South Africa today immediately has people suspecting a political move, but I don't believe that is the case here," Jones said. "CSC has chosen to invest in the development of new products and services in the U.S. rather than in [CSL]. As it is known, we did not make a profit last year."

Of a total revenue of $40 million rand in South Africa last year, CSL lost $5 million rand, the firm has said. The South African press reported the U.S. company has a $14 million rand interest in CSL, about $6 million U.S. dollars.

— John Desmond

A word for those who just bought a Unix system.

last week, but other issues took precedence. On Sept. 1 the South African government declared a four-month moratorium on debt principal repayments by South African companies on loans to foreign banks.

While the moratorium does not prevent multinationals from doing business in South Africa, it is a cause for concern. "The devaluation of the rand has had a very severe impact. We've had price increases in the last 12 to 18 months in excess of 60% for our users," van Vuuren said. "Users are thinking longer before making a decision."

Due to the sensitive situation in South Africa, what sources say off the record often differs markedly from comments made by official spokesmen.

The state of emergency imposed on 36 magisterial districts surrounding major South African cities has had an impact on day-to-day business. All the companies are making investments mindful of an ultimate risk. "The risk is that the whole country will plunge into civil war, and they may not get their payments," one source said.

■

U.S. high-tech firms' compliance rates high

Six U.S.-based high-technology firms were given a top rating for voluntary compliance with the Sullivan Principles, a code of conduct aimed at providing an equal opportunity for blacks in South Africa.

The six firms given top ratings in the latest report of compliance of U.S. companies doing business in South Africa were IBM, Burroughs Corp., Control Data Corp., Hewlett-Packard Co., Sperry Corp. and Xerox Corp.

Spokesmen for two of the firms said congressional and presidential approval of trade restrictions on the sale of U.S. computer technology to certain agencies of the South African government would hurt their efforts to comply with the principles.

A bill calling for restrictions, the Anti-Apartheid Act of 1985, is now being considered in the U.S. Senate.

The Sullivan Principles were drafted by the Rev. Leon Sullivan, a black clergyman from Philadelphia who became concerned about U.S. involvement with apartheid while he was a board member at General Motors Corp.

These principles call for the desegregation of "all eating, comfort and work facilities," as well as equal and fair employment practices.

Sullivan code signatories are asked to file semiannual reports that are summarized by Arthur D. Little, Inc., a consulting firm in Cambridge, Mass. The code is administered by the International Council for Equality of Opportunity Principles, Inc. of Philadelphia.

High-technology companies that received the second rating of "making progress" included Honeywell, Inc., ITT and Westinghouse Electric Corp.

Companies that received the lowest rating of "need to become more active" included Motorola, Inc. and NCR Corp., although both companies did pass the basic requirements.

"We have been doing many, many things in this country that go beyond the normal activity of selling computers," said Mias van Vuuren, general manager of South African operations for Burroughs, in an interview from South Africa. "We are spending millions per year in education and development programs for the blacks and deprived communities of the country. If any of our business volume disappears, it will make it very difficult for us to sustain the same level of community involvement.

"A cutback in our business means we will have to seriously look at what we can and cannot do," he said.

Any decision about pulling Burroughs out of South Africa would be made by Burroughs Chairman Michael Blumenthal. "It's not my decision because I'm a South African citisen," van Vuuren said. "I'd like to see Burroughs do business here for as long as we're allowed to do business. We believe our position in South Africa is a force for positive change."

Van Vuuren said he did not have a total on how much money Burroughs has spent since 1978 on community development programs, but he said the percentage increase is greater than the company's profit growth percentage year to year in South Africa.

IBM has spent more than $25 million since 1975 on community development, according to an Armonk, N.Y.-based IBM spokesman who specializes in IBM South Africa's business affairs. Of the 1,914 employees in IBM South Africa, IBM employs 99% South Africans, 15% of whom are black South Africans, the spokesman said.

IBM committed $10 million this year to a computer-assisted language lab program in the South African schools, the spokesman said. Only 11 of every 100 blacks in South Africa reach the high school level, and fewer than .05% of South African blacks have a university education, the spokesman said.

The IBM program is expected to reach some 37,000 children in five years. IBM has also obtained a commitment from the South African Department of Education to restructure the curriculum for black South African school children, the spokesman said.

"IBM has determined it will take significant efforts to bring about meaningful change in that country. Our resources are dwarfed by the problems of the country," the spokesman said.

— John [illegible]

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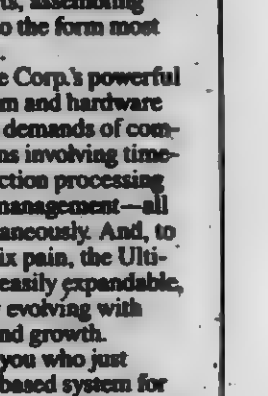

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From page 1

AT&T, Sun to converge on Unix standard

Berkeley 4.2-based systems, an AT&T spokesman said.

According to an AT&T spokesman, the agreement is precedent setting because it will incorporate non-AT&T modifications to Unix into AT&T's System V definition for the first time.

"When the System V and [Berkeley 4.2] shells are merged, all that will be part of the System V definition," the spokesman said.

The joint effort of Sun and AT&T may or may not result in a new release of Unix System V, according to the AT&T spokesman.

"We just don't know yet," he continued.

The timetable for the completion of the project is early 1986, the AT&T spokesman said.

However, a spokesman for Sun predicted that the project may require 12 to 24 months for completion.

AT&T rolls out 1M-bit chip

Full production slated for early next year

BERKELEY HEIGHTS, N.J. — Claiming a jump on widespread competition, AT&T last week said it has begun production of 1M-bit random-access memory chips that it is now offering for sampling by selected commercial customers.

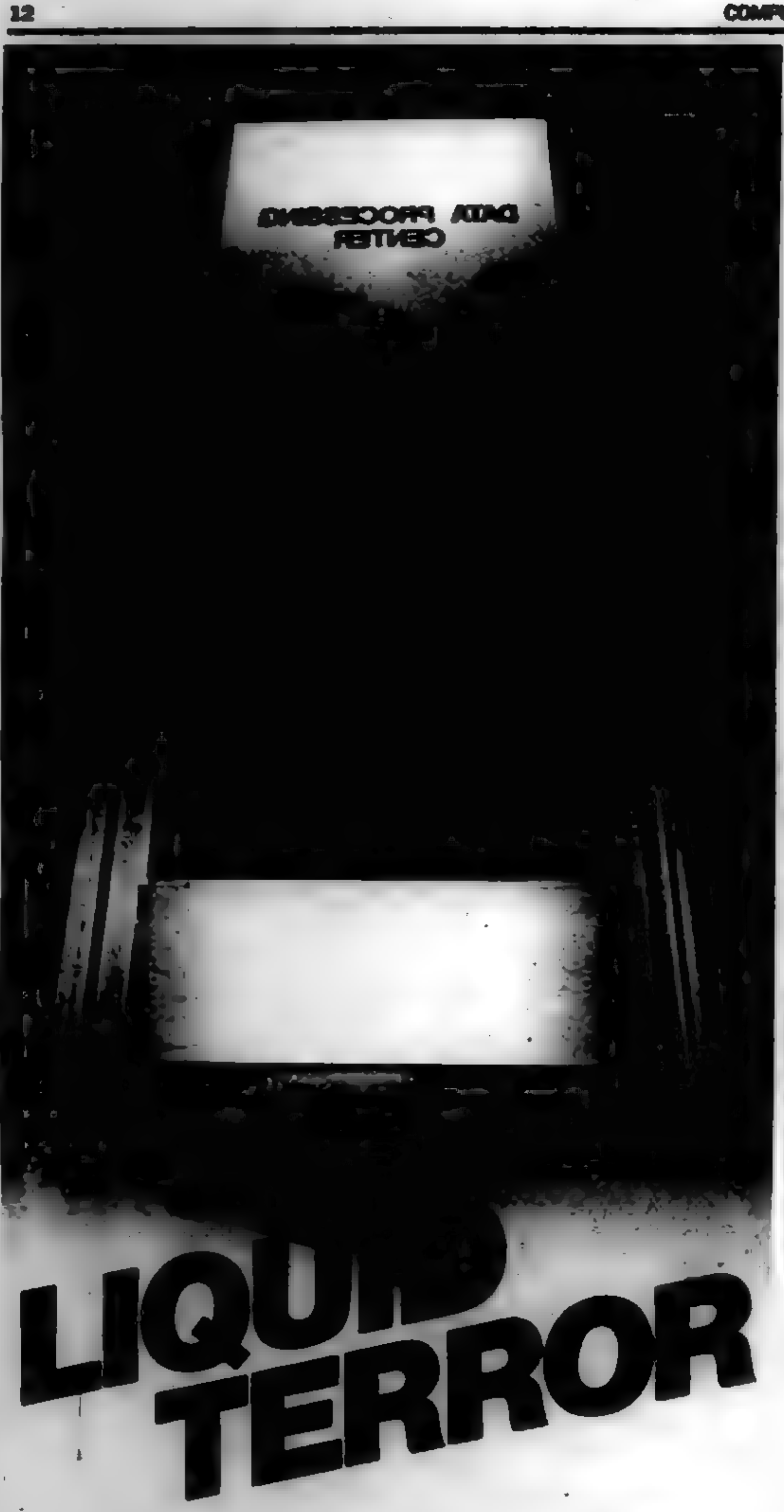
The company said it plans limited commercial production by the end of this year and full production early next year.

Several vendors have announced prototype development of 1M-bit chips, including large Japanese vendors and IBM, but AT&T claimed to be the first U.S. firm to reach an advanced stage in production.

In a prepared background statement, Bob Lucky, executive director of AT&T Bell Laboratories' Communications Sciences Research Division, said the 1M-bit chip will allow vendors to cross a threshold in the cost of silicon memory that will make feasible a whole array of new functions on personal computers.

A computer using the 1M-bit chip and a 32-bit microprocessor "has essentially all the power of today's mainframes and could someday be cheap enough and small enough to be sold as a personal computer for the home or office," Lucky said.

AT&T predicted that revolutionary developments are also likely in laptop computers because the 1M-bit chip requires less power and less physical space than existing memory chips.



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Regulation of bulletin boards faces strong opposition

By Mitch Betts

WASHINGTON, D.C. — The American Civil Liberties Union (ACLU) and a group of computer bulletin board operators are mobilizing to fight legislation that would regulate the content of bulletin board messages, spokesmen for both groups said recently.

The lobbying campaign is a response to several recent legislative efforts to stop bulletin boards from posting computer passwords, network access codes, credit card numbers, pornography and other messages that can be used for illegal purposes.

Examples of these legislative efforts include the following:

■ U.S. Sen. Paul S. Trible Jr. (R-Va.) introduced a bill (S. 1305) to make illegal pornographic bulletin boards such as "sex talk computer services" and computer networks run by child molesters who share information about their victims.

■ State Sen. John Doolittle (R-Calif.) sponsored a computer crime bill (S. 1012) that would make it illegal for anyone to place a password, access code or financial account number on a computer bulletin board without authorization and would make system operators liable once they are notified.

> ”
>
> *'The technology of bulletin board systems has developed faster than the ethics.'*
>
> — **Richard Cashion**
> **Tennessee Technological University**

■ The computer crime committee of the Data Processing Managers Association (DPMA) is drafting model legislation that would outlaw actions that contribute to a computer crime such as posting a computer password or network access code on an electronic bulletin board [CW, July 1].

Jerry J. Berman, chief legislative counsel for the ACLU here, said he is urging system operators to oppose the legislation — especially the Trible bill — on grounds that electronic bulletin boards are akin to newspaper publishing and, thus, are protected by the First Amendment right to free speech.

Government regulation may have a "chilling effect" on this form of electronic publishing because it will prompt operators to censor their bulletin boards for fear of prosecution, Berman said.

Moreover, legislation that makes operators liable for the messages on their systems places a great burden on operators to monitor them, Berman said, adding that the burden may put some out of operation.

Paul Bernstein, a Chicago attorney who runs a bulletin board, agreed. He said politicians are moving too fast with the legislation without understanding the technology, the beneficial uses of bulletin boards or the burdens of monitoring the systems.

Bernstein said he and other system operators plan to revitalize the National Association of Bulletin Board System Operators so it can lobby Congress and perhaps draft a code of ethics.

In response, an aide to Trible said there is no constitutional protection for obscenity, and Congress frequently has outlawed the use of interstate communications facilities for criminal purposes.

A hearing on S. 1305 is scheduled for Oct. 1, the aide said.

Supporters of the computer crime legislation said it is needed to curb a rash of computer trespasses caused by hackers who obtained access codes and passwords from underground bulletin boards [CW, June 24].

"The technology of bulletin board systems has developed faster than the ethics," commented Richard Cashion, who is drafting the DPMA bill and who is assistant DP director at Tennessee Technological University in Cookeville, Tenn.

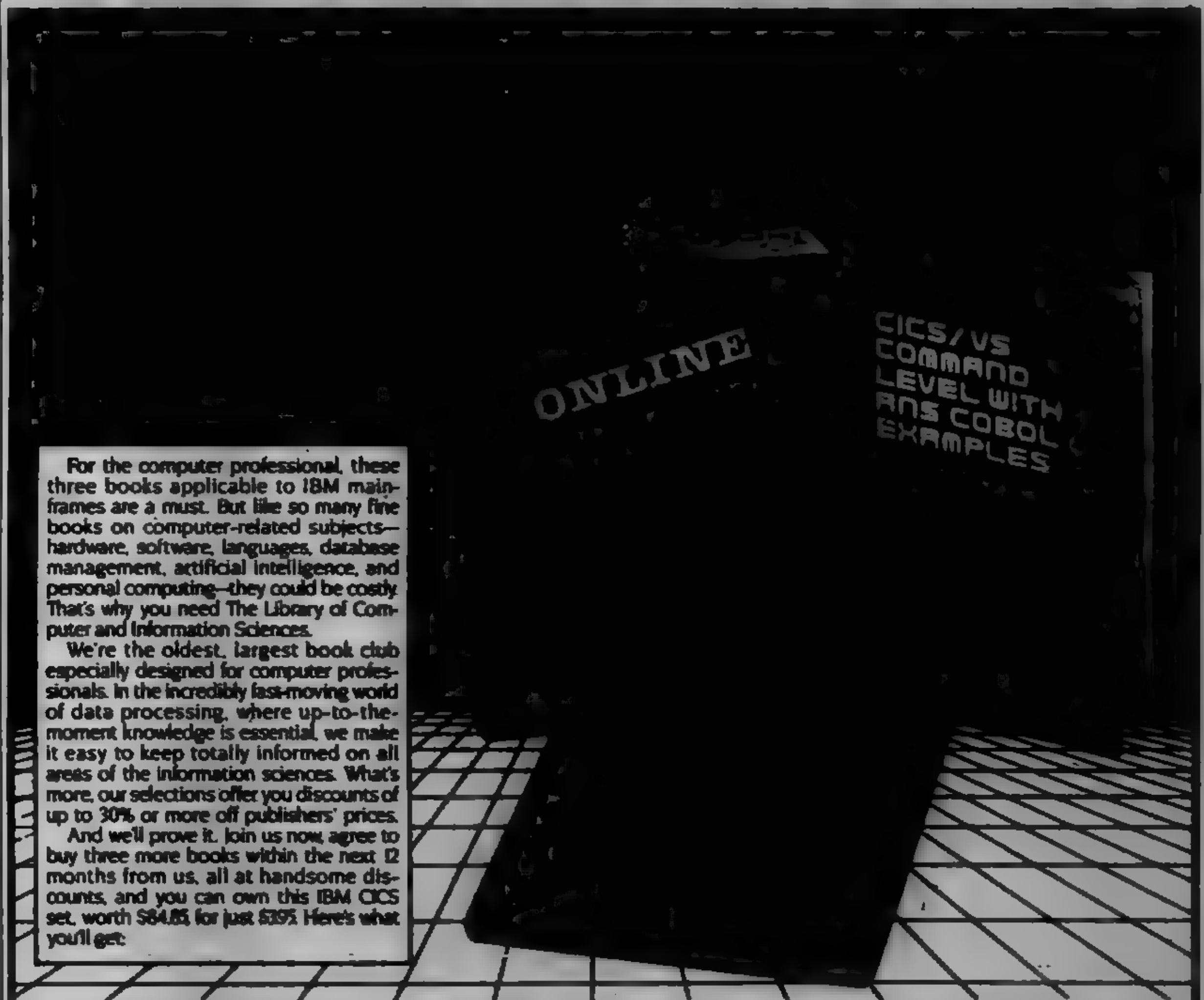
Donald G. Ingraham, an assistant district attorney in Alameda County, Calif., said he strongly supports the Doolittle bill, which recently passed the state Senate and is pending in the Assembly's Committee on Public Safety.

"Our main point is that we are dealing with the misuse of stolen property [such as passwords and credit card numbers]. There is no First Amendment protection for criminal activity," he said.

John T. Vanadia, a spokesman for the EDP Auditors Association, said he supports tough legislation.

"The security responsibility of DP managers is difficult enough even without these bulletin boards passing on passwords and access codes," he said.

In a related development, the California legislature is studying a proposed state constitutional amendment (ACA. 9), sponsored by Assemblywoman Gwen Moore, that would guarantee the freedom to communicate electronically on all subjects. The ACLU-supported amendment also would protect against unwarranted search and seizure of personal information stored in information systems.



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Computerworld 9/9/85

Government DP costs plateau

Outside vendor services to consume half of budget

By Mitch Betts

WASHINGTON, D.C. — Just as in the private sector, expenditures for computer technology by the U.S. government have reached a plateau after years of increasingly heavy spending, according to figures recently released by the U.S. Office of Management and Budget (OMB).

A new OMB report said the federal information technology budget rose sharply by 13% a year between fiscal 1982 and fiscal 1985 when the figures are adjusted for inflation. But the inflation-adjusted budget will remain constant — at $13 billion — between fiscal 1985 and fiscal 1986, the OMB said.

The flattening DP budget, however, hides an important trend: The government increasingly gets its DP and telecommunications services from outside vendors. By fiscal 1986, almost half of the federal DP budget will be owed to commercial services, the OMB said.

Perhaps because of this move to commercial services, the size of the government's in-house DP work force is growing slower than in the past and will increase only 1% between fiscal 1985 and fiscal 1986, the report said.

In a departmental breakdown, the OMB report showed that the U.S. Department of Defense continues to dominate the federal DP budget. The department plans to spend $7.7 billion in fiscal 1986 (in current dollars), about half the federal budget for information systems.

The OMB figures indicated that information systems represent 1.6% of the total budget of the U.S. government. "While it has become a cliche to observe that the federal government is an information enterprise, it is important to realise that many federal programs simply could not operate without effective technology support systems," the report said.

The observations came from "A Five-Year Plan for Meeting the Automatic Data Processing and Telecommunications Needs of the Federal Government," an OMB report that is more a compendium of DP management strategies and statistics than it is a five-year plan.

The report discussed the value of information systems planning and security programs, the need to improve management over software maintenance and end-user computing and the need to respond to new computer technologies and the rapidly changing telecommunications marketplace.

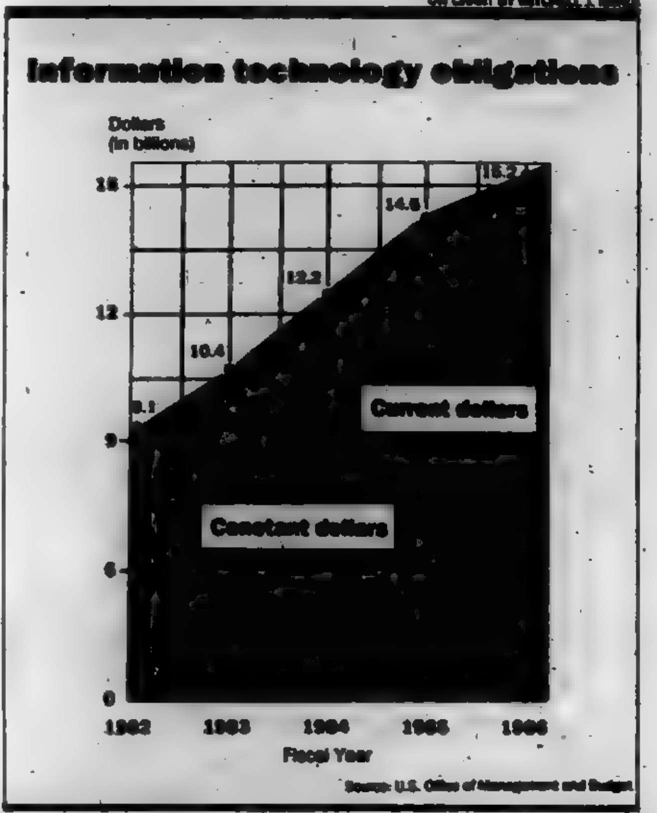
One OMB strategy is to encourage agencies to use commercial, off-the-shelf software rather than custom-developed programs to save on software development and maintenance costs [CW, Feb. 25].

The OMB also said it will give extra management scrutiny to eight major government DP projects, such as the Patent and Trademark Office's automation program and the Social Security Administration's modernization program.

A separate report — the federal DP inventory published by the General Services Administration's Federal Equipment Data Center — said that in fiscal 1984 the U.S. government owned or leased 206,512 items of DP hardware, valued at more than $6.7 billion. However, this inventory counts only items that are components of computer systems costing more than $50,000, thus omitting minicomputers and micros.

By dollar value, Sperry Corp., IBM, Control Data Corp., Honeywell, Inc., Digital Equipment Corp. and Burroughs Corp. were the largest suppliers of DP equipment to the government, in that order.

CW CHART BY MITCHELL J. [illegible]



Source: U.S. Office of Management and Budget

The Office of Management and Budget projects a flat rate of expenditures for data processing.

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Census Bureau counts 1984 hardware shipments

By Mitch Betts

WASHINGTON, D.C. — Nearly 88% of the digital computers shipped in 1984 were priced at less than $2,500, but that 88% accounted for only 28% of the total value of computer shipments, according to statistics from the U.S. Bureau of the Census.

Sales of large computers — retailing for $1 million or more — had a value of more than $1 billion but represented less than 1% of the number shipped, the Census Bureau reported.

The figures are from a recent Census Bureau report that, for the first time, provides production statistics on general-purpose digital computers by retail price categories. The large number of inexpensive computers highlights the growing influence of microcomputers in the computer industry, noted Stephen Pope, the analyst who prepared the report.

The report showed that while the total value of computer shipments increased by 35% from 1983 to 1984, quantities shipped increased less than 1%, to 4,157,513 units.

Value of peripherals shipped up 13%

The total value of peripheral equipment shipped in 1984 was $18.9 billion, up 13% from the previous year, the report added.

The bureau also reported the following:

- Shipments of general-purpose computer terminals remained relatively constant from 1983 to 1984, valued at roughly $2 billion in both years.
- Shipments of point-of-sale terminals and funds-transfer terminals together were valued at $871.3 million in 1984, an increase of 14% from 1983.
- Shipments of automatic typing and word processing machines were valued at $1.9 billion in 1984, an increase of 21% from 1983.
- The value of magnetic tape drives shipped in 1984 was $882.6 million, up from the 1983 level of $772.3 million. Likewise, the value of magnetic tape shipped in 1984 was $204.4 million, up from $116.8 million in 1983.
- The value of disk drives shipped in 1984 was $4.9 billion, up from the 1983 level of $4 billion. The value of both rigid and floppy disks shipped in 1984 was $1.6 billion, down slightly from the 1983 level of $1.7 billion.
- The value of computer printers shipped in 1984 was $1.7 billion, down from $1.9 billion the previous year.

Copies of the Census Bureau report, "Computers and Office and Accounting Machines, 1984 (Current Industrial Report Series MA35R)," are available from the U.S. Government Printing Office in Washington, D.C.

Bureau tallies robot 'births'

By Mitch Betts

WASHINGTON, D.C. — The U.S. Bureau of the Census, after nearly 200 years of counting people, has counted the number of robots "born" in the U.S. for the first time: 5,535 robots in 1984.

The new report said 75 companies shipped that number of complete robots in 1984, at a value of $306.7 million.

The automotive industry is the primary customer of industrial robots, and the report showed that the single largest category of industrial robots were those used for welding, soldering, brazing and/or cutting. Shipments of these units totaled 1,454, or 27% of all robots shipped, the Census Bureau said, adding that their value was $124.2 million.

In other categories, the report said that 450 robots used to spray, paint or glue materials were shipped last year, at a value of $58.8 million. Also, 613 assembly robots were shipped, with a value of $29.1 million.

Before the Census Bureau survey, robot statistics were either estimates by industry analysts and consultants or statistics compiled by the Robotic Industries Association (RIA) of Dearborn, Mich.

Donald Vincent, RIA executive vice-president, said he welcomes the Census Bureau effort because it is the first step toward government recognition of the robot industry. He said the government census is the first procedural step required for the U.S. Department of Commerce to assign the industry a Standard Industrial Classification code in 1987.

RIA statistics showed that 3,060 robots were shipped in 1983 at a value of $194.4 million [CW, Dec. 17], and 5,136 robots were shipped in 1984 at a value of $332.5 million.

Although the Census Bureau and RIA figures for 1984 are similar in magnitude, the Census Bureau said the number of shipped robots was 399 units higher than the RIA estimate.

Copies of the Census Bureau report, "Robots, 1984 (Current Industrial Report Series MA-35X)," are available from the U.S. Government Printing Office in Washington, D.C.

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EDITORIAL

The Japanese 'problem'

When the going gets tough, the tough get . . . ugly.

The recent descent into name-calling and creative number crunching by U.S. and Japanese semiconductor trade groups has not been a pretty sight. When the slogan "red herring" resurfaced late last month in a countercharge from the Electronic Industries Association of Japan (EIAJ) against the U.S. Semiconductor Industry Association's (SIA) allegations of chip trade imbalance, it stirred up some unpleasant memories. How odd to hear the Japanese high-tech high flyers of the 1980s echoing a slogan from the U.S. political witch-hunts of the 1950s.

The increasingly bitter semiconductor trade battle heating up headlines in the business and trade press is more of a symptom than a problem in itself. The real problem, obviously, is the industry slump, which has prolonged and intensified the downward curve of the chip industry's roller coaster business cycle.

Just a few short years ago, when the chip foundries of Silicon Valley were churning out 64K-byte dynamic random-access memory (RAM) circuits to feed a demand then perceived to be insatiable, Japanese vendors simply shared in the wealth. There was competition but more in the sense of who could cut the next slice from an ever-expanding pie.

When demand slowed and advancing technology rendered simple RAM chips into off-the-shelf commodities, Japanese manufacturers did what they do best. They boosted their legendary high-volume, low-cost production lines and turned out cheaper semiconductors.

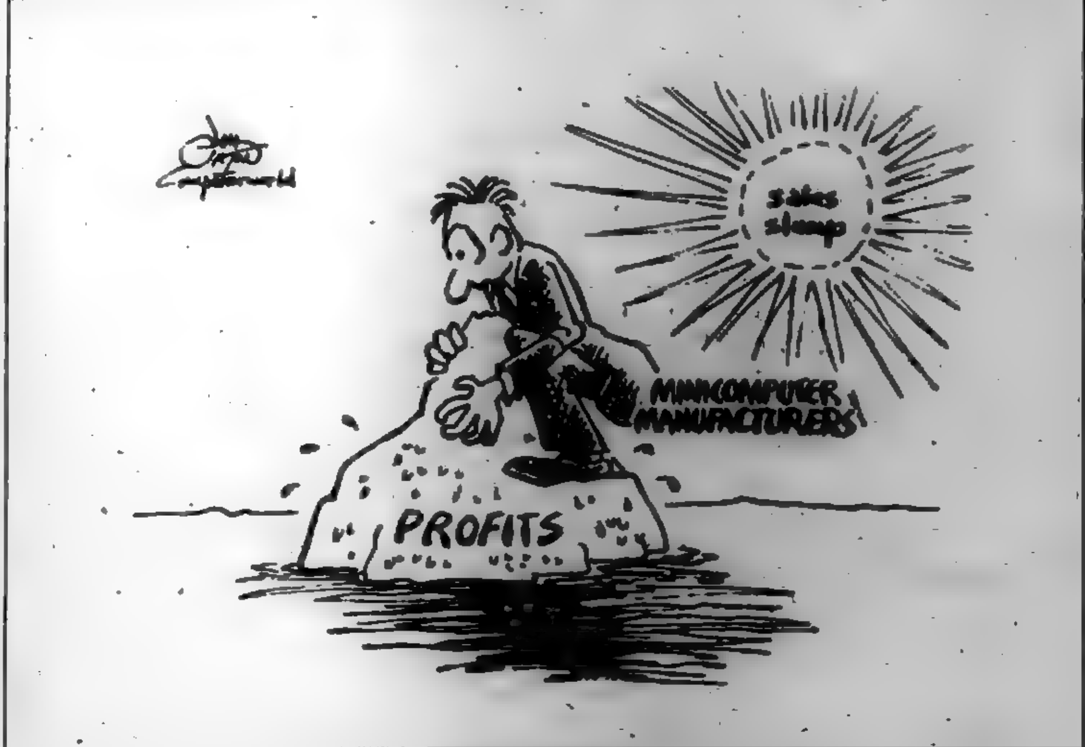
The U.S. companies have learned some painful lessons as the pie has shrunk, but much of the learning has come too late. Some important omissions include the failure to adapt to a commodity marketplace, overly aggressive capacity expansion and a tendency to continue milking a current, and declining, demand while neglecting to anticipate trends in end-user needs.

Times are extremely tough in the semiconductor business, but Japanese chip vendors have hardly been the cause; the basic law of supply and demand deals out penalties when manufacturers dwell on only the supply half of the equation. And now, even more important, restrictive trade actions, whether they increase U.S. chip sales in Japan or cut Japanese market share here, are not going to be the cure.

The current SIA-EIAJ dispute over market share figures is a simplistic approach to a complex industry — one in which distinctions between which products are American and which are Japanese, ordinarily a point of xenophobic pride, are becoming more blurred every day.

To cite just three examples, this is a world in which National Semiconductor Corp.'s National Advanced Systems subsidiary sells Hitachi Ltd. mainframes with an NAS label; RCA Corp. and Sharp Electronics Corp. have plans to build jointly Cmos chips in the state of Washington; IBM is about to complete an agreement with the government of Japan that will ease Big Blue's access to the research fruits of its Japanese cross-licensing partners.

In such a context, the angry voices of the semiconductor trade groups on both sides of the Pacific ring hollow. We safely presume that a semiconductor industry rebound, if and when it comes, will render those voices happily mute. Until then, we recommend silence and good works aimed at the corrective management steps that will facilitate that rebound.



Tip of the iceberg

LETTERS

Hawaii cited as ideal exporting location

I fear for the future of the U.S. high-technology industry when I read of large-scale layoffs at many U.S. high-tech firms, The slowdown in the computer industry seems to have hit many larger firms with unsold inventory and manufacturing excess capacity.

Yet for many small- and medium-size companies, rapid growth is still possible, especially in high-tech exports to the second largest computer market in the world — Japan — and the world's fastest growing computer market — Southeast Asia. There are also the newly industrialized Four Dragons: Taiwan, Hong Kong, Singapore and South Korea — all booming markets.

However, many U.S. firms don't think of exporting at all, deciding that it is next to impossible to market products to Asia half-a-world away. Hawaii, though, has been overlooked as the perfect site for marketing to Asia.

The Hawaii High-Technology Council was formed last year with state government and private sector support to aid U.S. companies that are investigating Asian marketing from Hawaii.

Ray K. Tsuchiyama
Honolulu

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or fewer. Letters may be edited for the purposes of clarity and brevity. Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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VIEWPOINT

On students, computers and the Soviets

LECHT ON SCIENCE
Charles P. Lecht

U.S. universities that have taken in a supercomputer as well as some Soviet graduate students may soon regret having done either or both. Department of Defense and other national security officials are being quoted in the overseas press, warning universities to be wary of their Soviet pupils. If students are studying science and are given open research access to our supercomputer systems, we are told that we must be especially careful. We must worry that some might, in the course of their studies, use these very same devices on behalf of the defensive — or even offensive — efforts of their home land. And that access by the students leaves our supercomputer facilities open to sabotage or espionage.

Reputed to be far behind the U.S. in computer technology and, at the same time, considered to be the foremost threat to U.S. national security, the Soviet Union presents us with motive for much of our defense program. For the past few years, schools like MIT, Brown University, New York University and Cornell University have been the recipients of new supercomputer systems, and with these, they have received various governmentally sponsored research grants related to defense. Therefore, it is not surprising that the issue of how to handle graduate students in science from the Soviet Union at schools such as these has come to the fore.

One precaution suggested by U.S. government officials is to ban Soviet graduate students from using university supercomputer facilities. The question is whether this is needed — forget about whether it is fair while their companions in the same courses from the U.S. have essentially unlimited use.

I do not believe that the Soviet students who have come here to do scientific research with supercomputers should be prevented from doing so because we fear that they might be running Soviet military applications instead of homework. This suggests that the Soviet Union is not worried about our surveillance of its results, or that they have a need to process work because the Soviet Union hasn't got supercomputers of its own.

If the Soviet Union lacks supercomputers, I'd like someone to explain how it developed its nuclear and space technologies. I've never believed it was behind the U.S. in the manufacturing and use of the kinds of logic and memory devices we use in our most vital defense areas — there are just too many signs to the contrary. From *Sputnik* to *Soyuz* to the hydrogen bomb, the Soviets have managed to come up with some fancy results, none of which could have been achieved without supercomputers.

Back to sabotage and espionage. Doubtless there is always the possibility of either from the students, but it is far less likely to occur from them than from trained experts in these nefarious arts. We need not be ashamed to warn all students, Soviet and American, of the penalties for becoming so engaged. And foreign students from countries that are not U.S. allies must be especially careful to avoid even the slightest appearance of involvement in such events.

So what about everything we read in the papers on the theft of our technology by the Soviets? Doesn't it mean that they lack our inventions? Why else would they be buying these through less than savory channels or even stealing them? Rather, it seems far more logical that they have been actively seeking our technology because in it is contained, at minimum, the message of where we are in the world of science and, at maximum, the secrets of our capabilities and limitations. This kind of information pieced together with other facts, such as which of our defense facilities are using a specific technology, can go a long way toward planning counter measures and those more aggressive. I'd be really disappointed if we weren't engaged in the same — forewarned is forearmed.

It cannot be viewed as anything but intelligent leadership that our defense and security establishments saw fit to outfit some of our universities with supercomputers and to support their development and application by providing research grants. If brains cannot be found in our leading academic institutions, then where else? It is only natural that we must take measures to protect the results from people who may do us harm. This can be best achieved by implementing systems security features, including those that preclude access to data bases and programs. Supercomputers are known to be super at such tasks as these. Faculty monitoring of the use of the systems is also in order, but I suspect this might be too much to ask. The unauthorized use of university computer facilities by faculty for personal reasons has always been nothing short of scandalous.

But, let's not get carried away by banning, not to speak of expelling, our Soviet students. We don't need another episode like the 1950s when suspicion of foreign students was followed by suspicion of their professors. The arrival of students from abroad is a positive step in the preservation of our way of life. Sure, there will always be a bad apple or two in the lot, but that's unavoidable. Most will go home after their training with fond memories of the fairness and freedom they found in the U.S. And that's just about the best conflict deterrent I can think of.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Maintaining morale when the contractors enter

THE DATA CENTER
John P. Murray

Many installations find that they must enlist the services of contract programmers to satisfy expanding demand. It is unfortunate that in some instances, while the contractors may do a very good job, because of the way their services are used, considerable harm can be done to the morale of the systems and programming staff.

It is not uncommon to find a situation where a new, unplanned system is required immediately. To respond to this demand, the management of the installation will review the work in progress and discover that all members of the systems and programming staff are fully committed to already approved projects and maintenance work. Given that situation and considering the need to begin the work immediately, the logical answer is to hire contractors.

So far, so good. The harm to morale does not usually arise with the introduction of contractors but with the assignment of duties once the contractors have arrived. Often the stance of the department management is that these people are expensive, that they have considerable experience and skills and that they will be best used on the new development project. Sounds logical, even reasonable.

Although that may be a very pragmatic approach, let's consider the effect it has on the members of the systems and programming staff, particularly those who are in charge of maintenance.

Application system maintenance, right or wrong, is often viewed as work that is less than desirable. It is often the case that those who have this responsibility accept it with reluctance and are eager to move to the development area. Given that scenario, it is easy to see the negative impact on morale when new people, who are not even employees, are brought in and assigned to more desirable work.

Because adopting the approach of the assignment of development work to the contractors sends negative signals to staff members, the adverse effect on morale is understandable. Sometimes managers will seek to justify this assignment of duties by saying that these contractors have prior experience on similar projects and can, therefore, do the job more rapidly.

It may also be stated, unfortunately, that the contractors are too expensive to be assigned to maintenance work. That position should tell everyone something about the feeling toward maintenance in that installation.

There have even been instances where management has stated that the contractors are unwilling to work on maintenance, and the only alternative available is to assign them to the development project. Clearly, in that situation, something is wrong. Either the management is so weak that it is unable to control the contractors, or it is simply a case of lying to avoid facing the issue. In either case, that installation has far more serious problems than those of dealing with contractor assignments.

The use of contractors can be effective while morale within systems and programming can be maintained if a different approach is taken. If it is necessary to bring contractors into the installation, they should, wherever possible, be assigned to work in the maintenance areas.

One exception would be in an enlightened installation where maintenance is understood to be a necessary and valuable component of the entire information processing function. In such a place, people with maintenance assignments are likely to be very satisfied with their work and probably will not want a different assignment. In that case, assignment of the contractors to the new projects will not create problems.

The idea that contractors are more experienced and that they can complete development work more rapidly may be quite valid. The problem is that using such an approach stifles the growth and development of the people within the installation.

In those departments where development work is considered to be the ultimate, the result will be a lowering of morale, a growing tension within the systems and programming section and ultimately an increase in turnover within the department.

Careless handling of the introduction and use of contract programmers can lead to more harm than good. As they press to attack the problems of an increasing work load, information processing managers must be aware of the needs and concerns of the staff.

To be effective, management must be carried out so that all staff members view it as being fair and even-handed. The most effective use of the contractors may not be the best approach in the long run.

Murray is director of management and information services for American Breeders Service, a DeForest, Wis., division of W. R. Grace & Co. and is the author of Management Information Systems as a Corporate Resource.

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Today's MIS managers seen as facilitators of change

READER'S PLATFORM
John J. Connell

Traditional wisdom has it that computers and their use in MIS represent a mature technology supported by a substantial industry infrastructure that is conservative, slow moving and structured. Work is handled in an orderly way by professionals, caution is the watchword, and the boat is seldom rocked. But that was yesterday.

Today, the only constant in the world of computers and MIS is change. The challenge to those in the information field is to recognize and understand these changes and then to adapt to them. The challenge to general management is to facilitate that process of adaptation.

What are these changes? New machines, new systems, new approaches? Yes, all of these, but the basic underlying change is the move of computing and other technological capabilities out into the workplace. It is that phenomenon and its ramifications that will dominate the world of information technology in the years ahead.

Minis started the move

The move started with the introduction of minicomputers that offered an alternative to large data centers as a source of computing power. The term "distributed data processing" was coined to describe this development. In actual practice, however, minicomputer installations became small data centers managed by technical specialists, operating in parallel with and sometimes connected to large data centers.

The advanced office systems field continued the trend. It introduced word processing, electronic mail, teleconferencing and other capabilities for nonspecialists. In the process, it changed the face of the information technology world and enlarged beyond measure the number of people who use such capabilities as part of their regular work.

However, the advanced office systems field has been slow in developing. One can point to many success stories, but overall, the field has not yet lived up to its potential. Nevertheless, advanced office systems represent a major thrust to move technology into the workplace. The pace of that change has accelerated greatly with the advent of micros.

It is important to recognize that the driving force behind the introduction of microcomputers has not been the information technology community. Rather, it has been nonspecialists who want computing capabilities available at their fingertips. In many cases, micros are being introduced over the objections of information technology professionals, but, as legitimate as some of those objections may be, there is no holding back the tide. Knowledge workers need these machines to do their jobs effectively, they recognize the need, and they insist that their needs be met.

This development is a basic change in direction in the information technology field and calls for a reexamination of the philosophical underpinnings of that field.

There are two reasons for introducing machines into the office: The first is to streamline processes, and the second is to improve one's ability to compete.

Over the years, the data processing field has been concerned with the streamlining of processes — improving the handling of high-volume transaction-based systems, reducing the cost of maintaining large files, speeding up the production of reports and similar activities. Conversion of such activities to machines produces measurable, predictable

Continued on page 21

Connell is executive director of the Office Technology Research Group, headquartered in Pasadena, Calif.

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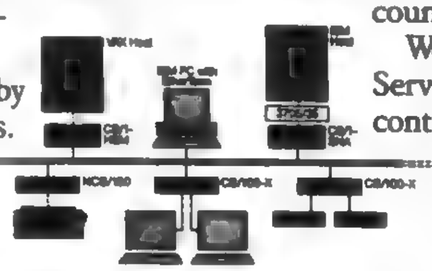

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LETTERS

Datapro poll clarified

I would like to clarify some points in the article "Poll shows mini mart saturated" [CW, July 22].

According to Mary Hemingway, managing editor of Datapro Research Corp., the survey was not given to all minicomputer manufacturers simply because they produce minicomputer systems. The criteria used for selecting minicomputer manufacturers was based on hardware technology and target markets.

Motorola/Four-Phase Systems, Inc.'s 4000 and 5000 series have traditionally been targeted at the distributed data processing market. The company had not announced any new minicomputer hardware technology recently. Therefore, Datapro did not feel that Motorola/Four-Phase matched the selection criteria.

Datapro classified the Motorola/Four-Phase 2000 and 6000 series as superminicomputer systems, and thus these did not match the selection criteria as well.

It appears that the elimination of Motorola/Four-Phase from the survey was based solely on Datapro's survey objectives and not on the viability of the minicomputer systems.

Howard Amundsen
Cupertino, Calif.

Publisher lauds vendor

A reader might infer from the article, "Switch to in-house data base musters interest in DSS" [CW, June 24] that Thomas Publishing Co. is unhappy with its service bureau vendor, when actually the opposite is true.

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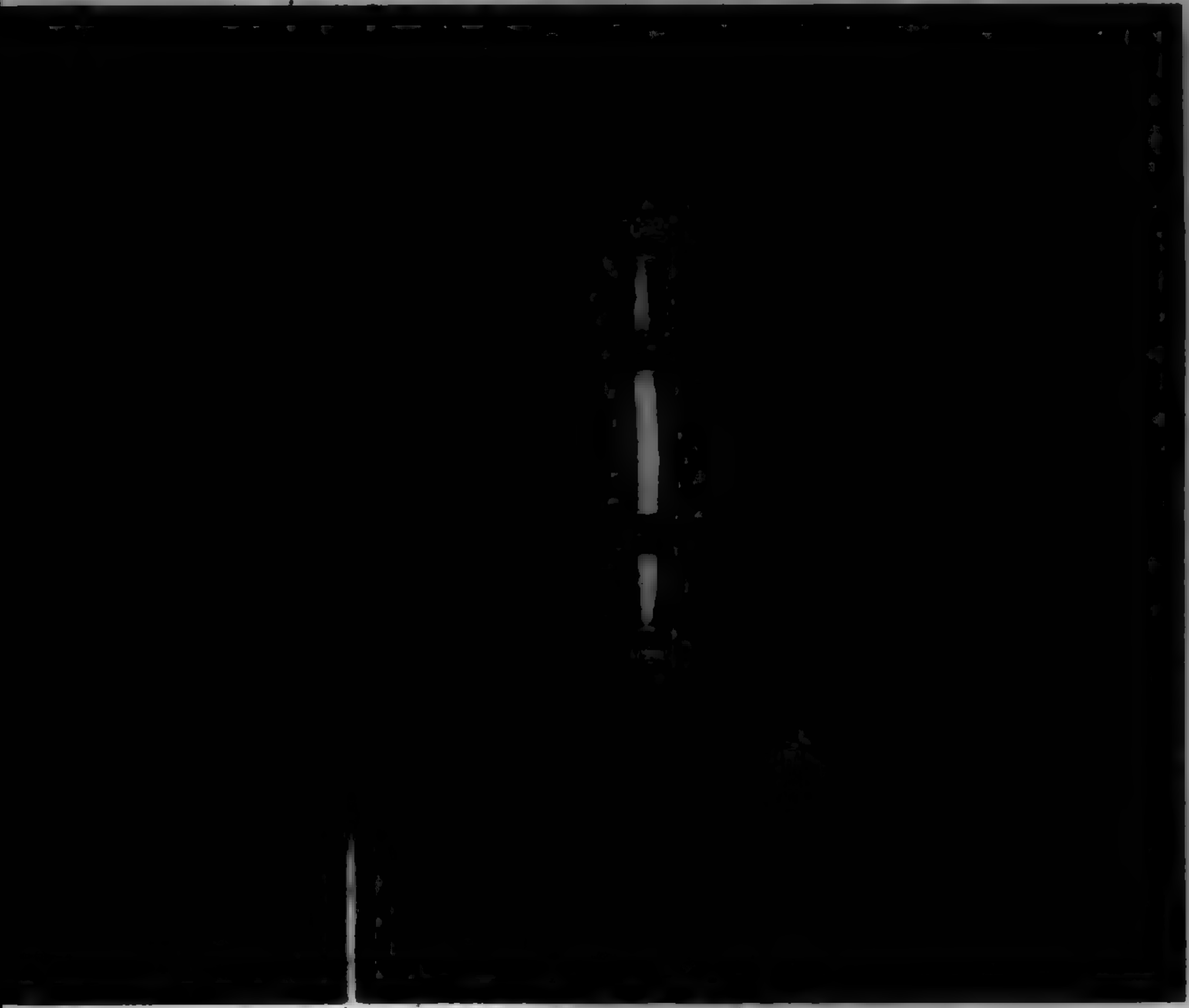
Albert W. Klein
New York



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From page 20

Today's managers facilitate change

gains with low risk of failure.

Return on investment is not easily measured, and risk is high. Yet it is these investments, ultimately, that determine the fate of an enterprise. One can be streamlined to the nth degree and still fail if the right competitive investments are not made.

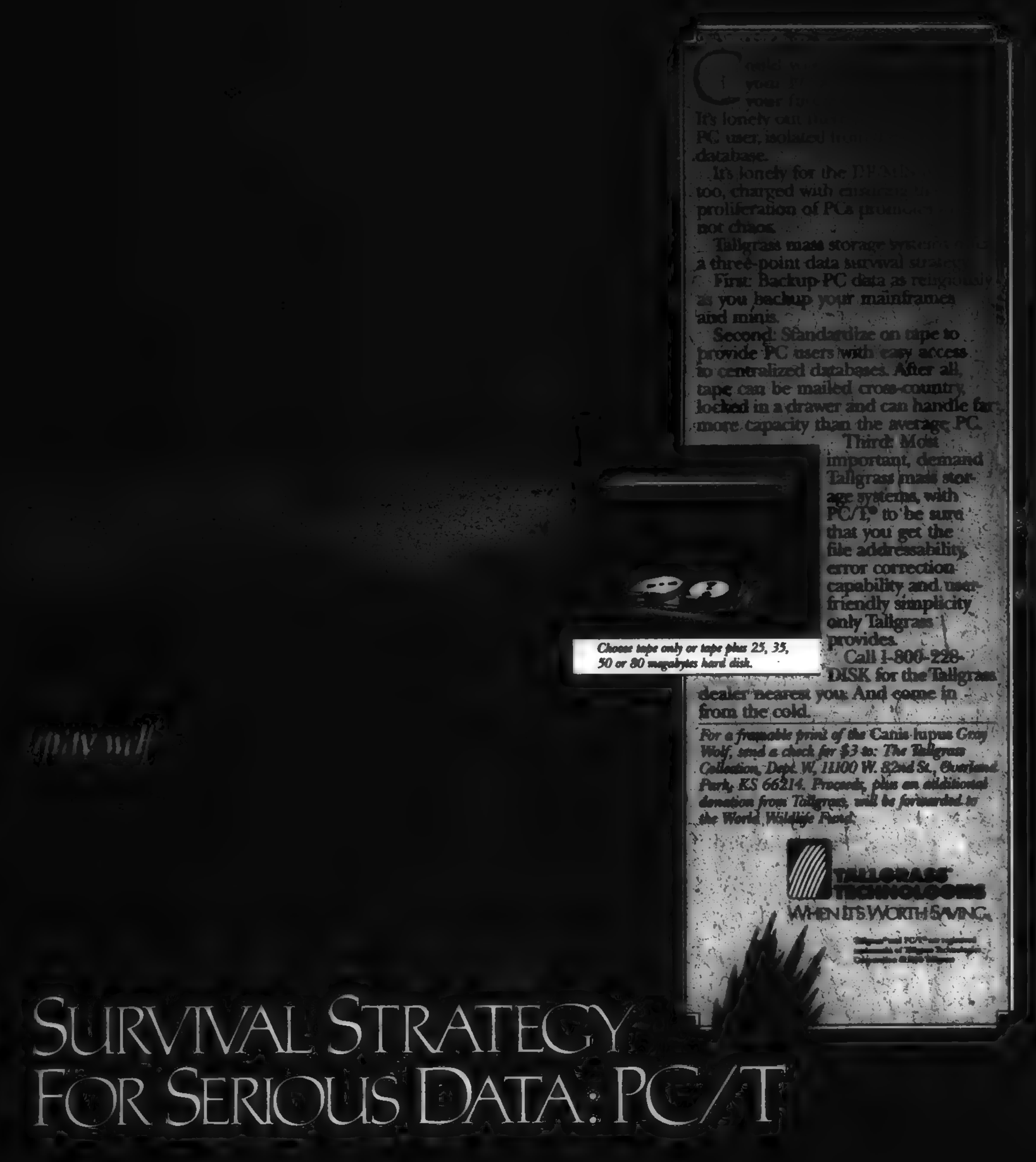
In this light, then, what is the new role of information technology professionals, MIS managers and the like? Their role is to make it happen and to provide an operating and technological atmosphere that supports the move of technology out into the workplace. This constitutes the new role of MIS professionals — facilitators rather than the exclusive providers of services.

In fact, some corporations have already responded by splitting their MIS organizations into two groups: One group aggregates all functions concerned with the operation of large, transaction-based processing systems and the maintenance of central data bases. The other group aggregates all activities concerned with moving technological capabilities out into the workplace. The managers of both are equal in rank and stature.

Change is never easy. Coping with major changes in direction, job content and career paths is doubly difficult. Couple that with a world that is exploding with new technological developments, and the situation becomes almost impossible.

Every change, however, represents an opportunity. Investments in advanced office systems will produce a community of office workers who are comfortable with information technologies and are aware of their potential.

That knowledge will then be translated into new ideas and approaches for improving overall corporate performance. Rather than the resistance often encountered in the past, MIS professionals will find themselves hard-pressed to keep up with this knowledgeable user community, and the challenge of their profession will grow immeasurably.



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SURVIVAL STRATEGY FOR SERIOUS DATA: PC/T

Integration under MVS/XA forecast for IBM line

By Donna Raimondi

IBM will adopt an integrated architecture across its extensive product line that will function under its MVS/XA operating system, according to a recently published report.

A heavy dependence on IBM's VM/CMS environment will provide interface capabilities for end users, according to "Inside Sierra," the report produced by Applied Management Services, Inc. of Patchogue, N.Y.

Within five years, the MVS/XA operating system will be modified to minimize user compatibility and migration problems, the report said.

The report examined IBM's Sierra announcement as part of an effort to provide data processing managers with an in-depth technical and managerial briefing on the 3090 (Sierra) systems. IBM's 3090 Model 200 and 400 announcements last February are the most significant factors contributing to the planning concerns of IBM mainframe users, the report said.

Since the 3090 announcement, high-end 3080 users have feared being stuck with suddenly old and hard-to-sell 3080 machines, the report said. The overall message in the 3090 announcement was IBM's hope that users would continue to purchase 3080 series processors. Despite its claims to the contrary, however, IBM is moving away from the 3080 mainframe family.

Lesson learned from 4300, 3080 era

IBM learned a lesson during the 4300 and 3080 series era, when its announcements of the new systems destroyed 370 and 3030 series residual values almost overnight. To avoid doing that to the 3080 series, the company held back announcements on the 3090's actual capabilities, the report said. IBM also dropped prices on 3080 series machines to promote their purchase.

During the next 18 months, overall internal performance of the 3090 Models 200 and 400 is expected to increase by 20%, the report predicted. Main memory capacity will increase, while the cost per megabyte of that memory will be reduced. Applied Management Services expects IBM to announce three new 3090 models by mid-1986, including two single-processor models and one that is halfway between the Model 200 and 400 in price and performance.

The report advised users to heed the following critical migration issues in relationship to IBM's 3090 announcement:

- Consider that the 3080s cannot be upgraded to the 3090s.
- Plan a move toward MVS/XA if future plans include 3090 technology.
- Pay attention to the functional changes that the 3090 contains. The real system price/performance level may be more important than the million instructions per second rating.
- Note that the 3090 offers up to 2.9 times the scientific and engineering power of the 3081 Model KX.
- Analyze total combined life cycle costs, including maintenance, floor space, upgrades and future enhancements.
- Note that the purchase-to-rental ratios for the 3090 series are extremely low — at unprecedented levels for IBM.

> "
>
> *During the next 18 months, overall internal performance of the 3090 Models 200 and 400 is expected to increase by 20%.*

- Strive to formulate 3080 vs. 3090 plans as quickly as possible.

Plug-compatible manufacturers (PCM) have suffered in the past few years from user loyalty toward IBM, the report continued. National Advanced Systems Corp. (NAS), however, responded to the 3090 announcement so swiftly with its family of AX/SL mainframes, manufactured by Hitachi Ltd., that it may make inroads with users who do not want to wait until 1987 for the 3090 Model 400.

NAS offers better delivery schedules, more competitive price structures and more advanced technologies than IBM in this case, the report said. Even the most conservative of large IBM users may find it difficult not to take advantage of the NAS mainframes, it said.

IBM, however, has seriously cut into the PCMs' market share with hints of a new modular MVS/XAA operating system that will not run on PCM equipment, the report said. The XAA concept centers on the implementation of microcode support, or assists, to the XA capability.

The PCMs' market share has dropped from 6% in 1981 to 4.5% at the end of 1984. As IBM moves closer to attaining the XAA microcode, the PCMs will be in for an even tougher time, the report said.

The report, which costs $120 per copy, is available from Applied Management Services.

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WASHINGTON UPDATE
CW Washington Bureau

OTA to study computer security, privacy issues

WASHINGTON, D.C. — The U.S. Congress' Office of Technology Assessment (OTA) recently announced plans to conduct a study of computer security and privacy issues.

The study, tentatively titled "New Communication Technologies: Implications for Privacy & Security," will delve into the following topics:

- Current technologies for monitoring the work of government and business employees, as well as technologies being developed that are likely to intrude on workers' privacy.
- The methods for mitigating the privacy threat of work monitoring through technology, legislation, labor agreements or other means.
- The ways in which computer systems can be misused or exploited by interception of data signals, unauthorized access and other means and the availability of security measures now and in the future.
- Case studies of specific computer systems whose disruption would be significant to the public or the economy.

GAO reports find federal payment systems faulty

WASHINGTON, D.C. — Several U.S. agencies often pay contractors twice for their goods and services, in part because their automated payments systems fail to stop the issuance of duplicate checks, according to three investigative reports by the U.S. Congress' General Accounting Office (GAO).

Recent GAO studies discovered more than $11 million worth of duplicate payments, the largest involving a $6.8 million payment that was mistakenly sent twice to a contractor for the Defense Logistics Agency.

Errors often occur when contractors send two or more invoices to the government; usually the contractors return the overpayments, the reports said. But the GAO identified several problems with the automated payment systems, including the following:

- A U.S. Department of Justice system "did not reliably identify duplicate payments, and it required action by payment center staff to stop those it did detect."
- The system at a General Services Administration office identified duplicate payments but only after the final computer tape for issuing checks had been made.
- A Defense Logistics Agency office sometimes paid contractors twice, once manually and once through the automated system, because the manual payment was not recorded.

ICCP announces certifying exam

DES PLAINES, Ill. — The Institute of Certification of Computer Professionals (ICCP) has announced the Associate Computer Professional exam, a certification program for computer professionals who have graduated with degrees in computer science or who have equivalent experience.

The certification requires passing a two-part examination. The language portion tests a person's knowledge of Cobol, Fortran, Pascal, C, RPG or structured Basic. The second portion examines a person's knowledge of data and file organization, principles and techniques of programming, interaction with hardware and software, quantitive techniques and systems analysis and interaction with people.

For more information, ICCP is located in Suite 268, 2200 E. Devon Ave., Des Plaines, Ill. 60018.

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WORLD DIGEST

CW International News Network

NORTH ROCKS, Australia — Rexona Pty. Ltd., a subsidiary of the Unilever Group, has obtained the first Australian license for Cincom Systems, Inc.'s Ultra Mantis fourth-generation operating system. John Greenlees, information services manager for Rexona, said the company chose Ultra Mantis to run on its Digital Equipment Corp. VAX 11/780 "because the systems are data driven."

■

COBURG, Australia — Kodak Australasia Pty. Ltd. will install data base and development tools from Applied Digital Research, Inc., (ADR) in keeping with Kodak Corp.'s mandate to standardize its organization's software worldwide. The ADR products — Datacom/DB, Datadictionary, Dataquery and Ideal — were chosen after an evaluation by a multinational task force commissioned by Kodak's Information System Management Council, a group of senior DP managers from Kodak's eight main DP installations around the world.

■

BROADMEADOWS, Australia — Ford Motor Co. of Australia Ltd. has signed a $7.5 million contract with Burroughs Corp. Industry insiders said it is the first of two such orders Ford will tak this year to cope with on-line real-time data base software development. The company will become the second Australian user of Burroughs' A 15 mainframe. Ford of Australia now uses dual B7900s, dual B7800s and an A 9 mainframe. The Ford of Australia contract calls for three subsystems of Memorex Corp. B9494-12 thin-film head disk assemblies.

■

HONG KONG — Stockbroker James Capel has placed a computer systems order worth $2.26 million with Hong Kong consulting company CCF Ltd., whose Fiscal package will be used on the central shared resource computer facility in the stockbroker's Exchange Square complex in Hong Kong. In London, however, Capel will install the software on a 150-terminal Ultimate Corp. system, which is considered one of the largest of its type in the world. The company is the first in Hong Kong to buy CCF's Fiscal International software. It will use 10 lines connecting its office to the Exchange Square system to service Capel's activities in Hong Kong, Tokyo and Singapore.

The CCF Fiscal software will provide settlement, valuation and fund management for its London, New York and Channel Islands, UK, offices. The London installation is valued at $1.76 million and will be based on Ultimate-/Honeywell, Inc. processors with 2M bytes of main memory and 2G bytes of disk storage. The system's 150 terminal devices will include laser printers and IBM Personal Computers, a company spokesman said.

■

HONG KONG — The Royal Hong Kong Jockey Club (RHKJC) is spending $5 million to train its staff as part of an office automation project with Digital Equipment Corp. The RHKJC is currently DEC's largest customer site in Asia with over 7,000 terminals and other peripheral devices to support its gambling operations. More than 100 of the club's off-track betting centers, plus a computerized telephone betting system serving 300,000 customers, are supported by some 110 VAX and PDP-11 computers. The RHKJC was also the first Asian site for DEC's high-end Venus system, according to a company spokesman.

■

HONG KONG — Smaller hotels in the Hyatt Regency chain, including one on the Pacific Ocean island of Saipan, plan to install a financial management system developed in Hong Kong. Hyatt hotels in Indonesia; the Philippines; Dubai, U.A.E.; Fiji; and New Zealand are expected to install FMS/PC, the multicurrency package launched in March by Hong Kong-based software house RCP Consulting Ltd. The package is a microcomputer version of RCP's Hotel Accounting System for minicomputers.

■

HONG KONG — Technical trials for an integrated services digital network, capable of carrying data, text and color-image communications, are scheduled for later this year by the Hong Kong Telephone Co. The territory's 66 telephone exchanges will all have digital switching by 1988.

■

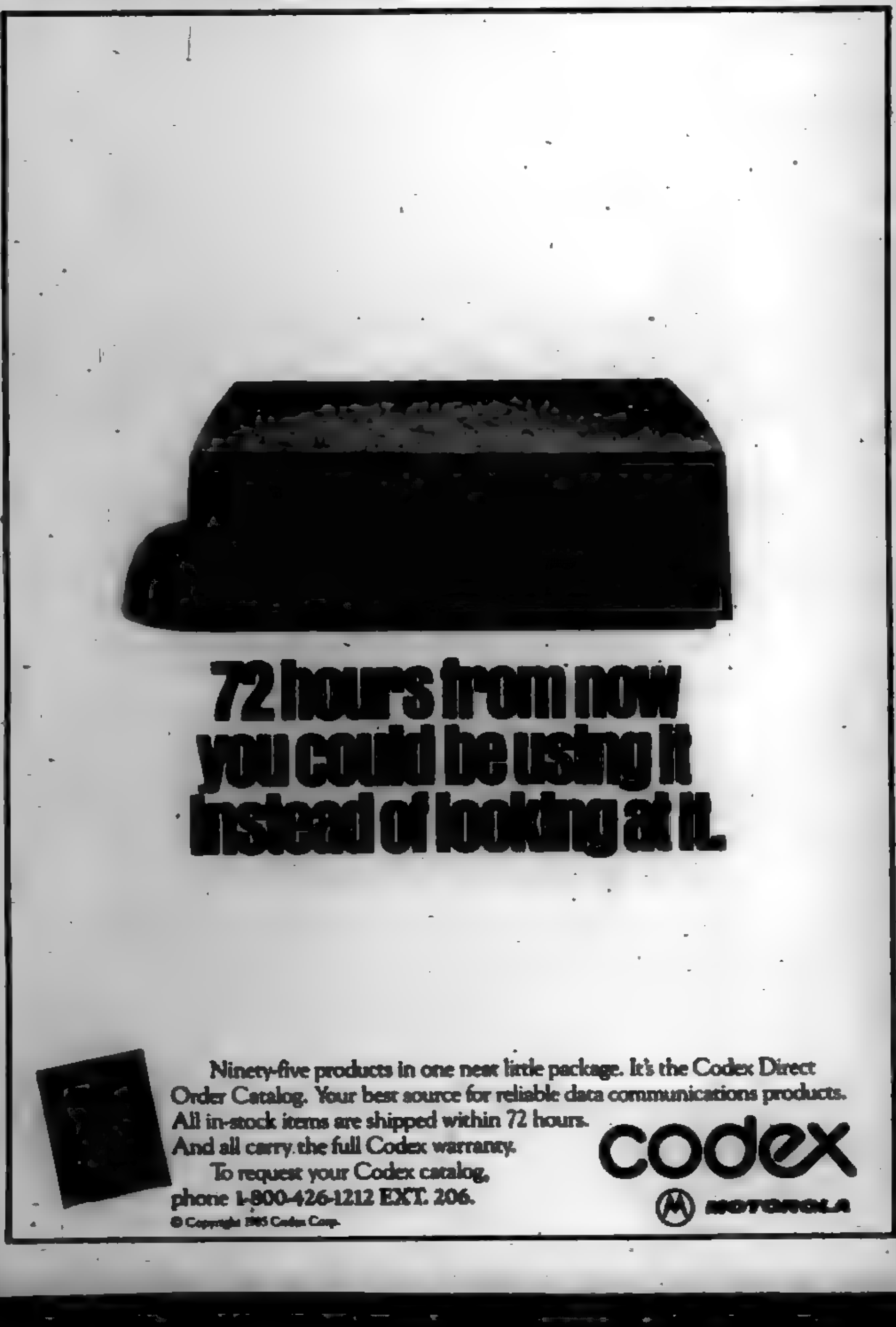
OSLO — The Osborne label will reappear on computers, but the new IBM Personal Computer XT-compatible Osborne system will be available only in Norway, it was learned. The Norwegian computer distributor, Nor Sales, was extremely successful three years ago with the original Osborne Computer Corp. portable computer.

When Osborne ended operations in the U.S., Nor Sales sold off the machines at low prices. The new "Norwegian" Osborne 20 XT is actually a U.S.-made Tandon Corp. computer, selling for about half the price of an IBM Personal Computer XT.

■

STOCKHOLM — Losses incurred by its personal computer division in the U.S. market are being blamed for Ericsson Information Systems, Inc.'s (EIS) recent financial woes. EIS invested heavily to penetrate the U.S. market but had very poor results, sources said.

Estimated sales for this year were reduced from 15,000 units to 6,000, and EIS has been forced to cut the micro's price by 15% to 20%. Ericsson recently reorganized its Information Systems division, reduced personal computer production and may relocate its manufacturing unit.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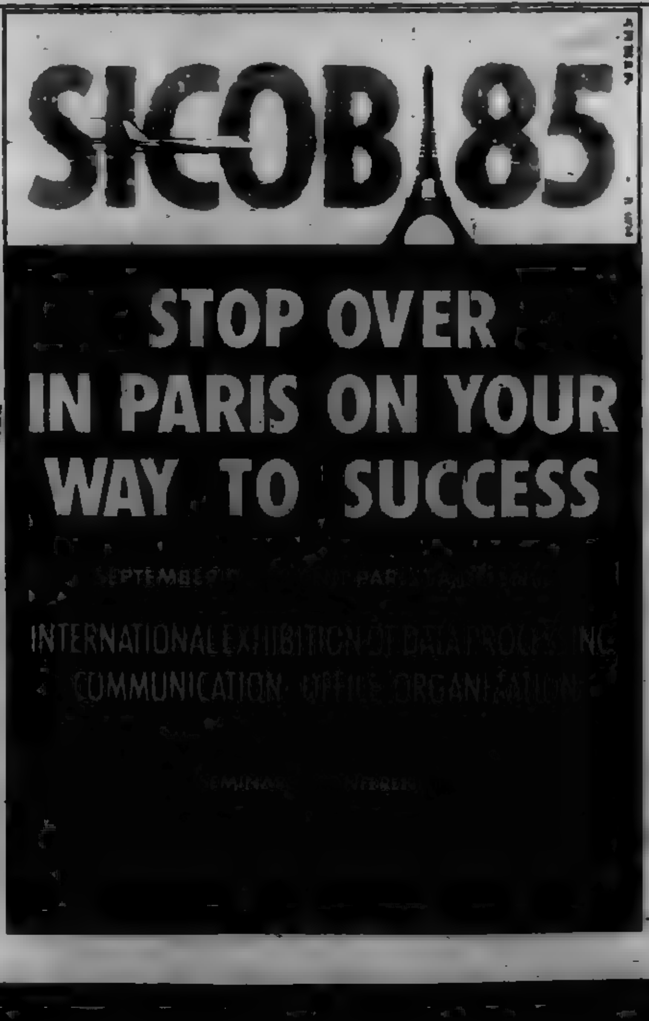
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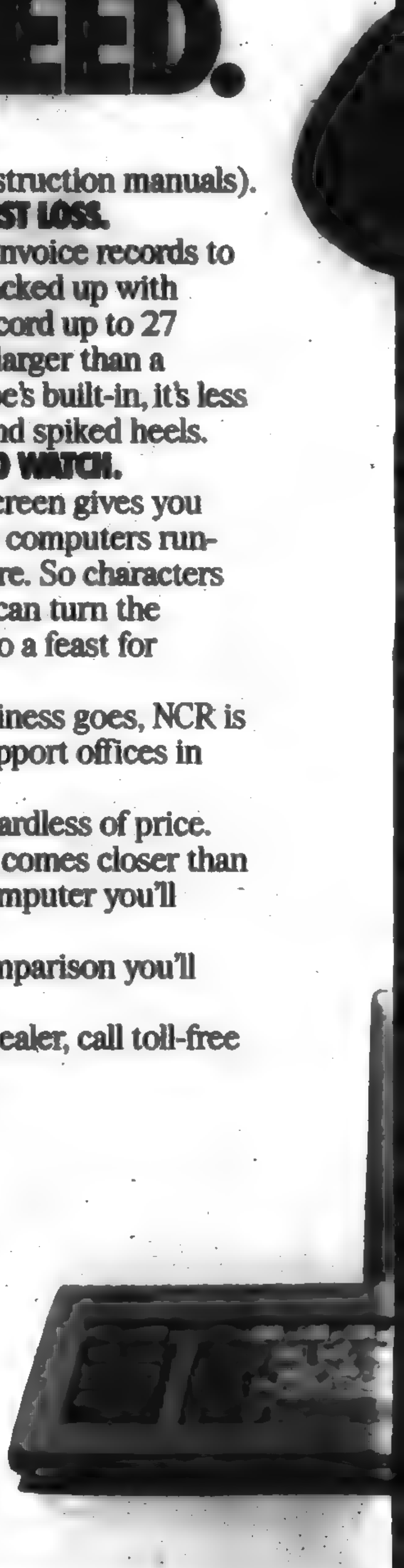

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NEWS

Support loss forces replacement

COLUMBUS, Ohio — It was a nightmare that every computer user dreads: A vendor halts support of a critical system, and the application is sufficiently esoteric that an alternative is not readily at hand. Not a moment can be lost, and the ensuing scramble involves not a little bit of risk.

For the Chemical Abstracts Service (CAS), a division of the American Chemical Society based in this Midwest capital, the system involved consisted of Conographic 9 terminals from Hughes Aircraft Co., used in publishing the CAS 77-year-old weekly journal, *Chemical Abstracts.*

"The vendor had withdrawn support of the product, and we were having trouble finding replacement parts," said Hans Dreyer, system engineer at CAS.

Chemical Abstracts contains summaries of chemistry articles, professional papers, chemical patents and reports.

The abstracts act as research sources for chemists, engineers, scientists, students and professors and often are accompanied by drawings of complex chemical structures and chemical and mathematical equations.

CAS requires graphics terminals like the Conographic 9 system because complex chemical structures and equations must be displayed on a screen exactly as they will appear in print in *Chemical Abstracts*, Dreyer maintained.

"If a mathematical symbol is to be printed twice as large as another, the two symbols must appear in proportion on the display screen," he said.

The terminals are connected to two Digital Equipment Corp. PDP-11/24 series minicomputers that are connected to an IBM 370 mainframe that controls data entry and phototypesetting operations.

Vendor support withdrawn

Hughes withdrew from the terminal market support, and CAS found itself without vendor support. Dreyer's group was responsible for scurrying to find a replacement. "We evaluated terminals from a number of manufacturers," he said.

CAS chose four Vistagraphic 1000 display terminals from Calcomp, an Anaheim, Calif., firm. With this system, whenever an image was altered by the operator, the change was seen on the screen instantly.

CAS needed this capability in publishing *Chemical Abstracts*, because large amounts of information were constantly altered.

The new terminals provided other benefits as well. "The old terminals had to be reinitialized from time to time to clear the screens because storage tube technology sometimes leaves traces of previous images on the terminals," Dreyer explained. This procedure was not necessary with the new terminals.

Magazine reproduction was not the only use that CAS made of the abstracts. They are also available from an on-line data base, a cumulative index for *Chemical Abstracts* that CAS publishes every five years.

The index is so large that it has earned a place in *The Guinness Book of World Records.* The 1983 edition, for example, contained more than 130,000 pages and 25 million entries in 75 volumes.

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Distributed processing system remedies hospital's ills

CHICAGO — Despite an ailing DP budget, a major hospital here implemented an information center and distributed processing technology with the hopes of nursing its report delivery system back to health.

When the manual system for delivering user reports throughout the sprawling 28-building South Side campus of Michael Reese Hospital & Medical Center reached capacity, Bill McNichols, the hospital's technical services manager, realized something had to be done.

"It became clear that we could not support our growing user base with one or two report deliveries per day like we did with our batch processing customers," McNichols said. "Users were going to need documents, memos and graphs on demand."

With the data center more than a mile away from some of these buildings, McNichols continued, "you can guess how many users were willing to make the trip over here just to pick up a report."

The hospital uses low-cost dumb terminals as user workstations with its IBM 4341 Group II mainframe running VM/CMS. Printer requirements, however, threatened to limit the network's effectiveness.

"We wanted to produce software tools that would emulate micro tools," McNichols said. Even with terminals in several work areas there was little printer support.

"We were trying to foster the use of productivity tools for office automation within the department," McNichols said.

Managing resources difficult

The hospital used IBM's DCF and GML for text processing and SAS Institute, Inc.'s SAS/Graph for presentation graphics and reporting. According to McNichols, this range of products created a big demand for small, specialty printers. "Once we got three or four different printers and 15 to 20 people using them, managing those resources got to be very difficult."

The printers were simply defined to Remote Spooling Communications Subsystems (RSCS), the spooling subcomponent of VM.

RSCS was a headache for the DP staff, McNichols said, because central systems operators had to leave the command room to go reset the printers numerous times per day.

The hospital wanted to be able to share work loads between printers and send reports to a list of printers. "RSCS could not help us accomplish these goals," he said.

Michael Reese Hospital now uses the ACX-PM Printer Manager from Autovative Computer Extensions, Inc. in Downers Grove, Ill., to support a network of printers. Included are Ascii printers connected to asynchronous communications lines.

Among the early users of the ACX-PM network were the Medical Center's clinical departments. Ascii terminals and printers were already in use, and the users were anxious to access the central computer for word processing or for developing departmental systems, McNichols said. ACX-PM allows users to connect to the host and control printer output.

A recently developed system that supports the Development Office allows users to print various types of forms, including letterhead stationery and envelopes on a Diablo Systems, Inc. 630 printer.

ACX-PM is built into the system and appears transparent to the user. Now, printers can be shared between different applications.

There are plans to continue the spread of low-cost printer devices within the institution.

"We're looking at the possibility of adding some new function to our Payroll/Personnel system by making the screen-image printers more versatile," McNichols said. "It will surely help get information to the user more quickly."

HOW TO
MAKE A
GREAT
IMPRESSION
AT THE
OFFICE

Stiff competition presses winery into use of graphics

System aids planning effort

SAN FRANCISCO — When prohibition confronted one Northern California wine company with the sour grapes of public opinion, the company made grape juice. Today, that winery is adapting again to outside influences, this time with computer graphics.

Italian Swiss Colony Wines of California, Inc., the country's fourth-largest wine maker, has been producing wine since the mid-1800s. The company reports annual sales of seven million cases of wine in the U.S. and 10 foreign countries, from its product line of dry table wines, dessert and fortified wines, sparkling wines, brandy and vermouth.

During the past three years, the firm and its products have faced an unusually competitive business climate. Foreign wines, which cost less to produce than domestic ones and sell for less despite import tarriffs, are hurting U.S. producers' sales, according to Bill Hardwick, a business analyst for Italian Swiss Colony. In addition, he said, the wine industry has been relatively stagnant for the past two years, so domestic companies are battling each other to increase their market shares.

Italian Swiss Colony has responded to business pressures with tight control and planning measures, some of which rely on effective use of computer graphics. The firm employs an IBM Personal Computer, Lotus Development Corp.'s 1-2-3 software and Hewlett-Packard Co.'s HP 7470 two-pen graphics plotter to produce charts and graphs that managers use to help them with business decisions.

Daily order report

Hardwick said the graphics application on which the firm's managers rely most heavily is a daily order report that he produces for them. Graphs included with the report show how many cases Italian Swiss Colony's distributors ordered the previous day and compare these numbers with the company's sales forecasts.

"These updates are necessary for quick assessments of our position and [for] decisions made between . . . business meetings," Hardwick said. He produces the reports by entering order statistics into the Personal Computer, filling in a Lotus worksheet, converting the information to a chart format, reviewing the chart on his screen and outputting the graphics to the plotter.

Hardwick's finished reports have numerical data on one side and charts on the other. Many managers prefer the graphics side, he said, because it gives them information at a glance.

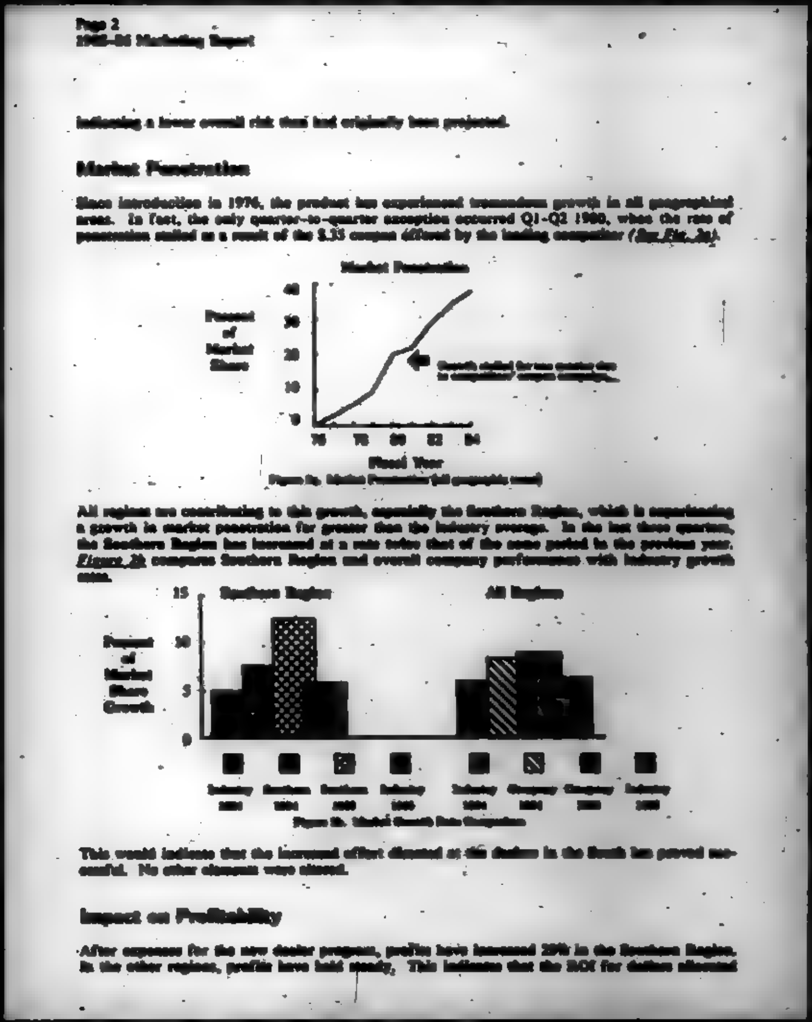
Because they are easy to understand, the charts help Italian Swiss Colony's managers make accurate business decisions. "The bar and line graphs generated by the plotter are much less confusing than columns of numbers," Hardwick explained. "The graphs decrease the possibility of misunderstanding information and, in doing so, prevent potential mistakes in decisions."

The wine maker also uses graphics in its monthly business meetings. Hardwick produces graphs that show year-to-date business figures, forecasts for the future and different brands' recent sales against previous years' sales. He has each graph made into a transparency that he uses to explain business results.

Before Italian Swiss Colony purchased its graphics plotter in October 1983, presentations at business meetings consisted of hard-copy output of raw data. "The method wasn't satisfactory," Hardwick said. "Trying to explain the numbers as they stood alone was too confusing."

The graphics presentations help managers get through business meetings and on to the business of producing wine, he said.

With the Hewlett-Packard LaserJet Printer.



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TANDEMCOMPUTERS

Disk drive eases computer game firm's system overload

PASADENA, Calif. — A computer game company here recently found itself in the unenviable position of having to turn away prospective business because its computer system could not handle the in-house load. The dilemma was resolved through the firm's adding a new disk drive and upgrading an old system, moves that also helped to increase productivity and cut costs.

Cheshire Engineering Corp., a small electronic engineering and computer science firm, found itself in a predicament last year when its Digital Equipment Corp. PDP-11/23 could no longer handle the company's development load, according to Larry Zwick, software design engineer and system manager.

The seven California Institute of Technology graduates who had launched the company in 1982 had chosen the PDP-11/23 because it was uniquely suited to a fledgling company's budget, Zwick said.

The computer's disk drive system combined an 8-in., 20M-byte Winchester with an access time of 60 to 70 msec and a floppy backup — a system that was inexpensive and reliable but offered neither high speed nor high performance.

Cheshire had three games on the market within a year and a half after its start-up, with two more under development. Also in the works were real-time control software products such as Vasi, a videotape recorder animation controller, and several other special applications systems including one to transmit a continuous loop program for a CATV network, according to Zwick.

Losing potential business

With 10 employees now up on its in-house system, the company found it was losing potential business because of system overload, Zwick said. In order to find the system's weak links, the staff performed a series of tests on the system that pinpointed the disk drive.

After surveying the marketplace, Cheshire settled on a 128M-byte Atlas disk drive with an access time of 18 msec, manufactured by Alpha Data, Inc., of Chatsworth, Calif., together with an Emulex Corp. converter.

At the same time, Cheshire added a Cipher Data Products, Inc. F880 streaming tape that operates at 100 in./sec. in 1,600 bit/in. mode and 50 in./sec. in 3,200 bit/in. mode and an Emulex controller.

Cheshire upgraded its PDP-11 by removing the 11/23 processor and adding an 11/73 .25M-byte processor board. A cabinet and power controller were also purchased, according to Zwick.

Overall time savings

"We estimate between 10% and 20% overall time saving per day per employee," said Will McCown, Cheshire vice-president and principal hardware engineer.

"This enables us to bid lower on new business proposals, charge clients less than our competitors and still increase our own profit margin."

Productivity is also up at Cheshire. "Before we acquired the new drive, the system would completely clog up during any payroll or financial work. What we call our real work — programming — as well as editing and word processing, would come to a halt," Zwick said.

More complete use

The staff at Cheshire is making more complete use of the computer's capacity now, Zwick said. Before upgrading, the staff went out of its way to avoid having to use the main system. They ignored mistakes or tried to remember where they were. Sometimes they resorted to writing down a catalog so they could feed in all the mistakes at once, he said.

Cheshire decided to run some tests to measure the improvement with the upgraded system, Zwick said. Using a time board, the staff measured when the computer was actually waiting for the disk, he added.

With the old system, it took 70 msec per average transfer. With the present system, it takes between 14 and 20 msec per transfer for a small number of blocks and 20 msec for a large number of blocks, according to Zwick.

Measuring daily backup time

Another test measured the time required to do the daily backup performed to save each day's work, Zwick said. This required more movement of the disk than most operations and involved bigger pieces of data. It took the same amount of time to back up the old disk as it did to back up the new one, but the new one was five times larger than the old one, according to Zwick.

He said the old disk was so slow that it could not keep the streaming tape in streaming mode, causing the backup to take a long time given the amount of data on the old disk.

"We may need more memory and a faster processor. But we will be able to keep the same disk drive, since we plan that it will serve up to 20 people easily," Zwick said.

Cheshire's system should serve for some time to come, according to Zwick. The PDP-11/73's .25M-byte main memory is now upgradable to 4M bytes of memory if they need it some time in the future, he said.

Guess who just unveiled seven

The new IBM 3161 ASCII Display Station is really seven different ASCII displays in one.

In addition to its own function-rich native mode, the new IBM 3161 can emulate:
- IBM 3101 Model 881
- ADDS Viewpoint*
- Hazeltine 1500*
- Lear Siegler ADM-3A*
- Lear Siegler ADM-5*
- TeleVideo 910*

Besides fitting nicely into existing systems, the IBM 3161 also offers impressive improvements in ergonomics.

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The IBM 3163 with Plug-in Cartridge

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The sharp 8 x 16 character matrix helps make for easier reading and fewer operator errors.

a second new ASCII display station with even higher function—the IBM 3163.

Outwardly, these two new displays look alike. But the 3163, in addition to its built-in emulation of the IBM 3101 Model 881, also offers the ability to emulate the DEC VT 52 and VT 100* by means of a unique plug-in cartridge.

And while you'll like the power and flexibility of the 3161, for your high-function applications the 3163 goes even further. For example, a 7,680-character buffer and up to three windows enable you to view and modify portions of different host data bases. The 3163 lets you redefine and even recap the keys.

On both displays the setup is menu-guided and written in plain English, so it can be done easily and quickly. The point is, both are designed to improve your user productivity.

Very Attractive Prices

The price per terminal is $695 for the 3161 and $1,095 for the 3163. Quantity discounts are available. What's more, IBM maintenance offerings start as low as $35 per year per terminal for customer carry-in repair.

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FEATURES	3161	3163
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Vertical scroll	Jump	Jump/Smooth
Definable function keys	36	36
Windowing	No	Yes
Partitioning	Horiz	Vert/Horiz

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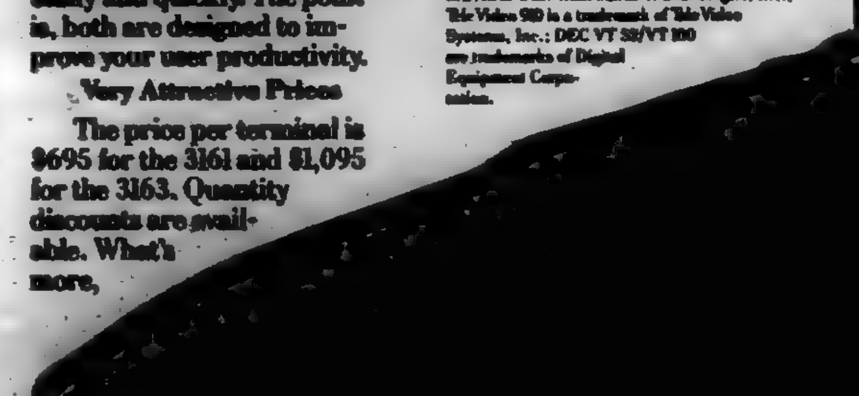

DBMS critical to firm's massive data analysis task

WINDSOR, Conn. — A firm here that helps nuclear utilities design and maintain portions of their reactors is using a relational data base management system to reduce engineers' work loads and expand report-writing capabilities.

The firm, Combustion Engineering, Inc., designs replacement cores for nuclear reactors, a task that calls on engineers to plug one piece of numerical data, or derivations of that data, into a number of different formulas. The firm also inspects its customers' steam generators for potential flaws, a job producing large data sets that require detailed engineering analyses.

Until last spring, when the firm brought up its DBMS, both of these processes suffered from inherent inefficiencies; among them were the following:

Replacement core design — data redundancy. A nuclear reactor exhausts a portion of its fuel supply every 12 to 24 months, and this must be carefully replenished. In this process, the added fuel and the fuel that remains inside the reactor must be arranged so that they produce even heat generation.

Combustion Engineering manufactures mechanical assemblies that hold about 200 of the long, thin rods in which nuclear fuel is stored. The firm also conducts sophisticated design work to determine how these fuel assemblies — a typical reactor holds 217 of them — should be positioned within the core.

Nuclear engineers at the firm study fuel depletion rates, energy production, reactor safety and other parameters to derive optimal configurations.

Before Combustion Engineering brought up the relational DBMS, engineers had to manipulate their design data to fit the various schemes, according to Steve Wagner, supervisor of physics design systems.

"The physics and engineering programs we use have been developed by different people and even different organizations, and they have used a variety of input formats," Wagner said. "Up to now, the design engineers have had to work with all of these; they've used a hand calculator or picked off the fundamental design data from a drawing and formatted it themselves for input into the programs."

One of the problems of the approach, he said, was that engineers had to manipulate the same piece of numerical data over and over for use in the different programs.

Generator inspection — inflexible reporting. As part of its maintenance services to clients, Combustion Engineering inspects tubes that carry steam through its customers' steam generators. The generators are one of a nuclear reactor's safeguards against radioactivity leaks, and the inspectors look for incipient flaws that might lead to a problem.

The Combustion Engineering inspectors send a probe that detects flaws into the thousands of tubes that each generator contains. With frequent inspections — some tubes must be inspected each time a reactor is refueled — the firm generates a large amount of data.

Data tracking crucial

The ability to keep track of this data is crucial, according to Wagner. "The key to our field-service business is our ability to manage the data we collect," he said.

Combustion Engineering had used standard Fortran programs to prepare client reports on a Control Data Corp. Cyber 180/855 with two million 60-bit words of memory. "These were inflexible" Wagner said, "and it was expensive to change the programs to suit each utility we serve."

Last spring, the firm brought Logica, Inc.'s Rapport relational DBMS up on the Cyber. Engineers and managers access data they need through Digital Equipment Corp. VT100 and CDC Viking 721 terminals and through IBM and Hewlett-Packard Co. microcomputers in terminal-emulation mode.

For design tasks, engineers use the DBMS to prepare and store data for the different fuel assembly arrangements they are considering. With a full screen input capability that Combustion Engineering designed, the engineers can call up a schematic diagram of the inside of a reactor and type in indicators of where they want to place assemblies.

The DBMS takes this and other design data and inputs it to the various engineering programs. The engineering programs, sequences of calculations, then simulate actual reactor operations and gauge the efficiency of proposed fuel assembly arrangements. The firm also uses its DBMS to organize and report on data that it gathers during probes of steam generator tubes. A Zetec Corp. DDA-4 signal processing system on a 1M-byte HP 9000 micro converts analog signals from the probes into digital information.

The investigators then pass the information on to the Cyber, and engineers working with the mainframe perform further analysis.

Managers can also call for ad hoc reports if they spot a new phenomenon and want to examine it. Wagner said they might, for example, ask for a report that lists each steam tube that has had a certain type of flaw.

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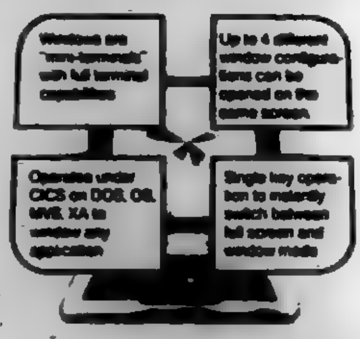
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NEWS

Bank's package rates commercial loan prospects

CHICAGO — Joseph d'Ouville, senior vice-president at Exchange National Bank of Chicago, has been searching for a commercial loan package for more than 10 years.

"Most of the packages I looked at required too much paperwork, were too regimented or were too difficult to use," d'Ouville said.

Until a year ago, his search focused on mainframe packages. Then he came upon Customer Relationship Information System Program (Crisp) developed by Micro Resources, Inc. (MRI) of Novato, Calif. The package runs on an IBM Personal Computer XT with IBM's PC-DOS operating system and 320K bytes of random-access memory.

"Crisp was the only functional microcomputer package available when we were looking at microcomputer commercial loan packages," d'Ouville noted. The senior vice-president said that approximately 50 officers from the bank's eight divisions currently use Crisp. The software runs on a Novell, Inc. local-area network of six IBM Personal Computers.

Through a complete business cycle

Crisp is an integrated, multifunction reporting system that takes commercial loan officers through a complete business cycle: selecting customers and markets, setting goals, implementing plans, soliciting business, pricing loan packages, managing the business and measuring results. The package is designed to measure the profitability of commercial customers and to determine pricing for new lines of credit. It supplies three functions: planning, information retrieval and reporting.

A commercial customer's business is typically spread throughout a bank — deposits are made in branches, loans are certified at the main office and services are supplied by operations. With most software packages, determining a customer's profitability can be difficult, the senior vice-president said.

Crisp helps to integrate customer data bases into one package that enables officers to measure immediately the profitability of business alternatives, price loan packages and report the information to management and customers. Since Crisp places the information at the officers' fingertips, it enables them to make better decisions faster and communicate the results in tailored, easy-to-use report formats, according to d'Ouville.

"We were looking for a way to show each bank division how to break down profitability by its officers," d'Ouville said.

In addition, Crisp provides officers with a profit planning tool to develop goals for a portfolio of customers. The system includes a business solicitation module to help officers manage time, keep records straight and organize their calendars. A sophisticated loan pricing module allows officers to respond almost immediately to customer questions about costs while an account management module monitors customer performance once the loans have been booked. Finally, Crisp evaluates officers' performance against preset goals.

Exchange Bank uses the package in conjunction with data stored on its IBM 370 and 4341 mainframes. "Crisp automatically extracts data from various bank applications on a monthly cycle and stores customer information files on the local-area network's 40M-byte hard disk," d'Ouville noted.

"We can respond to loan requests in a much more meaningful fashion by analyzing the situation with the pricing module and evaluating the alternatives we have," d'Ouville pointed out.

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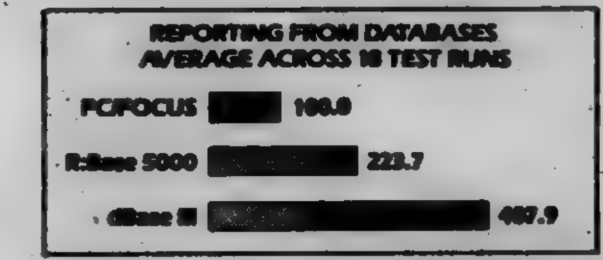

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Automated bookkeeping system aids customer services

Firm's on-line system tailors client reports

NEW YORK — A 17-year-old direct-mail list management firm recently purchased a new computer system to automate its bookkeeping functions — only to discover that its new system was useful in helping to supply critical customer services as well.

Demographic Systems, Inc. (DSI), based here, manages and maintains mailing lists for clients in such retail fields as packaged goods, according to Mark Yearick, the firm's advertising and promotion manager. In addition, the firm provides client companies with computer services from duplication elimination to list enhancement and age coding, Yearick said.

DSI previously used a time-shared IBM 3081 mainframe for such jobs as processing name and address records. However, these large systems proved unsuitable for smaller functions, such as bookkeeping and related reports, according to DSI President Stanley Monsky.

Moreover, Monsky said, record keeping also had to accommodate both DSI's internal reporting needs and the requirements of its clients, who usually wanted reports to match their own accounting systems. Since a mailing list is among a company's most valued assets, list owners insist on being supplied with details regarding sales, payments and receivables information.

"We need to have all this information in an interactive data base so that we have access to it when necessary," Monsky said. Because his clients' needs are quite varied and often difficult to predict, flexibility in entering and retrieving data is essential, he said. "We also wanted a machine we could quickly integrate into our operation."

To meet its growing needs, DSI bought a Wang Laboratories, Inc. VS 80 with 512K bytes of main memory that was installed in January 1983, according to marketing manager Yearick. The system included a 90M-byte disk drive, 10 CRT display terminals, a DW0558 600 line/min printer and a B600-22 letter-quality printer, all from Wang.

Bookkeeping software consists of accounts payable, accounts receivable and general ledger systems written in Cobol and supplied by Mini-Computer Business Applications, Inc. of Montrose, Calif., reported Allen Williams, DSI's DP manager.

Although the VS was purchased for bookkeeping applications, DSI management soon realized other possible uses for the system, such as compiling count reports.

"Our business," Monsky commented, "is renting lists and defining markets. If a packaged goods [client] wants to mail 30 million samples to specific groups of people, he needs to break down the country into certain geographic and demographic segments."

Count reports help clients plan such campaigns, Monsky said.

To streamline production of the reports, DSI moved its integrated data bases, which contain all available information by county, Zip code and census tract, to the Wang VS. The data can also be merged with information on the national population and with DSI's in-house data bases to help a user focus on a specific target market, according to Monsky.

DP manager Williams developed a report generator in Cobol for the system. Now, when an account asks for specific information, Williams said, he can generate new reports on the VS in a matter of hours. Information can be retrieved and displayed in virtually any format.

In one instance, Monsky related, a DSI client required a report on newspaper circulation. DSI added circulation data to its existing data base and delivered the report the next morning, he continued.

Household data base

In addition to analyses along county or Zip code lines, DSI has also developed reports based on household-level data, Monsky said. "We believe the best possible geographic definer is the household," he noted.

DSI's data on some 65 million households is the starting point for reports that allow clients to use age as a fundamental selection factor, he said. The company's time-shared mainframe first compares a data base of about 167 million names with a client's file, he said. For every matching record, it then attaches information on family members, including exact birth dates, to the client's file. Counts from this expanded file are transferred to the VS, available for use as dictated by a client's specific needs, he said.

The age report derived from these counts shows how the client's list compares to DSI's file and to the national population in terms of age distribution, Monsky said. An index number for each age bracket tells the client in which bracket his list is likely to achieve the best response, he added. Reports are compiled on a national, state or county basis.

More than half of DSI's staff already has hands-on use of the VS, and new employees quickly take to the system, Yearick said.

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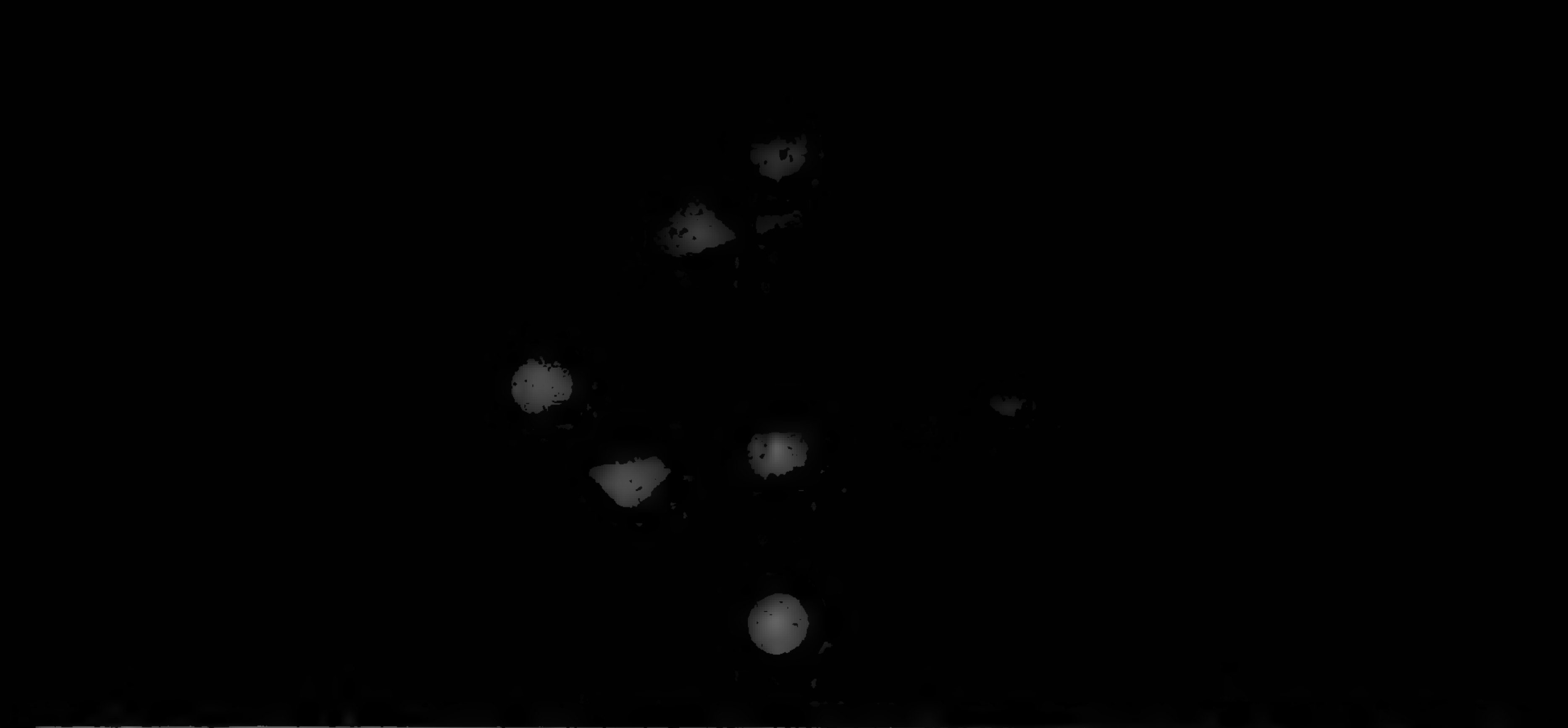

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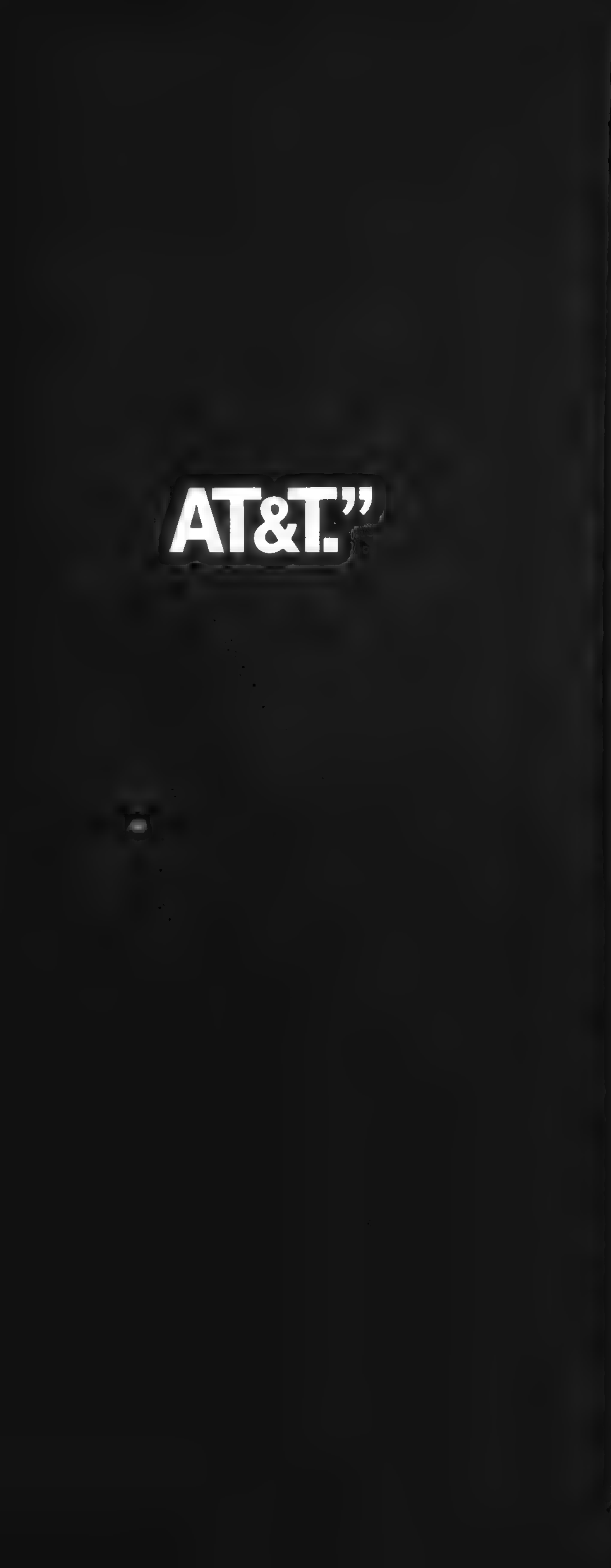

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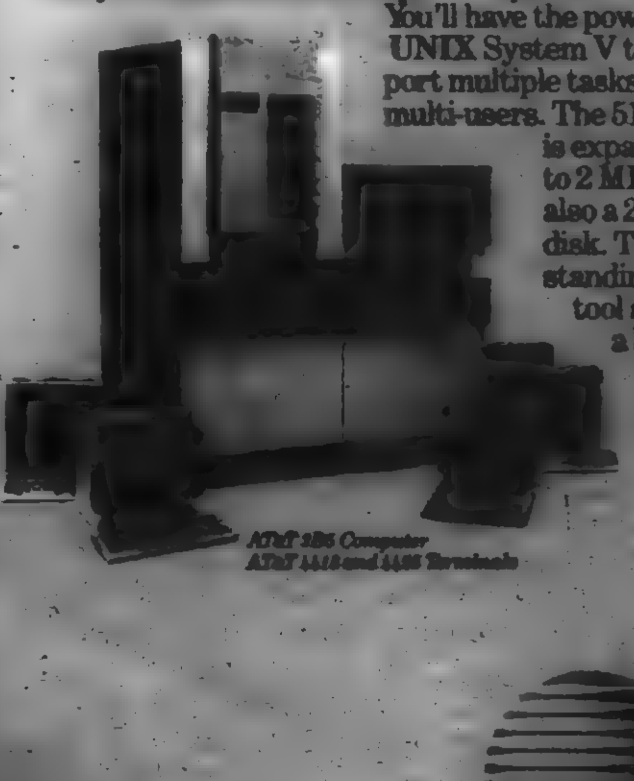
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Net fans air-conditioning supplier's delivery effort

FORT WORTH, Texas — A manufacturer here that once considered a three-day turnaround on deliveries an exemplary feat now consistently gets goods to customers two days after receiving an order — and often turns an order around in one day.

The time-saving was the result of a new on-line, satellite-based communications network, according to J. D. Ratliff, DP manager for Atco Rubber Co., a supplier of industrial air-conditioning duct products to some 4,000 customers.

According to Ratliff, delivery time is critical to the firm's success. "In our business," he said, "the prompt delivery of a customer's order is as important as price and product quality."

Before Atco Rubber brought in the satellite-based network, the firm had relied on dial-up Wats lines to transfer shipping and inventory data between terminals in its eight manufacturing plants and the corporate mainframe, a 196K-byte Honeywell, Inc. Level 62. An operator at Fort Worth corporate headquarters called each plant once a day to gather order and delivery information that would update the mainframe's central data bases.

The dial-up batch operation allowed only one plant to transmit data at any one time, and plant managers could only send data once each day. "Batch processing allows you to get your data from point A to point B," Ratliff said, "but it's very slow."

On-line communications capability

In the spring of 1983, Atco Rubber started looking for a system that would provide on-line communications capability. In January 1984 the firm acquired a 1M-byte Burroughs Corp. 1955 mainframe with Poll/Select protocol and linked the machine to terminals at the plants over RCA Cyclix Communications Network, Inc.'s satellite-based net.

Since then, Atco Rubber has opened four new plants. Each of its 12 locations now has an ET1100 terminal and an AP300 printer, both from Burroughs, with which to access the host computer.

Plant managers use the network to retrieve information about bills of lading, product inventory levels, production schedules and shipping transactions. Because all of Atco Rubber's data resides on the host, the satellite network plays a role in almost every phase of the company's operations.

When a customer calls in an order to the Fort Worth manufacturing facility, a clerk enters order data into an ET1100 terminal connected to the host. A proprietary software package automatically prices the order and creates a bill of lading, which is automatically transmitted over the network to the appropriate manufacturing plant.

At the plant, a manager receives the bill of lading on an AP300 and begins filling the order, either by using inventory or by initiating a manufacturing cycle to produce the necessary products. After each order is filled, the managers transmit a completed bill of lading back to the host, which produces an invoice for distribution to the customer.

Most customers receive their shipments and invoices within two days after they place their orders, and Ratliff said the turnaround helps cash flow. "The faster we can get the invoice into their hands," he explained, "the faster we'll be paid."

The on-line network also allows plant managers to update corporate data bases and make inquiries at all times, rather than once a day, and Ratliff said the capability has allowed Atco Rubber to improve its delivery and inventory trackings.

"With a dial-up Wats line, we were always behind in updating our shipments and inventory levels," he said. "With the on-line network, we can send shipments at any time during the day or night and have an instant record of what has been shipped and where," Ratliff added.

In turn, the improved tracking systems help the firm schedule its manufacturing capacity more efficiently, according to Ratliff. "The bottom line is that having fast and easy access to important operational data makes use more efficient and profitable," he said.

The satellite network itself is cost-efficient compared with the other option Atco Rubber considered for on-line communications. Ratliff said that when the firm was looking to install a network, it considered both AT&T and RCA Cyclix as vendors. Its managers figured that, in order to link the original eight plants, they would have to spend about $9,000/mo for AT&T line charges, compared with $4,000/mo for RCA Cyclix.

Included in the RCA Cyclix estimate were charges for network management services, a function Atco Rubber would have had to provide on its own under AT&T. "That's where the payoff was for me — not having to commit lots of money up front to start the network and then keep it running smoothly," Ratliff said.

Each of Atco Rubber's 12 plants currently transmits about two million char./mo over the network. Some plants have tied in Burroughs ET2000 personal computers, which employees use for word processing, spreadsheet analysis and terminal emulation.

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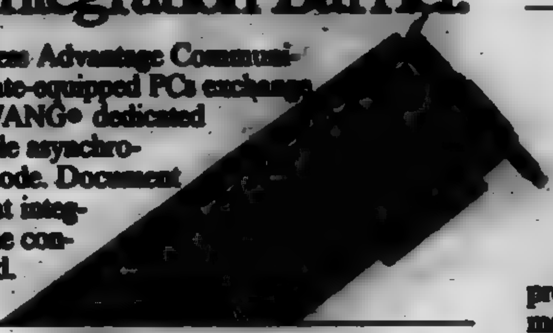

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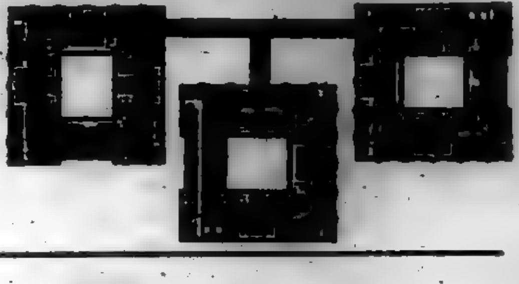

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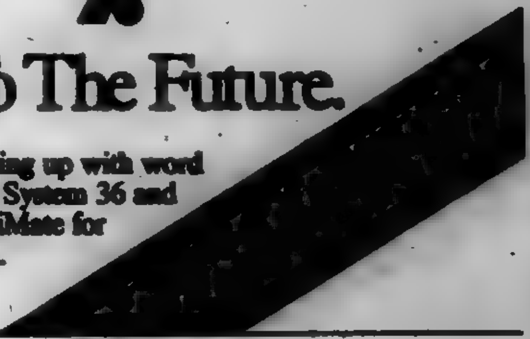

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Automation helps manufacturer track production

Micros and bar codes offer added flexibility

CHICAGO — One of the most fundamental automated operations in any factory is the shop floor data collection system used to record workers' production activities, such as arrival at work or completion of a shop order operation. At ITT McDonnell & Miller, a manufacturer here, microcomputers and bar code wand readers perform this vital task.

McDonnell & Miller, a unit within ITT's Fluid Handling Division that produces boiler safety controls and other fluid-handling products, installed the micros and wand readers in January 1984. According to David Jung, senior member of the technical staff at ITT's Advanced Technology Center, McDonnell & Miller brought in the configuration to give its managers a flexible system for data collection.

> *Regardless of hardware, the feature that makes the system operable is the DCSI software.*

The technology center staff, based in Shelton, Conn., performs research and development for ITT's 290 divisions and corporations worldwide. Jung and his coworkers helped McDonnell & Miller design and implement its bar code data collection configuration.

McDonnell & Miller's previous system was a manual effort that had production workers fill out time cards and punch them through mechanical time clocks. The cards were collected at the end of each day and checked for errors. Afterward, clerks keypunched the time data and loaded it into McDonnell & Miller's mainframe, a 3M-byte IBM 4331, for payroll processing.

To replace the error-prone mechanical time clocks and make the data collection process more timely and efficient, Jung said, the organization investigated automated systems.

Microcomputers appealed to McDonnell & Miller's management because data collection systems based on micros were less costly and required less maintenance than mini-based systems, he said. Also, the organization's size made it a strong candidate for a micro-based setup.

McDonnell & Miller's 100,000-sq-ft Chicago production facility employs about 150 production workers and processes almost 300 orders each week. To support this work, the organization decided it would need 14 data entry stations — an ideal number for a single micro to support, Jung said.

After surveying products available, McDonnell & Miller chose Data Collection Systems, Inc. (DCSI) as its software vendor for the micro data collection system and purchased hardware that DCSI recommended. The organization's system configuration consisted of the following:

- Fourteen Intermec Corp. 1240 bar code wands, each attached to an Intermec 9320 electronic bar code reader. Employees pass the wands over bar code templates to enter data whenever they complete a job, and the readers decode the wands' analog signals.
- Two Intermec 9161 port concentrators that are hard wired to the wand readers and connected to a micro. Each concentrator has 64K bytes of random-access memory to buffer transactions when the micro is unavailable. One concentrator supports six wand readers; the other supports eight.
- Two IBM Personal Computer XTs, one for data collection through the port concentrators, the other for support processing. The processing microcomputer is fitted with an AST Research, Inc. 3780 bisynchronous card that allows it to upload and download data to and from McDonnell & Miller's 4331. Both the micro and the mainframe run RJE software that supports the data transfers.

When McDonnell & Miller first configured its system, DCSI recommended IBM equipment. The vendor has since approved ITT's Xtra micro as a suitable host, Jung said, and McDonnell & Miller plans to switch over to its parent company's product soon.

Regardless of hardware, the feature that makes the system operable is the DCSI software. Jung said the software maintains employee definitions, transaction contents and formats, inquiry requirements and support processing parameters. It also allows for the real-time collection of data from the wands throughout the workday and prohibits real-time entry when necessary.

At the end of each workday, for example, payroll personnel use utility routines in the software to check data that has been collected and correct any errors. When they have finished their corrections, they use another routine to close the data file and dump it to a floppy disk for transfer to the support processing

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micro. During both the inquiry and dumping operations, data from the time clocks cannot enter the machine.

The DCSI software also aided McDonnell & Miller in its transition from the manual system to the micro-based one, Jung said. The organization's employees used one of the software's utilities, for example, to customize the field and transaction definitions they needed for various shop floor transaction sequences.

During the transition McDonnell & Miller also wrote a program that would convert data that had been downloaded from the mainframe's IBM Copics data base into a format the bar code wand readers could understand.

Before the organization switched to its new system, staff members from the Advanced Technology Center helped it with preparatory tasks. They designed factory-hardened enclosures for the Intermec bar code equipment, for example, and created a training program for McDonnell & Miller's users.

The program, a slide presentation, includes an explanation of the system's purpose and the use of the bar code equipment and provides an outline of problems and how they should be solved. Jung said employees are instructed to contact their supervisors if any equipment problems arise.

To stimulate factory workers' interest, he said, McDonnell & Miller's management held a contest to name the data collection system. The name has not been chosen yet, but the contest succeeded in raising workers' enthusiasm. According to Stan Brusicki, assistant controller at McDonnell & Miller, the switch to the new system has been extremely successful. The hardware and software have been running as expected, and users have accepted the change.

•

ITT data collection: A step-by-step process

ITT's manufacturing unit, ITT McDonnell & Miller, uses its data collection system as follows:

Work orders are downloaded from an IBM Copics data base on the organization's host mainframe to the support processing micro for output to a bar code printer.

The printer takes the downloaded data and prints work order sheets, which include job numbers, part numbers and other information that identifies shop floor tasks. The work order sheets also have a numerical template, the bar code equivalent of a numerical keypad, that workers use to record the quantities they produce.

Each time a worker completes a work order, he uses a bar code wand to record data about the task.

A reader attached to the wand decodes the wand's analog signal so it can be passed to the data collection micro.

The worker follows a specific sequence:

- First, he makes a pass with the wand over his bar code employee badge.
- Next, he makes a series of passes over bar code blocks on the work order printout: He passes the wand over the task's job number, the part number of the product on which he has done work and the operation number of the task, all of which are represented by individual bar code blocks.
- After he identifies himself and his task, the worker makes passes with the wand over the numeric template to record the number of parts accepted and rejected.
- Last, he makes a pass with the wand over a bar code Send command that transfers the shop floor information to the data collection micro.

After each pass, the reader beeps once to let the worker know the information has been accepted by the reader. After the last pass, the reader emits a series of beeps to let the worker know whether or not the transaction has been completed properly.

If the transaction is complete, the reader beeps twice; if not, the reader beeps four times and the worker must repeat the entire transaction.

The reader passes data from all completed transactions to one of two port concentrators, which timestamps the transactions and passes information on to the data collection micro.

The data collection micro accepts transaction data throughout the working day. At the end of each day, payroll employees check the transaction data, then close the data collection file and dump information from it to a floppy disk.

They load this disk into the support processing micro, which uploads the data to the host computer for processing.

Qantel users get pamphlet

Datawell, located in Reseda, Calif., has begun publishing "Quser News," a monthly pamphlet for users of Qantel Corp. computer systems.

The pamphlet reportedly includes articles on the operation of Qantel systems and programming tips. "Quser News" will also include a question-and-answer section and a calendar section.

Subscribers to "Quser News" may advertise for free in the publication, according to Datawell.

The first issue, with a projected size of eight to 12 pages, was scheduled to be mailed in August, Datawell said.

A year's subscription to "Quser News" costs $48.

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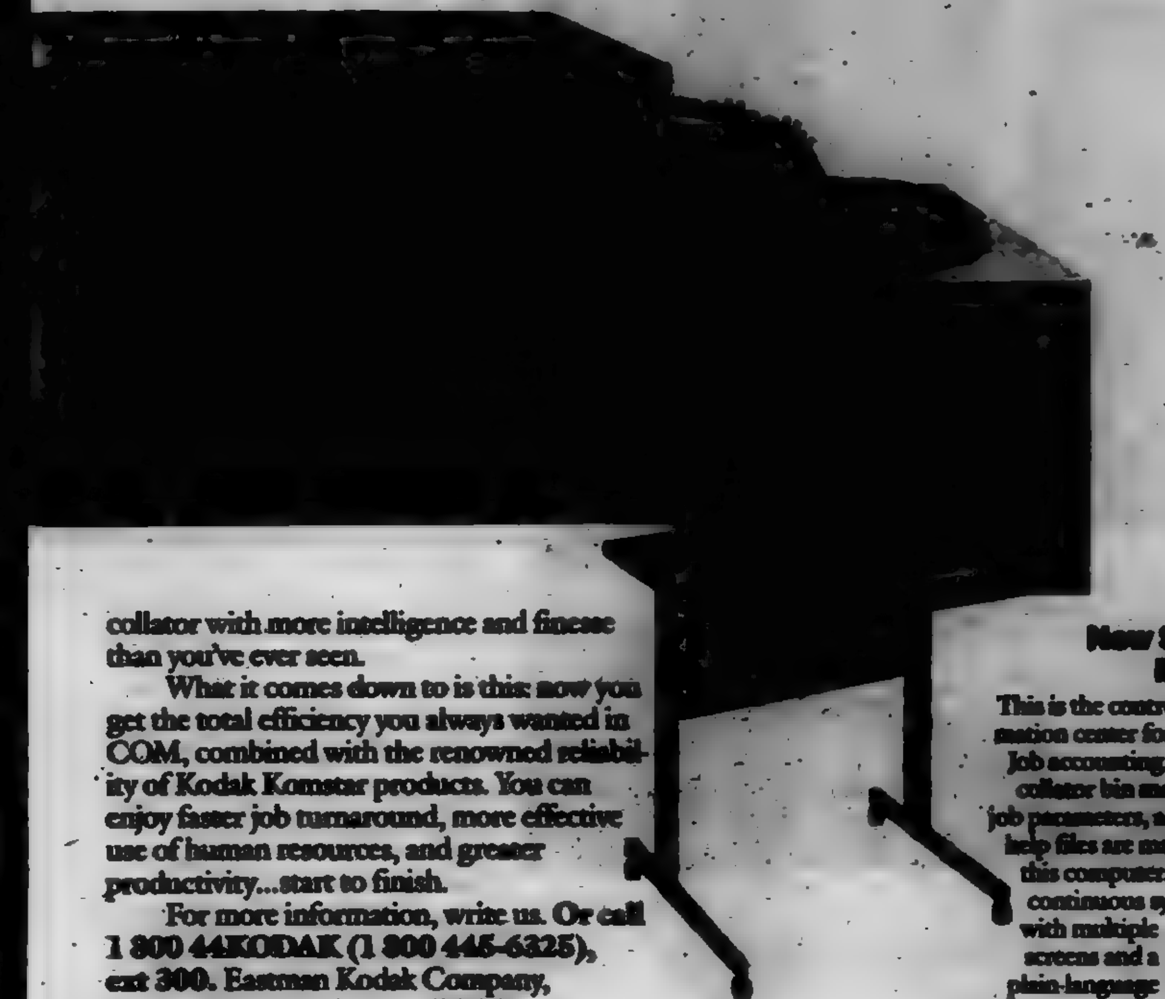

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Dairy condenses accounting time with ledger package

Off-the-shelf system keeps execs up to date

LIVONIA, Mich. — Accountants for a dairy products distributor here moved up their periodic financial closings by more than a week after the firm installed an off-the-shelf general ledger package.

Melody Farms Distributing Co., which delivers dairy products throughout Michigan, maintains a 13-period fiscal year and must close its books every four weeks. Until 1981, accountants armed with calculators managed to finish the work within two to three weeks after a period closed.

With the new general ledger software, from Executive Technology Data Systems, Inc., they finish the job within one week to ten days.

The quick closings allow Melody Farms executives to base their management decisions and marketing plans on more up-to-date information than they did previously, according to Philip Sattler, vice-president of information systems. Sattler said his firm originally planned to write its own general ledger software rather than purchase an off-the-shelf system, but changed its course after a frustrating 1980 experience with customized software development.

In that episode, Melody Farms had to pay a consulting company for more than four months of development work on three packages — order entry, route accounting and accounts receivable.

After the system was up and running on an IBM System/34 at Melody Farms, the consulting firm spent an additional eight months fixing bugs and making improvements on it, Sattler recalled. "If you can find software that can be modified to meet your needs, it is certainly the cheaper way to go."

But, Sattler added, "The problem was that a software package for Melody Farms had to meet several critical criteria." The firm decided that if it purchased a package, the software would have to have the following qualities:

- Be flexible enough to allow the controller and accounting department to structure general ledger account numbers in their own way.
- Allow the accounting department to work independent of the data processing department.
- Have source programs that were clean and consistent.

Melody Farms needed flexible software to enable its controller and his staff to number their accounts as they chose, rather than as a software system dictated, Sattler said. The firm runs several subsidiaries, including a production plant and a few financial companies, all with different types of accounts and financial statements.

Melody Farms' accountants had to be able to group the different accounts into cost centers as they saw fit. "With [the] parent company and subsidiaries requiring different financial statements, flexibility was a very important feature to us," he said.

Independence for the accountants was necessary, Sattler said, because he did not want them taking up MIS time with tasks that they could do on their own under a well-structured software system.

'At the vendor's mercy'

Consistent source code, with logic Melody Farms' programmers could understand, was a criterion, he said, because, "I don't want to be at the vendor's mercy." Sattler said he wanted to be able to modify the software on his own as the business' needs changed.

In 1981, Melody Farms purchased the general ledger package from Executive Technology Data Systems that met the three criteria, according to Sattler.

It proved to be flexible enough to run the parent company's and its subsidiaries' accounts and to accommodate acquisitions the firm has made since the software was purchased, he said. Last year, Melody Farms purchased a subzero warehouse and brought its accounts onto the general ledger system.

The software's source code, written in RPG-II, was easy to modify to meet Melody Farms' need for 13-period financial reporting, according to Sattler. He said that the package was set up for monthly reporting but that he changed it in one day to handle Melody Farms' reporting structure.

Sattler also added menus to the software so that the firm's accountants could set up reports they needed more easily. The accounting department now does almost all of its work without help from MIS.

"Our data processing department hasn't had to get involved in formatting financial statements or entering data," he said. "The accounting department sets up the statements and makes journal entries. All we do is make sure that everything is properly filed on disk storage and that we have backup copies on everything."

The package runs on a 256K-byte IBM System/34, one of two System/34s the firm operates. Melody Farms recently purchased an IBM System/36, but Sattler said he saw no need to transfer the general ledger to the new machine.

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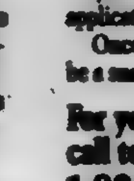

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NEWS

MANAGERS ON THE MOVE

WALTER F. ROBINSON will head Mincron SBC Corp.'s Financial Services Industry consulting group. In this position he will oversee day-to-day technical operations and facilitate new business development.

Previously he managed Chemical Bank's World Banking systems group, provided strategic planning support to International Paper Co.'s corporate MIS organization and headed Procter & Gamble Co.'s internal consulting group for line marketing systems.

He has a B.S. in computer science and an MBA.

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■

HUGH K. SWITZER has been promoted to senior vice-president of MIS for Columbia Pictures Industries, Inc.

Switzer joined Columbia in January 1983 as vice-president of MIS.

Previously he was associated with American Express Co., where he was vice-president of information systems and data services for Warner Amex Cable Communications Co. from 1981-83 and vice-president of systems planning for corporate systems and telecommunications from 1977-81.

He graduated in 1960 with a B.S. degree from New York Maritime College.

■

The Internal Revenue Service announced the appointment of **BERNARD F. MILLER** as director of the new user assistance and computer capacity management office. In his position, Miller will be responsible for providing technical assistance to all functional areas on new automation technologies and helping users in developing automation plans that are consistent with the IRS' automation policies.

Miller began his career with the IRS in 1959 as a revenue officer in Hartford, Conn. In 1961 he transferred to the IRS national office in Washington, D.C. and has held a series of positions in data processing operations.

In 1981 he was named assistant director of the systems support division and in 1982 was appointed assistant director for the hardware division, a position he held until his present appointment.

He is a graduate of Bridgeport University in Bridgeport, Conn., with a bachelor's degree in accounting.

■

Jones, Carter Hawley Hale Stores

Carter Hawley Hale Stores, Inc.'s information services division has announced a number of organizational changes designed to strengthen the division's continuing support of Carter Hawley Hale's systems strategies.

WILLIAM F. JONES JR. has been promoted to executive vice-president of development and information management. Prior to his promotion, Jones was senior vice-president of development.

Carter Hawley Hale Stores' Spellman

WALTER H. SPELLMAN JR. has been promoted to senior vice-president of development and assumes responsibility for all Carter Hawley Hale's common systems development. Previously he served as divisional vice-president for store systems.

TROY T. NGUYEN was promoted to vice-president of merchandise systems. He was divisional vice-president of merchandise systems.

Carter Hawley Hale Stores' Menar

ROBERT M. MENAR has been promoted to executive vice-president of computing communications and planning. Menar had been senior vice-president of computing and communications.

NORMAN H. LEIBSON was promoted to vice-president of communications. He had served as divisional vice-president of communications.

Carter Hawley Hale operates 125 department stores and 154 specialty stores.

■

JULES SIEBURGH has been promoted to vice-president of information systems at Sonesta International Hotels Corp. Sieburgh will now manage all telecommunications activities in addition to his supervision of all DP for Sonesta.

He has been with Sonesta since 1978 when he installed a comprehensive property management computer system at the Sonesta Hotel in his native city, Amsterdam.

After successfully completing this project, he moved to Sonesta's corporate headquarters in Boston to assume the role of director of DP.

Prior to his promotion, he was responsible for the installation of property management systems at all Sonesta Hotels.

He has a B.S. in hotel administration and an MBA, both from Cornell University in Ithaca, N.Y.

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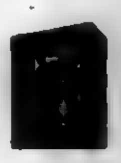

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TURNAROUND TIME

Larry Long

***Q** During the past six years, I have worked my way up to manager of corporate systems. Until recently, I reported to the same boss that hired me, an executive vice-president.*

I have been praised for growing with the increased responsibilities that my job required. I have never received a critical performance review or, for that matter, any constructive criticism.

I had only one computer course in college, so my computer education is mostly the result of on-the-job training. Two years ago, management discouraged me from taking graduate courses saying that I would learn no more than I could learn on the job.

Slightly more than a year ago, I hired someone with a master's degree in business administration and two years of experience as a programmer/analyst to be one of my managers.

Shortly after this person came on board, I received a memo from my boss stating that he would no longer report to me but to the president. I complained to my boss that after finally consolidating systems functions, we are fragmenting the department again.

Last month, my boss told me that a new position, called the director of MIS, had been created and would be filled by the person I had hired a year earlier.

I was also told that I would report to him and that most of the people that reported to me would now report to him and that he would report to the president.

On several occasions I have expressed my dissatisfaction with the organization to my new boss and have requested a revised job description that would demonstrate the company's desire for me to stay.

To date, I have received nothing but the assurances of the director of MIS that he wants me to stay. Could you suggest a strategy from this point?

It appears that you may be the victim of what I call the "gopher-to-vice-president phenomenon." This phenomenon occurs with surprising frequency in every variety of business endeavor.

Here's how it works. The president selects one of the top (usually, but not always, the top) young prospects to work directly with him on special projects. The gopher does a bang-up job (or the president believes this to be the case) and is made an assistant to the president. The next promotion is to something like assistant vice-president, followed shortly thereafter by a jump to, you guessed it — vice-president.

Your current boss was simply at the right place at the right time. There are definite advantages to rubbing shoulders with people in power positions. When a president or a vice-president needs someone in a hurry, the successful candidate is often within earshot.

To be sure, the change of power could have been handled more tactfully, but because of political exigencies, the situation may be irreversible. Reemphasize your concerns about your future with the company, then wait a reasonable period of time for a response.

In the interim, however, I would suggest that you update your resume, maintain good relationships with your colleagues and adopt a strategy that you are willing to leave if the right opportunity comes along.

***Q** After graduation, I took a job with a computer company and just had my six-month evaluation. Overall, my performance was rated as average, but all of the discussion centered on my attitude, dress and hairstyle, not on my job performance.*

During my sales training period, everyone gave me the impression that I was progressing at an accelerated rate, so my evaluation came as a surprise.

My evaluation was essentially a reflection of what my manager thought of my appearance. I wear a coat and tie and try to be neat. He told me that being neat was not good enough and that I should invest in some new clothes.

I would prefer to spend my money on other things. How can I convince him that clothes are not one of my priorities?

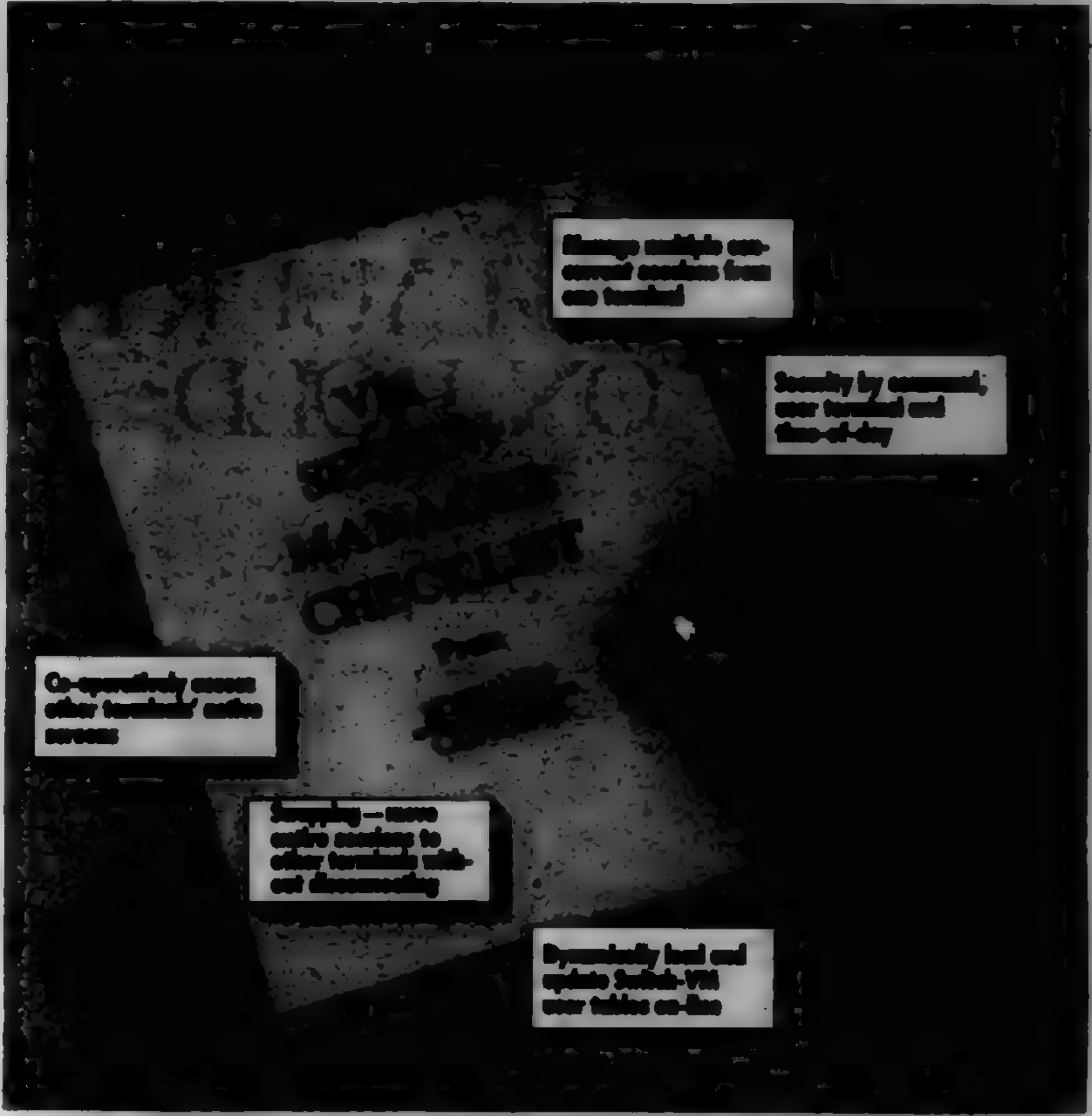
If being a successful computer salesman is one your priorities, then I would suggest that you rethink your priorities. Your manager was wrong to have downgraded your overall performance based solely on mode of dress, but he wanted to stress the importance of appearance.

Most jobs require some kind of personal concessions. Professionals that meet frequently with high-level customers and clients have found that adopting a traditional and conservative mode of dress generally yields the best results.

How you dress does not help you make a sale; it can, however, knock you out of the running.

The idea behind conservative dress is to help minimize the possibility of unnecessary objections so that the customer or client will focus on what you have to say or sell.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*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CALENDAR

WEEK OF OCTOBER 6

OCTOBER 6-8, SAN FRANCISCO — **Solid Modeling '85: Making CAD/CAM Pay Back.** Contact: Jacquelin Cooper, "CAD/CIM Alert," 824 Boylston St., Chestnut Hill, Mass. 02167.

OCTOBER 7-9, NEW YORK — **VM for Systems Programmers.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 7-10, LOS ANGELES — **CICS Command-Level Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 7-11, BELLEVUE, WASH. — **C Programming Workshop.** Contact: David Cheyette, Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

OCTOBER 7-11, KING OF PRUSSIA, PA. — **CICS/VS Command-Level Programming.** Contact: Ned Frey, Computer Assistance, Inc., Suite 490, 1150 First Ave., King of Prussia, Pa. 19406.

OCTOBER 7-11, LOS ANGELES — **Basic Systems Analysis.** Contact: Thomas J. Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Oct. 7-11 in Calgary, Alta.

OCTOBER 7-11, LOS ANGELES — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 7-11, NEW YORK — **CICS Macro-Level Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 7-10, DENVER — **Using Microcomputers in Government.** Contact: Conference Manager, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

OCTOBER 8-9, MINNEAPOLIS — **Tenth Conference on Local Computer Networks.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

OCTOBER 8-10, TOPEKA, KAN. — **DSSD Users' Conference — Feedback '85.** Contact: Ken Orr & Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

OCTOBER 8-12, NANJING — **Autoinfo China '85.** Contact: American Export Group International Services, Inc., Watergate 2600, 2600 Virginia Ave. N.W., Washington, D.C. 20037.

OCTOBER 9-10, CHICAGO — **The Financial Supermarket: New Fee Income Opportunities for Banks & Thrifts.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

OCTOBER 9-11, BOSTON — **Robots East.** Contact: Robotic Industries Association, P.O. Box 1366, Dearborn, Mich. 48121

OCTOBER 10, NEW YORK — **Vtam Operations Workshop.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

WEEK OF OCTOBER 13

OCTOBER 13-16, WASHINGTON, D.C. — **Information Science, Inc.'s 10th International Users Conference on Human Resource Management.** Contact: Information Science, Inc., 95 Chestnut Ridge Road, Montvale, N.J. 07645.

OCTOBER 14-16, SAN FRANCISCO — **Direct Response Marketing for Financial Institutions: Telemarketing, Direct Mail & Sales Training.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925. Also being held Oct. 21-22 in Los Angeles.

OCTOBER 14-16, PHILADELPHIA — **Managing Application Software Support Workshop.** Contact: Infosci, Inc., Box 7117, Menlo Park, Calif. 94026.

OCTOBER 14-17, NEW YORK — **Info '85 — Information Management Exposition & Conference.** Contact: Cahners Exposition Group, Client Services, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

OCTOBER 14-18, BOSTON — **Management Workshop.** Contact: Judy Trelogan, Arthur Young & Co. 1950 Roland Clarke Place, Reston, Va. 22091.

OCTOBER 14-18, NEW YORK — **Structured Systems Analysis Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 15, CHICAGO — **Transacting Business Electronically: Insights Into a Rapidly Changing Field.** Contact: Chi/Cor Information Management, Inc., 10 Riverside Plaza, Chicago, Ill. 60606.

OCTOBER 15-16, NEW YORK — **IMS Recovery Restart.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 15-17, NEW YORK — **Implementing SNA.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 15-17, WASHINGTON, D.C. — **Data Base: A Manager's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 15-17, WASHINGTON, D.C. — **The Micro-Mainframe Connection.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

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OCTOBER 15-18, HOUSTON — **CMC '85 and A/E Systems — Fall.** Contact: Conference Director, CMC '85 and A/E Systems — Fall, P.O. Box 11318, Newington, Conn. 06111.

OCTOBER 16-17, LOS ANGELES — **The Yates Second Annual Unix Market Forum.** Contact: Yates Ventures, Suite 301, 3350 Bayshore Road, Palo Alto, Calif. 94303.

OCTOBER 17-18, DENVER — **Federal ADP and Telecommunications Procurement.** Contact: International Data Corp., Washington Division, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102. Also being held Oct. 31 to Nov. 1 in San Antonio and Nov. 14-15 in McLean, Va.

OCTOBER 17-18, NEW YORK — **VS Cobol II.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 17-18, PHILADELPHIA — **Rapid Prototyping Workshop.** Contact: Infotec, Inc., Box 7117, Menlo Park, Calif. 94026.

OCTOBER 17-18, ATLANTIC CITY, N.J. — **The Third Annual NCR Users Eastern America Conference.** Contact: Jack Hibbard, A.D.R., Inc., P.O. Box 429, Willow Grove, Pa. 19090.

WEEK OF OCTOBER 20

OCTOBER 21-22, SAN FRANCISCO — **Lamond on IBM.** Contact: Reggi Veatch, National Marketing, Suite E-1A, Standard Court East, 9160 Red Branch Road, Columbia, Md. 21045. Also being held Oct. 29-31 in Dallas and Nov. 4-6 in Boston.

OCTOBER 21-23, BOSTON — **Hammer Forum '85: Shaping the Second Revolution in End-User Computing.** Contact: Hammer and Co., Hammer Forum, 5 Cambridge Center, Cambridge, Mass. 02142.

OCTOBER 21-23, WASHINGTON, D.C. — **Controlling Software Projects: Management, Measurement and Estimation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Dec. 9-11 in Dallas.

OCTOBER 21-24, CHICAGO — **Systems & Applied Technology Conference & Exhibition (Satech '85).** Contact: Satech '85, 2472 Eastman Ave., No. 34, Ventura, Calif. 93003.

OCTOBER 21-24, PITTSBURGH — **Work Measurement Techniques Workshop Series.** Contact: Institute of Industrial Engineers, Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

OCTOBER 21-25, NEW YORK — **Comprehensive Course in Data Communications.** Contact: *Data Communications*, Special Projects Conference Management Center, c/o Information-Breakthroughs, Inc., 445 W. Main St., Wyckoff, N.J. 07481. Also being held Nov. 18-22 in Lake Buena Vista, Fla.

OCTOBER 21-25, WASHINGTON, D.C. — **Ada Software Engineering Workshop.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Oct. 28 to Nov. 1 in Los Angeles.

OCTOBER 21-25, BOSTON — **Analysis Workshop.** Contact: Judy Treloggen, Arthur Young & Co., 1950 Roland Clarke Place, Reston, Va. 22091.

OCTOBER 21-25, CHICAGO — **CICS Macro-Level Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 21-25, NEW YORK — **Structured Systems Design Workshop.** Contact: Elise Rabelais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 22-23, BOSTON — **Developing End-of-Arm Tooling for Industrial Robots.** Contact: Robotics International of the Society of Manufacturing Engineers (SME), P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

OCTOBER 22-25, SAN FRANCISCO — **Worldcom '85 — World Communications and Computers: 1985-2000 Conference and Exhibit.** Contact: International Council for Planning and Innovation, P.O. Box 17392, Washington, D.C. 20041.

OCTOBER 22-25, DENVER — **Data Base: A Builder's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Nov. 12-15 in Dallas and Dec. 3-6 in Washington, D.C.

OCTOBER 22-26, SAN FRANCISCO — **Fifth Multinational Conference on World Communications and Computers.** Contact: International Council for Planning, P.O. Box 17392, Washington, D.C. 20041.

OCTOBER 23-25, NEW YORK — **Strategies for Office Automation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held March 11-13 in Boston.

OCTOBER 24, NEW YORK — **DOS/VSE for Systems Programmers.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 24-25, LOS ANGELES — **Local-Area Networks: Selection and Implementation.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

OCTOBER 24-25, SAN FRANCISCO — **PC as a Programmer/Analyst Workstation.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Nov. 21-22 in Washington, D.C. and Dec. 12-13 in Boston.

OCTOBER 24-25, SAN FRANCISCO — **Lamond — The IBM PC.** Contact: Reggie Veatch, National Marketing, Suite E-1A, Standard Court East, 99160 Red Branch Road, Columbia, Md. 21045. Also being held Nov. 7-8 in Boston.

OCTOBER 25-27, FRANKFURT — **The Forth Modification Laboratory Conference.** Contact: Forth Interest Group, P.O. Box 8231, San Jose, Calif. 95155.

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M&D micro-mainframe link eases insurer's reporting woes

By [illegible]

FAIRFIELD, Conn. — While microcomputer users in the financial and management reporting groups of the Orion Group were finding their micros valuable for analysis, the company's information center manager concluded that too much time was being spent keying data from the mainframe into spreadsheets.

"They spent too much time on things that analysts just don't do," according to Orion Information Center Manager Scott Stein. He decided the firm needed to implement a micro-mainframe link, but he had to sell the idea to the management of the national property and casualty insurance company.

Researching potential micro-mainframe products was Stein's first assignment. He began looking for micro-mainframe links that would allow Orion analysts to extract and transfer data subsets from the corporate financial data base to Lotus Development Corp.'s 1-2-3 running on IBM Personal Computer XTs. The company's choice was limited by its use of a data base and application systems developed in-house, Stein said.

The data base held more than 1 billion records, and users needed to pull down subsets of data — not entire files. According to Stein, of the three types of links available — terminal emulators, file transfer products and universal links — only the universal products were suitable.

Although fourth-generation languages could give users sophisticated query and transfer capabilities, "they lock you into [vendor] data bases," Stein said. "On top of that you spend $150,000 for the pack-

Continued on page 74

Users like PC Link, not price

BOSTON — Users of McCormack & Dodge Corp.'s Interactive PC Link micro-mainframe link package interviewed at the World '85 users conference held here recently raved about the product's capabilities, but they wished it cost less.

Smith, Albuquerque Federal Savings and Loan

M&D released PC Link in November 1983. The company modifies a Digital Consulting Associates, Inc. Irma board to support M&D applications and sells it with documentation for $2,200. The mainframe side of PC Link, for IBM IMS data bases in CICS environments, is priced at $25,000. For those customers who already have Irma boards installed on their IBM Personal Computers, the micro software and documentation is priced at $1,195.

PC Link was upgraded to Version 2 in January of this year, and Version 3 is in development, the company said. Some 1,500 PC Link packages have been shipped to 200 clients, according to Scott Conrad, who markets the product for M&D.

PC Link user Larry Erb, a project manager in the systems area for Forest Oil Corp. of Denver, said the product has worked very well in his company. However, he said, "they are priced higher than is realistic." Because micro-mainframe technology is changing rapidly and no standards are emerging, "it's almost like [the PC Link micro software] should be a throw-in," Erb said.

Since Forest Oil is a Software AG Adabas data base management sys-

Continued on page 70

SOFTALK
John Gallant
CW Senior Editor

Will IBM take AI by storm?

Artificial intelligence and the information center concept provide an interesting contrast in style — IBM's style, that is.

Both AI and information centers have been in the news recently in the wake of the International Joint Conference on Artificial Intelligence (IJCAI) and the Information Center Conference & Exposition. The gatherings, though small compared with wider market shows like the National Computer Conference or Comdex, served to highlight the intense interest in their respective topics of concentration.

AI and information centers are hot for one very simple reason. Each holds the promise of addressing problems that traditional technologies or approaches have failed to solve. For that reason, both conferences drew aware, interested attendees and fostered an atmosphere of intense, constructive discussion. There were many topics to be debated and a great deal of information and newly won experience to be shared. With good reason, professionals in each area — whose job titles are still taking shape — see themselves as pioneers.

But IBM's role in the fields of artificial intelligence and information centers is a study in opposites. When it comes to information centers, IBM has been a leader. In AI, IBM has been something else altogether.

Wearing the weathered hat of the pioneer, IBM — actually, IBM's Canadian counterpart — unveiled the concept of the information center. The information center was designed to meet two very pressing needs, needs that are no less critical today.

The information center was geared

Continued on page 62

■ Uccel added to its Synova series/64

■ Martin Marietta enhanced Ramis II English/64

■ Informatics compressed Cullinet's IDMS data base/69

INSIDE

Application Packages/69

DBMS/69

Languages/69

Training/70

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SOFTSCOPE

Notes from the software industry front

The Hartford Insurance Group and **Wang Laboratories, Inc.** have agreed to develop and market integrated computer products and services aimed at enhancing DP productivity in large organizations. The Hartford has formed a subsidiary, Hartford Integrated Technologies, Inc. to develop the products.

■

Teknowledge, Inc. and **Digital Equipment Corp.** have announced an agreement that allows DEC to market, sell and distribute Teknowledge's S.1 knowledge development software for the VAX processor family. Teknowledge's recent announcement of S.1 Version 2 is said to integrate further knowledge-system technology into VAX and Microvax environments.

■

Apollo Computer, Inc. has announced five software supplier agreements for artificial intelligence-related products on its Domain workstations. Agreements were reached with the following: **Quintus Computer Systems, Inc.**, which markets Quintus Prolog; **Logicware, Inc.**, marketing Mprolog; **Production Systems Technologies, Inc.** marketing the OPS83 expert systems language; **Software Architecture and Engineering, Inc.**, marketing the Knowledge Engineering System expert system development tool; **and CCA Uniworks, Inc.**, marketing CCA Emacs, an intelligent real-time display editor.

■

Signal Technology, Inc. has announced that its Smartstar fourth-generation application development and data management system for VAX processors will be co-sold as part of DEC's Digital Classified Software program. Smartstar is said to be the only independently developed information management system that interfaces with DEC's Relational data base system.

■

Data General Corp. has announced that **Intersystems Corp.**'s "M," a systems software package combining the Ansi-standard Mumps programming language with utilities and data base software, will be available through DG's Independent Software Vendor program.

■

Intercontinental Hotels, Inc. has announced the development of a Group Sales data base system to be designed and implemented by **Multi Soft, Inc.**, the applications development and marketing subsidiary of **Multi Solutions, Inc.** of Lawrenceville, N.J.

Inference enhances ART development environment

Improves graphics, adds interfaces

Inference Corp., based in Los Angeles, has announced enhancements to its Automated Reasoning Tool (ART), a large-scale expert system development environment for end users and developers using artificial intelligence workstations from Symbolics, Inc., Lisp Machines, Inc. or Texas Instruments, Inc.

Added capabilities include improved color graphics, a graphics icon library, direct interactive and programmer interfaces to the knowledge data base, support for mixed initiative processing, a pseudo-natural-language syntax and separately compilable rule files.

The ART rule-based expert system framework is said to support integrated forward and backward chaining in order to optimize search strategies.

Knowledge language

The ART knowledge representation language allows developers to manage complexity through knowledge abstraction based on hierarchically structured facts, relationships and rules, according to a vendor spokesman.

The enhanced product's Viewpoints feature provides a way to evaluate multiple alternatives, rather than assigning artificial probabilities to decision points.

The Artist graphics environment is said to simplify the addition of images in an application by providing a set of drawing primitives controlled by rules in the knowledge base. The Artist features have been extended with color graphics and an icon library of predefined symbols.

Art Studio

The Art Studio development environment has been enhanced to provide added ways to view a knowledge base. An advanced browsing facility shows graphical views of hierarchical relationships.

A pseudo-natural-language syntax option reportedly simplifies the use of ART by allowing the developer to build a knowledge base readable in English-like syntax.

The mixed initiative processing allows an expert system developed in ART to prompt uses for information while reacting to user inquiries.

The ART system is priced at $85,000.

From page 61

Will IBM take AI by storm?

to help data processing reduce the massive applications backlog by giving users the resources and the expertise needed to build some systems on their own.

It was also intended to provide a focal point for management of the growing population of microcomputers within large companies. Information center personnel would tackle issues of personal computer hardware and software selection, installation and support and training of end users.

Thus they would allow DP pros to address more complex, technical problems.

IBM not only gave birth to the information center idea — it also has provided a variety of products that are mainstays in the information centers of today.

A prime example is the VM/CMS operating environment. Other important products include the Structured Query Language, the Professional Office Systems and DB2, IBM's relational data base management system entry which, despite initial criticism from analysts, has received good marks from users.

Horse of a different color

But AI is the proverbial horse of a different color — and, until recently, that color has not been blue.

According to AI aficionados, who, like descendants of the Pilgrims, take great pride in tracing their roots back to the beginning, artificial intelligence was a dirty word to IBM.

As they tell the story, Big Blue did not even acknowledge the field of AI until it became evident that customers were aware of AI developments and were willing to put out the cash — to vendors other than IBM — to experiment with AI and even implement some first-generation applications.

Even now that IBM has entered the commercial AI market, the criticism continues.

Sure, worried vendors say that IBM has validated or endorsed artificial intelligence with the introduction of systems like the Expert System Environment/VM and VM Programming in Logic [CW, Aug. 19].

But others in the field say that IBM's products are clearly less than state of the art and are designed only to keep users from straying to the same vendors clamoring about validation.

Dire predictions

Some in the AI field are making dire predictions about how IBM's entry will impact the pioneers, the vendors who were willing to take on the tasks deemed too insignificant by the big guys until now.

The restructuring of the AI market that is sure to happen may be painful, but it will certainly be interesting to observe. It's an unavoidable phase in AI's maturity, after all.

What's more, the negative assessment of IBM's performance in the AI field may be too harsh. It's true that IBM hasn't offered many commercial AI tools, but it has exhibited some fairly impressive AI research efforts. In all fairness, no one can expect IBM to be all things to all people.

But it is interesting to note IBM's approach to two of the most important areas of information processing today.

Only the future will tell whether IBM will take on the mantle of innovator in the field of AI or whether fears of a repeat of its shuddering impact on the personal computer market will be realized.

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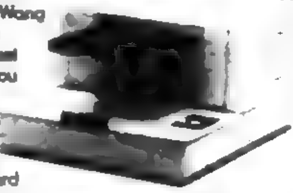

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Capacity planning modules out for Synova

Following up its June announcement of the Synova series, which is aimed at helping users integrate Uccel Corp. systems products with common logon, communications and command facilities, New York-based Uccel last week announced two capacity planning modules for the series.

The company announced Nova: Probe Resource Profiling Facility and Nova: Plan Capacity Modeling Facility.

The packages enable IBM mainframe users with MVS to model the impact of work-load changes on performance prior to allocating resources, a spokesman said.

The capacity planning model is based on data from standard data center monitors.

Model use

Capacity planners use the model to assess the effect of such measures as adding new batch or on-line work loads, expanding use of existing applications or increasing storage or CPU cycles.

Nova: Probe is priced at $12,500, and Nova: Plan is priced at $20,000. Together, the packages are priced at $26,000. Both are available immediately.

The Synova series was announced at Uccel's Systems Software Conference in Dallas.

Most Uccel software is integrated at the product level, with each package having limited predefined interfaces.

Layered architecture

The Synova series reportedly allows for full integration using a layered architecture, through which all commands and requests for data are controlled.

Other products in the series are Nova:Log, scheduled for September availability, and Nova:Save, which provides for the automatic backup of data stored on an IBM Personal Computer hard disk.

The products are said to be the result of a two-year research and development effort.

Enhanced Ramis II announced

Martin Marietta Data Systems of Princeton, N.J., has announced an enhanced Ramis II English release that reportedly improves the product's fluency and ease-of-use characteristics.

The company's Ramis II English natural language comprehension component adds artificial intelligence capabilities to the Ramis II fourth-generation language and data base management system, a spokesman said.

Release 2 of Ramis II English includes added ability to display information in graphics form using conversational English. Information can be displayed in either low-resolution graphics or high-resolution graphics on terminals from IBM, Tektronix, Inc. and Hewlett-Packard Co.

Graphics available for display include pie charts, histograms, bar charts, line graphs and point graphics.

Date and time references

The enhanced release is also said to improve date and time references. Information can be displayed and printed using conversational requests that include references to relative time and a variety of date patterns.

Users do not need to match dates in their request with the way dates are formatted in a data base.

The product's vocabulary has been extended with an additional 1,000 root words, bringing the total vocabulary to more than 5,000 root words.

The price for Release 2 of Ramis II English ranges from $13,500 to $27,000, depending on CPU.

Martin Marietta also announced that its Maxicalc II on-line electronic spreadsheet for IBM mainframes in the CICS environment now supports IBM's newly announced 3179 Model G color graphics terminal.

Maxicalc II is priced at $9,000 for DOS and $12,000 for OS operating systems.

Henco Software tool gets DG port

Henco Software, Inc., which is based in Waltham, Mass., has announced that its Info data management system and applications development tool has been ported to the Data General Corp. Eclipse/MV, Dasher/One and Data General/One series processors.

Info operates in conjunction with DG's Comprehensive Electronic Office system.

Henco was selected as the first member of DG's Authorized Software Vendor progam in February.

Info on the DG systems ranges in price from $14,300 to $30,000 for the Eclipse/MV family. The system costs $1,200 for the DG/One and Dasher/One systems.

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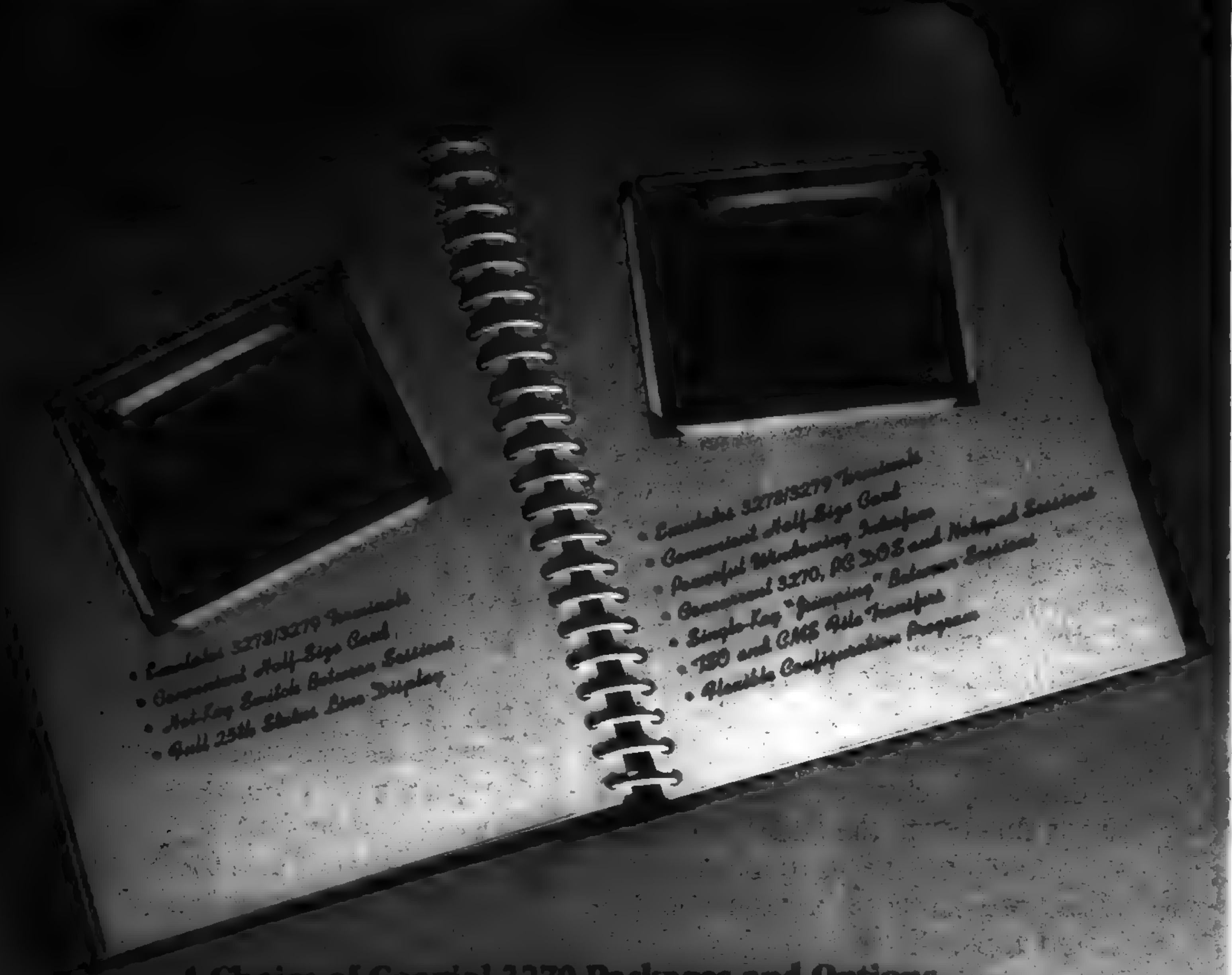

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[illegible] the household is the full- [illegible] standard, [illegible] and windowing capa- [illegible] economical [illegible] upgrade [illegible] with basic [illegible] as needed, to [illegible] windowing options. [illegible] 3270 terminal [illegible] IBM PC or compatible [illegible] PC's own native [illegible]

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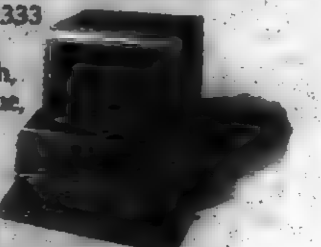


AST RESEARCH INC.

APPLICATION PACKAGES

■ Applied Computer Services, Inc. has announced that its software for the credit union industry now runs on the IBM System/36.

Previously available on the IBM System/34, Credit Union Solution software is an accounting system that provides functions for stock shares, drafts, certificates of deposit, loans and Individual Retirement Accounts. The software permits process accounting for branch operations and can be used to account for automated teller machine networks.

The Credit Union Solution is priced from $12,000 to $40,000.

Applied Computer Services, Suite 909, 2343 E. Broadway, Tucson, Ariz.

DATA BASE MANAGEMENT SYSTEMS

■ SAS Institute, Inc. has introduced an interface for its SAS System software and its System 2000 data base management system (DBMS).

The interface incorporates a prewritten procedure that selectively converts data base items and records into a permanent or temporary SAS data set. The interface, which is included in base SAS software under IBM's OS and CMS, allows users to select data from the data base using a full screen menu within an SAS session. The data can then be used for graphics, reporting and analysis.

First-year license for SAS software is $8,000. System 2000 DBMS is priced at $12,000.

SAS Institute, Box 8000, SAS Circle, Cary, N.C., 27511.

Informatics offers IDMS storage tool

Informatics General Corp. of Canoga Park, Calif., has announced mainframe software that is reported to compress and encrypt the data stored in Cullinet Software, Inc.'s IDMS data base management system by up to 80%.

Shrink/IDMS is intended to reduce the amount of disk space required to stored IDMS data bases, a spokesman said.

The product is an addition to the company's line of file compression products that includes Shrink/IMS for compression of IBM IMS data bases.

Shrink/IDMS has an error redundancy checking feature. The package is available under IBM's MVS and MVS/XA operating systems and will execute in batch and on-line modes under IBM's CICS/VS, TSO and IDMS/DC.

The product requires no changes to existing IDMS application programs, according to an Informatics spokesman.

The price for Shrink/IDMS is $65,000.

LANGUAGES

■ Touch Technologies, Inc. has announced an enhanced version of its fourth-generation language for Digital Equipment Corp.'s VAX series.

The new version of the Intouch language is said to include screen management facilities and extensions for applications development. The product is also said to extract and manipulate data, regardless of the way the data is stored.

The cost of enhanced Intouch is $7,500 for the VAX-11/730 and Microvax II, $15,000 for the VAX-11/750, $25,000 for the VAX-11/780 and 11/785, and $40,000 for the VAX 8600.

Touch Technologies, Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.

■ Sun Microsystems, Inc. has announced a version of Lucid, Inc.'s Portable Common Lisp AI programming language for the Sun family of workstations.

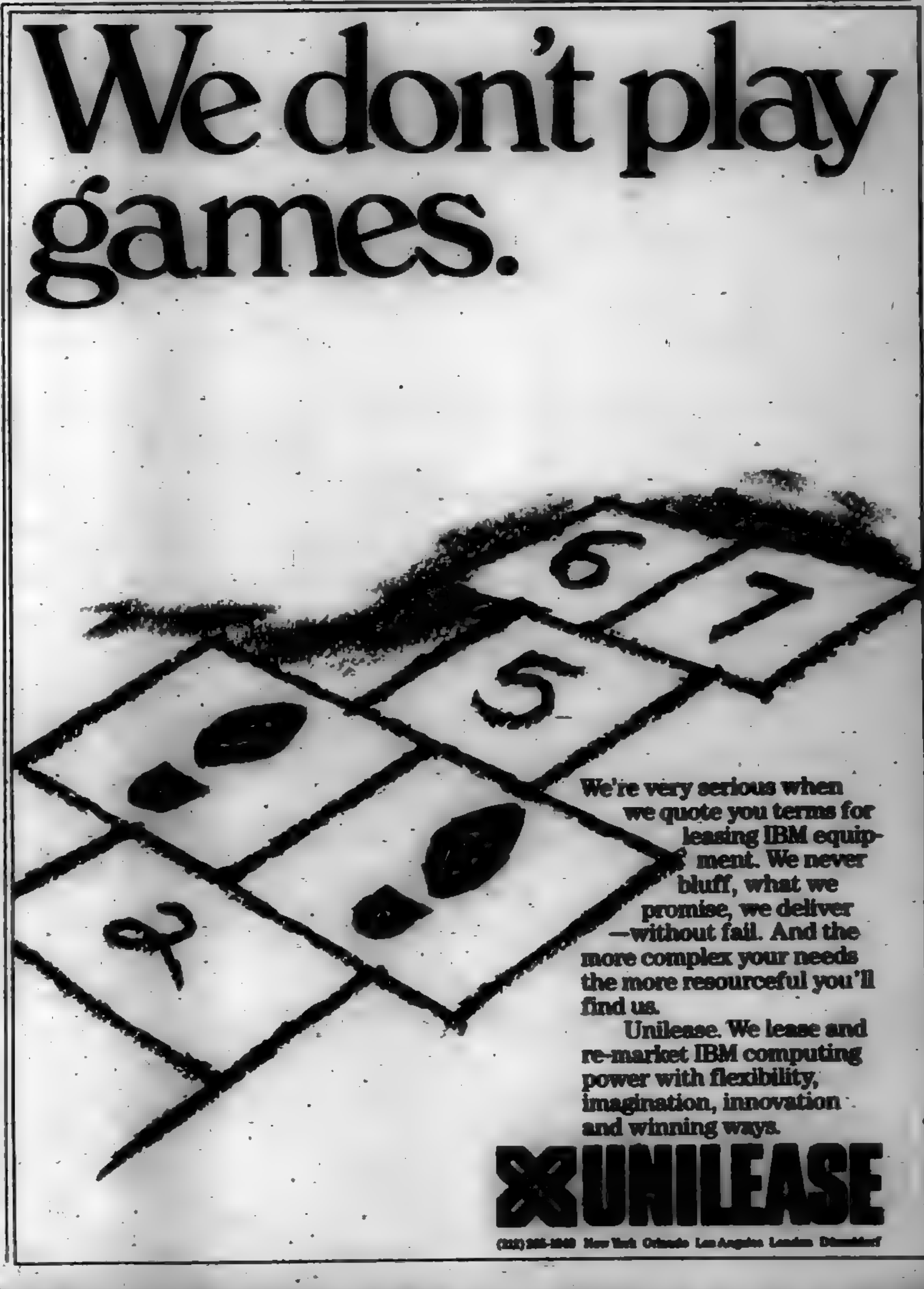
Sun Common Lisp is enhanced with tools to optimize its performance on Sun workstations and to integrate Lisp capabilities into Sun's AT&T Unix programming environment, a spokesman said.

The Sun Workstation computer systems with Sun Common Lisp range in price from $8,900 to $50,000. Sun Common Lisp is said to be a full implementation of Common Lisp. All programs written in Sun Common Lisp can use the interactive windowing and graphics capabilities of Sun workstations. Mechanisms are included for interfacing Sun Common Lisp to C, Pascal and Fortran programs.

Sun Common Lisp can be licensed as a development environment or as a runtime applications environment. The development environment features a library of functions, special forms and macros to speed programming. It also offers an optimizing compiler and an interpreter. A set of tracing and debugging facilities is said to enhance productivity. The development environment reportedly enables construction of hybrid applications that use symbolic and numeric computation.

Sun Common Lisp costs $3,500 for license, tape and documentation. The applications environment will be available separately for $875. The product is scheduled for fourth-quarter availability.

Sun Microsystems is located at 2550 Garcia Ave., Mountain View, Calif. 94043.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TRAINING

■ GMD Systems International, Inc. has announced an end-user training program for users of IBM's Mapics I or Mapics II business control system.

The program, dubbed Mapics Unsupervised System Education Resource (User), is a series of multimedia instructional packages intended to improve user skills necessary for using the display stations for data entry. The program trains users to obtain various reports and inquiries produced by the Mapics system.

The first User modules covering product data management, inventory management, costing and production control and costing are available now. Each Mapics User module is priced at $1,295.

GMD Systems International, Suite 420, 8601 Dunwoody Place, Atlanta, Ga. 30338.

■ Control Data Corp. has announced the Ada Programming Series, a 90-hour Plato computer-based training curriculum for training programmers in the higher order Ada language. The Ada Programming Series runs on CDC's Plato Personal Training Station and on other IBM Personal Computer-compatible systems.

The series includes three courses: Ada Programming: Fundamentals, Ada Programming: Advanced Features and Ada Programming: Soft-

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Users like PC Link, not price

tem (DBMS) shop, the firm evaluated Software AG's Natural Connection micro-mainframe link late last year, Erb said. He added the feeling was the Software AG link was not ready, so his firm went to M&D's PC Link.

Forest Oil now has five PC Link packages installed for budgeting applications. The micros link IBM Personal Computers to an IBM 4341 Group 2 mainframe running MVS. Instead of downloading production data into spreadsheets, the company downloads data to an Ashton-Tate Dbase III DBMS on the Personal Computer, Erb said. Users in several division centers with Personal Computers with PC Link prepare budgets and send them to corporate headquarters, where they are merged into a single budget, Erb said.

M&D's Conrad indicated that PC Link's price may be cut. "If anything, it will go down. I don't see the price on the micro side going up," he said. He said price was not an issue on the mainframe side.

User Bruce Pergament, vice-president of administration for Pergament Home Centers, a retail chain of 40 stores based in Melville, N.Y., said the PC Link price may be justified by the product's development costs. "It's not easy to say the product is too expensive," he said.

Pergament said his firm, which is privately held with revenue of more than $100 million annually, decided to buy PC Link when it bought M&D's general ledger accounting package nine months ago.

"We felt it was a necessary adjunct to the [general ledger]. We felt any [general ledger] we bought today needed a link. We feel we can do all our budgeting with two or three people," on IBM Personal Computers with PC Link connected to the company's IBM 4381 mainframe, he said.

Downloading to 1-2-3 attractive

PC Link's ability to download data to a Lotus Development Corp. 1-2-3 spreadsheet also attracted Pergament to the package. "Instead of forcing you to go into some type of micro package you don't want, M&D made a commitment to go to Lotus, which has become the industry standard. Many 1-2-3 users don't want to take the time to learn another package. They don't need anything else," he said.

Pergament has three PC Links installed now and has plans for more. The budgeting application is being worked out. The most time-consuming task is defining mainframe production data into fields, files and lengths appropriate for use on the Personal Computers. "If you try to download too much data, you send your [Personal Computer] into a coma," Pergament commented.

Training users on PC Link, especially users unfamiliar with M&D's Millennium on-line applications development system, also takes time. "Users have to make an effort to learn the intricacies of this package," Pergament said.

An Albuquerque, N.M., bank plans to use PC Link to connect executives on a local-area network to production data, said Jerry Smith, senior systems analyst at the Albuquerque Federal Savings and Loan. Like the other users, the bank is currently using the link to help prepare budgets. Four link packages have been installed, the first in early 1984.

A total of 25 subsidiary companies submit their budgets to Smith's group, which is linked to an IBM 4381 mainframe running MVS. The analysts work on the budgets in 1-2-3 then send them back up to the mainframe, Smith said.

The bank's latest PC Link project is to link the executives in a 10-node network, five in one building on a local-area network and five in another building on dial-in lines. "The thrust is to get information off the mainframe and into management's hands, 'to be available at any time with very little impact on data processing," Smith said.

The managers, including the company president, will access a version of the data base to be updated weekly, he said. For the executives' purposes of planning and evaluating how efficiently the company is operating, a once-a-week update is sufficient, Smith said.

For updated versions of PC Link, Smith said he hopes M&D will offer users a way to share templates they have prepared for use with 1-2-3. An M&D spokesman said the PC Link development effort is aimed at linking the IBM Personal Computer to minicomputers, and then linking the minicomputers to a mainframe.

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Available both as a plug-in card and as a standalone unit, Fastlink is both 212A and 103 compatible. That means it will slow down automatically to accommodate Hayes modems.

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In fact, if inferior line quality does necessitate a lower transmission rate, Fastlink does something other high-speed modems can't do. It adjusts its speed incrementally, a few bps at a time. So you can continue to transmit at the highest speed possible. Other modems now on the market drop their speeds dramatically, or even worse, stop transmitting altogether.

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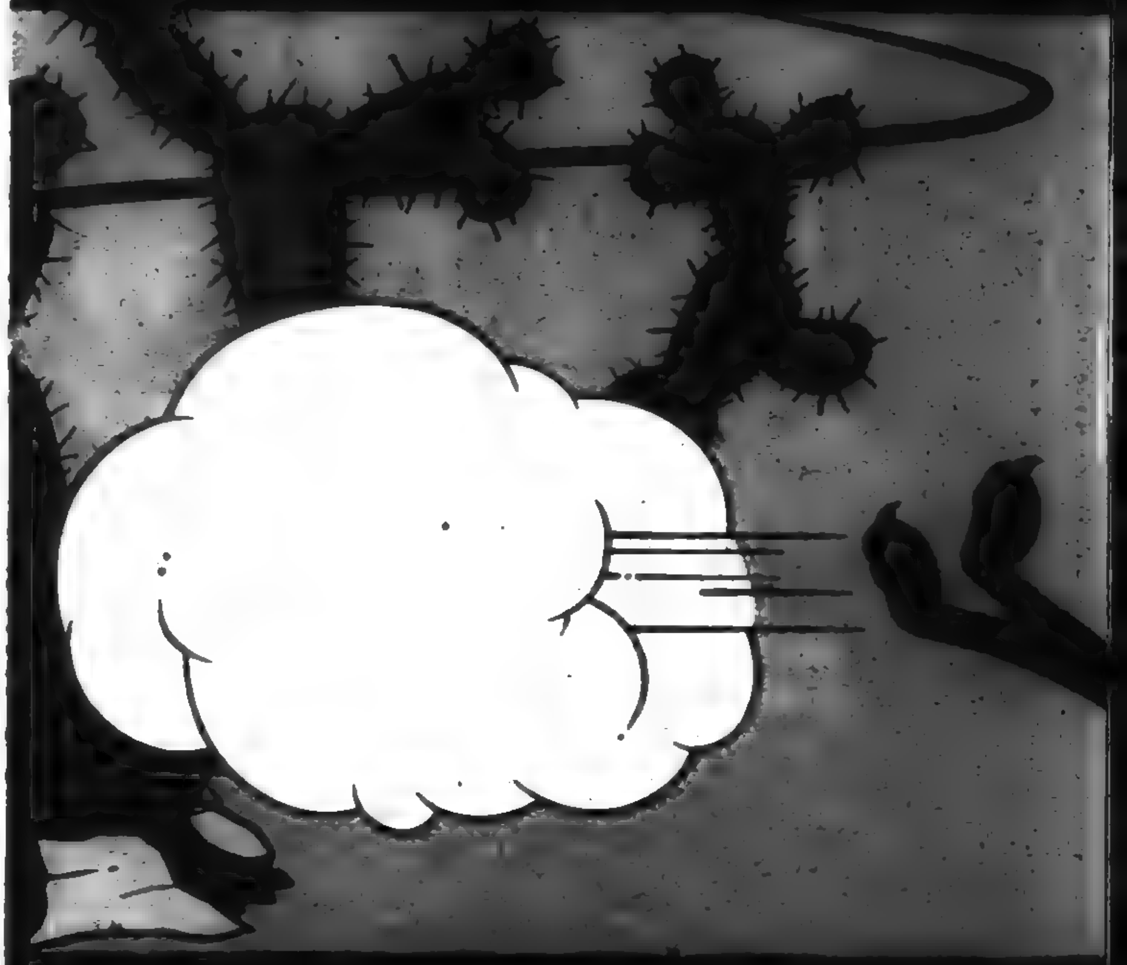


BEEP!
BEEP!

Continued from page 70

ware Engineering. Ada is a trademark of the Ada Joint Programs Office, U.S. Department of Defense.

Each course includes 10 hours of Plato instruction, reading and hands-on programming practice.

The courses are intended for programmers with at least two years experience with a high-level language like Fortran, Pascal or PL/I.

Each Ada Programming Series Learning Station Kit, including diskettes, is priced at $1,500; the Student Kit, including manuals and a diskette, is priced at $1,150.

CDC, Corporate Telemarketing, Mail Station MNB04A, P.O. Box 0, Minneapolis, Minn. 55440.

■ **Alsys, Inc. announced that its Lessons on Ada computer-aided instructional course now runs on Digital Equipment Corp.'s VAX computer systems running Version 4 or higher of the VMS operating system.**

The instruction package was previously available on the IBM Personal Computer and compatible machines, according to Alsys.

Lessons on Ada for the VAX requires a DEC VT241 color monitor.

Lessons on Ada for the VAX is priced from $6,000 for the Microvax to $15,000 for the VAX 8600.

Alsys, 1432 Main St., Waltham, Mass. 02154.

From page 61

M&D link eases reporting

age. We didn't have that kind of money." The micro-mainframe selection was budgeted at less than $30,000.

The two-month search for a solution to Orion's problem began in October, and soon the list of potential products was reduced to six. Price comparisons and vendor visits helped Stein narrow his selection.

He also considered the company's ultimate objective to allow remote users in four divisions to access mainframe data for their own spreadsheet analysis.

Recommendation made

In January, Stein presented management with a 14-page report comparing micro-mainframe products and recommending McCormack & Dodge Corp.'s Interactive PC Link.

The product allows microcomputer users to transfer portions of foreign files into a variety of spreadsheets, including 1-2-3.

But his job was not complete. Now Stein had to convince both users and management that the product could be supported.

Emphasis on training

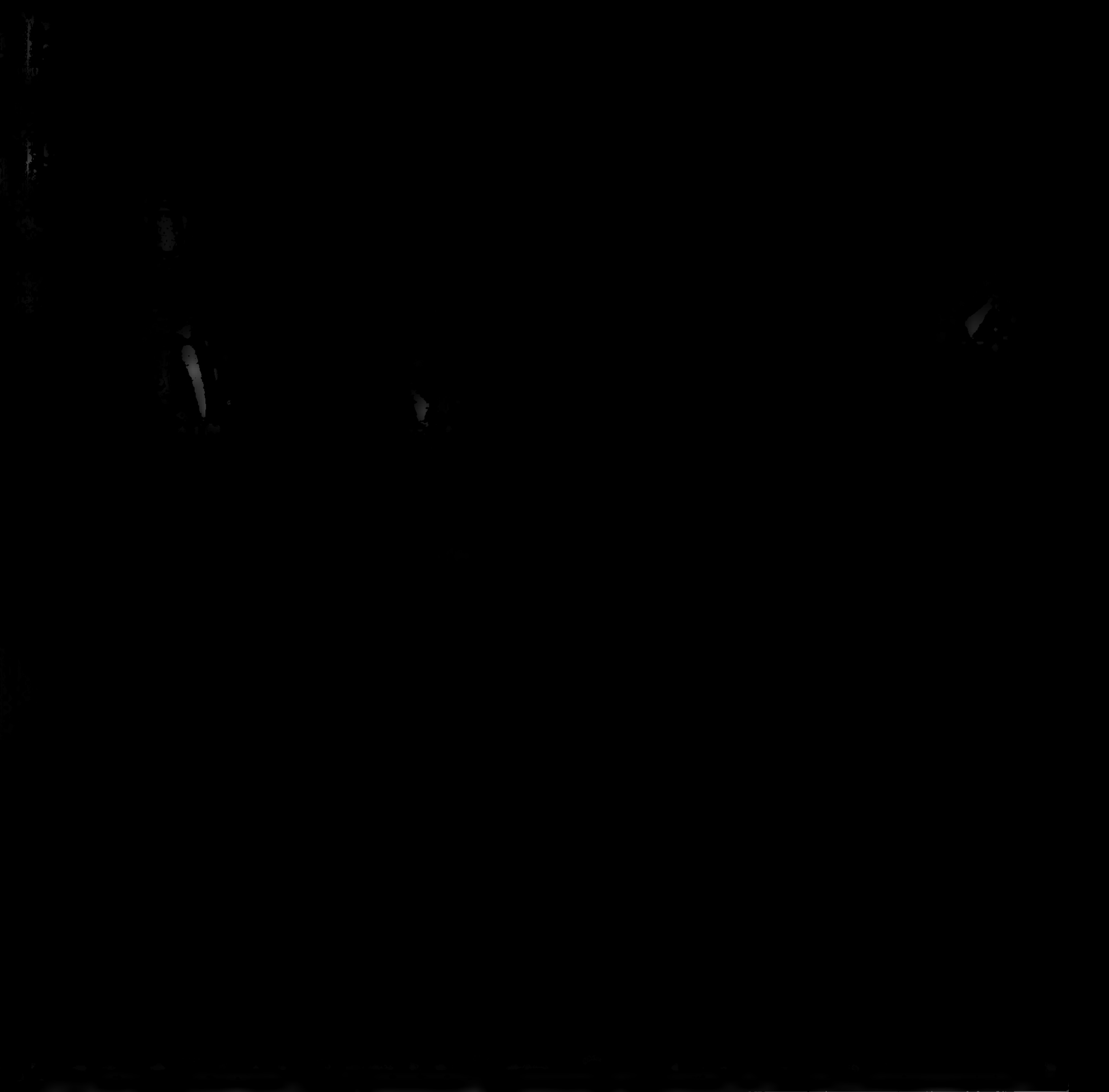
"One of the main reasons we got the product was not because it was clearly better," he said. "But it was the fact that we had a lot of assurance from the company that they were going to support us in everything we wanted to do." According to Stein, "I didn't want one product that we thought was outstanding because training wasn't a big issue to the vendor. In a start-up information center environment, training is a big thing in my book."

PC Link was more expensive than some of its competitors, Stein admitted. "I had a little explaining to do with management, but I pushed the training issue." Orion's workers needed a structured classroom environment. "I feel the best training anybody can give is in a classroom, where people can ask questions. You don't get that out of a demo disk." And, he added, "Management doesn't want something that costs $20,000 that no one will use."

The micro-mainframe link was not always a welcomed solution at Orion, according to Stein. "There was a lot of negativism," both from management and users, he said. Orion overcame some installation problems, with the help of M&D service technicians, he said.

"Everybody thought they could install it themselves," Stein noted. "The financial group thought they could do it, and the technical support people thought they could do it. We needed the help of the vendor."

For the analysts in Orion's financial group, PC Link has meant that less time is spent generating financial reports. Before installing the product, two workers spent two weeks each month generating financial reports, according to Richard Tardif, vice-president of financial information. "A lot of people were keypunch operators," Tardif said. "I look at this as a great tool to get us out of the manual sweat work."



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SPECIAL REPORT

Minis and Small Business Systems

September 30

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IN DEPTH

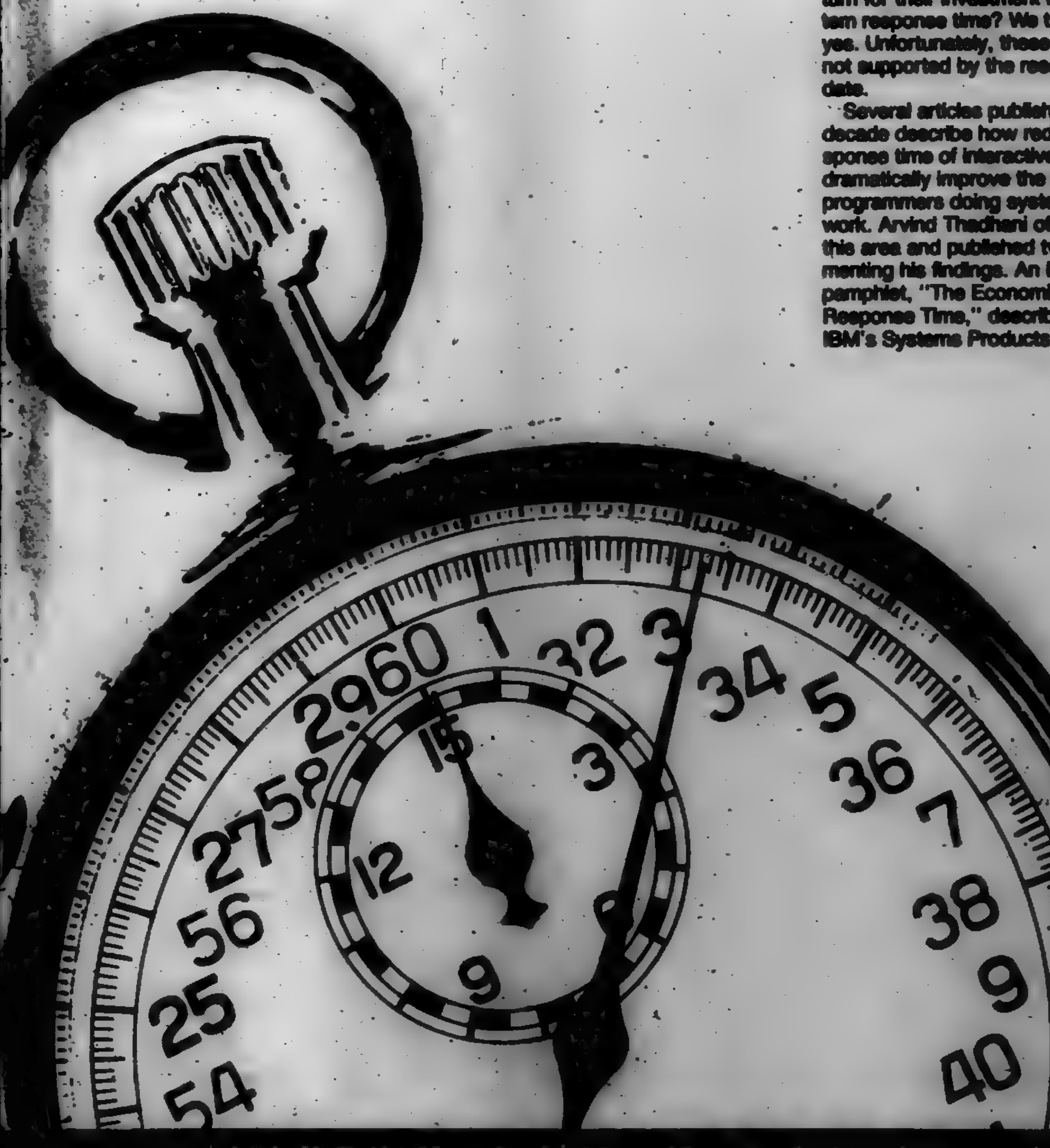
Are you rushing too fast to subsecond response time?

Can subsecond response time increase programmer productivity in your systems department? Is it worth the investment? Corporate managers must understand the research upon which claims are based before answering these questions.

By H. Thaine Lyman,
James Anderson
and Jeffrey Plewa

Are MIS managers expecting a magical increase in programmer productivity in return for their investment in subsecond system response time? We think the answer is yes. Unfortunately, these expectations are not supported by the research done to date.

Several articles published in the past decade describe how reducing the response time of interactive systems can dramatically improve the productivity of programmers doing systems development work. Arvind Thadhani of IBM pioneered this area and published two articles documenting his findings. An IBM marketing pamphlet, "The Economic Value of Rapid Response Time," describes experiments at IBM's Systems Products Division and the



company's program development facility at Portsmouth, England. The experiments purport to show significant productivity increases from improving response time. The pamphlet projects savings of up to $300,000 per month for a hypothetical 100-programmer group that reduces response time from 3 seconds to 0.3 seconds.

In systems departments, emphasis has shifted from evaluating and trying to confirm the claims made for subsecond response time toward implementing it to achieve the benefits — as though the question of benefits is settled. Many MIS managers have either adopted subsecond response time or are justifying it to top management.

One company has published an internal subsecond response time standard as an inducement for new programmer recruits to join up. Another has proposed a hardware expenditure in excess of $150,000 per month to secure the productivity increases expected from subsecond response time. These activities are taking place even though published research cautions against a simplistic application of findings and underscores the need for further applied study.

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> ***Many organizations would have to double the resources available to development in order to achieve the subsecond response goal.***

The stakes are high. As reported in the 1984 *Statistical Abstract of the United States*, there are nearly one million computer professionals now employed in the U.S. If as many as one-third of that number regularly engage in on-line programming, the impact of subsecond response time could mean billions of dollars annually in improved productivity. The costs of subsecond response time are similarly high: Many organizations would have to double the resources available to program development in order to achieve the subsecond response goal.

The impact of any systems productivity improvement will be visible. Firms in all industries increasingly depend upon computers for survival in markets where information and instantaneous service are crucial. Organizations' demand for computing is growing at an estimated 40% to 60% compound annual rate.

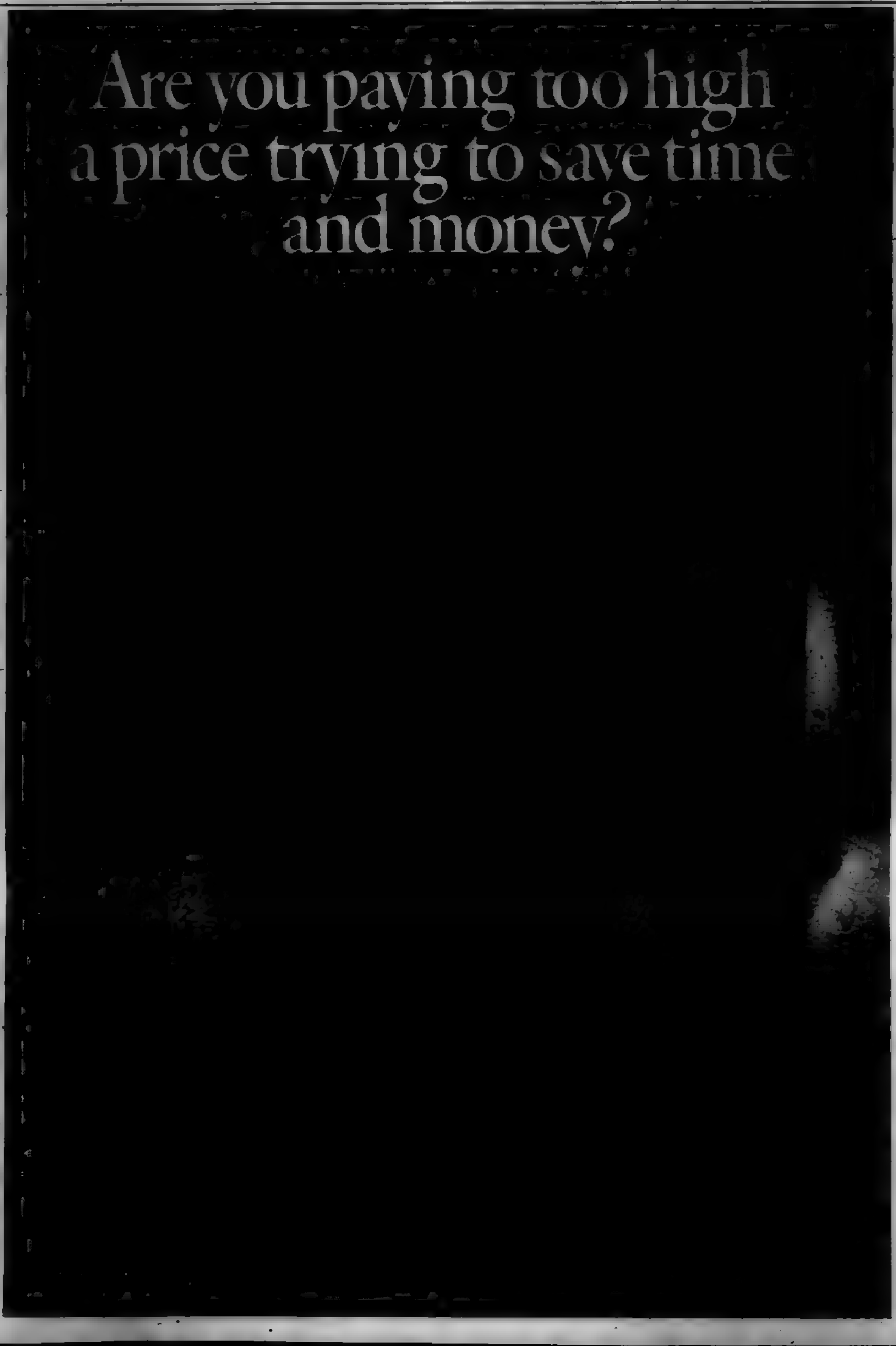
But the backlog for systems development projects is growing faster. One recent study found that the average waiting time for a project to be delivered has grown to more than two years from only 1.5 years in 1981.

Systems development managers are in the vanguard of those proclaiming the benefits of subsecond response time as a way to leverage their staff resources to greater throughput, shorter project times and smaller budgets.

Can subsecond response time increase programmer productivity in a systems department? Is it worth the investment? Corporate managers must understand the research upon which claims are based before the answers to these questions can be known.

The research

Thadhani's first experiment began as an unstructured exploration into the effects of system response time on computer user behavior. No experiment design or objective was stated in the article discussing his results. He studied two MVS/TSO environments passively. (No changes were introduced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into either environment by the experiment).

Thadhani finds that the number of transactions initiated by users increased by more than could be accounted for solely by the additional time available from quicker transactions. He concludes that this finding was caused by a decrease in user "think time" per transaction.

He reasons that if users complete the think time necessary before the next transaction in fewer seconds, they must be thinking more efficiently. This phenomenon was attributed to the slower decay of the "short-term mental memory buffer" mentioned in an earlier article. Productivity was assumed to increase based upon these results.

Thadhani, in a later article, also describes another effort to show the salutary effects of "good computer services." A project team was given subsecond response time, their own terminals, a private room (necessarily close to the machine room because subsecond response time was achieved through local connection of terminals), 15-minute test job turnaround time and high availability on the computer dedicated to program development and testing.

No attempt was made to isolate these variables. The author assumes that it was not possible to conduct a controlled experiment in which subsecond response time was the only variable.

Thadhani draws no quantitative conclusions regarding the effect of subsecond response time on programmer productivity. A summary finding of improved project productivity was reached: "These achieved productivity rates are significantly higher than those achieved on similar projects within IBM."

Productivity improvement

G.N. Lambert, writing in the *IBM Systems Journal* in 1984, reports on an experiment conducted in 1983. A group of systems developers was given an isolated project room, their own terminals and subsecond response time.

Based upon a measure of function points estimated to be involved in a project and "highly reliable" estimates of what the project would have required had it been undertaken with normal systems service, users with subsecond response time demonstrated substantially greater productivity than their counterparts with normal service.

Function points measure the complexity of a programmer's task. Point values are assigned to the program based upon the number of generic tasks the program performs, such as number of I/O files and number of computations. This method allows the work necessary to produce different kinds of programs (such as on-line vs. batch) to be compared on an equal basis.

Lambert documents a 58% improvement in productivity as well as a probable improvement in project quality (measured in number of trouble reports). The improvement in quality is attributed to what could be called a "synergistic effect" of subsecond response time and environmental factors. Programmers in the experimental group also provided highly positive feedback in subjective interviews after the study. Lambert states that the IBM unit where the project was conducted has since decided to install subsecond response time combined with private team project rooms in other program development centers.

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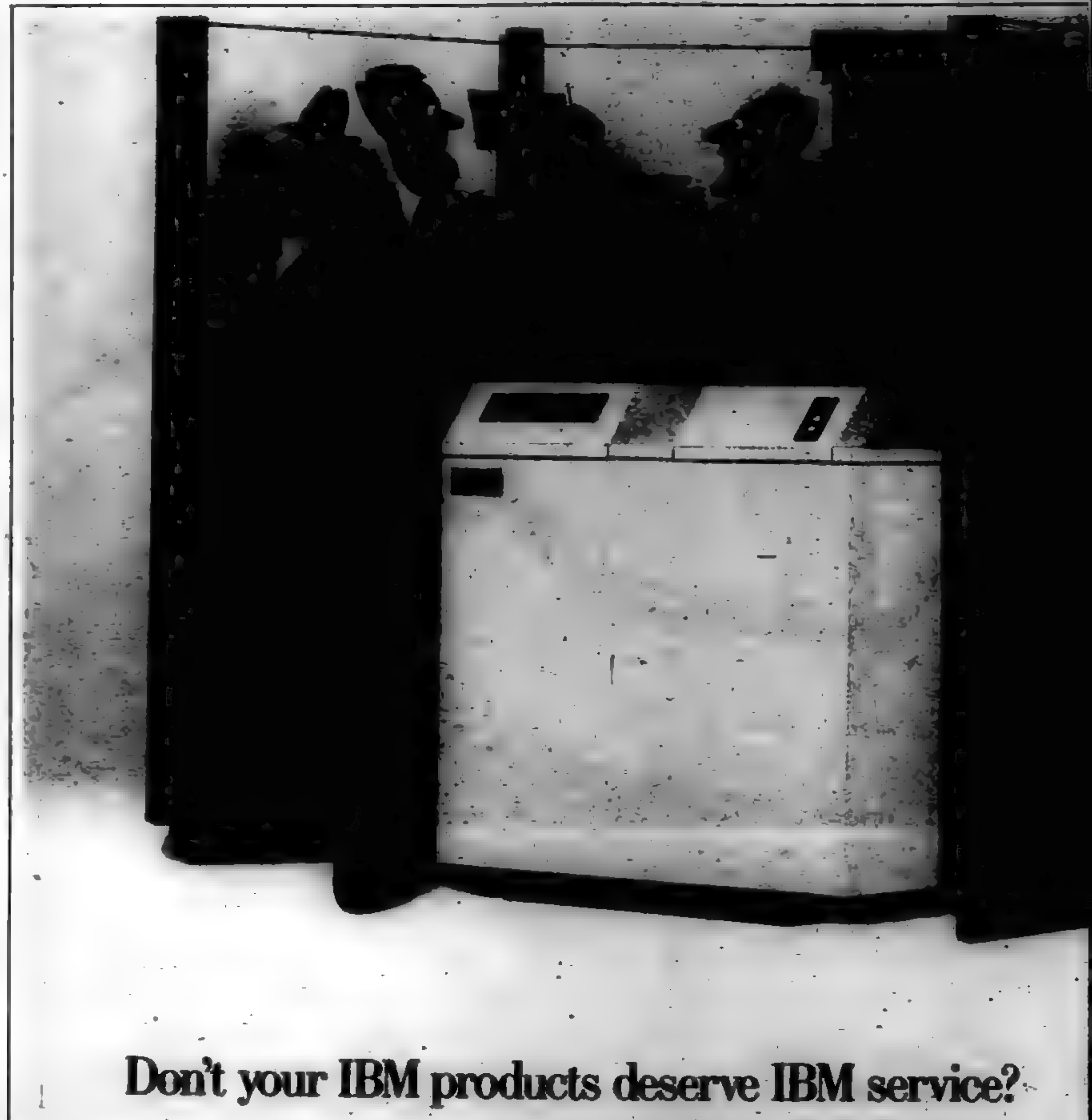
> *In systems departments, emphasis has shifted from evaluating and trying to confirm the claims made for subsecond response time toward implementing it to achieve the benefits — as though the question of benefits is settled.*

The IBM marketing pamphlet mentioned earlier summarizes a study of engineers performing card-wiring tasks using graphics display terminals. The work of 15 engineers of varying levels of expertise from four laboratories was measured. Although no comparisons were made between card wiring and systems development, productivity of the engineers, measured by number of transactions per hour and total time required to complete a wiring task, went up dramatically.

Lawrence Kosmatka, in a 1984 *Computerworld* article, describes efforts to duplicate Thadhani's results. His company installed subsecond response time attempting to achieve the published benefits. At various stages of enhancements, Thadhani's results were duplicated. At the end of the project, however, the systems development manager saw no substantive improvements in project completion times or budgets.

Kosmatka delved further into his data and discovered evidence of a "statistical illusion," which he suspected might be present in the previously published research.

Kosmatka finds that users modified their behavior or usage patterns of transactions as response time improved. While causality between the observed behaviors and subsecond response time is not proven, a substantial correlation is evident. Given subsecond response time, users significantly increased the percentage



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> *Conclusions about productivity enhancers in the DP professional's environment need to be correlated with the tools, work patterns and activities of the future rather than the editing-oriented coding of the past.*

of one-character transactions they executed.

He also finds that as system response time improved, reaction time sped up. Although Kosmatka does not generalize about the observations, one could conclude from his results that subsecond response time causes users to think less and press the Enter key more — a quite different conclusion from that drawn from the other articles.

Kosmatka concludes that Thadhani's "think time" improvement is an illusion; in fact, user think time appeared statistically unrelated to subsecond response time in Kosmatka's data.

Furthermore, Kosmatka finds that reaction time actually improves as system response time improves, resulting in real productivity saving (although much smaller saving than is attributed to "think time" improvement in earlier research) of "several tenths of a second." This particular finding is most pertinent to users of systems in which reaction time is a key component.

The IBM engineer card-wiring environment might be such a system with its higher routine content; a comparison of its results with Kosmatka's supports a conclusion that subsecond response time is most beneficial in a routine, production-oriented environment.

A study of the impact of response time on data entry performance by T.W. Butler further supports the conclusion that improvement in system response time has a more direct benefit in routine systems applications than in more general or "cognitive" situations such as applications development.

In an experiment conducted at Bell Laboratories, Butler found that there is a relationship between average system response time and user performance rather than between the most recent system response time and performance, contradicting the premise of short-term memory decay proposed by Doherty and Kelisk.

The authors of the published research all caution against a naive application of their results, citing the need for improvements in experiment design and measurement of the impact of subsecond response time. Managers should heed these cautions and understand the weak points in the research before applying subsecond response time in their own installations.

Problems with the research

Existing published research on the benefits of subsecond response time has several weaknesses. These weaknesses are especially important in light of the magnitude of the investments in productivity enhancement that data processing executives are being asked to make. Six major weaknesses exist in many of the studies and in documentation published to date:

- Mixed experimental factors
- Overemphasis on coding as the critical activity
- Ambiguity concerning the measurement of productivity
- Questionable methods of data aggregation
- Oversummarization of statistical results
- Omission of relevant variables.

Perhaps the most serious problem with many of the experimental results is the obvious mixing of variable factors controllable in the environment. In several studies, subjects were given not only subsecond response time but also a new, quieter work area, a team workroom and private desk terminals. Productivity improvements were measured, but were they caused by subsecond response time, the quiet workroom, private terminals or some other variable?

In this situation, perhaps nothing more exotic than the "Hawthorne effect" may have led to many of the observed improvements. This effect describes an artificial change in employee productivity or attitudes because the employees sense the company is paying more attention to them or is trying something novel.

Coding activity has been a central focus of much of the published research, yet coding seems to be a shrinking part of the DP professional's workload, while use of efficiency tools such as application generators and "programmer tool-kits" is on the rise. Such tools permit significant work to be accomplished with only a few commands or terminal transactions at a cost of higher per-transaction resource requirements.

The published research does not give insight into whether productivity benefits vary depending upon the use of such "advanced application development" tools. Conclusions about productivity enhancers in the DP professional's environment need to be correlated with the tools, work patterns and activities of the future rather than the editing-oriented coding activities of the past.

Methods of measuring productivity vary among the different research efforts. We favor the function point approach. Measurements that focus

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on keystrokes, transactions or other work-oriented variables have less credibility as productivity measures than as results-oriented function point measures.

Methods standardization

Different statistical methods are used in each study to boil down the large volume of data collected; that is, to eliminate inappropriate or suspect data and aggregate the remaining data into summary observations. These methods should be standardized for purposes of comparison.

Many adjustments to correct for bias in the raw data are not well supported. Looking at the "before and after" picture of a whole group of users for major periods of the day is only one possible approach to data aggregation. Use of a different technique — such as looking at individual users' productivity changes — might be more relevant.

We favor a measurement approach that focuses on each programmer's productivity before and after subsecond response time. Two groups of programmers — one control and one experimental — would be compared using an approach measuring before and after results for each programmer rather than the sum of all programmer productivity.

It is also important to measure all the relevant variables that describe the type of work being performed on any given terminal session. Kosmatka's data, showing the number of one-key transactions and how it changes with the implementation of subsecond response time, vividly demonstrates how measuring related variables can add a new perspective to experimental data.

People are quite different in their use of the terminal as a productivity aid. These differences are in "style," degree of preparation, use of sophisticated features or labor-saving techniques and so forth. Experiments must take such differences into account to be relevant to management's decision to invest or not invest in subsecond response time resources.

The published research has unquestionably pioneered our knowledge and understanding of the environment of the interactive terminal and its impact on productivity. Future inquiries should build on, not discard, what has been done. However, experimental results must be recognized to have been generalized prematurely to support computer purchase decisions.

Alternative enhancers

The discussion above is meant to refocus research activity on obtaining the most relevant insights possible into the complex world of systems development. It also should serve as a warning to managers that great care must be taken in applying published results to their own departments. We believe that systems managers should evaluate a variety of cost-effective strategies discussed below to increase systems development productivity.

Though per-unit hardware costs are declining, the implementation of subsecond response time is still very expensive. Personal costs are consuming an ever-growing share of the DP budget. Effective utilization of personnel is fundamental to planning and management in a well-run MIS department. Before spending huge amounts on hardware improvement, it is advisable to investigate alternative ways of improving productivity.

Programmers view the computer as a tool. Their satisfaction with this tool may affect programming productivity. The major factors that determine satisfaction with computer service are subjective and include the following:

- Reliability — The system must not go down in the middle of a complicated on-line debugging session.
- Availability — The system must be available according to a posted schedule (not necessarily around the clock).
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We believe that the key is to manage the expectations of the programming staff and to meet those expectations. Where system response time is concerned, is it not possible that the critical component in the measurement of programmer satisfaction is reliability of system response time rather than its sheer speed?

The programmer who consistently receives 1.5 second response time will, with all else equal, be more satisfied than the programmer whose system response time varies between 0.25 and 1.5 seconds. This view is based upon our observation that perceptions about response time may have more impact on programmer satisfaction than does numerical data. We have seen departments where programmer perceptions about system response time (in other words, it's "getting worse") are opposite of measured reality.

Environmental effects

There are numerous books, articles and papers devoted to productivity in the work environment. Researchers studying various settings have identified environmental factors that can affect productivity, such as lighting, room temperature, size of work space and proximity to other workers. Other studies have shown a link between productivity and the color of walls, carpeting and cubicle partitions.

These findings should lead the MIS manager to investigate the physical work environment of the MIS staff. Noisy printers or hallway traffic make concentrating on complex programming problems difficult. Partitioned cubicles and team meeting rooms can enhance the problem-solving process.

Another option is a project team programming room. Here, the interaction among programmers can increase productivity because team members "share knowledge."

Every study reviewed in this article provided a terminal for every user. Many companies are concerned that hundreds of thousands of dollars per year are wasted by programmers wandering around their MIS departments looking for an available terminal.

A terminal on every desk

Putting a terminal on every desk may be a relatively low-cost way of increasing programmer productivity. A programmer with a test job waiting for execution in a queue is more likely to monitor it closely if he can glance up occasionally and see its progress.

A terminal gives the programmer the luxury of immediate access to all tools, manuals, program listings and specifications required in the normal programming cycle. Programmers can work on documentation or research another problem while waiting for a job to finish execution. They know at once when the job is complete; they can review results, recompile the program if necessary and then resubmit the program for execution. Not having to walk back and forth between terminal and desk reduces the amount of time required to complete the programming task.

The basic disciplines of project management may be even more fundamental to productivity than the physical environment. Failure to employ certain basic management practices can often severely hinder the productivity of systems development staff.

> *We have seen many cases where simple before-and-after analyses are not done, where 'planned vs. actual' is not calculated and where 'this year compared to last year' is not understood. Such organizations know nothing of performance variance, much less the causes of the variance.*

Some common pitfalls include poor communication, poor personnel development, vague project goals, poorly defined responsibilities, little or no project task level planning, poor follow-up on critical tasks and lack of professionalism. Good project management methods can be difficult to implement and measure; nonetheless, MIS managers cannot afford to ignore them as a means of enhancing productivity.

Establishing programming standards and verifying compliance can also contribute to more effective use of programming resources. The use of structured design and programming, walkthroughs and standardized documentation, for example, can produce dramatic benefits in programming productivity and quality.

An effective training program is crucial to implementing these ideas. An MIS department that is successful over the long term usually knows how to transfer management expertise and technical knowledge to less experienced staff. Such organizations recognize that systems professionals require formal training well beyond the entry level to lock in professional growth and transfer skills effectively.

Beyond the obvious personal benefit of acquiring skills, many programmers perceive their employer more favorably for having made the investment in their growth. A more dramatic short-term impact on productivity can be obtained by hiring

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Massive amounts of time, effort and capital have been expended on the development and use of fourth-generation, user-friendly programming languages. It is not clear that these languages are fine-tuned to the point where most programming requirements can be accomplished by end users without needing the assistance of trained systems professionals.

These languages, however, when used by non-MIS staff to develop low-volume or one-time programs, can increase development staff effectiveness by freeing them to work on more critical applications.

Motivation

Motivation is another factor affecting productivity. Herzberg developed the Motivation-Hygiene theory to explain employee satisfaction. Hygiene factors, which contribute to job dissatisfaction, involve company policy, supervision, work conditions and relationships with supervisors, peers and subordinates. Motivators, which contribute to job satisfaction, include achievement, recognition, the work itself, responsibility and growth.

Quite possibly, however, technical staff may be very different from other corporate personnel in the way they view their work.

A Columbia University study sponsored by *Business Week* magazine reports that "the innovative specialists who help companies develop and use their computer systems effectively often bring to their jobs different work standards, definition of status and criteria for success than those of most managers."

Technical people rated learning new skills, security, location and better hours as higher priorities than other corporate managers did. Technical people also rated such factors as responsibility, salary, autonomy and job title as less important than did other corporate managers.

A highly quantitative approach to assessing performance in all phases of systems development is a common denominator among successful development organizations.

In contrast, we have seen many cases where simple before-and-after analyses are not done, where "planned vs. actual" is not calculated and where "this year compared to last year" is not understood. Such organizations know nothing of performance variance, much less the causes of the variance.

It would be difficult at best to justify the installation of subsecond response time in an organization where systems development productivity was not measured precisely. Without measurement and the resultant detailed understanding of the performance, management cannot know the impact of its decisions.

In the absence of generally applicable data concerning the possible effects of implementing a subsecond response time program, a recommended course of action for an organization interested in increasing productivity is to conduct its own experiment.

Results, based on the organization's own personnel and environment, are far more credible and meaningful than external research results as that organization considers extending such facilities to all systems professionals.

The ideal experiment should use function point measurement as well as "control" and experimental groups and measure individual programmer productivity rather than group totals.

About the authors

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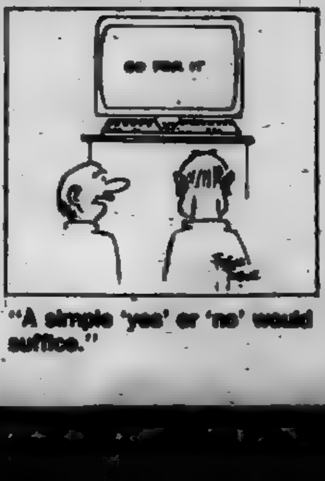

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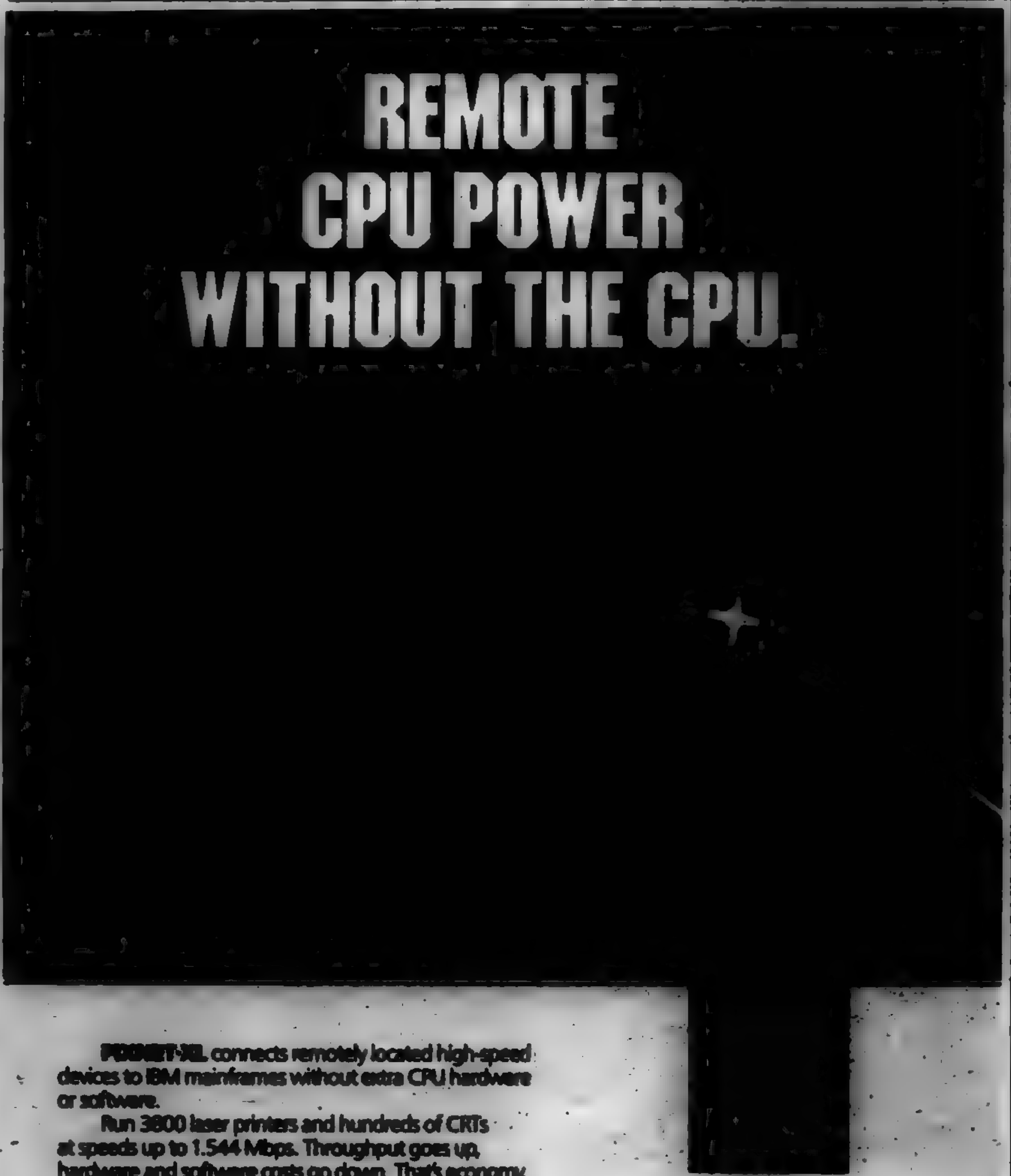

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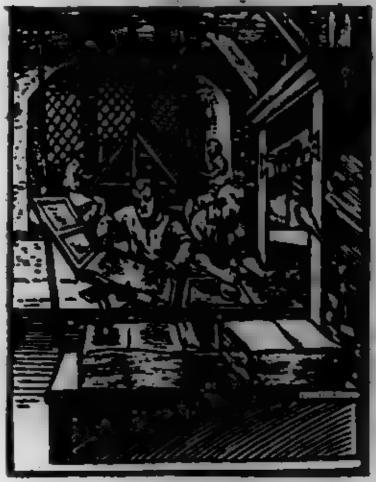
THE NEXT WAVE OF USER DOCUMENTATION



The next era of documentation will begin not because someone invents a better way to show a book on a screen, but because someone will decide it is time for the technology to adapt to the user instead of the reverse.

By Edmond Weiss

The traditional user manual is already obsolete.

When I make this statement to technical writers, I quickly reassure them that in data processing, many people work at obsolete tasks for years. (Consider all those folks still writing payroll programs in Cobol.) Some technical writers will keep laboring in their vintage 1960 reference-manual style for quite a while yet.

At the leading edge of documentation, however, profound changes are afoot. Like any futurist, I search for the future among the brightest practitioners of the present. What I see today is a second wave of interest in user documentation.

The first wave began in the late 1970s, with the proliferation of microcomputers into unaccustomed settings. The question then was, "How can we write manuals that users can understand?"

The second wave began more recently, probably impelled by the drop in the cost of memory. The question now is, "Why must productive use of technology depend on cumbersome documents or on any documents at all?"

In the early 1970s, when DP professionals were more worried about applications backlogs than the proliferation of user-written applications, documentation was little more than an administrative convenience. Before the advent of micros, the user or operator of a computer was likely to be a well-trained engineer, programmer or technician.

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> *The typical manual users are not the willing victims that their ancestors were. In part, the typical users are no longer technically educated and many not educated at all; although they are literate, they hardly ever read.*

The users of yore expected their technical publications to be murky and difficult. Indeed, an inpenetrable manual was the cachet of the programmer's job, the emblem of technical challenge. Similarly, if the manuals failed because they were inaccurate, incomplete or obsolete, these resourceful users could be expected to immerse themselves in their undocumented problems and persist until the machine yielded its mysteries.

All that has changed with the personal computer. When the typical operator/user of a system is a business professional who won't waste time on inaccurate and indecipherable junk or an office worker who is proficient in administrative skills but a novice on a micro, the documentation must change.

Gradually, the developers of systems and products have become aware of a trade-off. They saw that good documentation saves money: Having good manuals costs less than not having them. Every incompleteness, every error, every unclear or obsolete instruction has its price. And that price almost always involves personal services: training, consulting, telephone hot lines, field visits or late-night trips to the operations center.

So, as the 1970s ended, there was a flourish of manual writing, including run books, which told operators what procedures to follow and look-up books full of definitions, policies and arguments. Written by people who learned their trade in the military and used a style that evolved during World War II, these user manuals were classics. They were definitive, comprehensive and yet compact. One or two large books would fit every user's needs. Anyone resourceful enough to explore the text would surely be rewarded.

Of course, some organizations still have not reached even this elementary level. There are still complicated systems without much user documentation. Sometimes this situation occurs because the user and operators are of that older ilk — uncomplaining and resourceful, able to get by with slim or incomplete manuals or with no manuals at all. More likely, though, this situation comes about because the costs of the personal services are not accounted for.

Some companies (and apparently many government agencies) are still unable to assess the cost of work performed by salaried employees. They act as though work done by the staff is free — as if the cost of the hot line is the cost of the telephone bill, not the people who staff it.

Almost as bad is the notion that the only costs that matter are those incurred in one's department. One manager told me that he saw no reason to lower the training expense by increasing his documentation expense because the training budget was someone else's department. In a perversely similar vein, another manager told me not to make the manuals too clear because the company sells its training to the customers to make an additional profit.

For most organizations, though, the 1970s brought the realization that systems without user manuals are wasteful. In response, the classic, one-size-fits-all technical tomes have been made available by most of the large vendors and better developers.

Resisting tradition

However, by the 1980s this classical orientation was proving unpopular and unworkable. Traditional manuals seem slow and cumbersome to people working on-line. Indeed, many workstations have no room for an open book much less two, as some vendors suggest.

In the '70s, users wanted manuals. In the early '80s, manual writers complain that users don't read the manuals they have. In part, this situation occurs because the typical 1980 manual is unsuitable for and inaccessible to any readers who value their time. Typical manual users are not the willing victims that their ancestors were. In part, the typical users are no longer technically educated, and many not educated at all;

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although they are literate, they hardly ever read.

Considered another way, though, the modern users' resistance to traditional manuals is understandable. Reading a set of instructions from a book makes little sense when the instructions could just as well be read on the screen of the system being used. With the possible exception of the installation procedure, all the information for users can be communicated through the system.

In the '80s, then, the issue is less information products (manuals) vs. personal services. Rather, the question becomes what mix of information products best serves a user community with its diverse needs and abilities. So we see the a small library of manuals, geared to these needs: comprehensive reference works; "friendly" orientation manuals; and quick reference brochures.

If there is a conflict, it is between books and "nonbooks." Today, many who market systems or manage data processing believe that manuals should be on-line or on audio tape or videodisk. In some cases, this preference is merely stylistic. In many cases, however, it reflects the understanding that printed manuals are often the least effective way to support systems and software.

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> *The enlightened view is that user manuals are part of a library of documents that are part of a library of book and nonbook information that is part of a set of goods and services that support the user.*

Putting manuals into a data base (as opposed to merely shipping them on diskettes, another common practice) is more than a gimmick. Reducing the need for operators or users to leave their work in search of a printed table is simply good procedure. Jumping from screen to book to reference card to screen to book again irritates and inconveniences the user. More importantly, it causes errors and lowers productivity.

The people who benefit most from on-line user documentation are those with limited book skills; not limited reading skills — book skills. A large number of the people who are presumed to be poor readers are really only poor finders. Their problem is less with sentences and paragraphs than with indexes. If they could find what they need, they could read and understand it.

For these readers, the alternatives are either carefully written books that remove all extraneous and distracting material or on-line documents that find the material without much work by the reader.

In this second category, the two most prominent examples are the interactive tutorial and the context-sensitive Help screen. The former is an on-line realization of that most powerful of teaching tools, the branching programmed text, in which you must give the right answer before you may see the next increment of instruction.

Interactive tutorials give all the benefits of programmed texts without their central problem: the need to skip, branch, loop and detour. In a well-made tutorial (built with computer-based training (CBT), or "authoring," tools), the reader cannot misunderstand and, more importantly, cannot get lost.

Context-sensitive help is a utility in which the user asks for help (typically with one key), and the system finds the page in the manual that the user needs to see. Interestingly, the text files that underlie the Help facility are probably the classic user manual, indexed and partitioned so that each section corresponds to a particular task. And the next stage, no doubt, will give us "anticipatory" help, in which the system observes that the operator is having trouble (delays, errors and so on) and offers help before it is requested.

Moreover, getting documenters to write for the screen imposes a useful discipline on them. On-line documents must be organized into small, compact chunks; as hard as it is to use two pages at once in a manual, it is that much harder to see two pages at once on a screen. (Windows do little to solve this problem, but there are some emerging display devices that promise to show us several full-sized screens at once.) And the limited number of characters on the screen exacts an economy of expression that demands more editing than usual. That's why the most common flaw in on-line messages is that they are too compressed to be understood. The second most common flaw is the lack of procedural diagrams.

Support

What matters most now is support — the merging of documentation, quality control, training, implementation and customer service into one enterprise. The enlightened view is that user manuals are part of a library of documents that are part of a library of book and nonbook information products that are part of a set of goods and services that support the user.

Personal services involve little start-up cost. But they persist forever and usually increase as the number of users grows. Further, contrary to what many people expect, the better users get with their systems, the more support they want.

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> **"** *The latest issue in user documentation is a skepticism about the notion of support itself. The first step was to provide information; the second was to give support; the third is to ask why all this support is necessary.*

that are often the unintended consequence of inadequate documentation may also be viewed as a deliberate support strategy. Enlightened documenters may choose between goods and services, between books and nonbooks.

One firm can aspire to "customer independence" through an ambitious set of books, disks and tapes, while another brags about its personal service and unlimited consulting. One organization can seek to create manuals that will clearly solve any problems an operator might have; another might skip the manuals and add more supervisors.

Trade-offs between goods and services and between books and nonbooks often reduce themselves to the issue of short-term vs. long-term support costs. Good manuals, adapted for their users, are expensive to write, but they justify themselves later in productivity, good will and the reduced need for personal services.

The latest issue in user documentation — a harbinger of things to come — is a skepticism about the notion of support itself. The first step was to provide information; the second was to give support; the third is to ask why all this support is necessary.

Support, it turns out, is a euphemism for helping users adapt to the difficult aspects of their systems. Although terms such as "user interface" suggest that users merely plug themselves into the system, in fact, such ease is hardly the case.

Support is the name for all the activities that bridge the gap between the wishes and abilities of the user on the one hand and the capabilities and dispositions of the system on the other. Support compensates, underpins, retrofits, translates, spackles, patches and reinforces.

In a way, support gives prostheses that help the users overcome their handicaps. And the better we get at support technology, the more useful and ingenious the appliances we invent.

The next wave

Support is what helps the users adapt to the system, not vice versa. In effect, technical writers explain the ways of machine to man, not the other way around. Training programs teach users to act the way the machines want them to act, not the reverse. It is this principle that inspires the next wave of documentation.

If the user is viewed as one of the components in a system, then the very need for support may be viewed as evidence of a bad interface among the components. There is a bad fit between users and hardware — as, for example, when there is no way to tell whether a toggle switch is on or off. Or there is a bad fit between users and software — as when the same program uses different Enter keys at different times or when a commonly used word processing command requires what pianists call an "octave spread" between one's fingers.

What nearly every manual writer discovers early on is that clean, clear procedures need less written explanation than complicated, clumsy ones. Similarly, a procedure or concept that resists explanation probably resists proper use.

What the latest teams of documenters also realize is that this clumsiness that seems to cry out for heroic manual writing is much more than the inevitable consequence of advancing technology: It is evidence of poor engineering. Specifically, it means that the system or product is unreliable.

Reliability will be in the late 1980s what maintainability became in the late

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1970s — the main criterion of system quality and cost-effectiveness. And the last frontier of computer system reliability will be the user, the least well understood or controlled element in the process.

Shift in support

Instead of developing ever more friendly manuals, the goal will be to shift the nature of support from external goods and services to internal design features. (Perhaps "internal support" is a contradiction in terms.) The reliability of the system in use will derive less from slick manuals than from the following factors:

- Intelligibility — the ease with which prompts and messages can be read, understood and, where appropriate, obeyed.
- Invisibility — the degree to which users are unaware of the system's tasks and peculiarities (what programmers misleadingly call "transparency," a word that means obviousness) and are free instead to think and communicate in their own terms.
- Insight — the ability of the system to anitcipate what the user wants and interpret the user's "errors."

To an extent, putting reference material and procedures on-line is a rudimentary form of internal support. But a more dramatic move in this direction would be eliminating even the need for on-line pages.

From this perspective, preparing a readable booklet of error messages is the first step; putting this directory of error messages on-line is the next; making the error messages themselves intelligible is the next; eliminating the situation that caused error is the last.

In the fourth and fifth generation, then, documentation converges on design. Users stop asking how well-documented the system is and start questioning why the system needs so much documentation. Similarly, users may stop purchasing the products with the best support and service and instead choose the ones that do not require much support or service.

Writers as designers

When documenters are included on the design team, they tend to become designers. In the most advanced development groups, it is difficult to tell the writers from the programmers. Indeed, since today's technical writers work with computers using a variety of software tools, they can be considered programmers.

Those organizations that still want one-size-fits-all, comprehensive reference manuals should be looking for traditional technical writers, primarily those with backgrounds in aerospace or electronics. In those organizations with a variety of users and customers, especially places where the term "user-friendly" is uttered often, the best documenter might be thought of as a support engineer. This person is not only a skilled writer but also a skillful teacher and consultant.

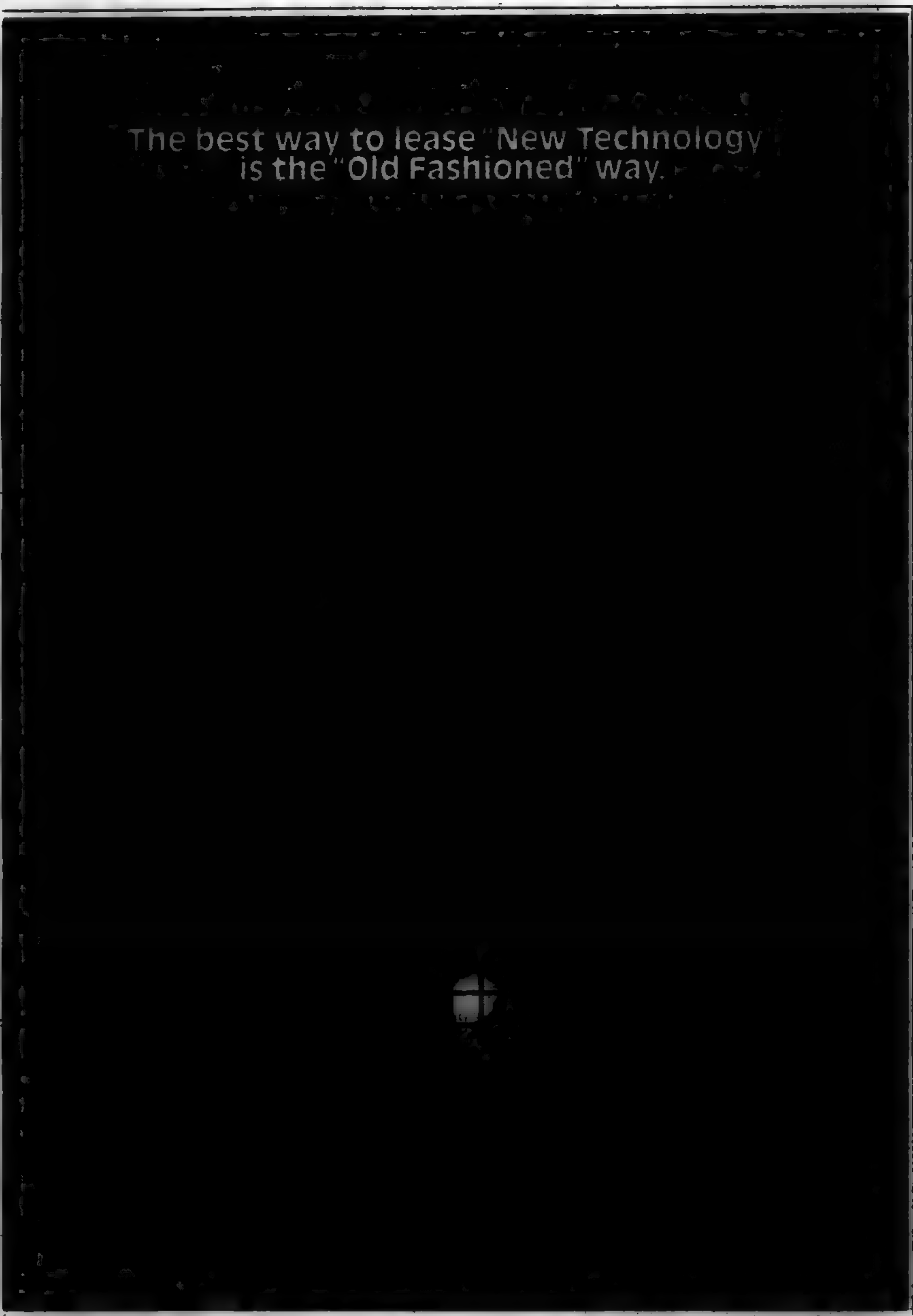
> ”
>
> *Reliability will be, in the late 1980s, the main criterion of system quality. And the last frontier of computer system reliability will be the user, the least well understood or controlled element in the process.*

More importantly, the support engineer is someone who believes that the burden of effective communication and implementation is on the developer, not the user.

Support engineers

Support engineers can come from any background. Like the programmers of the early 1960s, support engineers didn't learn their trade in school. They are drawn by aptitude, opportunity, even passion. And their challenge is the most interesting assignment in all of data processing: to bridge the gap between developers and users, between engineering and sales.

Support engineers must possess superior writing and communications skills, no matter what they studied in school. Beyond that, they must be able to understand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> ”
>
> *In the fourth and fifth generations, documentation converges on design. Users stop asking how well-documented the system is and start asking why the system needs so much documentation.*

what users and systems do and to referee heated arguments between business professionals and software wunderkind.

The best ones also have the knack of suddenly becoming blissfully naive about computers when it comes time to explain a procedure to a neophyte user.

Separate but united

Inevitably, there is some specialization among support engineers. Those who support managers and executives are often trained in management science and technology (financial analysis, operations research and so on), while those who work with clerks and neophytes tend to be from instructional technology or CBT.

Whatever their specialties and job titles, though, support engineers are united by their loyalty to the best interest of the users and customers and by a sense that, given the right mix of information products and services, a system can be operated effectively.

The next few years will be a time in which support technology improves dramatically. New storage and video hardware will make on-line manuals even more attractive and readable. There will be new ways to look things up, several of them involving lasers.

The skills of the manual writer will evolve into the skills of the information support specialist. Already, public seminars on user documentation include sections on how to write Help screens and interactive tutorials.

Internal support

The next issue in documentation is internal support. A procedure that needs external support is less reliable than one that does not. Thus, whenever there is a choice between supporting a procedure with a clever document or changing the procedure so that it does not need support, the wise technical writer will recommend the latter.

The best news about the future is that everything the support engineers are learning about user needs and proclivities — what they incorporate into usable manuals and Help screens — will be directly useful in the future.

In the fifth generation, systems will be expected to deal with the users, a skill that many systems analysts haven't learned yet. Today's technical writers will be teaching systems how to adapt to their users, a subject on which the writers are the undisputed experts.

Eventually, though, the next era will begin — not because someone invents a more spectacular way to show a book on a screen, but because someone will decide it is time for the technology to adapt to the user instead of the reverse.

About the author

Edmond Weiss is an independent consultant based in Cherry Hill, N.J. Weiss teaches seminars in technical communication and documentation.

He is the author of How to Write a Usable User Manual *(ISI Press, Philadelphia, 1985).*

SCIENCE/SCOPE

A new generation of powerful, ultrafast semiconductor microchips can soon be produced at rates required for commercial manufacturing, using the world's most sophisticated electron beam lithography system. The system is capable of writing circuit patterns with features as small as 0.5 micrometers — about 1/200th the diameter of a human hair. It was accepted recently by the U.S. Department of Defense for its VHSIC (very high speed integrated circuit) program. The acceptance culminates four years of development by Hughes Research Laboratories and Perkin Elmer Corporation leading to the direct-write system.

Controller-thrust aircraft engines will be tested at NASA's Lewis Research Center with three heat monitors. Three Probeye™ thermal video systems will monitor, measure, and analyze heat from the engines while they are operated within the environmental test chamber at the research center. Each Probeye system consists of an infrared imager, image processor, and TV display, all of which interface with a computer. Hughes designed and produces the Probeye system.

A prototype Amraam missile passed within lethal distance of a target aircraft in the first guided launch of its full-scale development program. The unarmed weapon was launched from a U.S. Air Force F-16 flying at Mach 0.85 at an altitude of 21,000 feet. It was fired from behind a QF-100 drone flying at Mach 0.7 at 21,800 feet over White Sands Missile Range in New Mexico. Telemetry data indicate the 12-foot-long, 335-pound missile met all test objectives. The flight also verified Amraam's interface with the F-16's avionics system and the performance of its active radar guidance capabilities. Hughes is developing the AIM-120A advanced medium-range air-to-air missile and its companion rail launcher for the U.S. Air Force and Navy.

A new 6x9-inch minicomputer executes one million instructions per second for a U.S. Navy communications terminal. The small rugged computer, developed by Hughes and designated the HMP-3220, is part of the Joint Tactical Information Distribution System (JTIDS) terminal. It executes standard Navy software written in the CMS-2 high order language. The computer uses a combination of advanced CMOS configurable gate array and advanced Schottky integrated circuitry packaged in digital hybrid technology. This advanced design and packaging concept enables two central processors (each with a 96K word ultraviolet erasable memory, 32K words of CMOS static random access memory, and a common data bus input/output interface) to be contained on a single, pluggable circuit card assembly. Total power consumption is less than 120 watts. JTIDS is a secure communications network used to link U.S. armed forces. JTIDS uses several computer-assisted techniques to transmit data while preventing enemy jamming and interception.

Hughes needs engineers, scientists, and programmers to forge new frontiers in aerospace radars, weapon control systems and avionics, airborne displays, aerovehicle data links, and airborne countermeasures. Current openings are for people experienced in design, development, test and manufacture for systems engineering, project/program management, design of circuits and mechanisms, and bringing these to reality through the application of advanced manufacturing techniques. Send your resume to Hughes Radar Systems Group, Engineering Employment, Dept. S3, P.O. Box 92426, Los Angeles, CA 90009. Equal opportunity employer. U.S. citizenship required.

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IN DEPTH

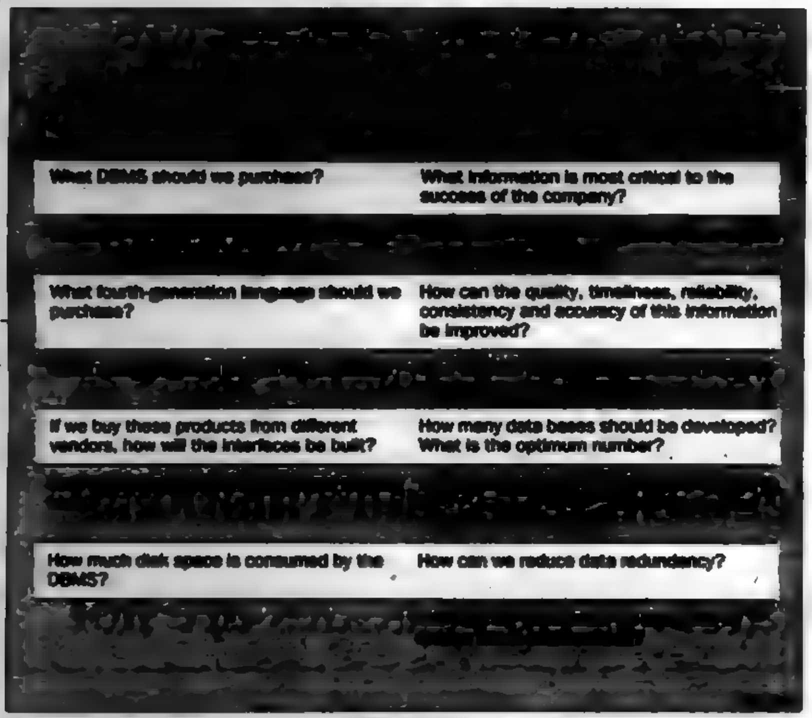
Although the technical challenges of implementing data administration are formidable, they are relatively small in comparison to the political, organizational and emotional issues facing the data administrator. If these issues are not understood or are ignored by an organization prior to instituting a data administrator function, the long-term success of data administration could be jeopardized.

The Politics of Data

By William Durell

The first challenge that data administration faces is a general lack of understanding of its purpose and nature. Many organizations perceive data administration in a purely technical light. If you ask the average data processing professional for a definition, the answer would probably express the technical aspects of a data dictionary or data base management system. Although these are two tools used by the data administrator, they are merely a means to an end and are certainly not the objective of data administration.

The objective is not to install and implement data base management systems and data dictionaries, but to use these as tools to achieve the management and control of information within the entire enterprise. Data administration is as much a managerial function as a technical one. Therefore, the data administrator must advertise and



What DBMS should we purchase?	What information is most critical to the success of the company?
What fourth-generation language should we purchase?	How can the quality, timeliness, reliability, consistency and accuracy of this information be improved?
If we buy these products from different vendors, how will the interfaces be built?	How many data bases should be developed? What is the optimum number?
How much disk space is consumed by the DBMS?	How can we reduce data redundancy?

Figure 1

emphasize the global data management aspects of his job to overcome the preconceived notion that it is technical in nature.

An organization tends to spend large amounts of time and money analyzing the advantages and disadvantages of various commercially available data administration software and hardware products, yet it ignores those data management problems that are nontechnical in nature.

For example, it is not unusual for a large organization to spend 12 to 24 person-months evaluating and selecting a DBMS. An equivalent amount of time is often devoted to the evaluation and procurement of a data dictionary system.

Yet most organizations are reluctant to spend even a fraction of these resources to analyze the nontechnical problems of information management. This analysis must include business systems planning and entity analysis activities.

Figure 1 illustrates the typical overemphasis on technical solutions and underemphasis on nontechnical problem solving.

Planning and control

The benefit of automated tools such as DBMS and data dictionaries can only be realized through proper planning, control and use of the tools. For example, many new users of data dictionaries haphazardly populate their tools with information from existing applications. Little thought is given to the benefits or costs of this approach or to how this information will be maintained once it is put into the dictionary.

Likewise, many new DBMS users load the DBMS with data stored in existing files. The only thing that has changed is the data access methods involved. Often nothing is done to improve the quality of the data or to reduce data redundancy.

Most problems of data redundancy and inconsistency cannot be blamed on the lack of quality data tools. Many cannot be solved with technical approaches because they are organizational, political and managerial in origin. To expect hardware or software tools to solve these problems is to use the tools as a scapegoat for the more basic, nontechnical problems.

While it is important that a company answer the technical questions related to information management problems, an enterprise must also address the following nontechnical issues:

- Does the existing organizational structure of the DP staff encourage the proliferation of redundant data to support different application systems? For example, do the payroll system and the personnel system each have their own data bases of redundant employee information? Do the purchase order system and the merchandising system use separate data bases that contain redundant customer information?
- What changes could be made to the DP organization to reduce data redundancy over the long term?
- What changes can be made to improve the communications and coordination necessary so common data can be shared among different application development groups?
- Do the existing end-user departments dictate the creation of overlapping DP systems and thus foster data redundancy? How can the lines of communication among end-user departments be improved to help reduce this problem?
- What can be done to pursuade end-user organizations to share funding for the development of common data, increasing the amount of common data used?
- How can the DP and end-user organizations better understand the commonality or similarity of information resources?

Data administration is at a disadvantage politically within the company because neither its goals nor its accomplishments can be measured by the traditional means used to evaluate other members of data processing. Data processing personnel traditionally have been measured by quantitative means, such as project budgets, elapsed time to develop a system, number of programs written, number of lines of code completed, number of terminals installed, number of manual processes automated and reduction in clerical work force.

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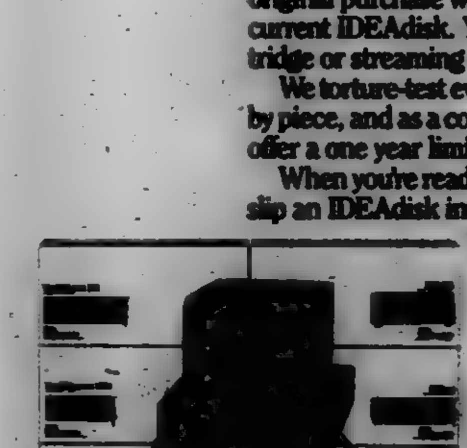

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> ***The success of an applications development group can be measured in terms of elapsed time and cost . . . The success of data administration, on the other hand, should be measured in terms of long-term reduction of overall data redundancy and improved quality of information.***

resources. Efficiency of operations may be measured simply in terms of CPU cycles and disk space consumed, response time and throughput from data entry to output.

Data administrators, to their chagrin, are sometimes judged by these same standards. Data administration must not be judged in terms of volume of metadata. How does one measure the reduction in redundancy or the improvement of the consistency of data that has been achieved by data administration? It would be ludicrous to measure a data administrator by the number of data elements loaded into a data dictionary or the number of data bases that have been implemented.

On the contrary, an inverse relationship exists between the quality of information and the quantity of data. For example, the data administrator employs information modeling techniques to reduce the number of data bases developed and at the same time increase data sharing.

A significant problem for data administration is the lack of tools or techniques to measure the quality of information. Quantity is much easier to measure than quality.

Another difference between the evaluation of DP and data administration staff members is the length of the evaluation period required. The goals and objectives of DP tend to be short-term and local in nature, data administration long-term and global.

The success of an applications development group can be measured in terms of elapsed time and cost to implement a single application system. The success of data administration, on the other hand, should be measured in terms of long-term reduction of overall data redundancy and improved quality of information throughout a company.

Thus, the evaluation period required to assess accurately the success of the data administrator is longer than that of a member of the applications development staff.

A trendy issue

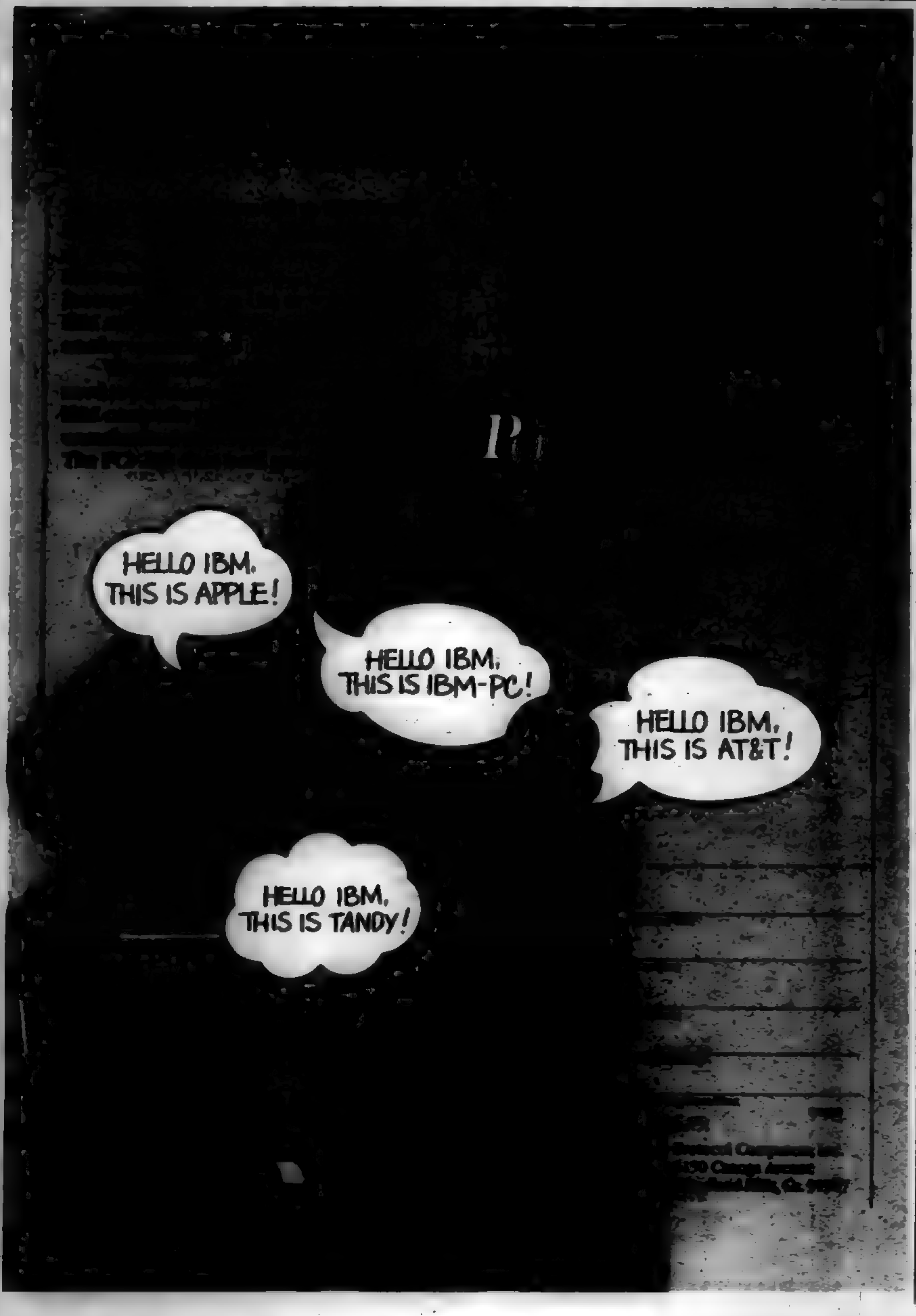
Many organizations implement data administration without sound motives for doing so. This reflects a lack of understanding of the nature, purpose and benefit of information management.

Some organizations are motivated to create a data administration function out of fear of falling behind the competition if they fail to do so. Others feel compelled to establish data administration because they perceive that it is the trend of the DP industry. Their curiosity about data administration is aroused by seeing articles on data administration in DP trade publications or hearing about it by word of mouth.

Still others are introduced to the concept of data administration by data dictionary or DBMS salespersons. Only after a data dictionary is purchased does someone ask, "What are we going to do with this?"

Thinking that they have purchased the tool and must now rapidly populate it so they can demonstrate some return on investment, these managers next ask, "What person or organization will be responsible for its maintenance?" This leads to the creation of data administration for the wrong reasons.

The proper approach would be to analyze and understand the cost of data administration, how it can improve the quality and value of a business' information and how this improved information can make the business more competitive. Unless an organization understands the real value of data administration, this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resource management function will merely exist, and never become a viable and beneficial part of the enterprise.

Methodology and creativity

The objective of data administration is to make the collection and use of information more uniform and consistent. The human being is a creative and imaginative creature and does not always enjoy performing the same tasks in the same manner, but consistency and standardization in data are crucial. Somehow the data administrator must combine intuitive or creative instincts in data design with a scientific, rigorous, methodical approach to data management.

The techniques used in entity-relationship-attribute modeling and logical data base design, for example are based on sound and precise mathematical principles. The successful implementation of data administration requires a significant change in the approach to data design and an overall shift in its emphasis from artistic to scientific.

We live in a prescription-oriented society. When we have a headache, we take an aspirin. When we have a stomach ache, we take an antacid. We search for "fast, fast, fast relief." Management also often looks to technical solutions as quick fixes for its data management problems.

However, as discussed earlier, many of these problems are not technical in nature. Many problems of inadequate information are related to problems of organization, lack of planning, lack of proper management, coordination and communication. And unlike technical problems, they cannot be solved quickly.

Many solutions of data management problems require changes in methodology, not technology. However, changes in technology can often be achieved faster than changes in methodology.

Changes in software or hardware can often be achieved faster than changes in the way people perform their jobs. Changing the manner in which a human being works requires selling and marketing efforts, creating a perceived need, communication, friendship and persuasion. These efforts often require several iterations and years to effect.

Challenging precepts

Traditional process-oriented design does not take into consideration the need for overall coordination and planning of data across application boundaries; rather, it concentrates on integration of local data within single application systems. The data administration professional understands that global planning of information must precede local data base development.

Data administration concepts advocate changing the sequence of events in traditional system development to shift the emphasis from process orientation to data orientation. The focal point of DP should be an integrated information model, and application systems should be developed on the periphery of this model. However, traditional process-oriented design dictates that peripheral interface data is necessary to integrate centralized hubs of applications. Thus, data administration challenges the basic process-oriented approach that has been employed during the last 20 years. This can be disconcerting and sometimes insulting to many long-time DP professionals.

The solutions to data administration problems advocated by the data administrator first require the identification of the data management problem itself. The worst problem is the one that goes unrecognized. Most DP organizations do not perceive the existence of data integrity problems. Many organizations have lived in a situation of data incompatibility and inconsistency for so long that, to many, this is a normal situation.

Some of these professionals may ask why there is a need for data management solutions when no problem currently exists. Because data administration discovers and advertises the existence of data integrity problems, it is accused of creating blemishes on the record of DP, when in fact it is only illuminating them.

Figure 2

Effective data administration requires several changes in the traditional responsibilities of data design and management. First, data administration employs a logical data analysis and a design specialist (the data analyst), which necessitates that the systems analyst and/or data base analyst relinquish this responsibility. Second, data administration advocates a shift in certain data design responsibilities — data element definitions, logical data base design and entity modeling — from DP to end user.

Traditionally, some data analysis and logical design tasks were performed within the data base administration or system development departments. Unfortunately, these data-related tasks were often performed on a part-time basis and were not given the necessary priority. The data administration seeks to concentrate these efforts into one organization.

Data administration advocates a vertical monopoly of personnel (*Figure 2*) that specialize in the entire

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application development report: MARK V

HARRISBURG MARATHON PROVIDES TRIAL RUN FOR MARK IV® AND MARK V® SOFTWARE

Within two hours after the last runner had crossed the finish line at the Harrisburg Marathon, Pennsylvania Blue Shield, chief sponsor of the annual event, had completed a computer-generated report on the run times and standings of the Marathon's 900 entrants and delivered it to the news media.

This was in sharp contrast to the previous year when it took approximately three days to get the Marathon results to the media. The greater responsiveness this year was largely the result of moving the Marathon application from an in-house Prime computer to Blue Shield's IBM 3081 system running in an IMS environment. The reprogramming of the Harrisburg Marathon application, completed in record time, was Blue Shield's initial test project for MARK V and MARK IV, Application Development Systems from Informatics General Corporation for generating online and batch applications respectively.

"We wanted to get acquainted with MARK V on a relatively simple and straightforward application like the Marathon before we began our full-scale pilot project, a new online claims processing system," Thomas M. Cline, Systems Development Supervisor, explained.

Programming the Marathon application consisted basically of creating and maintaining an online Entrant File including four screens to (1) maintain basic entrant information (name, address, phone number, and a "TAC" number to be used for Olympic identification in case the runner qualifies for the U.S. Olympics); (2) maintain control information (payment of fees, lunch and dinner reservations, etc.); (3) record the run time of each of the approximately 900 entrants; and (4) provide a menu for accessing the other three screens.

To produce reports in addition to the online portion of the Harrisburg Marathon application, Blue Shield used another Informatics Implementation System, MARK IV, to produce the required batch reports. A productivity tool designed for generation of batch applications, MARK IV also had its "trial run" for Blue Shield with the Marathon application.

Approximately 12 different reports were produced for the Marathon, including check-in sheets for use on the day of the race (cross-referencing the runners alphabetically and by runner number), three sets of mailing labels, and several types of reports listing the finishers by time, sex, and class of the runner. The reports on finishers were prepared for the news media, for internal use, and for the Athletic Congress listing any runners who qualified for the U.S. Olympics.

1983 was the eleventh year that the Harrisburg Marathon has been run. Unlike the famous Boston Marathon, which requires that entrants meet qualification standards, anyone can enter the Harrisburg event. The grueling course — 26 miles and 385 yards in length — begins near the Pennsylvania State Capitol building and winds through the streets of Harrisburg and the surrounding countryside.

Each year, large numbers of Pennsylvania Blue Shield employees volunteer their time to help with the race. "Probably 30 percent of our DP staff were involved in some kind of volunteer work for the Marathon," said Hugh Gallagher, also a Systems Development Supervisor, who coordinated the record-keeping for the Marathon. "This included registering entrants, manning water stations, keeping track of times, all sorts of things. For example, our Director of Systems Development, Karl Mundis, was in charge of one of the water stations, and I was in charge of the finish line."

Everything about the Marathon was done on a volunteer basis — including the programming for the new online Entrant File application, which was done primarily in evenings, lunch hours, and weekends, with Tom Cline doing most of the programming himself in MARK V and MARK IV.

"Our time for preparing this was so short that some of the software had never been tested prior to the day of the race," Gallagher recalled. "Fortunately, it worked like a charm".

"One of the things I found in implementing the Harrisburg Marathon application was that you don't need a lot of in-depth knowledge of IMS to use MARK V in a straightforward application like this, where you're just going in against a data base to update and add segments," Cline noted.

"I found that MARK IV and MARK V complemented each other very well," Cline added. "I found that with MARK IV, once I had established a set of reports, it was very easy to go back in and change a report, or set one up with a different set of selection criteria. I found I could make a change to a report in minutes. If I'd been working with COBOL, as I have in the past, this would not have been a matter of minutes."

"So far, we've only just gotton our feet wet with MARK IV and MARK V," Cline concluded. "But it looks quite promising in terms of potential productivity increases. I'm particularly impressed by the flexibility I've seen in setting up our initial application — the ability to make changes in a very short period of time."

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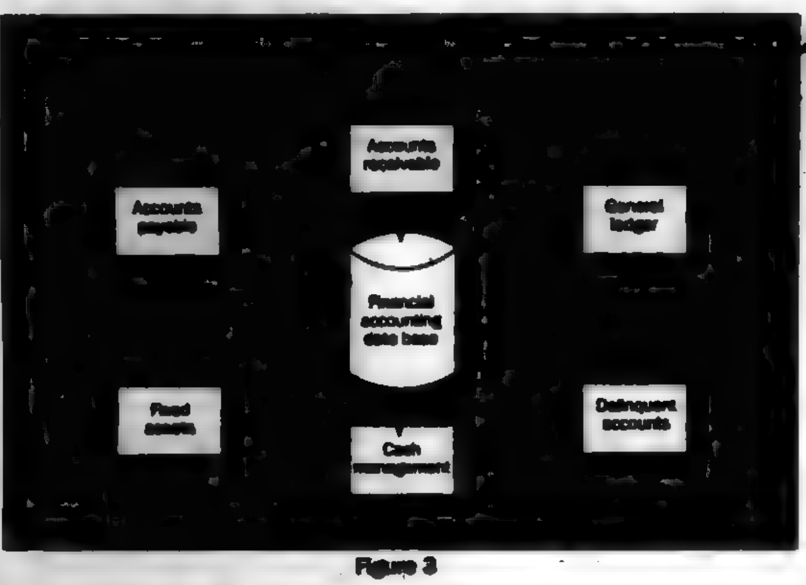

Figure 3

spectrum of information management, from initial planning to final design. These specialists administer and manage information from the global, information modeling level to the local, application design level. Thus, the data administrator seeks to create a "data organization" parallel to the traditional system or application development organization.

Administration vs. processing

In many ways, the methods and objectives of data administration are in direct contrast to those of DP. These contrasts include methodology, organization, responsibility and philosophy.

First of all, the data-driven data administration approach is quite distinct from the traditional process-oriented DP approach to systems development. Data administration advocates a centralized hub of information (the information model) surrounded by a periphery of application systems. (Figure 3). The traditional DP approach directs the creation of single-purpose data bases built in support of single-application data processing systems. (Figure 4, ID/31).

Significant differences in the timing, sequence and importance of tasks exist between the process-oriented and the data-oriented system development scenarios. The traditional DP approach dictates that data be subordinate or subservient to application-oriented systems.

The data administrator handles application programs and systems as the input and output procedures for a centralized data base. The administrator recommends the analysis of the information requirements in parallel with or prior to the analysis of the process (function or service) requirements.

Structure

Many DP organizations are established and structured to support application-oriented programming staffs that in turn support single end-user departments. Different project leaders are often designated to support individual human-resource applications such as payroll, personnel and benefits systems. These systems are built to service single end-user organizations such as the payroll, personnel and benefits departments, respectively.

However, the data administration organization is structured around the management and control of each subject-oriented subset of the global information model, such as all employee-related data. This leads to the concept of several subject data-administrators within a large company.

In the early days of DP, one technician (such as the programmer/analyst) assumed responsibility for the majority of DP-related tasks. As DP became more specialized, the traditional roles of DP personnel were divided between software and hardware responsibilities.

This boundary lay between the personnel in and around the computer room and those external to computerized hardware and facilities. These personnel were typically labeled operations and applications.

The recent impetus to management information as a corporate asset has affected the way DP professionals are organized and created new specialists within DP. These new specialists are data-oriented, whereas the traditional DP roles are process-oriented (Figure 5, ID/31).

This segregation of responsibilities is advantageous for two reasons. First, specialization should permit personnel to narrow their range of responsibilities and thereby produce a higher quality product. Second, it can relieve conflict between the data administration and data base administration specialists.

This is particularly true if the data analyst (responsible for logical data base design) reports to data administration, yet the data base analyst (responsible for physical data base design) reports to systems development or a separate data base administration organization. Third, it improves the coordination and communication among data-oriented specialists.

However, the situation pictured in Figure 5 requires that the systems

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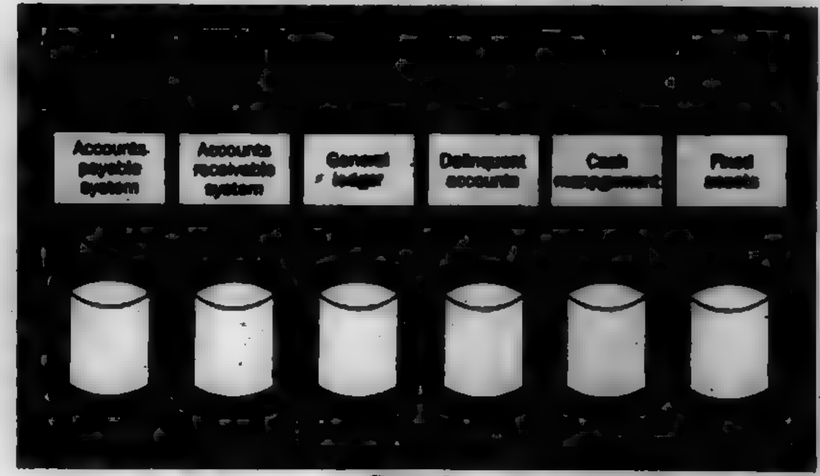


Figure 4

development staff relinquish responsibility for the design and maintenance of data structures. Systems analysts or programmer/analysts have traditionally designed and developed their own tables, files, records and data bases. The data monopoly illustrated shifts this responsibility to data administration.

The pride of ownership issue involved in this transition is a very real one. The data administration is committed to tearing down the data ownership walls that stand between application systems and to socializing the ownership of information among all applications.

The sharing or use of external data by an application-oriented staff is not easily achieved. Typically, various application development groups operate autonomously and develop their own data structures to support privately developed systems. The "not invented here" attitude toward foreign data bases is as real as the resistance to buy "not built here" proprietary software packages.

End-user tasks

In pursuit of its goals, data administration often displaces the data analysis and design responsibilities traditionally assumed by systems analysts and programmers and encourages assumption of these responsibilities by the end-user organization whenever possible.

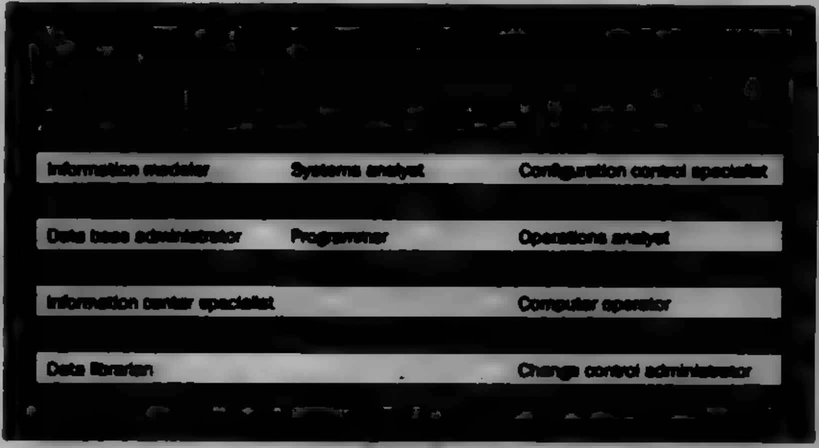
In some organizations, responsibilities such as data element definition and naming, information modeling, user-view synthesis and logical data base design have been successfully completed by end-user staff. Often, these activities are performed by end users with only the supervision and guidance of data administration.

This shift in the responsibility of data analysis and design is yet another example of the gradual but steady transfer of tasks from DP-oriented systems development to user-oriented development. Thus, data administration is a catalyst in the transfer of traditional DP responsibility to the end user.

The data administrator feels that, whenever feasible, DP should get out of the "process" (applications or programming) business and concentrate on the business of managing and inventorying information for use by the end user. Data administration emphasizes not only the rigorous analysis and design of information but also the prototyping of processes by end users, using fourth-generation languages.

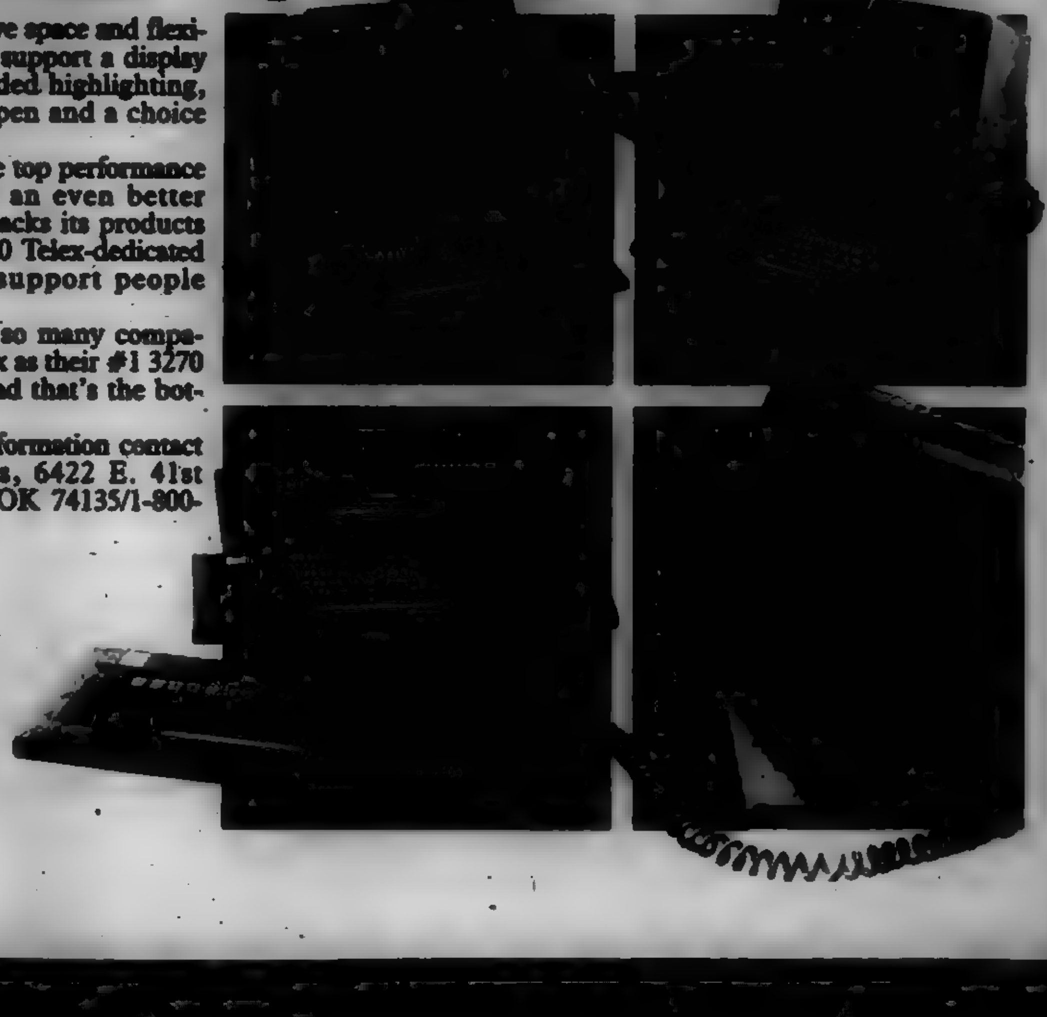
A strong data administration model dictates that DP should concentrate on the acquisition, control, security and management of data for the end user but that the end users themselves should be allowed to control how this data will be reported and used. Because of these factors, data administration is sometimes perceived as a further threat in the displacement of DP responsibility to the end user.

And data administration is circumventing DP in other ways. First, the data administration encourages the design and storage of all logically related data in one repository. This consolidates the information needed by the end users and eliminates the



Information modeler	Systems analyst	Configuration control specialist
Data base administrator	Programmer	Operations analyst
Information center specialist		Computer operator
Data librarian		Change control administrator

Figure 5



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need for data processors to sort, merge, synthesize, filter and extract data from several sources in order to present it to the end user.

Second, the data administrator advocates the storage of data in more user-friendly tables (called relations or relational data bases). Data is formatted and represented in rows and columns and is more accessible than it would be in traditional hierarchical or relational data bases. It appears as spreadsheets and does not require translation or interpretation by the DP professional.

Third, metadata — documentation about the data — is prepared by the data administrator to permit the end users do their own retrieval of needed data. The data dictionary represents a self-service index of information.

Technology conflict

Another potential conflict between data administration and DP concerns computer technology. Data administration tends to be more business-oriented, and DP tends to be more technically oriented.

Data administration stresses the need to understand the relevance of information to the competitive success of the business. DP tends to concentrate on how the machine or software can most efficiently use data. The data administrator feels that it is part of his job to understand the nature of the company's business, what data is most important to the success of that business and how best to manage this data.

There are several reasons for the technical orientation of DP. First, DP was established to manage computers and computer support staff, not necessarily information. DP management is directed to manage the finances of computer equipment and personnel, not to improve the profitability of the company via better data and better business decisions.

Second, monetary rewards traditionally have been associated more with technical expertise than with business information expertise; therefore, DP personnel have commanded relatively high wages because of their technical knowledge.

But the data administrator relies on an understanding of the overall business and its data more heavily than on computer technology. This is indeed a monetary threat to those DP professionals who are fearful that their technical knowledge will be devalued.

And their concern is legitimate to some degree. It is relatively easy to become proficient in IBM software and hardware technology and to sell your skills from one company to the next. It is much more difficult to specialize in the information needs of an aerospace company and then change your career to an insurance business.

> ”
>
> *Data administration stresses the need to understand the relevance of information to the competitive success of the business.*

Impact on end users

Traditionally, DP management instigates the development of single-application computerized systems to respond to requests for DP services from individual end-user departments. Thus, the DP staff consists of distinct groups of programmers and systems analysts servicing separate end-user units.

For example, a centralized personnel system is developed and maintained under the direction of the personnel systems project leader. The development of this system was sponsored, funded and finally accepted by the personnel department.

Likewise, a centralized payroll system is developed and maintained under the direction of the payroll systems project leader for a single end-user organization — the payroll department. This scenario is typical of many other DP systems that have been built in a piecemeal, uncoordinated fashion.

There are several unfavorable consequences of this method of development. The first is that end-user management is expending funds and staff to support redundant data — each department maintains complete employee records.

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The second is that excessive DP staff must be committed to develop and maintain duplicate systems and data bases that support this redundancy. Furthermore, a network of additional interface software, controls and auditing capabilities must be built to maintain consistency of data between the two systems.

Duplication costly

Because of the complexity of both data and processes, the systems are more costly to maintain. The elapsed time to make enhancements increases, and the responsiveness to changes requested by the users often decreases. This situation also limits the availability and accessibility of employee information to each user area.

For example, the payroll supervisor may not have access to data maintained on the personnel data base, and the personnel manager may be ignorant of certain employee information available on the payroll data base.

The data-driven approach to human resource allocation dictates that payroll and personnel data be consolidated into a single subject data base of employee information. This data-driven approach requires significant changes on the part of end-user management.

Joint funding

The most significant change is that the two departments must share the funding for the development of a common data base. This joint funding arrangement often requires considerable marketing efforts on the part of the data administrator.

The cost for this common data base can be itemized as follows: information modeling for employee-related data, data element standardization and definition, logical data base design, physical data base design, conversion of existing payroll data and conversion of existing personnel data.

Assuming that a shared-funding arrangement can be accomplished, the next most formidable challenge arises during the design of the data base itself. The data administrator has the unenviable job of arbitrating between the two user areas concerning the standardization and consistency of the data to be stored in the data bases. Data element definition, format, length, edit requirements and code values must all be standardized between the end-user departments.

Drastic differences in data naming and format might exist between the data owned by each user area. For example, the employee salary field on the existing payroll files could be represented as a weekly amount, but on the personnel file this could be stored as an hourly amount.

The data administrator must be tactful and diplomatic in order to persuade the departments to arrive at some equitable information definitions for the common data base.

The end-user organizations must also address the data ownership issue. Since common employee-related information will now be maintained by both departments, it is essential to reach agreements concerning individual responsibilities for inserting, changing and deleting employee data. Data deletion or archiving can now be permitted only with the advise and consent of both end-user departments.

> **"**
>
> ***Because data base administrators concentrated on the local management of individual data bases, data administration was created to fill the void in the global management, coordination and consistency of all corporate information.***

Often for the first time, the shared data base environment requires user involvement on data ownership and security issues. Because the common data base can now be accessed by a greater variety of users, all end-user organizations should implement formal data security procedures for employee data.

Most data base administration organizations were created to control and coordinate DBMS activities and data base interfaces with application programs.

Data base administrators were usually assigned to develop and maintain application-oriented data bases and single data base systems. The administrators were usually only responsible for physical data base design.

The data analysis and requirements were often dictated by applications development. Thus, data base administration had little if any, control over data redundancy or the planning of a data base across multiple systems.

Because data base administrators concentrated on the local management of individual data bases, the data administration function was created to fill the void in the global management, coordination and consistency of all corporate information.

Umbrella organization

The data administration organization in many companies has evolved as the umbrella organization containing the data base administration

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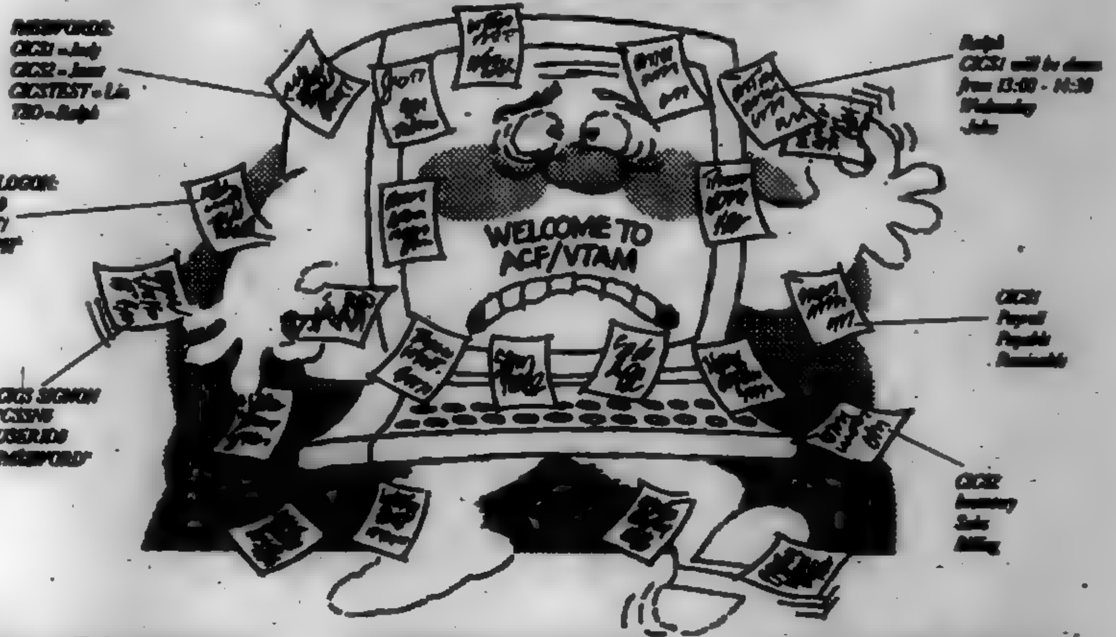

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staff. Because the data administrator and the data base administrator specialize in logical and physical data base design, respectively, the potential exists to create some antagonism between the two specialties.

Shifts and conflicts

Data administration is chartered to maximize the flexibility and modularity of data base design, which tends to degrade the performance of the data base and thus to conflict with the goals of data base administration.

Placing data base administration within data administration reinforces for the data base administrator the importance of reducing data base labor costs, and data base machine costs become secondary in importance. Thus, the traditional data base administration responsibility — machine optimization — becomes secondary to the data administration responsibility — labor optimization.

The shift in emphasis from machine costs to labor costs is one indication of the gradual but steady shift in importance from data base administration to data administration. Relational data bases (as advocated by data administration) can also have significant ramifications for data base administration. Since relational data bases are easier to use and understand than other types of DBMS, the need for the data technician in data base administration diminishes.

In a relational environment, logically analyzing and modeling the information prior to physical data base design becomes critical. Because normalized data is much more fragmented than typical raw data, the need to understand the logical relationship of information between relations also becomes critical.

Thus, in a relational environment, the need for data administration increases, and the need for data base administration should decrease.

The metadata maintained on the data dictionary also decreases the end-user reliance on data base administration staff for information concerning the contents of the data base. Also, data base machines can potentially reduce the need for human involvement in data base backup, recovery and reorganization. This will further erode the importance of data base administration.

The data administrator

The misunderstanding about data administration and its provocative nature have certainly taken their toll on the data administrator and the data administration organization itself. Some organizations have made several attempts at data administration before finally achieving some level of success.

Compared with other professions, the turnover rate of data processors is above average. However, the turnover rate among the data administration staff appears to be higher than that of other DP staff members.

Significantly, although this turnover rate is high, few data administrators leave data administration to return to traditional DP ranks outside of data administration. On the contrary, most unhappy or unchallenged data administrators will shift companies but not roles.

Most data administrators are more dedicated to their profession than to their employer. Although there is a great deal of skepticism, pessimism and uncertainty surrounding data administration, many data administration personnel are convinced of the necessity of their roles and dedicated to the task. The typical data administrator is convinced that the global planning, management, control, inventory and integrity of information are essential to the long-term profitability of an enterprise.

About the author

William Durell is president and founder of Data Administration, Inc., a California corporation that specializes in information resource management. During his 13 years in DP, he has worked as a programmer, systems analyst, project leader, data analyst and data administrator. He is the author of Data Administration, *a guidebook on the implementation of data administration.*

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MICROCOMPUTERS

HP offers Laser Jet Plus in high-end printer mart

By Jeffry Beeler

CUPERTINO, Calif. — Hewlett-Packard Co., seeking to address the high end of the personal computer printing market, has complemented its original Laser Jet printer with an enhanced model that yields improved output quality.

HP also trimmed the price of its existing Laser Jet from $3,495 to $2,995 — a reduction of slightly more than 14%.

As its name suggests, the new Laser Jet Plus is targeted at the portion of the microcomputer laser printing market that HP's first offering intentionally ignored. Announced in May 1984, the vendor's original Laser Jet model is configured to address 80% of the market for office personal printers.

Now, with the introduction of Laser Jet Plus, HP is reportedly taking aim at the remaining 20% of the market, which demands higher-than-average print quality and is willing to pay a reasonable premium to get it.

The new device's key difference is expanded memory. HP has equipped Laser Jet Plus with 395K bytes of user storage, compared with the original version's 56K bytes, according to Roger Archibald, a project manager with the firm's Boise, Idaho, division.

Expanded memory yields improved resolution and output clarity. When producing full-page images, Laser Jet Plus can squeeze 150 dots into a single inch, vs. 75 dot/in. for its predecessor, Archibald said. For half-page images, Laser Jet Plus' resolution improves to 300 dot/in.

The increased dot density enables the latest member of the company's laser printer family to create characters and graphics exceeding the capabilities of the original Laser Jet model. Laser Jet Plus, for example, can print characters as large as 128 dots high, compared with the previous HP limit of 64 dots, Archibald said.

The system's superior resolution also reportedly lends a sharpness and a professional look to forms and graphics that otherwise would fall noticeably short of letter quality.

Laser Jet Plus' other main features include the ability to store up to 32 electronic forms in its internal memory and to download additional forms, logos or letterheads, Archibald said. The enhanced unit can also download fonts and thus circum-

Continued on page 86

Add-on graphics processor out

Superset, Inc., based in San Diego, has announced an add-on processor that reportedly supports 48-bit, virtual memory mainframe graphics on the IBM Personal Computer, XT and AT.

The XP/48 Graphics Extension Processor is said to support 4096- by 4096-pixel resolution graphics, 24-bit color depth and graphics such as bar charts, exploded pies, shaded fonts, three-dimensional surfaces and axes and spline or polynomial curves.

Other features include full digitizer support, user extendable fonts and multipass rasterization with halftoning, paneling and color separation.

The basic system consists of an expansion bus card and a cabinet with a 48-bit virtual processor, 400K-byte error-correcting memory and a 20M-byte hard disk.

Based on Fortran

The XP/48 is Fortran-based, with a Fortran 77 compiler and debug facility.

The XP/48 is said to support all of Superset's graphics applications packages, including interactive data-driven graphics, device independent plot manager, solids modeler and large-scale Personal Computer board schematic design with autorouting.

The system will be available in November for a base price of $10,000.

SMALL TALK
Edward Warner
CW Senior Writer

MMA, Tasc: joint venture?

The Microcomputer Managers Association (MMA), a group of executives representing approximately 100 New York corporations, is holding its annual meeting in New York this week amid events that call into question its very existence.

The organization, which sprang up just more than two years ago, once promised to represent the voice of corporate personal computer managers nationwide, as Share and Common do for IBM mainframe users.

Regional branches of the organization formed in the Midwest, Boston, Dallas and Minneapolis. MMA President Alan Gross was talking of forming an umbrella organization that would speak for microcomputer managers nationwide.

Such a group was formed by microcomputer managers early this year, but it's not a national MMA.

The group calls itself Technology Advancement through Strategic Cooperation (Tasc), and one of its first acts was to put some distance between itself and the MMA, which it said was more interested in antagonizing vendors than cooperating with them.

Gross denies that the MMA of New York is taking an antagonistic pose. The MMA did, however, issue a white paper to software publishers at a personal computing trade show in New York this summer. The paper called for site licensing and an end to copy protection, two things large software publishers have been loath to provide.

Tasc accepts vendors as members and, according to Tasc President Robert Corr, sees itself as embodying, in its cooperativeness with vendors, the spirit

Continued on page 86

■ Microsoft plunges into the network applications arena with a version of Word tailored to run on most IBM Personal Computer local area networks/86

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■ **The ORACLE Application Development Center** provides a PC-based development center for the creation of DB2 and SQL/DS applications. The flexibility of the personal computing environment is made available to programmers creating applications for use with IBM's relational database products.

■ **The ORACLE Personal Information Center** extends the Information Center concept to the Personal Computer. ORACLE's application generator, graphics, spreadsheet and other end-user tools provide a SQL/DS and DB2 compatible Information Center on the desktop.

Users can become acquainted with the facilities and power of the Information Center in the personal computing environment, and transfer their knowledge and skills as the MIS Information Center facility evolves. The ORACLE Personal Information Center provides the facilities for MIS to develop the cooperative relationship with end users so vital to the success of the Information Center.

In addition, with ORACLE on departmental superminis, users can create identical Information Centers at the department level.

■ **The ORACLE Distributed Information Center** provides an intelligent set of communication links among multiple systems, with ORACLE running on IBM mainframes and various minis and PCs.

Using ORACLE's SQL*LINK networking facility, ORACLE on such diverse systems as MVS, VM/CMS, VAX/VMS, UNIX and PC/DOS can selectively exchange database information using the full capabilities of the SQL language. Applications, portable across all environments, can be run identically on any system, and data can be intelligently extracted for use at any site.

ORACLE is currently installed on over 1000 supermini and mainframe systems around the world, as well as on thousands of PCs and compatibles. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and many government agencies.

For further information, contact Oracle Corp., Dept. C, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350.

Harris micro compatible with IBM

Harris Business Information Systems/Lanier Business Products, Inc. in Atlanta introduced its first IBM Personal Computer-compatible microcomputer.

The Concept 2000 is based on the Intel Corp. 8088 microprocessor chip running at 4.77 MHz. The product runs the Microsoft Corp. MS-DOS 2.11 operating system and uses the Phoenix Software Ltd. basic I/O system.

The basic configuration includes 256K bytes of memory, reportedly expandable to 512K bytes on the motherboard without using expansion slots. The board includes two serial ports, one parallel port and a real-time clock with battery backup.

The system is available with dual floppy disk drives or one floppy and one 10M-byte Winchester drive. A 14-in. color or monochrome monitor is included.

Later product offerings will allow users to interface with other operating systems and communicate on the Harris/Lanier Concept 6000 office automation network, according to the vendor.

The Concept 2000 is priced at $2,995.

McDonnell Douglas unveils analyst aid

Software designed to aid systems analysts in the preparation of data flow diagrams has been introduced by McDonnell Douglas Professional Services Co., which is located in St. Louis.

The Prokit-Analyst software reportedly runs on the IBM Personal Computer XT or AT and uses structured analysis techniques to create a data base for software systems design.

The software permits analysts to draw and edit data flow diagrams while the system produces and updates an applications directory at the same time.

Dictionary analysis

The product reportedly provides dictionary analysis and documentation, with automatic creation of the applications data dictionary.

It also offers full integrity checking, under which it enforces standard rules on the user as the user creates and updates data flow diagrams.

With Prokit-Analyst, reports may be generated that include all necessary data dictionary listings as well as the definitions of the relationships of symbols and warnings of imbalance conditions within a diagram, the vendor said.

Those reports also relate the entries in the dictionary to the data flow diagrams, according to the vendor.

The software will operate in conjunction with a mouse and requires a color graphics interface board. It is priced at $2,450.

SOFTWARE

■ **Syscomp has announced a software program that reportedly allows users of Lotus Development Corp. Symphony Release 1.1 to access up to 4M bytes of virtual memory without expanded memory boards.**

VMSYM runs on the IBM Personal Computer, Personal Computer XT and Personal Computer AT running PC-DOS 2 or higher. The product switches data between the computer's conventional memory and its fixed disk or a device simulating a fixed disk. It requires 640K bytes of memory.

VMSYM is priced at $75, the vendor said.

Syscomp, Suite 210, 8525 Aero Drive, San Diego, Calif. 92123.

COMMUNICATIONS

■ **Quadram Corp. has introduced its Quad3278 gateway board, a micro-mainframe communications board for local-area networks.**

Quad3278 reportedly offers a link between local-area-network-based IBM Personal Computers and mainframe hosts based on the IBM Systems Network Architecture.

It supports PU Types 1, 2 and 3 communications and emulates an IBM 3274 Model 51C/61C remote communications controller. It also provides for IBM 3278-type display emulation and offers four-color IBM 3279 emulation and IBM 3278 printer emulation.

The Quad3278 reportedly includes 512K bytes of memory and the National Semiconductor Corp. 32016 microprocessor. It is sold in three versions, offering support for eight, 16 or 32 logical units on a local-area network. The versions are priced at $4,529, $4,983 and $5,742, respectively.

Quadram, 4357 Park Drive, Norcross, Ga. 30093.

■ **Bellsoft, Inc. has announced an enhanced version of Pop-Up Telecomm communications software for the IBM Personal Computer, Personal Computer XT and 3270 Personal Computer using a Hayes Microcomputer Products, Inc. modem or compatible equipment.**

Version 1.5 includes an enhanced Pop-Up modem component that is said to support modems transmitting at 2,400 bit/sec. and to provide direct

Continued on page 81

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Microsoft launches first net application package

By Eric Bender

BELLEVUE, Wash. — Microsoft Corp. late last month rolled out its first network application, a version of the Microsoft Word word processing package that runs on most IBM Personal Computer local-area networks. The move by the second-largest independent microcomputer software vendor will help accelerate the trend toward micro networks, analysts and vendors agreed.

Available Sept. 15 for $1,195, Microsoft Word for Networks establishes licensing practices that suppliers will follow for future network applications, product manager Charles Stevens said.

The basic package includes software and manuals for five network nodes, with pricing set at three times the single-user price, Stevens noted. Microsoft Word for Networks will be sold through the company's key dealers, who will be able to split open the five-node package for customers who want to install the software on more than five but fewer than 10 workstations, he said.

Not copy protected

Unlike the single-user versions of Word, the network software is not copy protected, Stevens said. Microsoft dropped copy protection because "it degrades performance of the product on the net and inconveniences users," he explained.

The company chose Word for its first network application because "it's one of our major products, and there was a lot of demand," Stevens said. "Word naturally lends itself to a networking environment" with one prime feature being support for the laser printers that many users want to share on a network, he maintained.

Microsoft, which expects 30% to 50% of business micros to be networked within the next couple of years, currently is evaluating the market potential for network versions of Project, Chart, Multiplan and others among its offerings, Steven said.

The Word package is "the first word processor that really tries to take advantage of a network," he said. Both style sheets, which can save formats and automatically apply them to varied documents to give them a standard appearance, and glossaries, which allow users to store frequently used boilerplate text, can be shared among various users in a work group.

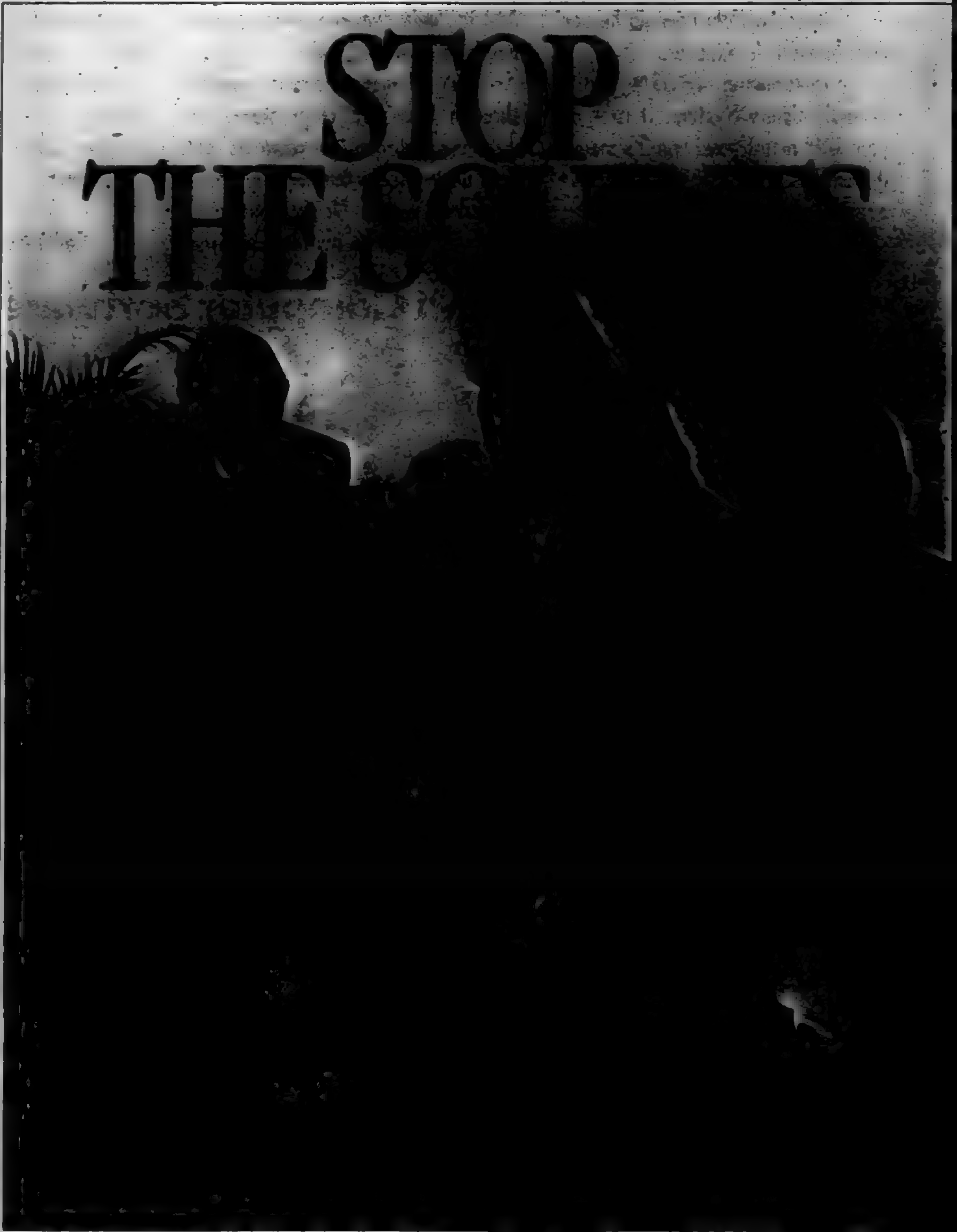
Tracor Applied Sciences, Inc. in Rockville, Md., which installed a beta copy of the program on a Corvus Systems, Inc. Omninet, has been very pleased with the overall results, according to technical editor Michael Kleinbeck. Acting as a contractor to the Naval Electronic Systems Engineering Activity, Tracor found the style sheet and glossary features particularly useful, Kleinbeck said.

"Dealing with the government, you're dealing with very rigid style formats," he pointed out. Once the styles are created on the network, new users automatically print out documents in the proper formats. Glossary functions prove useful because of the government's fondness for long titles and obscure acronyms, he added.

The ability to move to a network version was one critical requirement when Tracor began talking with Microsoft about standardizing on Word 1½ years ago, Kleinbeck said.

Word for Networks will run on the IBM PC Network, other networks compatible with the Microsoft Networks system software or on existing networks supplied by AST Research, Inc.; Corvus Systems; Fox Research, Inc.; Nestar Systems, Inc.; Novell, Inc.; Orchid Technology Co.; 3Com Corp.; and Ungermann-Bass, Inc.

The program supports file locking, either through MS-DOS 3.1 routines or through network software in existing MS-DOS 2 networks, Stevens said. Network print spooling and print job separation also are supported. The software



may be installed multiple times on a file server, so that the server may be reorganized or repartitioned any number of times.

A spelling checker permits the creation of specialized dictionaries shared among all users or dedicated to an individual user. A mail merge facility can draw data from a common mailing list on popular data base management programs like Ashton-Tate's Dbase III and Dbase II or Microrim, Inc.'s R:Base 5000 and R:Base 4000, Microsoft said.

The package requires PC-DOS or MS-DOS 2 or higher and a file server with a hard disk drive. Each workstation must be equipped with 256K bytes of random-access memory, with 320K bytes recommended, but a disk drive is not required.

Existing Word users with at least three copies can upgrade to the network version for $395. ■

String of vendors unveiling net tools

With its introduction of Word for Networks, Microsoft Corp. has joined a string of micro software vendors that are announcing network packages, industry observers noted. Among these, another major supplier, Multimate International Corp., began shipping net versions of its word processing software late in July.

Now that Microsoft has moved into net applications, "we may see others get off their duff and do something," predicted Paul Cubbage, senior industry analyst at Dataquest, Inc. "The big question mark is [Lotus Development Corp]."

Another key player is Ashton-Tate, which promised a network version of its best-selling Dbase III package when the software debuted in July 1984, Cubbage said. "I'd be surprised if that didn't come out pretty soon," he added.

Cubbage downplayed the risks of piracy for the unprotected Microsoft Word for Networks. "I don't think it's going to be a significant problem," he said. "Corporate people pretty well understand what stance they ought to take."

Bill Krause, president of 3Com Corp., a Mountain View, Calif., network supplier, called Microsoft Word "an important step in the right direction." However, Krause said, the availability of network multiuser data base managers and general business applications, such as accounting packages, is more crucial to the acceptance of networks.

"Over the next three to six months, there will be an ongoing series of announcements from virtually all the major players for multiuser network software," he said.

Continued from page 78

connection support up to 9.6K bit/sec. It also includes Xmodem error checking data transfer protocol, emulation of Digital Equipment Corp. VT100 and VT52 terminals and support for automatic logon scripts.

The new version of Pop-Up Telecomm requires IBM PC-DOS 1 through 3.1 and is available for $79.95. Pop-Up Deskset Plus Version 1.5, which includes Pop-Up Telecomm 1.5 as well as a calendar, two calculators, disk file utilities, alarm clock and a text and file editor, is priced at $129.95.

Bellsoft, 2820 Northrup Way, Bellevue, Wash. 98004.

BOARD-LEVEL DEVICES

■ **Ten X Technology, Inc. has announced an expander board and software system that is said to allow the IBM Personal Computer XT and AT to run Texas Instruments, Inc. Business Computers minicomputer software programs.**

The X-Porter system consists of a board with the TI TMS99000 microprocessor and 512K bytes of local random-access memory (RAM) and TX10 software that emulates the TI DX10 operating system. The system reportedly supports most of the 10,000 applications software

Continued on page 84

"She keeps losing her RAM."

WITH A REAL EYE-OPENER

THE ELECTROHOME ECP 2000 COLOR COMPUTER PROJECTION SYSTEM.

As modern business continues to recognize the effectiveness of computer-projected data and images, The Squints continue to wreak havoc in boardrooms, training sessions, and trade shows. Wherever people are forced to view small color CRT-screens or dull and often fuzzy projected color images, you'll find The Squints running rampant.

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The Electrohome ECP 2000 color data/graphics projection system is a real eye-opener – in more ways than one. To begin with, it's easy to use and interfaces with virtually all computer terminals and PCs, making it the most versatile color projection system on the market.

In performance, it's the heads-up winner. Electrohome's Vari-Focus Control allows simple optical focusing on screens from 5' to 14' diagonal – using only 3 handy knobs on the back of the unit. This exclusive Electrohome feature makes the ECP 2000 the easiest-to-set-up color projection system available today.

Electrohome's single lens system automatically converges colors within the unit to project a crisp, clear, consistently brilliant color image of all data/graphics and video. In fixed or portable applications, difficult, time-consuming set-ups and focusing are a thing of the past.

MORE EYE-OPENERS.

There are many other eye-opening differences that set the ECP 2000 apart from all other color projection systems on the market. For example, the ECP 2000 offers a 1,000 line lens and displays 1024 × 1280 pixels.

Advanced pincushion circuitry reduces eye-boggling distortion to an absolute minimum on curved, flat or rear screens. In addition, you get a maximum brightness rating of 400 lumens. Finally, sophisticated high voltage regulation assures image stability and overall performance dependability.

But the best way to judge the ECP 2000 is to see it for yourself. For more eye-opening information on how to Stop the Squints with the ECP 2000, the CAD/CAM 2000 for ultra-high resolution terminals operating at 30 – 65 KHz, or the EDP-58 monochrome systems, send your business card to:
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To find out more about the Networking capabilities of System 85 and System 75, call your AT&T Information Systems Account Executive or 1-800-247-1212.

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MICROCOMPUTERS

Continued from page 93

programs for TI minis on the micro.

The X-Porter is compatible with DX10 Release 3.3 or higher, except for programs that read or modify DX10 data structures, programs that directly access TI Business Systems interfaces and programs that use the TI 990/12 extended instruction set.

The product requires 256K to 512K bytes of memory, the XT running PC-DOS 2.1 or the AT running PC-DOS 3 as well as one full-size slot and a 10M-byte hard disk (or larger, depending on the software application). A communications link is required to port the application from the TI Business System to the micro.

The cost of X-Porter is $2,825.

Ten X Technology, Suite B14, 3933 Steck Ave., Austin, Texas 78759.

■ **CXI, Inc. has announced a memory board that is said to expand random-access memory (RAM) of the IBM Personal Computer and Personal Computer XT by up to 256K bytes.**

The Memory/Plus board is designed for use with CXI's 3270 PC coaxial connection, 3270 remote connection, 3278/79 Plus remote connection and 3278/79 Standard remote connection. The board reportedly allows these products to address memory above the 640K-byte limit of the DOS operating system.

The Memory/Plus board is said to provide 256K additional bytes of RAM on the IBM Personal Computer, 192K additional bytes on the Personal Computer XT and 128K additional bytes on the Personal Computer XT with the IBM Enhanced Graphics Adapter. The product is reportedly organized in four 64K-byte memory blocks, which can start on any 64K-byte boundary up to 896K bytes.

The Memory/Plus board is priced at $396 and is available for $200 when purchased with supporting CXI products.

CXI, 3606 W. Bayshore Road, Palo Alto, Calif. 94303.

■ **Emulex Corp. has announced a monochrome display adapter card with an optional printer port for the IBM Personal Computer, Personal Computer XT and AT.**

The Persyst Mini-Mono Card is said to fit in a Personal Computer XT short slot or full-size slot in the Personal Computer or Personal Computer AT. It reportedly provides 80-char. by 25-row display, uses 4K bytes of main memory and performs direct memory access operations directly to or from the display memory.

The optional parallel port reportedly supports either Centronics Data Computer Corp. or Dataproducts Corp. printer interfaces.

The cost is $225 for the standard product and $250 for the printer port model.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

■ **Alloy Computer Products, Inc. has announced an add-in memory board for AT&T's Unix PC personal computer.**

The RAM-73 board is said to allow users to add 2M bytes of expansion random-access memory to the Unix PC. The memory is built on a plug-in card that requires one slot in the computer.

The board costs $1,495.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, Mass. 01701.

■ **Applied Reasoning Corp. has introduced PC-Elevator, a board for the IBM Personal Computer and Personal Computer XT that reportedly upgrades these machines to the performance level of the IBM Personal Computer AT.**

PC-Elevator is said to incorporate the Intel Corp. 80286 microprocessor and either 512K bytes or 1M byte of on-board memory. Also included is the software for its basic I/O system.

The product costs $1,695 with 512K bytes of memory. With 1M byte of memory, it costs $2,495.

Applied Reasoning, 84 Sherman St., Cambridge, Mass. 02140.

■ **AST Research, Inc. has introduced Colorgraphplus, a graphics adapter board for the IBM Personal Computer.**

Colorgraphplus is compatible with all software written for the IBM 4910 color adapter and occupies one expansion slot, according to the vendor. It offers two modes of display: alphanumeric and all-points-addressable graphics.

In its base configuration, the board reportedly provides up to 16 colors in its medium resolution mode of 320 by 200 pixels and up to four colors at high resolution, 640 by 200 pixels.

Colorgraphplus is priced at $295.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

■ **Phoenix Computer Products Corp. has introduced an Intel Corp. 80286-based add-on board that reportedly increases the processing speed of the IBM Personal Computer, Personal Computer XT and compatible machines to exceed that of the Personal Computer AT.**

Pfaster286 uses coprocessor technology to speed up the data processing power by allowing the Intel 80286 processor to function as the system CPU, the vendor said. The product reportedly allows users to switch to native Intel 8088 mode without having to reboot the machine.

Pfaster286 costs $2,395. The 80287 option costs $350, and each additional 512K bytes of random-access memory is $400, according to the vendor.

Phoenix Computer Products, Suite 220, 1416 Providence Highway, Norwood, Mass. 02062.

■ **STB Systems, Inc. has announced an adapter board said to extend the graphics capabilities of the IBM Personal Computer, Personal Computer XT and AT.**

Continued on page 96

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Data News reaches 12,500 Brazilian DP professionals weekly. It covers new products and services, current applications and latest industry developments and trends.

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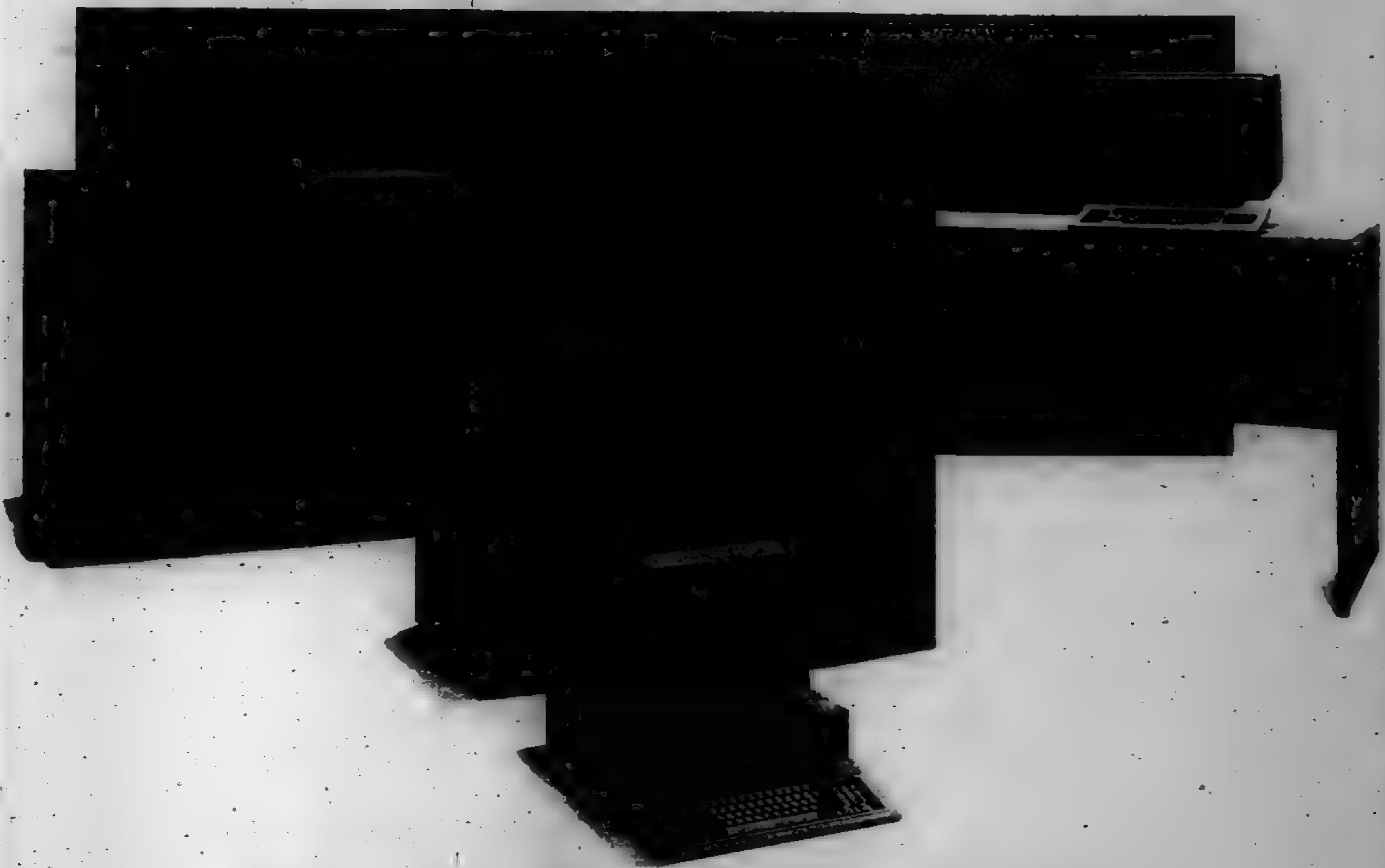


The UNIX* operating system from PC to mainframe.

MICROCOMPUTERS

From page 77

HP offers Laser Jet Plus in high-end printer mart

vent the capacity constraints of HP's plug-in font cartridges.

The combination of improved print quality and additional performance features makes Laser Jet Plus particularly suitable for high-end commercial applications such as office typesetting, technical word processing, presentation graphics and computer-aided design and manufacturing output, Archibald said.

Laser Jet Plus runs the same software as its supplier's original model and is compatible with an assortment of both HP and non-HP microcomputers.

Shipments of the enhanced printer, which costs $3,995, start immediately.

Continued from page 84

The one-slot Colorific board works with the standard IBM color monitor. With appropriate software, the Colorific supports high-resolution display modes of 640 by 200 pixels in four-color mode and 320 by 200 pixels in 16-color mode.

The board offers 16K bytes of memory for standard graphics and text display and 32K bytes of memory for extended graphics display.

It includes an IBM Printer Adapter-compatible parallel port. The Colorific is bundled with Resicorp's PC Accelerator software, which provides drivers for the extended graphics display of Lotus Development Corp.'s 1-2-3 and Symphony and Ashton-Tate's Framework files.

The Colorific costs $275.

STB Systems, Suite 125, 601 N. Glenville, Richardson, Texas 75081.

AUXILIARY EQUIPMENT

■ Assimilation, Inc. has announced a full-function numeric keypad and input device for the Apple Computer, Inc. Macintosh.

Numeric Turbo reportedly combines a full-scale numeric keyboard with the vendor's Mac Turbo Touch track ball cursor controller to be used in place of a mouse. It attaches to either side of the main keyboard with velcro strips for both right-handed and left-handed operators.

The device is reportedly compatible with most Macintosh software, including Lotus Development Corp.'s Jazz and Microsoft Corp.'s Excel. It is also compatible for network use.

The cost of Numeric Turbo is $149.

Assimilation, 485 Alberto Way, Los Gatos, Calif. 95030.

■ Sola, a unit of General Signal, has released power conditioners for personal computers.

The Personal Computer Power Conditioner (PCPC) portable plug-in unit is said to protect personal computers, small office computers and sensitive peripheral hardware from all ac power problems except total line failure.

The unit combines voltage regulation and isolation and operates as a portable dedicated line, according to the vendor.

There are two models available. The $119 PCPC 150 handles 150 kVA (1.25A).

The PCPC 300 was designed for larger personal computers and handles 300 kVA (2.5A), according to Sola. It costs $149.

Sola, 1717 Busse Road, Elk Grove Village, Ill. 60007.

From page 77

Will MMA, Tasc join forces?

behind such mainframe users groups as Share and Common.

Today, the MMA of New York — the original chapter and still the largest — sits at a crossroads.

Many of those who formed Tasc are MMA members, and although the MMA says a dual membership can be held, members of MMA chapters outside of New York may switch their allegiance to the upstart.

Were that to happen, the MMA of New York might find itself isolated, speaking only for that city's micro managers and lacking the authority that comes from sheer size of membership.

As for the vendors, they apparently are throwing their weight behind Tasc. At a recent Tasc meeting in Detroit, which drew representatives of microcomputer management from some of the nation's largest firms, Lotus Development Corp. reportedly gave attendees a preview of the new release of its 1-2-3 spreadsheet.

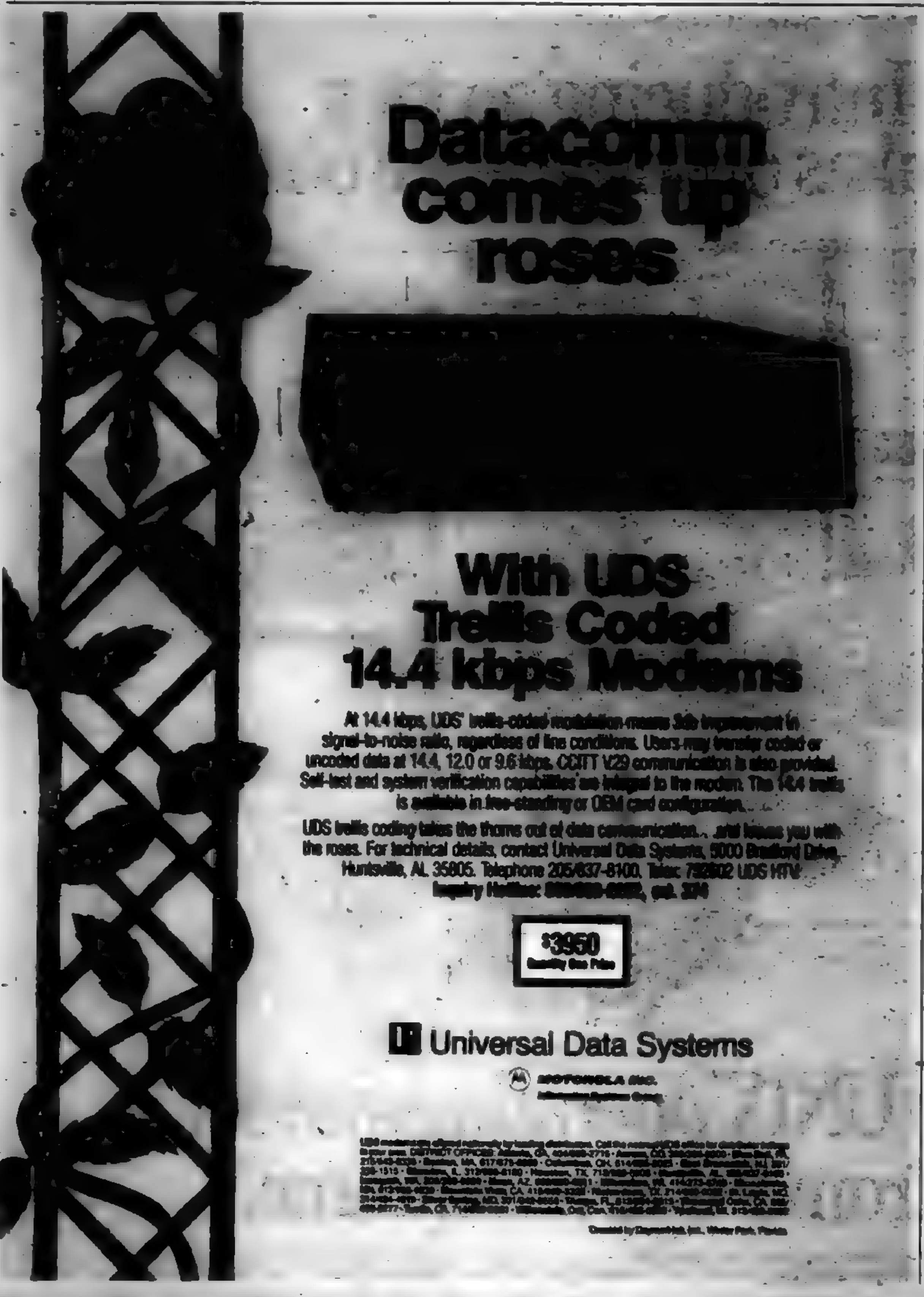
By contrast, the MMA's Gross reported just three weeks ago that he had not yet found a speaker to deliver the keynote speech at Tuesday's Microforum, the MMA's annual gathering. The MMA had hoped to get John Opel to speak, but the IBM chairman declined.

With both vendors and former or potential members joining the ranks of Tasc, the MMA is faced with a difficult situation. It could, as Gross recently suggested, become an organization that speaks for the major corporations in New York. To do so, however, would be to confine the MMA's fine sense of feistiness to one region — one that vendors could more easily ignore.

A better approach would be for the MMA of New York to become affiliated with Tasc and to speak as part of a unified voice of microcomputer managers nationwide, while retaining its name and chapter autonomy.

Such a union would give Tasc a base of members in the city that likely has the most corporate personal computer users. True, those MMA members are a contentious lot, but having a few more devil's advocates around the house can't hurt Tasc.

With the MMA at its side, Tasc could become the truly nationwide corporate personal computer users group that members of both organizations have been long awaiting.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COMMUNICATIONS

WEBSTAP/DANIEL MINOLI

How to choose the proper financial model

THIRD IN A THREE-PART SERIES

To do his job well, a communications manager must know how to purchase the right equipment. Financial models can help to make these decisions.

Sophisticated financial models have existed for a long time. The need for them was somewhat less evident when communications equipment was relatively inexpensive or when equipment lasted from 8 to 15 years. Today, equipment may well be obsolete by the time it is shipped and before it is installed.

In my past two columns, I presented key factors in the decision-making process. Next, I will present four techniques that for capital budgeting.

Generally, this is the best of the four methods listed. The first step involves calculating the net cash flow generated by a project. The net cash flow starts with project revenues and subtracts expenses other than depreciation, capital expenditures and taxes. Taxes are calculated by using the tax rate applied to revenues and by subtracting all project expenses, including depreciation.

The net present value is the sum of the present value of all future cash flows, minus the initial cost. A positive net present value means that the project yields a rate of return exceeding the cost of capital; a negative net present value means that a project earns less than the rate of interest from a bank.

There are two ways to use this method. In an accept-reject decision, the project is selected if the net present value is positive; the project is not undertaken if the net present value is negative.

The second method involves mutually exclusive alternatives, such as buying either modem A or modem B. If the net present values of both alternatives are positive, then select the one that has greatest net present value.

The internal rate of return method gives a rate of return on a project. If the rate of return exceeds the cost of capital, then the project is selected. If the internal rate of return does not exceed the cost of capital, then the project is not selected.

Internal rate of return can be explained by the following scenario. A manager has $1. This money, *if* put into the intended project, will earn cash at various times. If the rate is low, the project should not be accepted because a bank could easily

Continued on page 93

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

- Local Data has announced a protocol converter that connects up to seven Ascii devices to an IBM System/34, 36 or 38/96
- T-Bar has introduced matrix switches with a nonblocked capacity of 2,048 circuits/91

INSIDE

Protocol Converters/96
Multiplexers/Modems/92
Local-Area Networks/93
Test Equipment/93

Firm launches E-mail micro

American Teleprocessing Corp., located in Houston, has announced a personal computer designed for users of electronic mail services.

The ATC 100 features two 360K-byte disk drives, 256K bytes of random-access memory, a monochrome monitor, communications software and an Okidata Corp. 182A printer.

The product works with communications products from MCI Communications Corp., Western Union Co. and TRT Data Products. The ATC 100 classifies and

Continued on page 90

Net management aid debuts

Monitors 512 modems

Anderson Jacobson, Inc. of San Jose, Calif., has become the latest vendor to enter the rapidly growing network management field. The company's Modem Diagnostic and Test System monitors and controls up to 512 four-wire lease-line modems.

The product supplies wraparound boxes that work with modems transmitting data at speeds between 1,200 and 14.4K bit/sec.

The system monitors 10 Electronics Industries Association leads, two analog signals and two auxiliary inputs. It also records network performance and can help to restore line problems.

Users can define operating thresholds and set alarms for conditions such as analog carrier level, the number of signals on an RS-232 interface and the presence of a streaming condition in a modem. These operating thresholds may be checked, changed and managed centrally for up to 256 modems.

The product consists of an IBM Personal Computer, system software and wraparound boxes.

Prices range from $4,195 to $14,480 for the central controller and are $895 for the wraparound boxes.

Boeing instrumental in creation of new users group

Exec sees TOP as companion protocol to GM's MAP

By Jeffry Beeler

SAN FRANCISCO — Boeing Computer Services Co. (BCS) has gained approval to take the lead in supporting an infant users group that seeks to promote communications standards for offices and factory floors.

On Aug. 20, company President Robert Dryden formally okayed a proposal for BCS to spearhead the cooperative development of the emerging Technical and Office Protocols (TOP) users group.

The announcement of Dryden's blessing came here on Aug. 26 at the annual Integrated Information Technology Conference and Exposition (Intech).

Dryden's decision will permit selected Boeing employees to take time off to serve on TOP's subcommittees and serve as liaisons between group members and standard-setting bodies, according to BCS manager Laurie Bride.

To increase the TOP users group's chances of success, BCS will bear most of the burden of shepherding the [illegible] during its critical formative stages. [illegible] of TOP, set up a TOP task force and technical review committee, and we will be the focal point for collection and dissemination of TOP information," Dryden said at Intech.

But in roughly a year, the company will gradually begin to "step back from some of its [leadership] duties and let some of TOP's other member companies start to carry the ball," Bride said.

Currently, most of the TOP organization's membership are users of the Manufacturing Automation Protocol (MAP), which General Motors Corp. developed and adopted as a standard for interconnecting incompatible factory floor devices. In other words, TOP's membership today is composed mainly of representatives from the manufacturing sector, according to Bride.

But despite its great size, the manufacturing sector by itself is probably too small to create sufficient market demand to persuade vendors to develop products that conform to TOP specifications. In the future, the TOP users group will seek to broaden its membership base beyond the manufacturing arena to include representatives of service-oriented industries like banking and insurance, Bride said.

"We [illegible] afford to ignore a demonstrated [illegible]," she said during an interview at Intech. [illegible] but we can do so in concert with a lot of other users."

Bride describes TOP as a BCS-developed "companion protocol to MAP" and envisions it as a communications standard that will do for offices what the GM interconnection scheme has already done for factories. If the BCS-led users group succeeds in diversifying its membership, TOP may someday emerge as a common protocol for exchanging information among competing vendors' office products, she said.

Both MAP and TOP conform to the first three levels of the seven-layer Open Systems Interconnect protocol. The third level, which defines the specifications for networking dissimilar equipment models, was added only recently and links devices in a MAP environment to their TOP counterparts.

"Addition of the [networking] capability was an important advance in the development of TOP because office workers need to have access to information on the factory floor" and vice versa, Bride said.

The first public demonstration of interconnected MAP and TOP environments will be jointly sponsored by GM and [illegible] this [illegible]

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ITT
COURIER

Data acquisition units bow

Data Translation, Inc., based in Marlboro, Mass., has announced two data acquisition modules. One converts analog signals to digital with a throughput rate of 800 kHz, and a second works at speeds up to 100 kHz.

Applications for the faster product, the DT5732, include seismic/geophysical analysis, vibration analysis, radar signal processing and high-speed waveform analysis.

The DT5732 is able to make real-time analog measurements, according to Data Translation.

It consists of an input multiplexer, a separate instrumentation amplifier for each channel, sample and hold and 12-bit analog-to-digital converter, the vendor said.

Output is compatible with Digital Equipment Corp.'s Q-Bus and Multibus and the bus on the IBM Personal Computer AT.

The DT216 was designed for data acquisition systems, automatic semiconductor testing, frequency synthesis and speech analysis applications. The module contains two converters that can be changed independently and are addressed sequentially, the vendor said.

The DT216 features a proprietary deglitching circuit that eliminates glitches caused by changes to input-offset binary code.

The DT5732 costs $1,995, and the DT216 sells for $695.

Local Data converter links Ascii devices to IBM systems

Local Data, Inc., headquartered in Torrance, Calif., has announced a protocol converter that connects up to seven Ascii devices to an IBM System/34, System/36 or System/38 via its native twin-axial I/O channel.

With Interlynx/5251, Ascii terminals or printers can reportedly emulate IBM 5251 or 5291 terminals or IBM 5256 printers.

The asynchronous devices can be attached directly or remotely with modems and dial-up lines.

The product supplies a two-level password-protection scheme for dial-up users. Interlynx/5251 supplies an RS-232 interface that is switch selectable as data terminal equipment or data circuit equipment.

A parallel port supports printers from Centronics Data Computer Corp. and Datapoint Corp. at transfer rates in excess of 2,500 char./sec., according to the vendor.

The protocol converter supports transmission speeds up to 38.4K bit/sec.

Interlynx/5251 supports terminals from a number of vendors including Digital Equipment Corp., Lear Siegler, Inc., Televideo Systems, Inc. and IBM.

The product's diagnostic features include a timer that automatically restarts the unit in an unattended operation.

LEDs tell a user what station is being polled by the host and whether it is a dial-up or direct connection.

There are two models for the protocol converter. Model 1, $1,595, is nonexpandable with one serial or parallel port. Model 2 costs $1,995 and has one RS-232 port. Additional ports can be added for $550.

Bell Atlantic gets FCC nod for expansion

The Federal Communications Commission has granted Bell Atlantic Mobile Systems of Basking Ridge, N.J., permission to expand its cellular telephone service in the Delaware Valley.

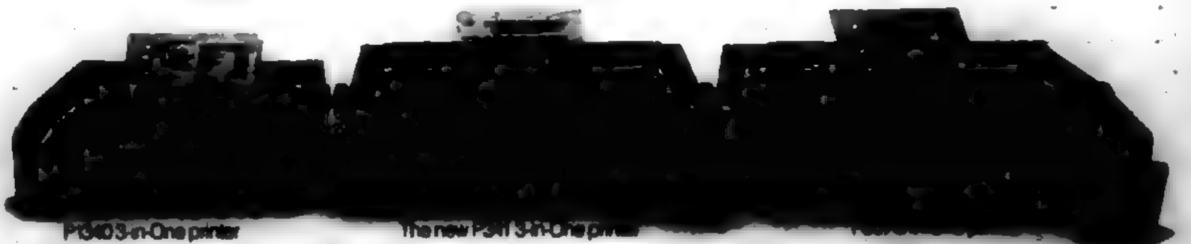
The action enables the company to increase its service area by 400 sq miles in the valley so that it covers 2,400 sq miles.

New sites will be put into operation in West Rock Hill Township, Doylestown, Phoenixville and Guthriesville in Pennsylvania and in Sicklerville, N.J.

The company estimated the cost of the project would be $2.25 million. The West Rock Hill, Doylestown and Phoenixville sites are operational. The Guthriesville site will be running in November, and the New Jersey facility will be working this month.

Bell Atlantic began offering the service in July 1984 and now serves 17 sites.

"That reminds me of the network you put in!"



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PROTOCOL CONVERTERS

■ **Wall Data, Inc. has enhanced its line of IBM 3270 and 5251 protocol converters.**

The DCF/3270 connects Ascii personal computers and terminals to IBM mainframes running 3270 Systems Network Architecture and Binary Synchronous protocols. The DCT/5251 connects Ascii devices to IBM System/34, 36 or 38 hosts.

Enhancements to the DCF/3270 and DCF/5251 enable the products to support Apple Computer, Inc.'s Macintosh's native mode, speeds of up to 19.2K bit/sec. on all ports and high-speed screen painting for personal computers and terminals.

Prices for the converters range from $3,995 to $5,995.

Wall Data, 17769 N.E. 78th Place, Redmond, Wash. 98052.

MULTIPLEXERS/ MODEMS

■ **MDB Systems, Inc. has announced a version of the Digital Equipment Corp. Q-bus DHU11 multiplexer, expandable from 32 to 256 channels.**

The product works with the DEC PDP-11/23, 11/73 and Microvax Q-bus-based systems and is compatible with DEC's RSX11 and RSTS/E operating systems.

The multiplexer's host module, the MLSI-DHU-MP, contains a 16-bit microprocessor, random-access memory files and interrupt and programmed I/O sequencers.

The module is coupled to one or more boards containing the parallel bus interconnect circuitry and 32 universal asynchronous receiver transmitters (Uarts). The Uarts convert parallel data to serial and serial to parallel for RS-232 communications with most terminals and microcomputers.

The 32-channel series with DHU11 emulation, Model MLSI-F-DHU-A32, includes the master module, one PBI-A32 board and two distribution panels with a total of 32 connectors. The price is approximately $6,500.

MDB Systems, 1995 N. Batavia St., Orange, Calif. 92665.

■ **Anderson-Jacobson, Inc. has announced the AJ 4801 modem for point-to-point or multipoint applications.**

The AJ 4801 is compatible with the CCITT V.27 standard for use over four-wire, unconditioned leased lines. The modem permits serial data transmission at 2,400 bit/sec. or 4.8K bit/sec.

The modem uses a single board and measures 2.8 in. high by 8.3 in. wide by 13.8 in. deep. The device is said to monitor and adapt to changing line conditions.

It employs digital signal processing and diagnostics, including error detection and six loop tests that can be operated centrally.

The AJ 4801 is priced at $1,495 and is available immediately.

Anderson-Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

■ **Amcom Systems, Inc. has announced a short-haul modem built inside a connector case.**

Localmodem was designed to overcome distance limitations of RS-232 connections. The modems can be used in pairs for point-to-point links and operate at speeds of up to 9.6K bit/sec. over a five-mile distance. The product can be used as either data communications equipment or as data termination equipment.

The snap-together case connects to either modular wire via a built-in RJ 11 jack or twisted pair. There are two models — one with a male connection and a second with a female connection.

Model 411 is designed for telephone company lines, employs balanced transformers to reduce crosstalk and sells for $98. Model 401 works with electronic protection circuitry and costs $76.

Amcom Systems, Suite 611, 5646 Milton St., Dallas, Texas 75206.

T-Bar introduces 19.2K bit/sec. matrix switches

T-Bar, Inc., located in Wilton, Conn., has introduced matrix switches that reportedly offer more than 17 times the nonblocked capacity of IBM's recently announced 3728 switch.

DSM Series 2001 supplies 2,048 circuits that support transmission speeds of up to 19.2K bit/sec., compared with a figure of 120 circuits for an IBM product, T-Bar claimed. The switches work with nonblocked satellite architecture, according to the vendor.

The T-Bar offering supplies up to 32,000 ports, which are compatible with various modems from AT&T and IBM, the company said.

T-Bar added that the product's control terminal can be a personal computer from AT&T, IBM, Texas Instruments, Inc. or other companies that run Microsoft Corp.'s MS-DOS operating system.

There are two versions of the product, Galaxy and Monolith. The Galaxy version supplies 2,048 ports and the Monolith version supports 320 ports.

The switches are available at an average cost of $300 to $350 per port, according to the vendor.

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MicroPro.

*MultiMate states that [illegible] out of [illegible] commands are mnemonic.
For a complete comparison chart, write: MicroPro, Dept. 2000, 33 San Pablo Ave., San Rafael, CA [illegible]. Specifications are for the latest released versions of all products effective July 1985. MultiMate is a trademark of MultiMate Corp.; Microsoft is a registered trademark of Microsoft Corp.; WordStar and MicroPro are trademarks of MicroPro International.

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From page 87

How to choose the proper financial model

match a low rate. If the rate is high, then the project should be pursued, because a bank probably could not match a high rate of return.

The internal rate of return method may not be as reliable as the net present value method for two reasons. When comparing alternatives, it may not be advantageous simply to pick the alternative with the highest internal rate of return. Also, there are projects that do not yield a meaningful internal rate of return.

The payback period is the length of time it takes to recover an initial investment. When comparing two options, the one with the shorter payback period would be selected. This method is not as good as the net present value method because it does not include cash flows beyond the payback period.

The accounting rate of return, also called the return on investment, is the average annual after-tax accounting profit generated by the investment divided by the initial expense. This method is also inferior to the net present value method because it does not evaluate cash flow or take into account the cost of money.

Although these last two methods have been used prior to the general availability of computing power being arithmetically simpler, the other methods should now be used. With micro and mainframe spreadsheet packages, one has the tools to apply the appropriate methodology.

We are now going to examine two examples of purchase decisions. First, we can either buy some equipment for $2,000 or lease it for $80 for 36 months. Assuming a revenue benefit from the new equipment of $1,800 for each of three years, a cost of capital of 10%, an amortization schedule of 36 months, a salvage value of $100, a tax rate of 50% and an investment tax credit of 8%, we find with the net present value method that the buy option is better. The net present value in the purchase case is $1,262; the net present value in the lease case is $1,044. Only when the equipment cost exceeds $2,428 does the lease option become better.

In a second example, we can either buy equipment for $2,000 and have a $100 per month maintenance fee, or we can buy it for $3,000 and have a $50 per month maintenance fee. All the other factors are the same as in the first example. In this case, the $3,000 option is better because the respective net present values are $231 and $9. Only when the maintenance on the $2,000 item decreases to $84 per month does it become the better option.

From page 87

Firm launches E-mail personal computer

saves messages that are created, sent or received.

The micro supplies multitasking capabilities that enable users to edit one message while sending a second. Documents created on an IBM Personal Computer can be transferred to the ATC 100. The ATC 100 costs $2,995.

From page 87

Boeing instrumental in creation of group

also reportedly coincide with the TOP Version 1 specification.

About one month later, the TOP users group will hold its first organizational meeting in Seattle. "We want to capitalize on the enthusiasm that will be left over from the demonstration at Autofact," Bride said.

Although the TOP and MAP users groups are expected to have their own separate executive committees, the two organizations will likely rely on a common steering committee made up of representatives from 14 member corporations. "The sharing is necessary to avoid duplication of effort and to make sure that MAP and TOP remain in step with each other," Bride said.

LOCAL-AREA NETWORKS

■ Syros, Inc. has announced connectionless Internet Protocol (IP) software, a product that is said to conform to the International Standards Organization National Bureau of Standards Class 4 Transport Protocol.

The software is written in C programming language and can be ported across a variety of CPU types.

IP software costs $2,500.

Syros, P.O. Box 24477, Tempe, Ariz., 85282.

TEST EQUIPMENT

■ Atlantic Research Corp. (ARC) has announced an internal autoanswer/autodial modem for its Comstate I and Interview 40B and 30B data analyzers.

The Comstate I, Interview 40B and 30B can be programmed with a phone number to call the user when preprogrammed conditions exist, the vendor said.

Captured data and test results can then be transferred to the receiving Comstate or Interview data analyzer by remote control, according to the vendor.

The Unattended Remote feature allows control of the analyzer from an Ascii terminal or any other ARC analyzer with terminal mode over a communications circuit.

The price for the modem option is $650.

ARC, 5390 Cherokee Ave. Alexandria, Va. 22312.

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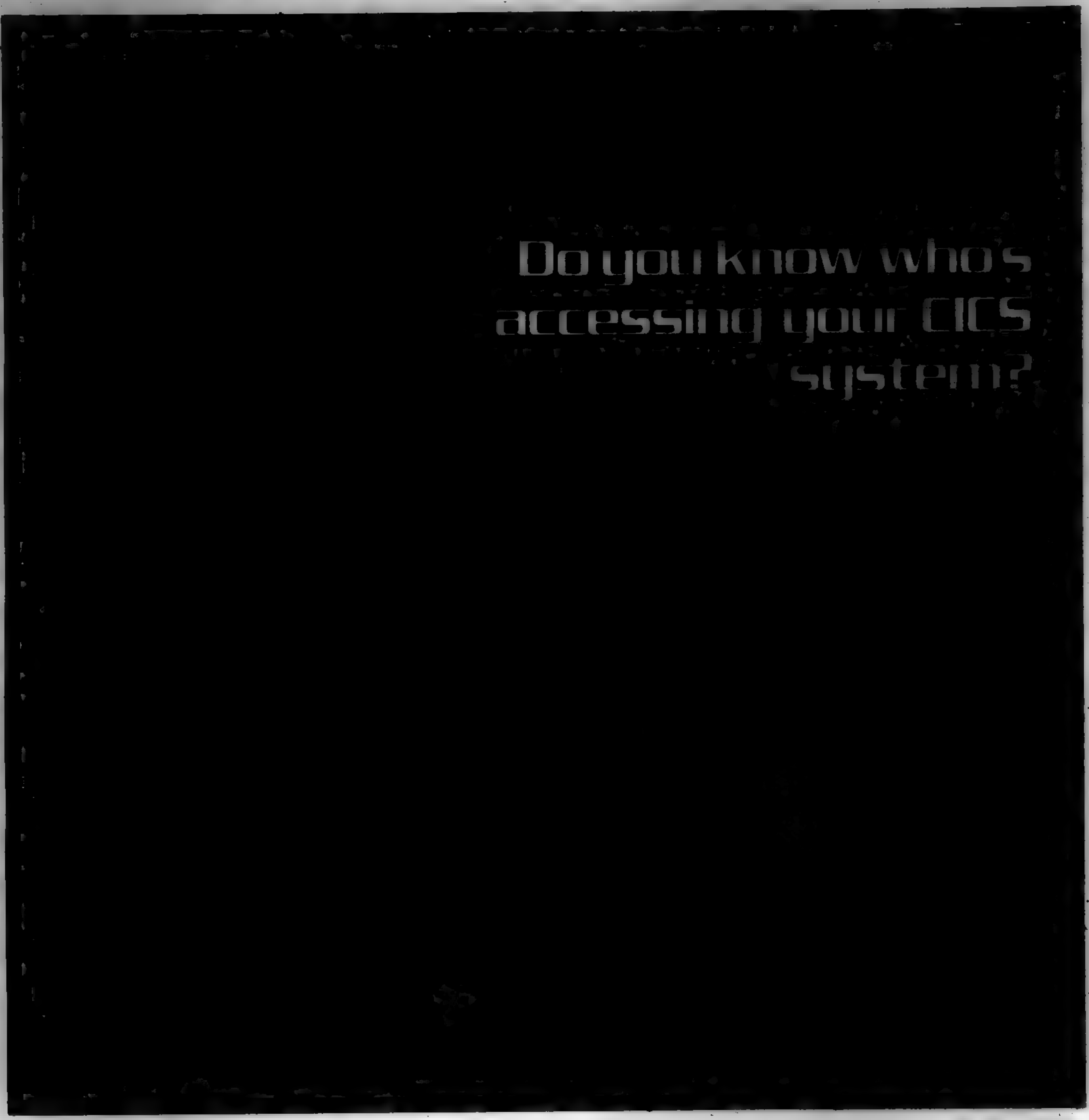

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SYSTEMS & PERIPHERALS

Research, acquisitions tell Honeywell's tale

FIFTH IN A SERIES

By Tom Henkel

Like other companies that divide their attentions today between building computer systems and sophisticated electronics gear, Honeywell, Inc. made its mark on the industry partly through its own early electronics research and partly by acquiring successful computer companies.

By 1955, when Honeywell officially entered the computer business by cofounding Datamatic, Corp. in Newton, Mass., it was already a successful purveyor of electronics gear. But unlike IBM and Sperry Corp., which evolved into computer businesses largely by replacing corporate electromechanical business machines with improved electronic devices, Honeywell approached the computer industry by a less likely path.

The roots of Honeywell extend to the late 1800s and a gadget called the "damper flapper," a Rube Goldberg-like device designed by a Swiss immigrant, Albert Butz. The damper flapper's function was to manipulate the dampers on a coal-fired furnace to maintain an even room temperature and, with any luck, to keep one's home from burning to the ground due to an overly stoked furnace.

While the damper flapper itself had nothing to do with computing, it gave rise to a company that — through a somewhat circuitous route — did deal with computing. The damper flapper and its patent caused two men, Mark Honeywell and W. R. Sweatt, to merge their respective heat control companies to form the Minneapolis Honeywell Heat Regulator Co. in 1927.

Building upon the heat regulator — thermostat — business, Minneapolis Honeywell Heat Regulator branched out to manufacture various types of control systems. In 1934, Minneapolis Honeywell Heat Regulator bought out Brown Instrument Co. in Philadelphia.

Brown Instrument was one of the leading manufacturers of recording, indicating and controlling instruments. That acquisition propelled Minneapolis Honeywell Heat Regulator to a stronger dependence on electronics.

World War II bolstered Minneapolis Honeywell's interest in electronics as the company developed various instruments for the armed forces, including the C-1 electronic autopilot system.

By the early 1950s, Honeywell researchers were experimenting with Bell Laboratories transistors, a move that led to the formation of Datamatic in 1955. Datamatic was a joint effort by Raytheon Corp. and Honeywell to develop a large-scale computer system. Raytheon sold its 40% share in the company in

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School district's NAS drives get high marks

Cache controllers provide IBM power at 60% of cost

By Donna Raimondi

MIAMI — The fourth largest school district in the U.S. installed one of the first National Advanced Systems, Inc. NAS 7880 disk drives with cache controllers to handle its 26G bytes of storage data. As a result, the Dade County School District is getting performance comparable to that of an IBM 3380 disk drive for 60% of the cost.

The school district serves approximately 232,000 Dade County public school students, said Management Information Systems Director Gene Brewer. The Florida legislature has mandated that all school districts transmit student information electronically to the capitol in Tallahassee by July 1, 1987. But even before the mandate, Dade's school system had been in the process of automating for seven or eight years, said Brewer.

With an annual budget of over $1 billion, $10 million of which is dedicated to MIS, the school system must track student information such as grades, attendance records, schedules and career counseling activities for grades kindergarten through 12. The district's mainframe system, a NAS 9080 processor running under IBM's MVS/SP 1.3.1 operating system, also handles all budget, financial, personnel, food services and transportation information processing for the school district.

The more than 1,500 terminal users in the state-controlled information resource network (Dade provides data processing services for school districts in two *Florida* panhandle counties, as well as for itself) have experienced response times of less than a second since adding the NAS 7880 disk drives with cache controllers, Brewer said. These response times, down from as much as 30 seconds, cannot be attributed solely to the cache controller feature because there have been upgrades to the whole system, he said.

The reason the school district is so heavily stocked with NAS equipment is purely based on price, Brewer said. When bids went out for computer equipment, NAS came in at about 60% of what comparable IBM equipment costs. The mainte-

Continued on page 113

Floating Point Systems adds MP32 series array processor

Targeting signal- and image-processing systems integrators and OEMs, Floating Point Systems, Inc. in Beaverton, Ore., has announced its MP32 series array processor.

The processor is said to perform up to 54 million floating-point operations per second. It is a multiple-instruction, multiple-data multiprocessor supporting up to three arithmetic processors and two I/O processors. Its internally shared memory can hold one million to seven million 32-bit words, with 24-bit addressing for up to 16 million words.

The company said that a Motorola, Inc. 68000-based control processor directs the flow of data and instructions through the system and that concurrent, asynchronous operation is facilitated by a control language similar to Fortran with utilities for handling parallel processing.

Memory reportedly can be addressed in arbitrary increments such as rows, columns and diagonals. There are nine slots for memory and processor options. There is also a switch-selectable formatter to perform fix and float operations and a 6M byte/sec. I/O processor transfer rate.

The MP32 was designed to be compatible with Data General Corp. and Perkin-Elmer Corp. computers used as front-end processors.

Available now, it is priced starting at $57,500.

SI clusters Microvax II

By Donna Raimondi

MILPITAS, Calif.— System Industries, Inc. (SI) has taken the wraps off a $4,000 interface to its 9900 controller that reportedly enables the Digital Equipment Corp. Microvax II to be clustered with up to eight VAX machines of any size on an SI 9900 series cluster controller.

The 9900 controller supports up to eight CPU interfaces when it has a $16,000 SI multiple access controller system added to it. The controller system is said to allow any machine on the cluster to act as I/O manager, eliminating the need for one machine to be a dedicated traffic manager.

A newly announced option for the 9900 controller — a disk cache controller — enables the most often accessed or selected data to be cached in the controller, allowing a 2-msec average access time as opposed to a 25-msec access time if the data had to go out to the disk.

The company also announced a product that is said to allow the Microvax II to access up to 2G bytes of storage in stand-alone mode or to directly access up to 5G bytes of storage data on a cluster. The company's QDA/50 disk controller system is a Q-bus disk adapter that allows all of Fujitsu Systems of America Winchester drives to run on the Microvax II. It is a DEC Storage Architecture-compatible option for DEC's PDP and VAX series machines, an SI spokesman said.

The QDA-50 is said to offer SI's Power-Pack configuration, which allows disks and tapes to be put in a single cabinet, and to offer a sub-20

Continued on page 113

Shiva unveils turnkeys said to speed circuit simulation

SX series based on Sequent system

A parallel system announced recently speeds circuit simulation of integrated circuit designs and is based on the Sequent Computer Systems Balance 8000 parallel computer with National Semiconductor Corp. 32032 chips.

Shiva Multisystems Corp., a 2-year-old Menlo Park, Calif., company that develops systems to address the computation-intensive problems in the computer-aided engineering industry, announced its SX series of turnkey systems.

The systems are said to be dedicated to electronic circuit simulation. The SX series operates under Sequent's Dynix operating system, a University of California at Berkeley 4.2 version of AT&T's Unix. Shiva's Powerspice circuit simulation software is included in the system.

The SX series is said to simulate performance of integrated circuits while running at speeds of up to 100 times faster than a Digital Equipment Corp. VAX-11/780 running the public domain Spice2 circuit simulation software developed by the University of California at Berkeley. The VAX-11/780 running Spice2 is a standard way to compare circuit simulation systems, a Shiva spokesman said.

The SX series can communicate via Ethernet using the TCP/IP protocol with DEC's VAX series computers running under the AT&T Unix or DEC VMS operating systems; with IBM or plug-compatibles running VM; and with AT&T Unix-based workstations, including those from Apollo Computer, Inc., Masscomp and Sun Microsystems, Inc.

Shiva plans to mix the 32032 chips with its own accelerator processors into the configuration needed to reach certain performance levels at the prices listed below.

Models include the SX-250, which is projected to have two National Semi 32032 processors and two Shiva accelerator processors. This model is said to offer 20 times the performance of a DEC VAX-11/780 running Spice2, and it costs $125,000.

The SX-1000 will most likely have six 32032s and six accelerators. It is said to offer 50 times the VAX-11/780's performance at a price of $240,000. The top-of-the-line SX-2000 costs $350,000 and will contain between eight and 12 processors and the same number of accelerators. This model is said to offer 100 times the VAX's performance.

All units will ship in October.

Study eyes optical disks

Optical disk systems will represent almost one-quarter of the value of automated document storage equipment shipments by the end of the decade, according to a study by Venture Development Corp., a management consulting firm based in Natick, Mass.

The study examined the market for image storage equipment in the U.S. and noted that the $400 million to $500 million annual market for conventional document storage and retrieval equipment, including micrographics and COM, has grown only gradually in recent years.

But the report, "Micrographics and Optical Digital Disk Systems 1985-1990," added that the market for optical digital disk systems has moved from a few test sites in 1984 to commercial shipments of $6 million for 1985. By 1990, annual shipments will be worth $160 million, the report said.

Venture Development noted that while the $160 million figure is below the estimates of some industry observers, optical systems will still represent an important market.

The report cited three prime areas of concern in relation to optical technology. It said the six-figure price tag for a complete optical disk system increases the importance of cost justification. It noted that the useful life of images stored on optical disk remains a question while microfilm images made 100 years ago are still usable today. And, it observed that if courts do not accept optical disks as legal evidence then COM backup of optical systems will be necessary for some applications.

However, the report forecast that by 1990 optical digital disk systems will represent 24.4% of the automated document storage and retrieval equipment shipments, vaulting that technology from the point of having no market share in 1984 into second place in the market behind standalone micrographics systems.

The 140-page report costs $2,970.

PROCESSORS

■ **Computervision Corp. has unwrapped a file server for engineering project management and resource sharing.**

The CDS 3701-E file server is part of Computervision's CDS 3000 family of workstations. The file server acts as a resource node on an Ethernet TCP/IP network, the vendor said. The basic unit includes a dual Motorola, Inc. 68000 central processing unit, 2M bytes of main memory, a 33M-byte 5¼-in. hard disk drive, the C programming language and AT&T's Unix 4.2 BSD operating system. That system costs from $25,900.

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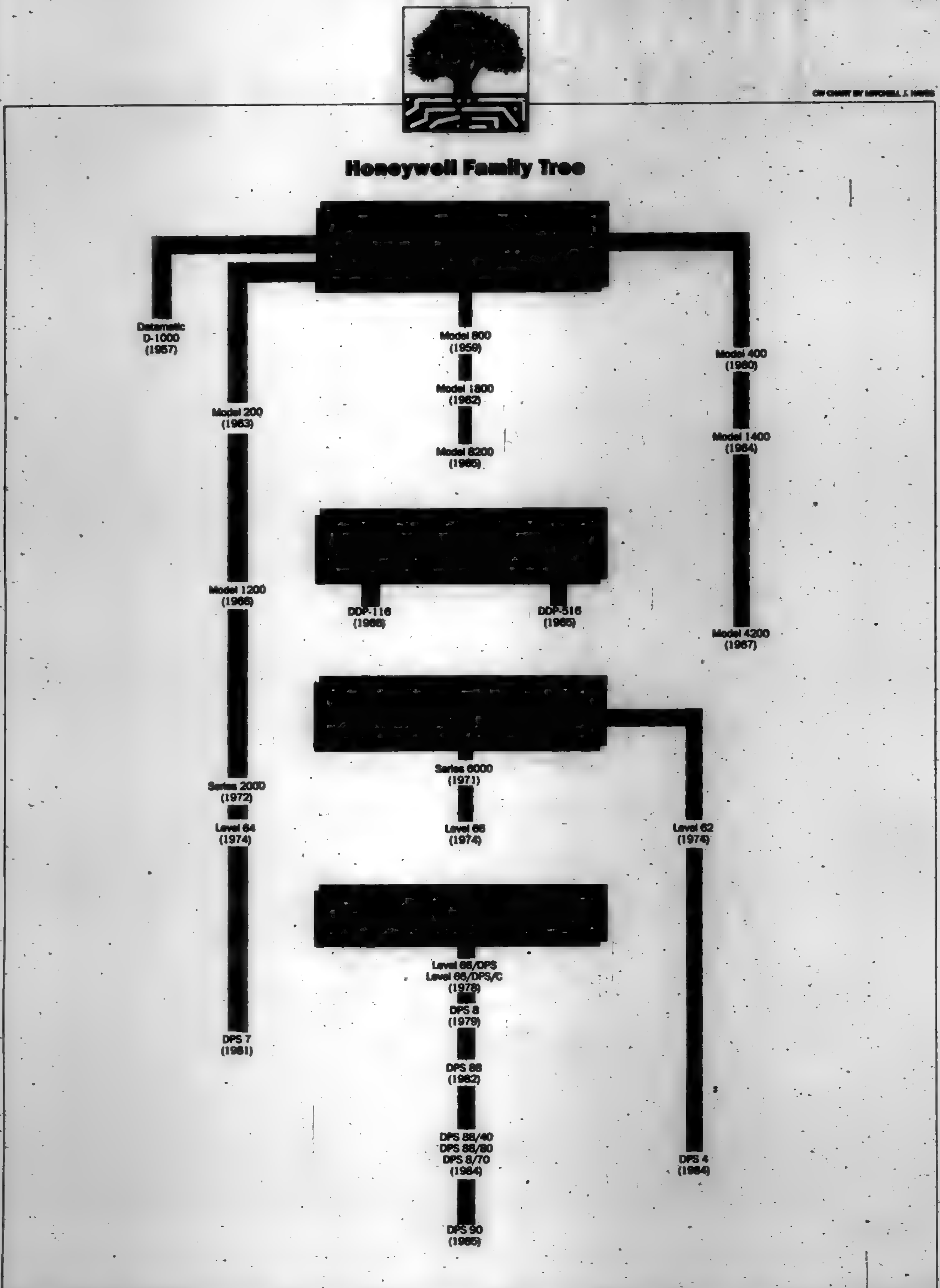

CW CHART BY MITCHELL J. HAYES

From page 95

Research, acquisitions tell Honeywell's tale

1957, and Datamatic became a division of Honeywell.

The Datamatic Division produced its first system, the D-1000 in 1957, which was installed by Blue Cross and Blue Shield of Michigan. About 14 of the vacuum tube D-1000 units were installed, recalled George Olsen, now a director of quality management for Honeywell.

The D-1000 gave way to the Model 800 processor in 1959, which was superseded by the 1800 model in 1962. Also in 1962, Honeywell unveiled the Model 400, which used an innovative snake logic switch patented by a young researcher at MIT.

That researcher, Ken Olsen, was the founder and chief executive officer of Digital Equipment Corp. The Model 400 was an attempt to compete with IBM's 1400 series of processors, noted Honeywell's George Olsen.

The Model 400 was superseded in 1965 by the Model 200, which Honeywell's Olsen claims was five times more powerful than IBM's 1401.

In 1966, Honeywell acquired another company, Computer Control Co. of Framingham, Mass., which added two small 16-bit minicomputers to the Honeywell lineup — the DDP-116 in 1966 and the Series 1640 in 1970.

But by far, the most significant turn of events that propelled Honeywell into the mainframe business was the acquisition of General Electric Corp.'s failing computer business in 1970.

Honeywell called the deal a "partial purchase-partial pooling," whereby both Honeywell and GE would contribute to the formation of a new firm. The firm became Honeywell Information Services. Honeywell owned 81.5% of the company, and GE owned 18.5%.

To gain such a commanding role in the new company, Honeywell agreed to give GE 1.5 million shares of stock and $110 million in notes, interest free, for the first year. The merger led to the acquisition of Series 60 and Series 6000 processors, which have been enhanced into what is the firm's current product lineup.

In 1976, Honeywell acquired an interest in another failing computer company — Xerox Data Systems. Honeywell agreed to assume marketing, support and maintenance for the Xerox Sigma line of mainframes. Honeywell eventually developed a migration path to allow Sigma users to move to Honeywell mainframes.

> ❞
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> *But by far, the most significant turn of events that propelled Honeywell into the mainframe business was the acquisition of General Electric Corp.'s failing computer business in 1970.*

That same year, Honeywell introduced its Level 6 line, which it considered a major thrust into the minicomputer business.

The company began emphasizing distributed processing in 1977 with the announcement of its Distributed Systems Environment and an extension of that environment to the Level 68/Distributed Processing System (DPS) and the integration of host and satellite functionality with multifunctional Level 6 Gcos software.

Four large-scale computers, the DPS 8 line, and the Gcos 8 operating system were added in 1979, followed by a family of small, distributed processing systems, the DPS 6 and various word processing and administration systems a year later, marking Honeywell's entry into the office automation market.

The DPS 7, a family of medium-scale systems using current-mode logic technology, was introduced in 1981. The same year, Honeywell acquired Action Communication Systems, Inc., a tandem switching and private voice network vendor, and renamed it the Communications Networks Division.

A new line of large systems, the DPS 88 family, was announced in 1982, but Honeywell shifted its attention to small systems in 1983 with the introduction of its first microcomputer, the Microsystem 6/10.

In 1984 Honeywell added to its DPS 88 series and signed a technology agreement calling for Honeywell to use NCR Corp.'s 32-bit very large-scale integrated processor chips in developing a future computer.

Earlier this year, the company added a high-end system, the DPS 90, designed to serve the commercial, engineering and scientific communities as the central system in large distributed networks.

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CIM: The future of factory management, automation

By Warren Hinze
Special to CW

Computer-integrated manufacturing (CIM), the blueprint for the future of factory management and automation, is an informational model of the manufacturing business.

To understand CIM, MIS managers must approach it from both the information side and the business applications side.

Two models — one for each side — provide some guidance.

Applications model

This model is composed of nine elements:

- Business planning.
- Resource planning.
- Resource scheduling.
- Demand management.
- Distribution management.
- Factory automation.
- Measurement and control systems.
- Configuration management.
- Financial management.

Together, these elements compose a comprehensive view of the business of factory management and automation.

Business planning encompasses the areas of market and financial planning. It uses modeling, simulations and fourth-generation computer languages to provide managers with the information they need. These tools promote the development of a feasible business plan.

Resource planning concerns plans for materials, manpower, machines and tooling. These resources must be present if an organization is to execute the business plan its managers have created.

Resource scheduling makes priorities for the consumption of resources. It addresses such questions as "What materials should the purchasing department buy next?" and "Which product should manufacturing produce next?"

Demand management encompasses three key elements: sales forecasting, customer order entry and sales tracking and analysis. Based on these, demand management provides business planners with the data they need to analyze the effects that actual and projected customer activity have had or will have on business.

Distribution management is concerned with distribution requirements planning (DRP) and transportation management.

DRP manages the movement of inventory from the factory, through the distribution system, to the customer. It also manages inventory within the distribution system, ensuring that excess inventory is properly redistributed.

Transportation management cannot be entirely separated from distribution management because the mode of transportation a firm uses affects the nature of the distribution system. Cost trade-offs between various modes of transportation, for example, determine the sizes and locations of a firm's warehouses.

Factory automation captures the imagination of many senior managers, who envision robots (serviced by automated materials handling equipment) effortlessly producing quality products at the lowest possible cost. But without business plans that are incorporated through CIM, those robots effortlessly produce high-quality, low-cost parts that no one wants.

Measurement and control systems collect data from manufacturing machines and analyse those machines' performances. The data acquisition process is beneficial because it tells managers what has happened. The analyses, however, provide the real payback: They show the effects the past is likely to have on the future. Because CIM is based in business planning, it provides the outline for the future against which managers can analyse the past.

Configuration management defines — through a series of steps — what a manufacturer will produce.

First, engineers use computer-aided design tools to define a product. Then manufacturing management transforms that data into bills of material, and computer-aided manufacturing tools transform the design into instructions for machine tools. Process planning software then identifies each work center machine cell or assembly area that will be required for the production of the product, and manufacturing resource planning systems identify actual materials and processes.

Each of these areas must be controlled to ensure that the products the engineers designed actually got produced and delivered, and configuration management within CIM provides the necessary control.

Financial management under CIM will make use of tools that analyze production performance against future plans. This will allow for more timely analysis than current practices allow.

Most companies today analyze production against financial actuals. In well-run companies, where books are closed within five days after a month's end, data is an average of 17 days out of date. In contrast, analysis

Continued on page 108

Hinze is vice-president for systems planning at Comserv Corp., an Eagan, Minn.-based supplier of manufacturing software and services.

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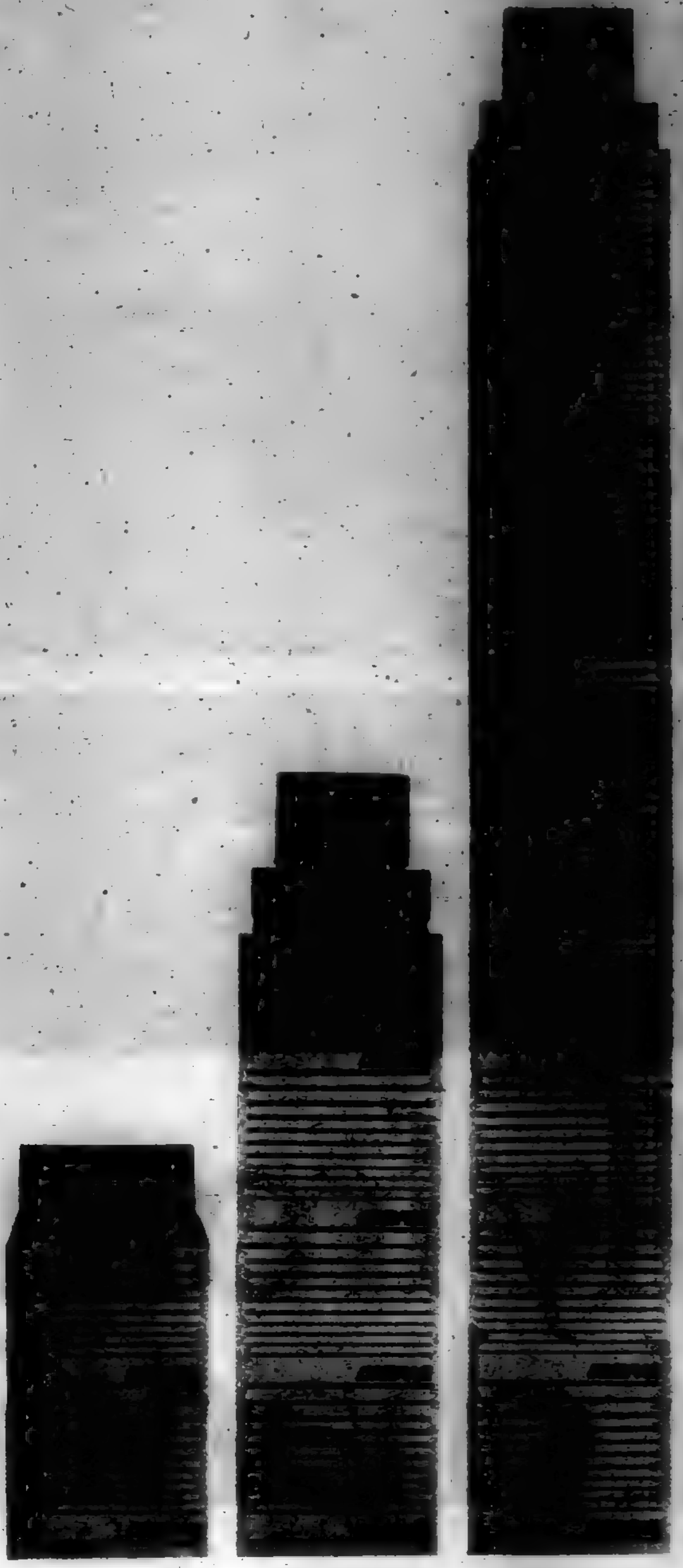

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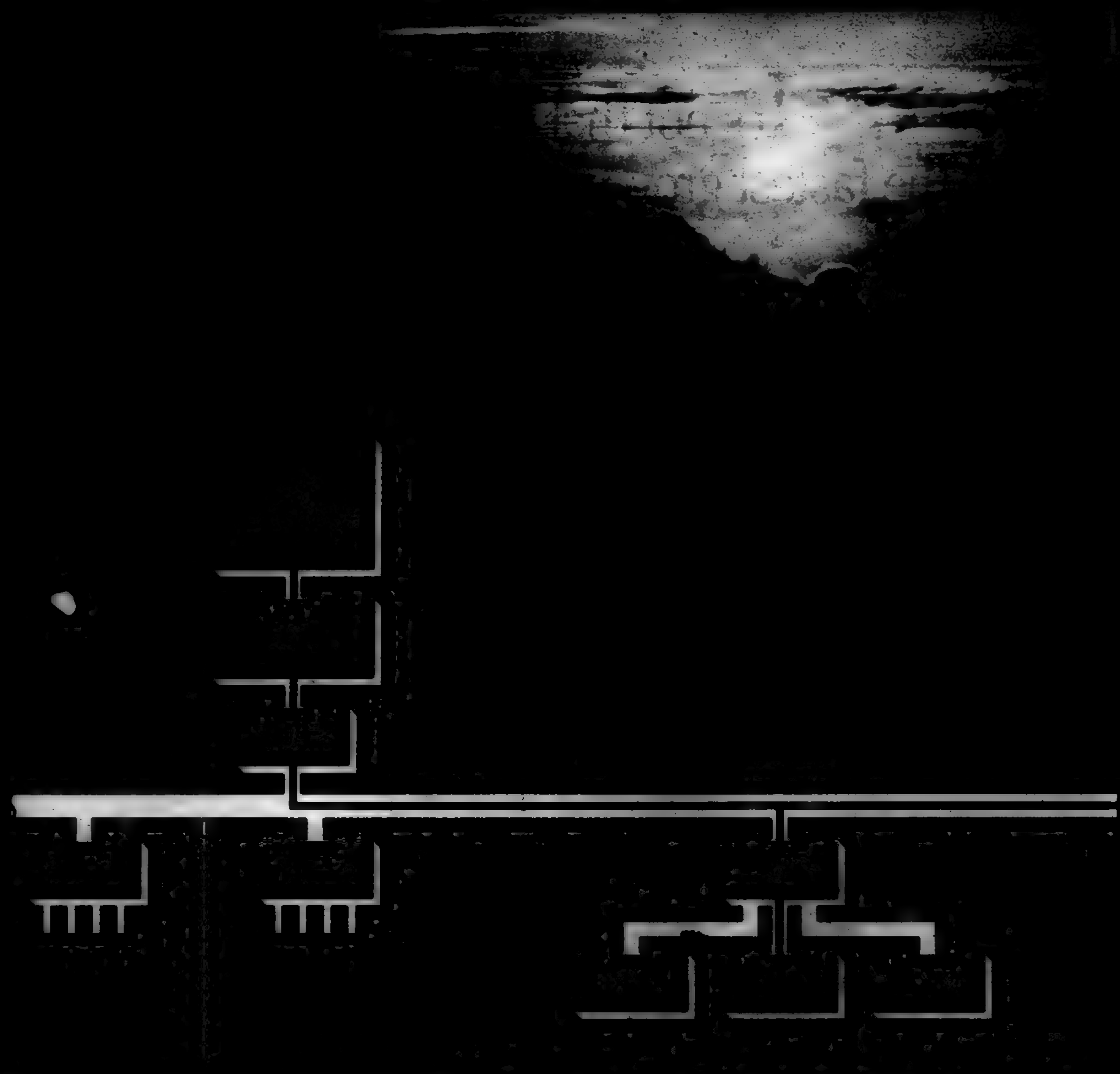

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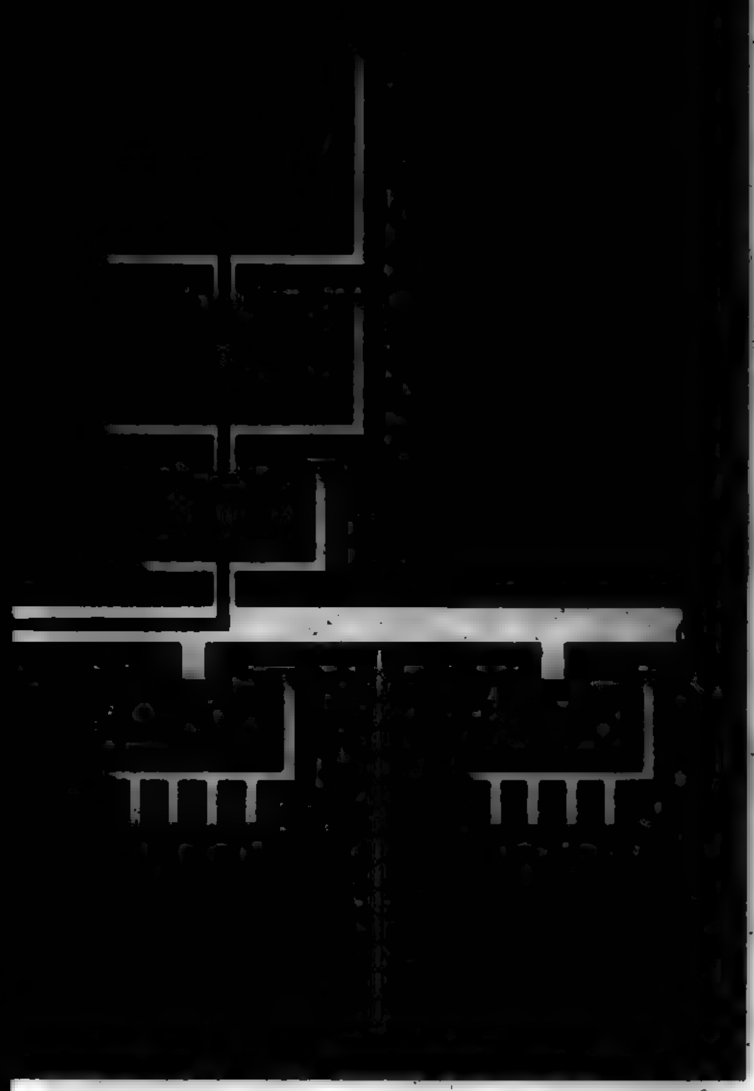

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DFM aids manufacturing priorities in design cycle

**By Henry W. Stoll
and Joanne H. Cole
Special to CW**

One of the most significant changes that has resulted from the computer revolution is the redefinition and evaluation of many job requirements into terms that a computer can understand.

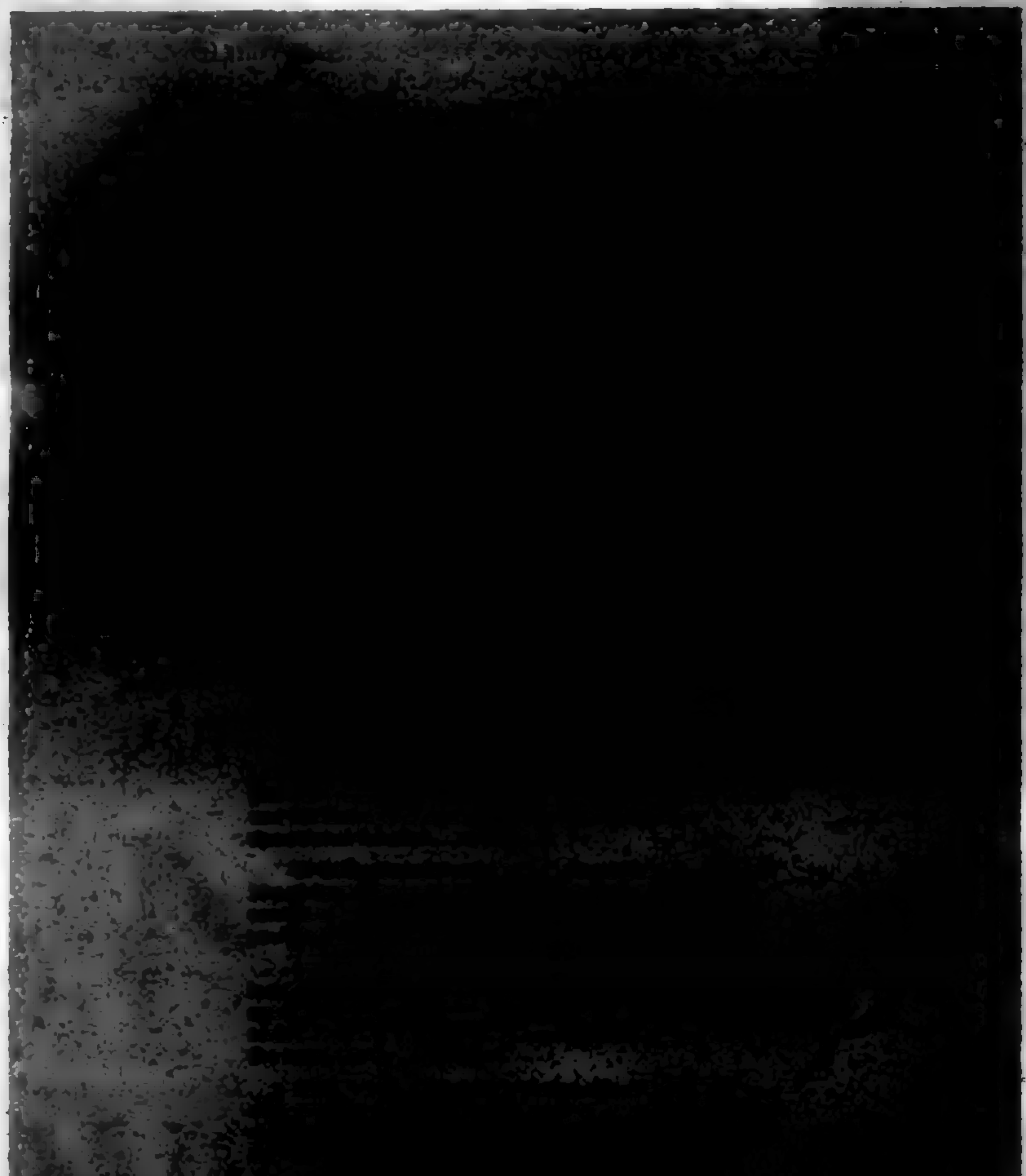
In the manufacturing environment, computerized systems are actively being used in many areas. Plant operations changes have been pervasive and well publicized. Manufacturing techniques include Kanban (just-in-time) inventory control systems, modeling and simulation of operations and assembly operations, direct computer links between user and supplier, automated material handling, statistical process control and flexible machining and assembly.

Less publicized have been the advances in product design. Design engineers now use computers extensively as engineering aids. Computer-aided design and engineering, finite element modeling, dynamic simulation and solid modeling are glamorous computer applications currently being used.

Not quite so well known is the engineering concept of design for manufacture (DFM). This concept ensures that manufacturing considerations enter early into a product's design cycle. Products designed under DFM guidelines have highly standardized components, and all unnecessary, difficult-to-manufacture features are eliminated.

The DFM concept emerged from early attempts to automate simple, manual assembly tasks. Engineers found that when people performed simple assembly tasks, they were able to compensate for problems with tools or with parts they were assembling. Machines could not perform many of these operations until the material and process problems were corrected.

Management realized that many of the problems with human assembly operations occurred when nonstandard parts or operations were required. DFM minimizes these nonstandard components and operations within the manufacturing and assembly process.



Consider manufacturing early

DFM stresses that seemingly insignificant decisions made during the initial design phase will affect manufacturing throughout the product's life cycle. Most products can be designed for easy manufacture and assembly if manufacturing is considered early in the design process. The DFM concept seeks the following goals:

- To choose product design concepts that are inherently easy to manufacture.
- To choose component designs for ease of manufacture and assembly.
- To integrate manufacturing process design with product design to assure manufacturing process capability.
- To eliminate component or assembly features that disrupt the smooth flow of production.
- To add component or assembly recognition or fixturing features to aid manufacture and assembly.
- To maximize simplicity in components and operations.
- To maximize design commonality among similar products and differentiate among products as late in production as possible.
- To match the production system to the product in an optimal way.

Several important techniques are becoming available to provide assistance in DFM. A numeric system for rating the assembly efficiency of a product design was developed in 1983 by Geoffrey Boothroyd and Peter Dewhurst, professors at the University of Massachusetts, Amherst, Mass.

This system, based on time studies of assembly operations, rates an assembly based upon the number and configurations of component parts required. It is available in both handbook and computer software versions. The system can also be used to identify the appropriate assembly operation (such as manual, flexible automation, hard automation and others) based upon expected production volumes and company investment criteria.

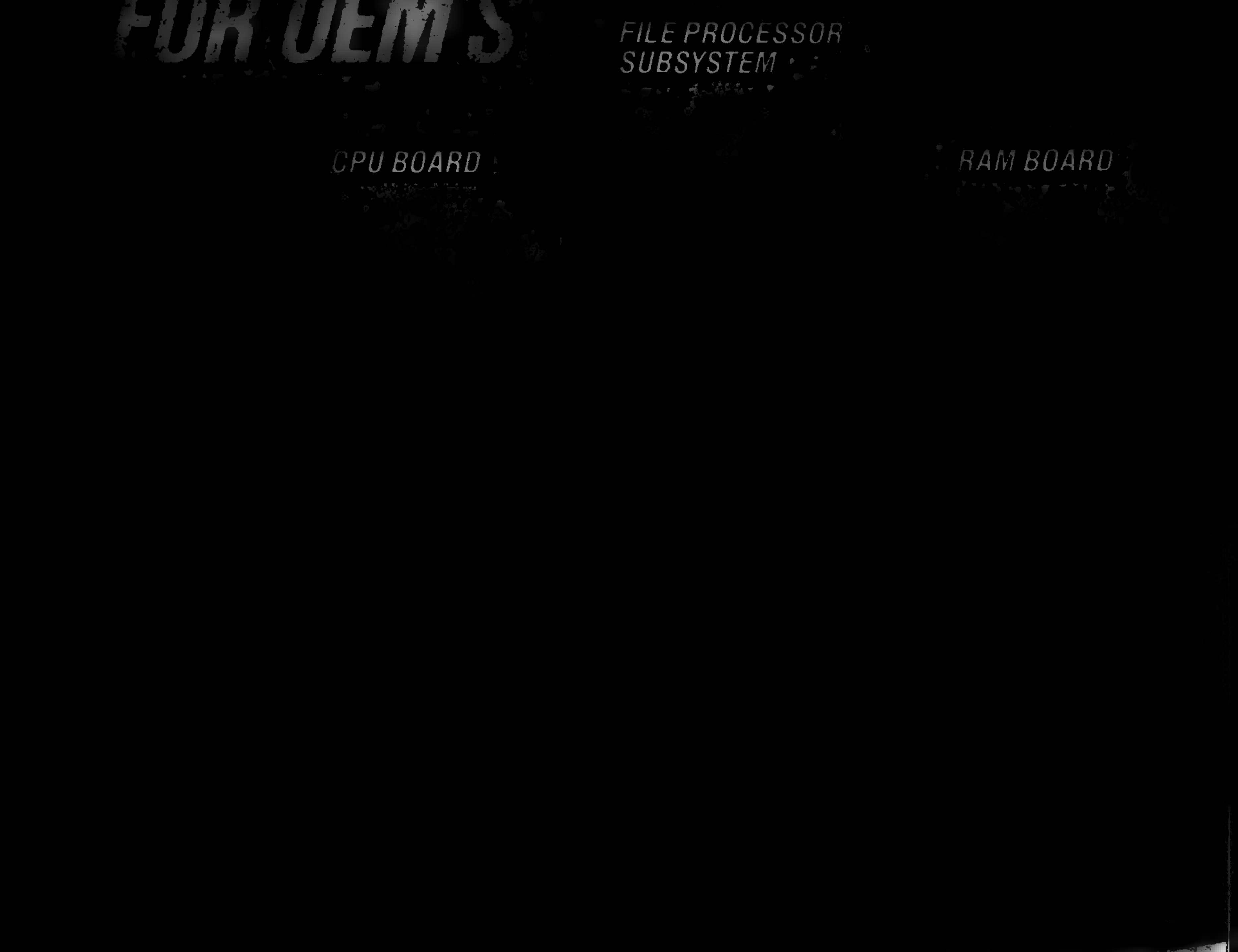
Many consulting companies have also recognized the importance of DFM and are now providing assistance in this area.

A number of companies have successfully implemented DFM programs. DFM techniques resulted in significant design changes for the Apple Computer, Inc. Macintosh, Sony Corp. Walkman, Hewlett-Packard Co. 9000 line of desktops, and Whirlpool Corp. and General Electric Co. appliances. Although these companies are very large and produce high volumes of assemblies in highly automated facilities, the principles and benefits of DFM do not depend on

Continued on page 113

The authors work in the Flexible Inspection and Assembly Laboratory at the Industrial Technology Institute, a consulting firm in Ann Arbor, Mich. Stoll is manager of design for manufacture; Cole is a senior staff engineer in the flexible inspection systems group.

THE ALTOS 3068: SIX BREAKTHROUGHS [illegible] FOR OEM'S



BREAKTHROUGH PRICE/PERFORMANCE

Combining the 32-bit MC68020, multiple auxiliary processors, and a tuned version of UNIX™ System V, the 30-user 3068 "is capable of a performance that rivals large mini-computers." (Computerworld, April 1985). And it does it for a micro computer price—from $7,900 for OEM quantities.

BREAKTHROUGH MODULARITY

"Using plug-in boards the way a personal computer does really sets Altos apart" (research firm Creative Strategies, Computerworld, April 1985). OEM's can choose from a wide range of modules: 10 to 40 serial ports; 1 to 16 MB of memory; 17 to 280 MB (formatted) hard disk storage.

BREAKTHROUGH HARDWARE DESIGN

"Altos is way ahead of everybody else." (Creative Strategies, Computerworld, April 1985): high speed [illegible] CPU speed, with no wait-states; cache [illegible] processors. [illegible]

[illegible]

BREAKTHROUGH UNIX™ SUPPORT

To meet the most rigorous applications requirements, the 3068 incorporates demand paged virtual memory, record locking, and sophisticated interprocess communication. An optimizing C-compiler, symbolic debugger, and a full set of development tools and languages form a complete development environment. Productivity tools include an integrated package of word processing, spreadsheet, DBMS, graphics, and electronic mail.

UNIX is a trademark of Bell Labs

BREAKTHROUGH COMMUNICATIONS AND NETWORKING

With a variety of protocols and the Altos Worknet™ LAN, 3068 communications span PC's to mainframes. The standard communications board has 10 serial ports, an on-board micro-processor, and up to 128 KB of RAM. The system can be configured with up to four communications boards.

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Continued from page 96

A typical configuration includes an enhanced CPU that is said to offer twice the performance of the basic unit, 2M bytes of main memory, a 32M-byte hard disk, a 1M-byte floppy disk, an Ethernet controller, six RS-232 I/O ports and one Versatec, Inc. I/O port. The typical configuration costs $41,700.

Computervision, 15 Crosby Drive, Bedford, Mass. 01730.

DATA STORAGE

■ Wilson Laboratories, Inc. has unwrapped a disk drive analyzer that is said to test up to four Winchester-type drives in sequence.

The Digital Analog Test System-2000 (Data-2000) analyzer incorporates analog testing for missing pulse, extra pulse, phase margin, amplitude and resolution. Digital analyses verify media defects, measure read window margins and check format, write/read, timing, seek action and status/control monitors.

Analyzers that work with all Storage Technology Corp. ST506 or ST412 drives cost $14,950. The Data-2000 may be ordered for drives with an enhanced small disk interface at a cost of $15,175.

Wilson Laboratories, 2237 N. Batavia St., Orange, Calif. 92665.

TERMINALS

■ Wyse Technology, Inc. has announced the release of two Ascii terminals that will be sold through distributors and OEMs.

The WY-50+ is an enhanced version of Wyse's WY-50 and is aimed at the full-function terminal market. It features two to four times the display memory of the WY-50 and terminal emulations for the IBM 3101, the Data General Corp. 200 and Televideo Systems, Inc.'s 950 terminals. It also features a bidirectional auxiliary port, enhanced function key capabilities and an amber display. The unit costs $699, and it has an optional four-page memory that costs $30.

The WY-30 is a low-end unit for basic applications such as data entry. The unit features a mechanical switch keyboard, four dedicated function keys, 41 programmable functions, an 80-col. display, a printer port, split-screen capability and a 14-in. flat screen.

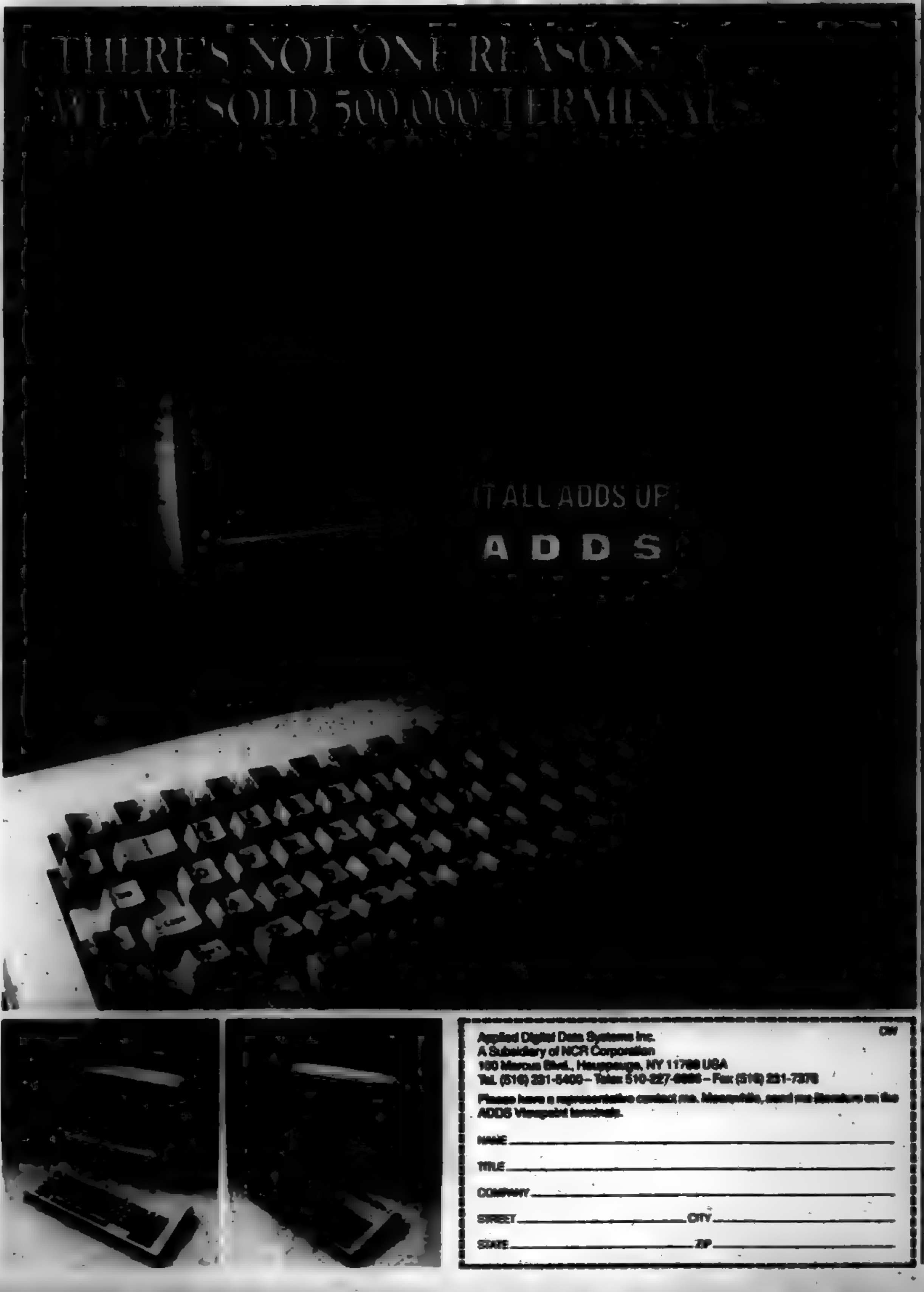
The unit is compatible with Lear Siegler Corp.'s ADM 3A/5, Applied Digital Data Systems, Inc.'s Viewpoint terminal and Televideo Systems, Inc.'s 925 and 910+ terminals. It can send data at 38.4K bit/sec. The WY-30 costs $399, and it has an optional tilt-and-swivel base and a height-adjustable arm that cost $20 and $99, respectively.

Wyse Technology, 3571 N. First St., San Jose, Calif. 95134.

■ Intecolor Corp. has introduced a color graphics terminal for Digital Equipment Corp. and other serial ported minicomputers.

The 8820 terminal features one page of dot-addressable screen memory, an 80-char. by 48-line screen format and 480- by 384-pixel resolution on a 19-in. color display. Users may

Continued on page 112



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From page 100

CIM: Future of factory management

against a plan can be made as soon as a production process is completed. The plan, however, has to be an extremely accurate projection.

CIM will improve financial projections by improving financial control.

Information model

The information model of CIM is quite simple. It is composed of four parts: input, processing, output and feedback. This model is applicable both to CIM as a whole and to each distinct business application because both the whole and the parts are closed-loop systems.

Business planning serves as the overall closed loop. It monitors output from one production application and immediately inputs modifications to related applications.

Every application functions as a discrete loop. Each element of CIM, then, is a control loop within the control loop of business planning.

From page 104

DFM aids priorities in design cycle

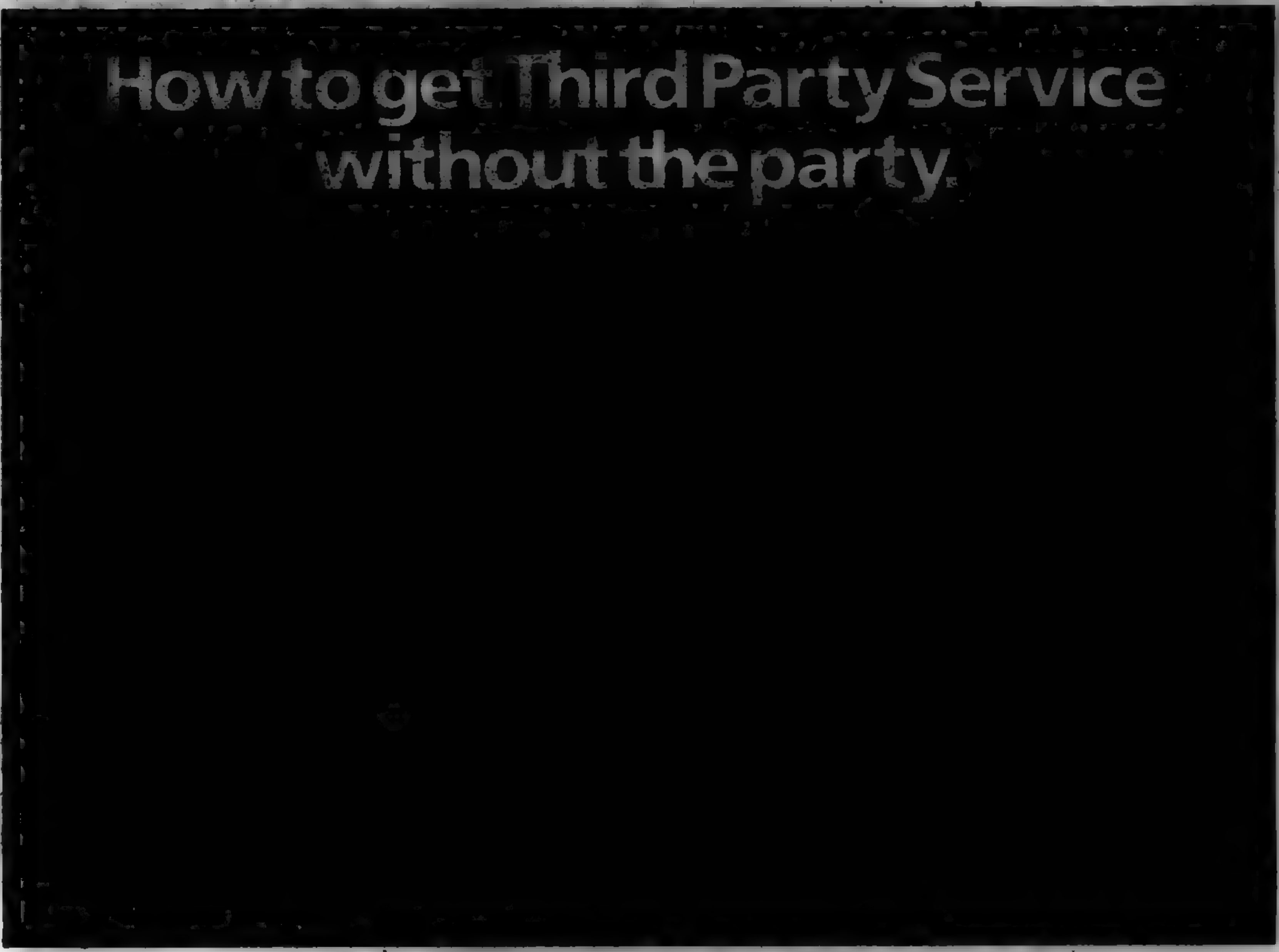
the manufacturing process or degree of automation employed. DFM methodologies will help even the smallest manufacturer who relies solely on manual assembly.

Users of DFM techniques report the following benefits:

- Direct labor and material cost reductions.
- Product consistency and quality improvement with subsequent reductions in scrap, warranty and product liability costs and improved market share.
- Production and inventory control cost reductions.
- Improved interaction between design and manufacturing.
- Employee attitude and morale improvement.

DFM works because it provides an effective tool for product analysis and evaluation, which in turn ensures that manufacturing considerations enter early into the product design cycle.

DFM is the basis for a common language between research, design and manufacturing technologies. This language will promote the cooperation and understanding needed to achieve improved manufacturing productivity.



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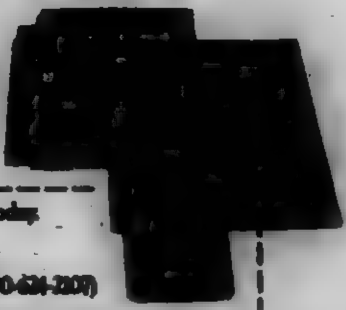

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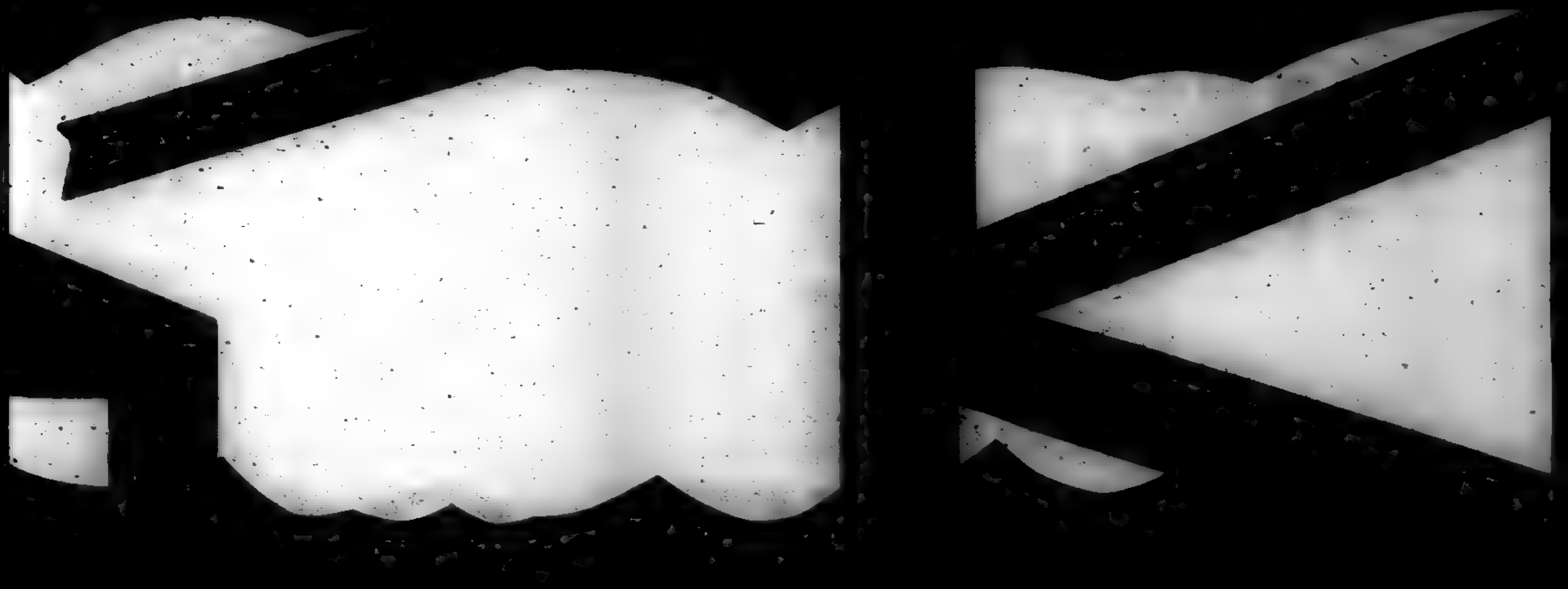

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Pansophic Systems, Incorporated, 709 Enterprise Drive,
Oak Brook, Illinois 60521

Continued from page 100

choose any one of eight foreground colors on any one of eight background colors, the vendor said.

The unit costs $3,495.

Intecolor, Intecolor Drive, 225 Technology Park, Norcross, Ga. 30092.

PRINTERS/PLOTTERS

■ Florida Data Corp. has announced that it has added an internal interface capability to its matrix printer Models OSP 130 and 3000 to allow compatibility with IBM's System/34, 36 and 38 minicomputers.

The Model OSP 130 is said to have a triple paper path.

It comes with seven resident fonts and prints up to 600 char./sec. in draft mode and up to 100 char./sec. in letter-quality mode, according to Florida Data.

The Model 3000 tractor-feed data processing printer comes with six resident fonts and prints up to 675 char./sec., the vendor said.

The Model OSP 130 costs $5,995, and the Model 3000 costs $5,395, the vendor said.

Florida Data, 600D John Rodes Blvd., Melbourne, Fla. 32935.

GRAPHICS SYSTEMS

■ Lexidata Corp. has released a direct memory access interface for its LEX 90 family of graphics display systems and Digital Equipment Corp.'s Microvax II product line.

The 22-bit Q-bus interface uses burst mode operation that is said to transfer data at up to 4 bytes per memory acquisition for enhanced graphics response time.

A built-in diagnostics feature reportedly enables testing and servicing of the interface by OEMs.

The interface costs $1,595, according to the vendor.

An optional software driver and graphics library for DEC's MicroVMS operating system is said to facilitate system integration by allowing access to Lexidata's graphics commands.

The driver and library cost $2,000, Lexidata said.

Lexidata, 755 Middlesex Tpk., Billerica, Mass. 01865.

■ Raster Technologies, Inc. has announced that it has reached an agreement with Texas Instruments, Inc. of Austin, Texas, in which customers for TI's Lisp-based Explorer symbolic processor system can receive Raster Technologies' color graphics systems.

TI is said to have developed software to integrate Raster's color graphics controllers with the Explorer.

Raster has developed an interface adapter card for use with the TI Explorer.

TI will reportedly be sublicensing Raster software and acting as a marketing representative for the Raster card.

The graphics systems supplied by Raster will range from the low-end Model One/10 up to the recently introduced Model One/380, according to Raster.

Prices will range from $6,925 to $41,000 — in quantities of one — depending upon features selected, a spokesman said.

Raster Technologies, 9 Executive Park Drive, North Billerica, Mass. 01862.

From page 96

School district's drives get high marks

nance costs for the IBM and NAS equipment are about the same, he added.

Before NAS added the cache controller feature to its disk devices, Brewer bought two strings of IBM 3380s that had the controllers. Buying devices with the cache feature was an attempt to upgrade the response time performance of the computer center's CICS applications, Brewer said.

The NAS disk drives have worked as well as, and maybe better than, the two IBM 3380 strings. "We have been getting hit rates in the 90% to 98% range in the cache with the Hitachi [NAS] controllers, and we've been getting good hit rates with the IBM also . . . about 85-87% . . . but it's a different application, and I can't say that NAS is better," Brewer said.

The district has Software AG's Adabase data base to keep track of its student information. The index for that information is kept in the cache, so when a user needs data, the system does not have to seek from the disk drive controller itself.

The difference in the size of the two IBM storage device strings and the two NAS strings is slight, Brewer said.

From page 95

SI clusters Microvax II with interface to 9000

msec seek time. The unit is available in four storage configurations ranging from 120M-byte ($10,000) to 1.9G-byte ($50,000) capacity.

The company's Disk Cache Processor (DCP) reportedly reduces average access time to less than 2 msecs. The DCP allows most frequently used data from the disk to reside in the cache memory so that the CPU need not access the disk for each request. The DCP has a 2M-byte capacity and is controlled by a Motorola, Inc. 68000 microprocessor. It costs $20,000 with a six-readout LED display performance monitor system; the system costs $15,000 without the monitor.

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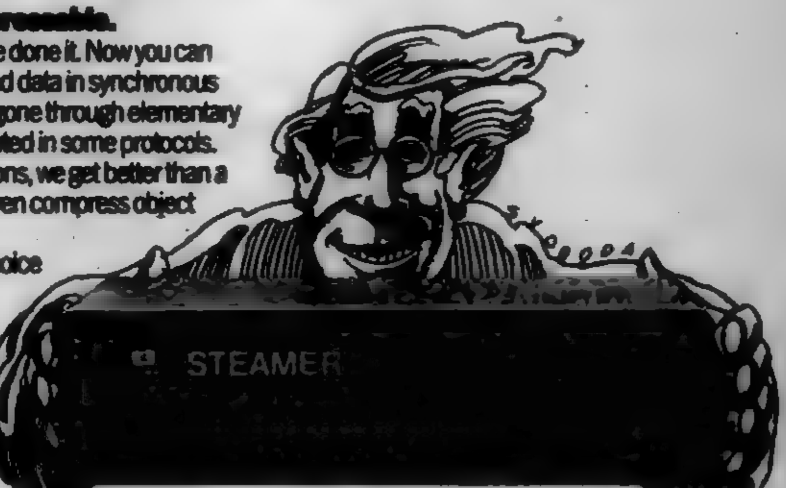

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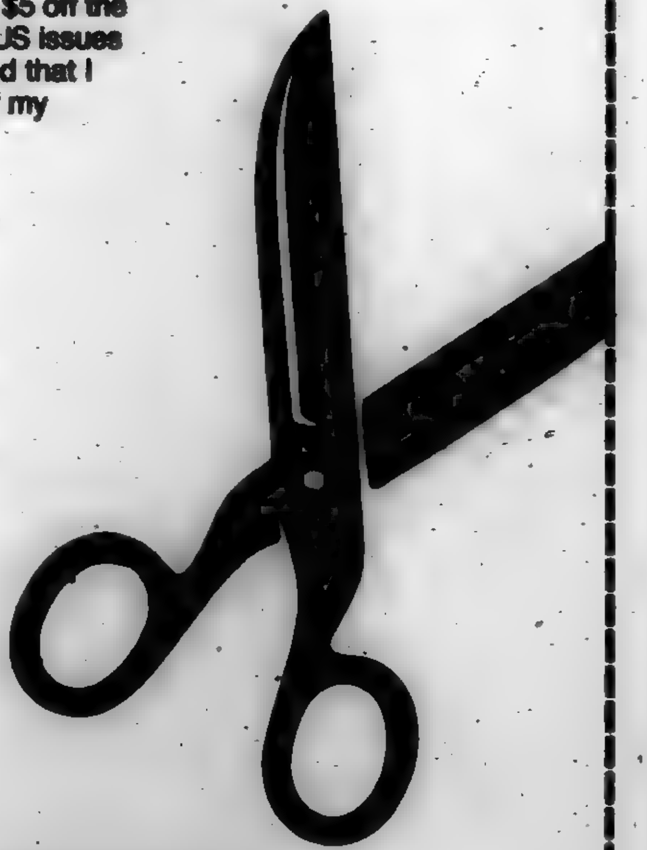

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COMPUTER INDUSTRY

Analyst: Chip market down until 1988

By Clinton Wilder

BOSTON — The worldwide market for semiconductors will not return to its record 1984 levels until 1988, according to Jack Beedle, president of In-Stat, Inc., a Scottsdale, Ariz., semiconductor market research firm.

Beedle, speaking at a recent briefing of the Semiconductor Equipment and Materials Institute, Inc. here, predicted that a coming U.S. recession and the lack of a future chip-based product boom combine to spell continued rough times for U.S. integrated circuit vendors.

"In the computer and computer peripheral industry, a lot of the people who bought vast quantities of chips aren't around anymore," Beedle said. "And there is no new 'hula hoop' — no new super growth market that would support a continuation of runaway semiconductor usage."

Beedle cited handheld calculators, citizens band radios, digital watches, videocassette recorders, video games and microcomputers as products that have driven the semiconductor boom cycles since the early 1970s.

More ominous for the near term are the vast inventories accumulated by major computer manufacturers during the current industry slump. From March 1984 to March 1985, according to In-Stat, Apple Computer, Inc.'s inventory increased by 118%, Data General Corp.'s by 38%, Sperry Corp.'s by 33% and Digital Equipment Corp.'s by 16%. Reducing those stockpiles in a low demand period is a slow process that translates into continued slow sales of chips to computer vendors.

"Computer manufacturers increased their semiconductor purchases by 63.5% in 1984 while the industry grew only 18%," Beedle noted. "That means a lot of unsold equipment." In-Stat has predicted a 53% drop in computer vendors' chip purchases this year and a modest 2.2% decline in 1986 before an upturn the following year.

In other semiconductor market industries, such as industrial and consumer applications, a U.S. slide into recession in the near future will keep a damper on demand, Beedle said.

"The probability of recession looms over everything," he said. "The business expansion cycle, which historically lasts 36 months, has run out of gas. . . . The continuation of economic decay, spilling over into all segments of the manufacturing sector, paints a bleak picture for the semiconductor industry in the near term."

The battle for the shrinking chip market has sparked charges and countercharges between U.S. and Japanese vendors over pricing and trade barriers [CW, Sept. 2], but Beedle claimed the Japanese import issue is a very small part of U.S. chip makers' current woes.

"I really don't think these suits will amount to much," he said. "If they're talking about drastic price cutting, everyone does it."

■ The ax from IBM's contract termination fell on 160 employees at Computer Memories/118

■ Eleven hardware vendors have formed a trade group to seek and promote non-Unix data base standards/120

■ AT&T and the Spanish telephone company received the go-ahead to make Cmos chips in Spain/122

GEM buoys Digital Research

Firm looks to corporate sales to boost revenue

By Eric Bender

FRAMINGHAM, Mass. — Shifting its emphasis from microcomputer systems software to applications packages in the past year, Digital Research, Inc. experienced a sharp downturn in sales and slashed its work force by more than half, from more than 600 people to less than 300.

But the Monterey, Calif., firm has seen strong demand for its Graphics Environment Manager (GEM) applications, with 30,000 units shipped in the first 90 days of deliveries, company President John Rowley said in an interview recently.

Additionally, a $10 million cash infusion from Motorola, Inc. and Northern Telecom, Inc. announced in July leaves Digital Research well funded for its thrust into the applications market, Rowley emphasized in an interview here recently.

"A year ago at this time, 80% of our sales was system software for OEMs, and 20% was retail," with retail business split between graphics applications and system and language products, Rowley said. Digital Research's current new business in the U.S. is about 60% retail, almost exclusively GEM applications, and 40% OEM.

He declined to give specific financial figures, stating only that Digital Research showed the highest sales figures for its fiscal year ended Aug. 31 in the fourth quarter and that he expects the current quarter

Continued on page 131

Downturn seen in service bids

By Peter Bartolik

The bid offers for third-party service companies may have already exceeded the value of such acquisitions, according to a planning executive with one of the first large systems vendors to move toward integrated systems services.

William E. Charlton, vice-president of marketing and business management operations with Honeywell, Inc.'s Customer Services Division, said in a recent interview that sales prices for third-party service organizations will probably recede to more realistic levels.

Honeywell's Customer Services Division has been involved in third-party service

Continued on page 130

Lotus position inconsistent

INDUSTRY INSIGHT
Peter Bartolik
and Clinton Wilder
CW Staff

What's good for the goose isn't good for the gander.

Lotus Development Corp. insistently holds to its policy of not granting site licenses to large users of its 1-2-3 and Symphony products. But if you want to sell something to Lotus, a different rule applies.

In an interview with the *The Boston Globe* recently, former Software Arts, Inc. Chairman and Visicalc co-developer Daniel S. Bricklin said he is developing a program for software developers, and Lotus, which bought Software Arts' assets and employed Bricklin until Sept. 1, will be a tester and first user. Bricklin said Lotus will receive a site license to use the product and a copy of source code for internal use.

●

The public relations fickle finger of fate award this week goes to Digital Equipment Corp. Attempting to track down a spokesman recently, a reporter was informed that the DEC man was at a press conference. Asked what the press conference concerned, the DEC employee informed the member of the press that, "I don't think I'm at liberty to tell you."

Good thing salesmen don't use that approach with customers.

●

At a recent press briefing in Boston, Varian Associates' Executive Vice-President Larry Hansen called for an end to trade barriers, but it was a plea with a different twist. Hansen said the biggest roadblock

Continued on page 131

PE looks to new products as buffer against slump

NORWALK, Conn. — Bucking a depressing trend for minicomputer and semiconductor vendors, Perkin-Elmer Corp. recently reported operating profits were up 38% for the year ended July 31 and up 20% for the fourth quarter, although net profits declined in the last quarter compared with last year's results.

Horace G. McDonnell, chairman and chief executive officer of the company, said in a statement announcing the results that economic conditions have weakened in recent quarters, but the company "hopes to counter these trends with new products and more focused marketing." He added that it seems clear a more difficult period is ahead.

The company posted operating profits for the year of $134.2 million, compared with $97.4 million the previous year. Operating profits in the fourth quarter were $40.3 million, up from $33.5 million a year earlier.

Net profits, including extraordinary items both years, were $82.1 million, or $1.84 per share, for the year just ended, compared with $66.1 million, or $1.49 per share, in the previous year. Excluding the extraordinary items, 1985 profits would be $1.77 per share, compared with $1.30 per share in 1984.

In the fourth quarter, net profits were $24.3 million, or 54 cents per share, down from year-earlier net profits of $29.1 million, or 66 cents per share. Excluding extraordinary items, fourth-quarter profits would be 56 cents per share, compared with 47 cents per share a year earlier.

Revenue in the fourth quarter was up approximately 3% to $350.2 million, compared with $340 million in the last quarter of 1984. For the year, revenue was up 10% to $1.3 billion, compared with $1.18 billion in 1984.

CMI lays off 160 employees in wake of lost IBM contract

CHATSWORTH, Calif. — Computer Memories, Inc. (CMI), which recently announced that IBM had declined to renew a contract for CMI's microcomputer disk drives, laid off 160 of the 440 employees at its headquarters here.

The contract to supply 20M-byte hard disk drives to IBM expires at the end of this year and accounted for 67% of CMI's sales in the fiscal year ended March 31 and 81% of sales in the quarter ended in June [CW, Aug. 19].

The dismissals took affect Aug. 30, CMI said.

Irwin Rubin, chairman and chief executive officer, said in a prepared statement that the company is seeking to reduce costs in virtually every aspect of its business.

He said the company will continue to concentrate its resources on engineering, product development, sales and marketing.

The company will continue to transfer production functions to its Singapore facility.

According to Rubin, the Singapore facility will soon be able to fill all of CMI's production requirements, including new orders.

Filing software copyrights

SECOND IN A SERIES

By Jerome Roberts
and Michael Brownell
Special to CW

Previously, we discussed steps owners of proprietary software should take to establish copyright. There are also various issues concerning the registration of software with the U.S. Copyright Office as well as an owner's legal remedies to prevent, restrain or recover damages from a copyright infringement.

REGISTRATION

Registration of software at the Copyright Office is not a precondition to owning a copyright. However, several considerations support early registration. An owner must register a copyrighted work prior to commencing an infringement suit relating to that work; moreover, timely registration creates a presumption of copyright validity as well as preserving the availability of several statutory remedies.

Registration involves completing and submitting to the Copyright Office one of several registration forms that it provides, along with a $10 registration fee and a copy of the copyrighted materials. While the registration process was designed to be simple, sometimes software-specific issues, particularly trade secret considerations, can make compliance difficult. Accordingly, the owner may wish to consult an attorney experienced in the software area prior to registering software.

Arguably, filing a source code with the Copyright Office endangers or even forfeits trade secret protection because the source code becomes a public document. However, the Copyright Office has attempted to foreclose the issue altogether by establishing an "alternative deposit" procedure for software containing trade secrets.

To use the alternative deposit option, the owner must advise the Copyright Office in writing that depositing the first and last 25 pages of source code would disclose trade secret material and submit one of the following alternative deposits: the first and last 25 pages of source code with the trade secret code blocked out, the first and last 10 pages of source code in its entirety or the first and last 10 pages of object code and 10 consecutive pages of source code.

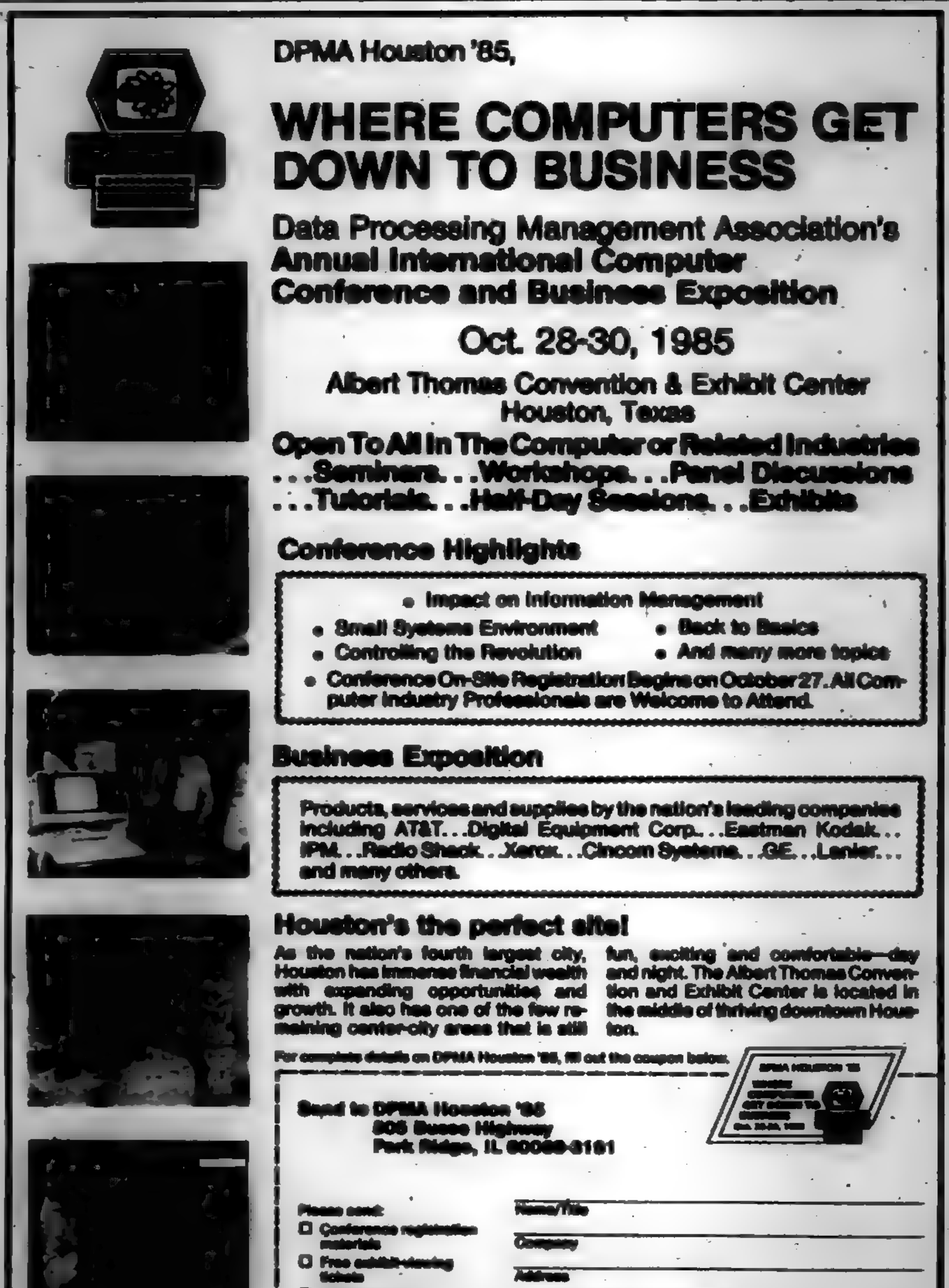
Owners sometimes deposit only object code. Although such a practice serves to lessen the likelihood of trade secret disclosure, it will prevent the Copyright Office from issuing an unqualified certificate of registration.

COPYRIGHT REMEDIES

The unauthorized exercise of any of the owner's exclusive rights constitutes copyright infringement, conferring upon the owner remedies available from federal courts:

- The owner may obtain a court injunction to prevent or restrain the infringing activity and a court order to impound and ultimately destroy the infringing articles.
- The owner may also seek monetary damages equal to its loss and/or the infringer's profits from the infringing activity.
- The owner may request statutory damages in an amount not greater than $50,000, provided the owner has registered the software under the Copyright Act in time to be eligible for statutory damages and provided it is impossible for the owner to prove actual damages.

Roberts and Brownell are attorneys with the law firm of Berman, Roberts & Kelly in Chicago. This firm's practice deals with legal issues relating to procurement, development, distribution, management and protection of computer resources.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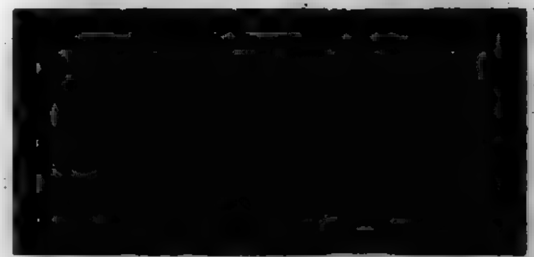

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Mergers, acquisitions growing in info services mart

OUTSIDE LINES
Edward I. Metz

The information services and software industry is one of the most acquisitive in the U.S. economic structure.

According to the Broadview Associates/Association of Data Processing Service Organizations, Inc. Index, an annual recap of merger and acquisition activity in the information services and software industry marketplace, this relatively small ($39 billion in 1984) segment turned in nearly 150 acquisitions for the year, bringing the total for the first half of the decade to 650 completed deals with a total value of more than $6.5 billion. In fact, the information services and software industry acquisition activity is exceeded only by that of the banking and finance communities.

From the buyer's perspective, acquisition continues to satisfy traditional objectives. It provides a relatively low-risk method for adding products, services, markets and technology; a ready-made pool of talented personnel; an opportunity for rapid geographic expansion; and a method of supplementing internal growth to meet ambitious financial objectives.

While return on investment criteria have traditionally been considered, return on investment per se has not been the dominant consideration in the short run. This factor could change in the future as buyers' ranks swell with firms from outside the industry accustomed to slower growth rates and different market conditions that demand more conservative investment considerations.

There's money to be made

From the seller's point of view, enormous personal wealth is being created through these transactions, as more and more entrepreneurial owner/operators achieve financial independence. The acquisition of Electronic Data Systems Corp. (EDS) by General Motors Corp. in 1984 produced more personal wealth for EDS' largest stockholder than the total of the top 50 entrepreneurs who took their companies public during that year.

The high rate of merger and acquisition activities is having a profound effect on the overall structure of the industry. In the past five years, the number of firms with annual revenues in excess of $100 million has more than tripled from 20 companies in 1979 to nearly 70 in 1984. These include some of the most acquisition-oriented firms in the industry, such as Automatic Data Processing, Inc., EDS, McDonnell Douglas Automation Co. and Computer Sciences Corp.

In the past five years, a number of new forces has been at work driving the merger and acquisition apparatus in this industry even harder.

The initial public offering window is closed for all but extraordinary cases, making mergers and acquisitions the only viable alternative for many firms in need of capital infusion.

At the same time, the venture capital community's focus on shoring up their portfolios by pruning the less promising properties will continue to serve as an effective blockade to firms seeking venture capital funding.

With these two avenues blocked at a time when second- or third-round financing is required, dozens and perhaps hundreds of firms will be driven to the merger and acquisition alternative to keep momentum going, if not to stay afloat.

During the past 10 years we have seen aerospace and energy firms enter the market through acquisitions. More recently, publishers, insurance companies, banks and hospital services have joined in, and even more banks are expected to join the fray. Communications firms and hardware manufacturers will almost certainly see more action.

The net result is more acquisitions of smaller services and software firms. These firms offer the acquirer the venue to build complex systems, attract competent information professionals and penetrate specialized vertical market niches. Smaller information services and software industry firms often provide earnings and growth rates far exceeding those in traditional, more mature industries.

Larger firms in this industry are also poised for a higher level of merger and acquisition activity. Others are recognizing the need to shift from functional or cross-industry marketing strategies to vertical industry approaches.

The purging of the micro industry, which began in 1984, will continue for the next several years as the result of far too many products in already saturated distribution channels. Although there will be failures, there will also be some highly creative solutions applied to the bailout and rescue problem. The information

Continued on page 131

Metz is a partner with Broadview Associates, a Fort Lee, N.J.-based firm that specializes in information industry mergers and acquisitions.

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Trade group to develop data base standards

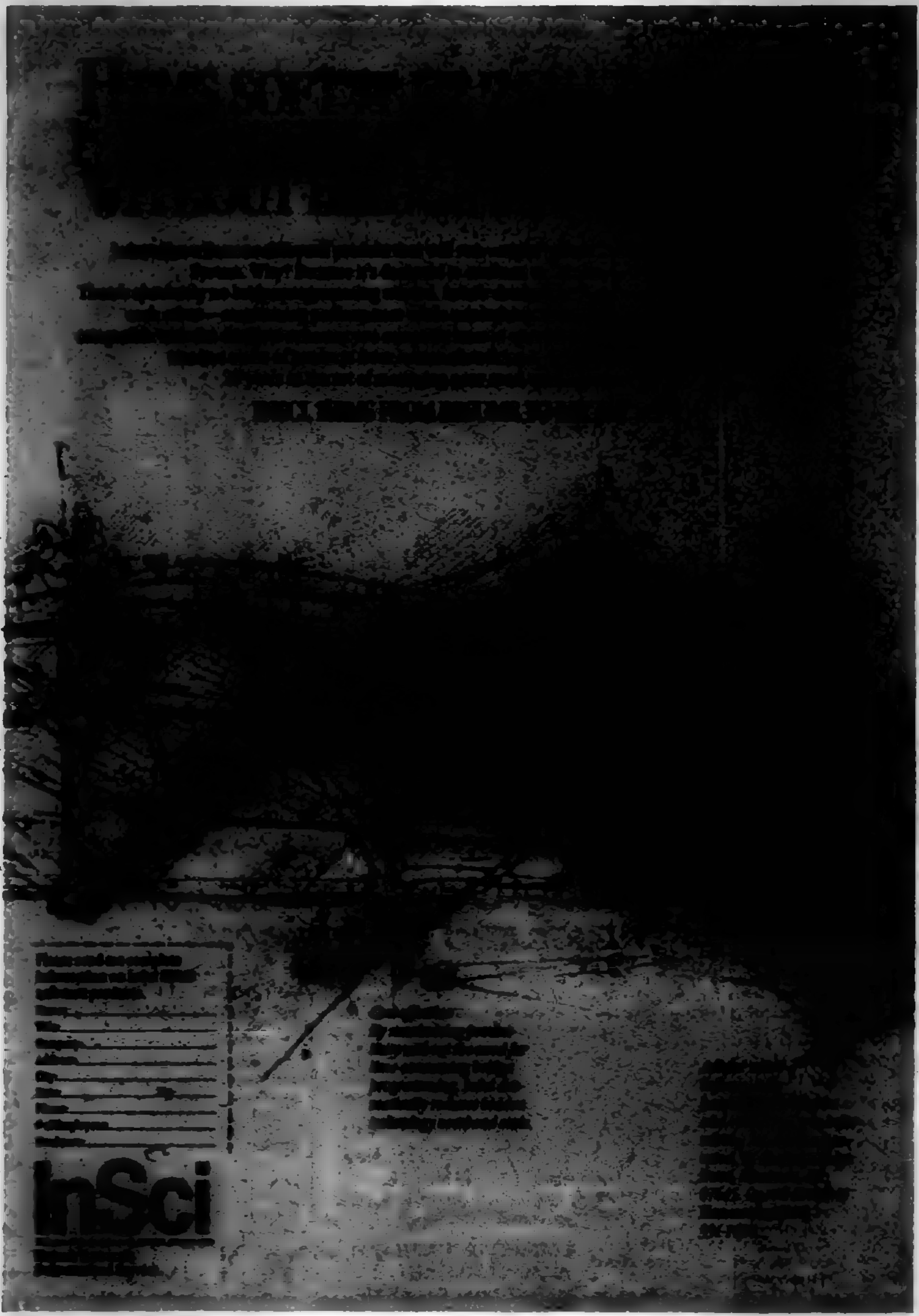
LAS VEGAS — Executives from 11 hardware vendors recently announced here the formation of a trade association to create technical standards for and promote a number of related data base environments.

The group, in announcing its formation, left little doubt that part of its intent is to promote data base environments as a better alternative to AT&T's Unix and variants.

"The operating systems we use are closely related to each other," said Leonard M. MacKenzie, chairman of General Automation, Inc. and acting chairman of the new association. "There is at least as much transportability between these sophisticated relational data base managers as there is in the so-called Unix world."

Hosting the meeting of the vendors and named as the association management company for the group was the International Data Base Management Association, a trade group devoted to promotion of Pick Systems, Inc. Pick operating system-based machines and variants.

Firms represented at the meeting were CDI Information Systems, Inc.; CIE Systems, Inc.; Cosmos, Inc.; Datamedia Corp.; Fujitsu Ltd.; General Automation, Inc.; McDonnell Douglas Computer Systems; Nixdorf Computer Corp.; Prime Computer, Inc.; Systems Management, Inc.; and Ultimate Corp.



Tandon cuts work force by 131

CHATSWORTH, Calif. — Disk drive manufacturer Tandon Corp. recently announced the layoff of 131 employees, most of them from manufacturing positions.

The company said the cutbacks resulted from a decision to combine its floppy disk drive manufacturing and engineering operations, previously located at company headquarters here, with its Winchester disk drive operations in Simi Valley, Calif.

The company said the action reduces its domestic work force to about 1,000 people. The company, which has suffered financial setbacks in recent quarters due to a transition to new products, has located much of its production offshore.

Shareholders OK Harvard Software sale

MOUNTAIN VIEW, Calif. — The shareholders of Harvard Software, Inc. approved the company's acquisition by Software Publishing Corp. late last month, marking the final step in the $4.2 million purchase.

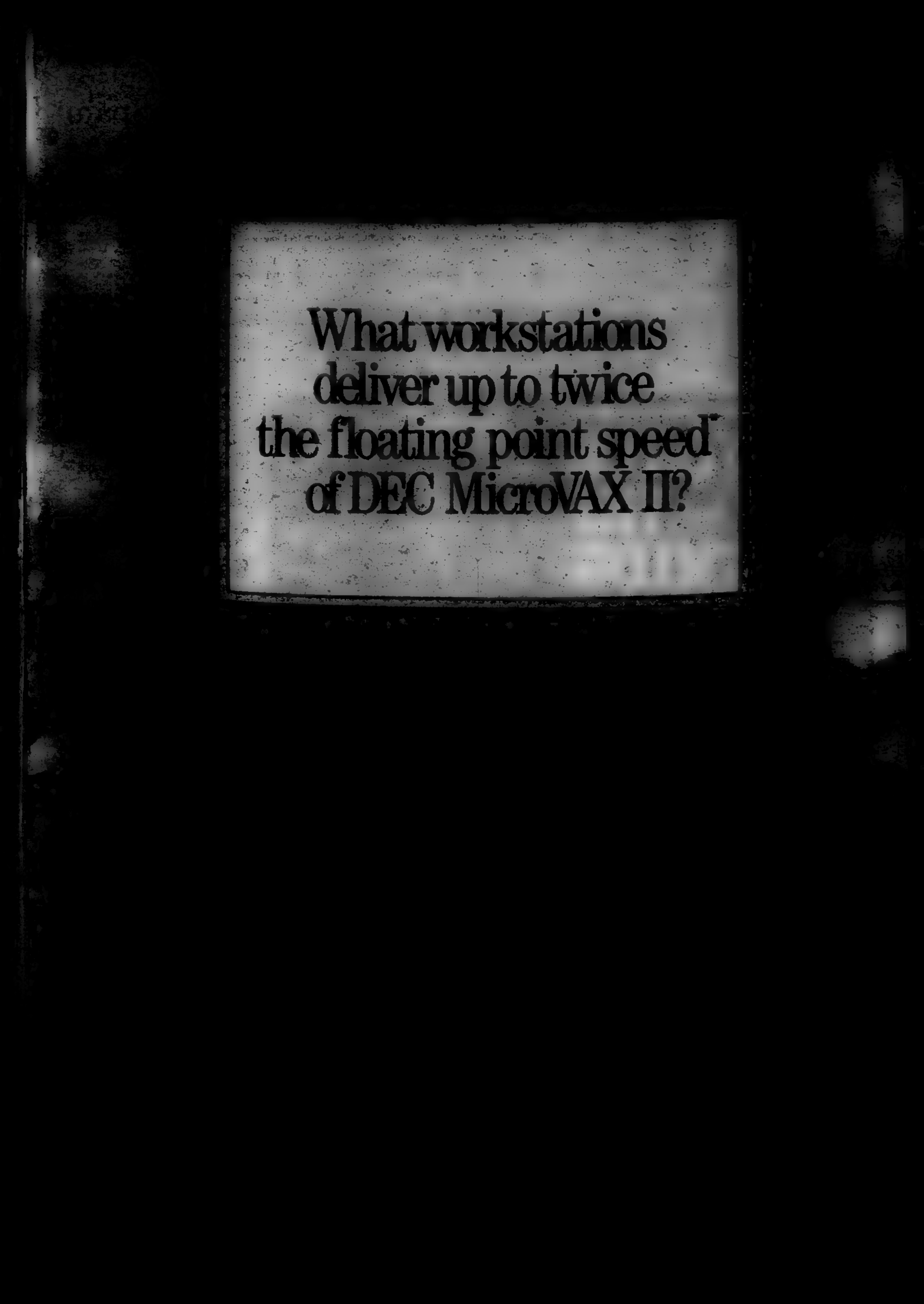
The shareholders agreed to terms under which they will receive 400,000 shares of Software Publishing, the developer based here of the PFS series of business microcomputer software.

Software Publishing has closed Harvard Software's former headquarters in Littleton, Mass., and has moved the operation to California. Software Publishing will market and sell Harvard's Project Manager and Total Project Manager software from the West Coast office.

Software Publishing retained only eight of Harvard's 30 employees. Those who were not retained were offered severance packages.

In another development, Software Publishing recently sold its Power Up! division to a new spin-off firm, of which it owns 10%. The firm, Channelmark Corp., will sell accessory software "the way L.L. Bean sells outdoor gear," according to President Edward Lauing, former head of Software Publishing's catalog division.

Channelmark will move next week from Software Publishing's headquarters to a new office in San Mateo, Calif.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the floating point speed*
of DEC MicroVAX II?

Hitachi to purchase U.S.-made products

Datacom, Microsoft gain major contracts

NEW YORK — Datacom Industries, Inc. of Middlebury, Conn., and Microsoft Corp. of Bellevue, Wash., were among the contract winners as Hitachi Ltd. recently announced agreements to purchase $25 million worth of U.S.-made computer and electronics products.

The Japanese industrial giant said it will announce additional contracts with U.S. vendors totaling $15 million in the next two months, part of its plan to buy $400 million worth of U.S. products in fiscal 1986.

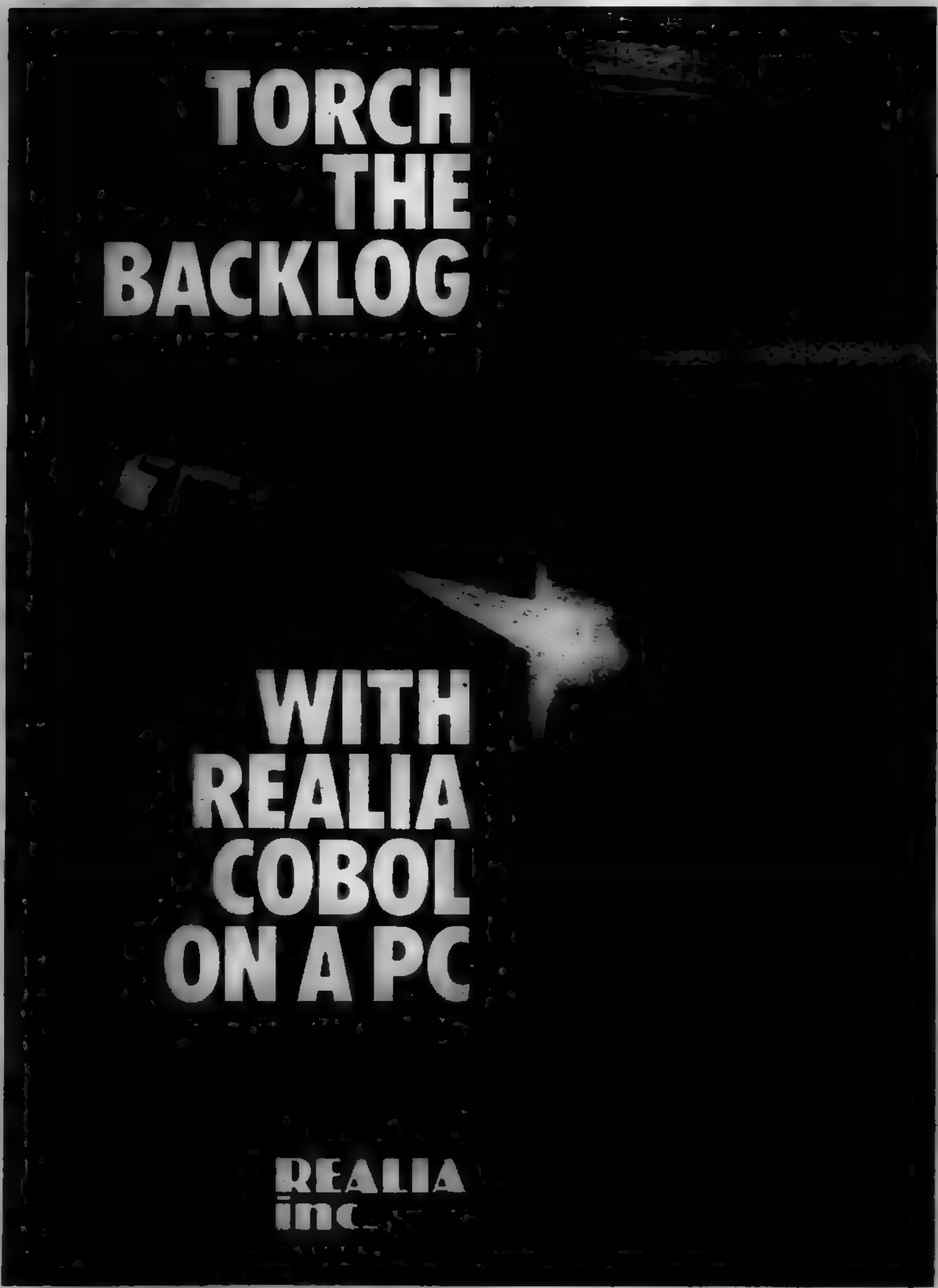
Datacom Industries, with a contract worth $4 million, and Technology for Communications International, Inc. of Mountain View, Calif., with a $3 million contract, shared Hitachi's $7 million purchase in the telecommunications field.

Microsoft's $2.3 million contract represented the lion's share of Hitachi's $4.3 million investment in industrial components and other products, which include software.

The largest product category involved in the purchases was manufacturing, research and development equipment, in which Hitachi signed contracts worth $12 million and reached agreement on $15 million in additional contracts to be announced.

Major U.S. vendors included were Digital Equipment Corp. with a $1 million contract, Hewlett-Packard Co. with a contract worth $1.3 million, Genrad, Inc. with a $1.3 million contract and Tektronix, Inc., which won a $700,000 contract.

Notably absent from the purchase list were U.S. semiconductor manufacturers, some of which have accused Hitachi of predatory pricing and other unfair trade practices in their campaign for greater access to Japanese markets. Hitachi Executive Vice-President Shiro Kawada said the company will be sending an "import promotion team" to the U.S. by the end of the year specifically to purchase U.S.-made chips.



AT&T Spain venture gets U.S. license

BERKELEY HEIGHTS, N.J. — AT&T announced recently it has received a U.S. Department of Commerce project license required to begin construction of a proposed semiconductor plant in Spain.

AT&T said the license marks formal approval to move forward with plans for a joint venture with Telefonica, Spain's national telephone company.

The venture, called AT&T Microelectronics Espana, will be located outside of Madrid, and the plant is scheduled for completion in 1987, a spokesman said.

The plant will manufacture Cmos integrated circuits. AT&T said the venture will employ approximately 700 people and will not have any adverse impact on AT&T's domestic work force.

NAS announces Korean venture

MOUNTAIN VIEW, Calif. — National Advanced Systems Corp. (NAS), the mainframe manufacturing subsidiary of National Semiconductor Corp., recently announced the formation of a joint venture company with Hyosung Corp. of Seoul, South Korea, to distribute NAS data processing equipment in the Republic of Korea.

Hyosung is a $2 billion diversified manufacturing company with more than 20 subsidiaries producing a broad range of products, including some DP equipment.

The joint venture began operations Aug. 29. At the same time, Hyosung-NAS announced its first sales, an AS/8083 system purchased by the South Korean government for the Korea Advanced Institute of Science and Technology and an AS/6630 purchased by Tongyang Nylon Co.

Xebec settles with Miniscribe

SAN JOSE, Calif. — Xebec Corp. and Miniscribe Corp. recently announced an out-of-court settlement of a disputed $2.2 million contract on which litigation had been pending since April.

Miniscribe, of Longmont, Colo., had sought to collect the amount from Xebec, which had contracted to purchase Miniscribe's 5¼-in., 10M-byte disk drives.

In a counterclaim, Xebec, based here, had charged that Miniscribe broke the contract by changing the specifications and performance of the drives.

In the settlement, Miniscribe agreed to offer Xebec price discounts and most-favored-customer status.

What workstations deliver up to six times the speed of IBM PC/AT?

Dyna found guilty of copyright violations

SANTA CLARA, Calif. — computer retail store has been ordered to forfeit its entire inventory of alleged Taiwanese copies of Hercules Computer Technology, Inc. graphics cards.

In an Aug. 5 ruling in U.S. District Court in San Jose, Calif., Judge William A. Ingram ruled that retailer Dyna Systems violated trade, copyright and unfair competition laws by selling copies of the Hercules Graphics Card, a monochrome graphics expansion board for the IBM Personal Computer.

Dyna Systems, a single-store operation, was ordered to pay Hercules' legal expenses for the July 5 suit and turn over the boards, software diskettes and operating documentation to Hercules for either destruction or disposal.

'Unfair competition'

"It was unfair competition and was causing confusion in the marketplace," said Michael W. Hall, attorney for Berkeley, Calif.-based Hercules.

"The strategy of Hercules is to go after stores that are selling rip-off copies of our products. We will be watching the marketplace and will monitor complaints from our customers to ensure they are not using copied products," Hall added.

Hall said he did not know the number of boards that Dyna Systems will turn over to Hercules.

Franklin pays debts, issues stock

PENNSAUKEN, N.J. — Franklin Computer Corp. recently issued more than 70,000 shares of its common stock to creditors in the latest phase of its bankruptcy reorganization plan.

The vendor of Apple Computer, Inc.-compatible microcomputers issued the shares to 500 creditors to settle approximately $7 million in debts by issuing one share per $100 of debt. Under its reorganization plan approved by the federal Bankruptcy Court in Philadelphia last February, Franklin may issue up to 250,000 shares to settle its accounts.

The creditor-shareholders will share ownership of the company with management and the New York venture capital firm of Renaissance Technologies. Renaissance partner Morton E. David is Franklin's chairman, chief executive officer and president.

In order to reemerge in the personal computer market, Franklin plans to shift much of its production to the Far East.

Last month, Franklin acquired Cord Electronics, Inc. of Westbury, N.Y., an OEM vendor of electronic components and subassemblies from its plants in Japan, Taiwan, Hong Kong and South Korea. "It is anticipated that a substantial portion of Franklin's future product lines will be manufactured in Asia," according to a spokesman.

Franklin is expected to announce a microcomputer product line, the Ace 2000 series, later this month.

NICKELS AND DIMES

Xidex Corp. reported revenue for the fiscal year of $259.5 million, an increase of 46% over the $178.2 million for the previous year. Profits for the year were $24.5 million, or 81 cents per share, compared with $24 million, or $1.06 per share, in the like period one year earlier.

Revenue for the quarter ended June 30 was $88.4 million, up 73% from $51.2 million for the same three months a year ago. Profits were $7.9 million, or 19 cents per share, compared with $6.4 million, or 28 cents per share, in the comparable period one year earlier.

■

Trilogy Ltd. reported rev-

See DIMES page 126

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DIMES

from page 124

enue for the second quarter of $1.4 million, compared with $4.3 million in the like quarter one year ago. The company reported a net loss of $3.4 million, or 10 cents per share, compared with a net loss of $59.3 million, or $1.57 per share, in the corresponding quarter one year earlier.

■

Timeplex, Inc. announced revenue for the year ended June 30 of $96 million, an increase of 45% over the fiscal 1984 revenue of $66 million. Profits were $10 million, or $1.15 per share, compared with $1.1 million, or 13 cents per share, in the same quarter last year.

Revenue of $26.3 million for the fourth quarter of fiscal 1985 increased 36% over $19.3 million for the same quarter a year ago. Quarterly profits were $2.4 million, or 28 cents per share, compared with $1.9 million, or 22 cents per share, in the comparable quarter last year.

■

Network Systems Corp. reported revenue for the second quarter ended June 30 of $24.3 million, up 51% from $16 million a year ago. Profits for the quarter were $5.3 million, or 18 cents per share, compared with $3.4 million, or 12 cents per share, one year ago.

■

Endata, Inc. announced second-quarter revenue results of $12.8 million, compared with $12.4 million in the corresponding quarter last year. Net income was a loss of $354,000, or 8 cents per share, compared with profits of $581,000, or 14 cents per share, in the comparable quarter one year earlier.

Computer Memories, Inc. reported revenue for the first quarter of fiscal 1986 of $50.5 million, an increase of 164% over $19.1 million in revenue for the comparable quarter last year.

Profits were $4.8 million, or 43 cents per share, an increase of 408% over $948,000, or 9 cents per share, in the like period one year earlier.

■

Masstor Systems Corp. reported a net loss of $3.4 million, including $2.5 million in operating losses, in its second quarter ended June 30, compared with a net loss of $5.3 million in the same period a year ago.

Second-quarter revenue rose to $8.1 million, compared with $4.7 million the second quarter last year.

■

Archive Corp. announced profits of $15.8 million for the third quarter ended June 28, an increase of 55% from the $10.2 million reported a year ago.

Profits for the quarter were $383,000, or 4 cents per share, from the $636,000, or 6 cents per share, reported a year ago.

■

Research, Inc. reported a 233% increase in profits for the fiscal year ended June 30 of $19 million, or $1.96 per share, compared with $5.7 million, or 69 cents per share, in the corresponding period one year ago. Revenue was $138.6 million, compared with $63.8 million in the prior year's quarter.

Fourth-quarter profits were $6.7 million, or 61 cents per share, on revenue of $42.4 million, compared with profits of $1.7 million, or 20 cents per share, on revenue of $23.8 million in the comparable period one year ago.

■

Seagate Technology, Inc. reported profits for the fourth quarter of $712,000, or 1 cent per share, including a tax benefit of $1.7 million; in the year-earlier period, the company reported profits of $10.5 million, or 22 cents per share. Revenue was $71.8 million, down from $100.5 million in the like quarter last year.

Despite a pretax loss of $10.2 million for the year ended June 30, net profits were $1 million, or 2 cents per share, including a tax benefit of $11.3 million; in the previous year, net profits were $39.4 million, or 84 cents per share. Revenue for the year was $214.6 million, compared with $343.9 million the previous year.

■

Xicor, Inc. reported revenue for the second quarter ended June 16 of $6.5 million, compared with $8.6 million last year. The firm posted a loss of $4.6 million, or 40 cents per share, compared with a net income of $1 million, or 9 cents per share, in the same quarter one year ago.

■

VLSI Technology, Inc. announced second-quarter revenue of $19.6 million, compared with $17.6 million a year ago. Profits for the quarter ended June 30 were $115,000, or 1 cent per share, compared with $2 million, or 10 cents per share, in the comparable period one year ago.

■

Duquesne Systems, Inc. reported revenue for the third quarter ended June 30 of $2.9 million, up 48% from $1.9 million for the same period a year ago. Profits for the quarter were $563,000, or 26 cents per share, compared with $390,355 or 19 cents per share, in the like period a year ago.

■

Tseng Laboratories, Inc. announced revenue for the second quarter ended June 30 of $719,982, a 33% increase from $539,828 in the same period one year earlier. Profits for the quarter were $82,385, or 5 cents per share, compared with $58,235, or 2 cents per share, in the corresponding period last year.

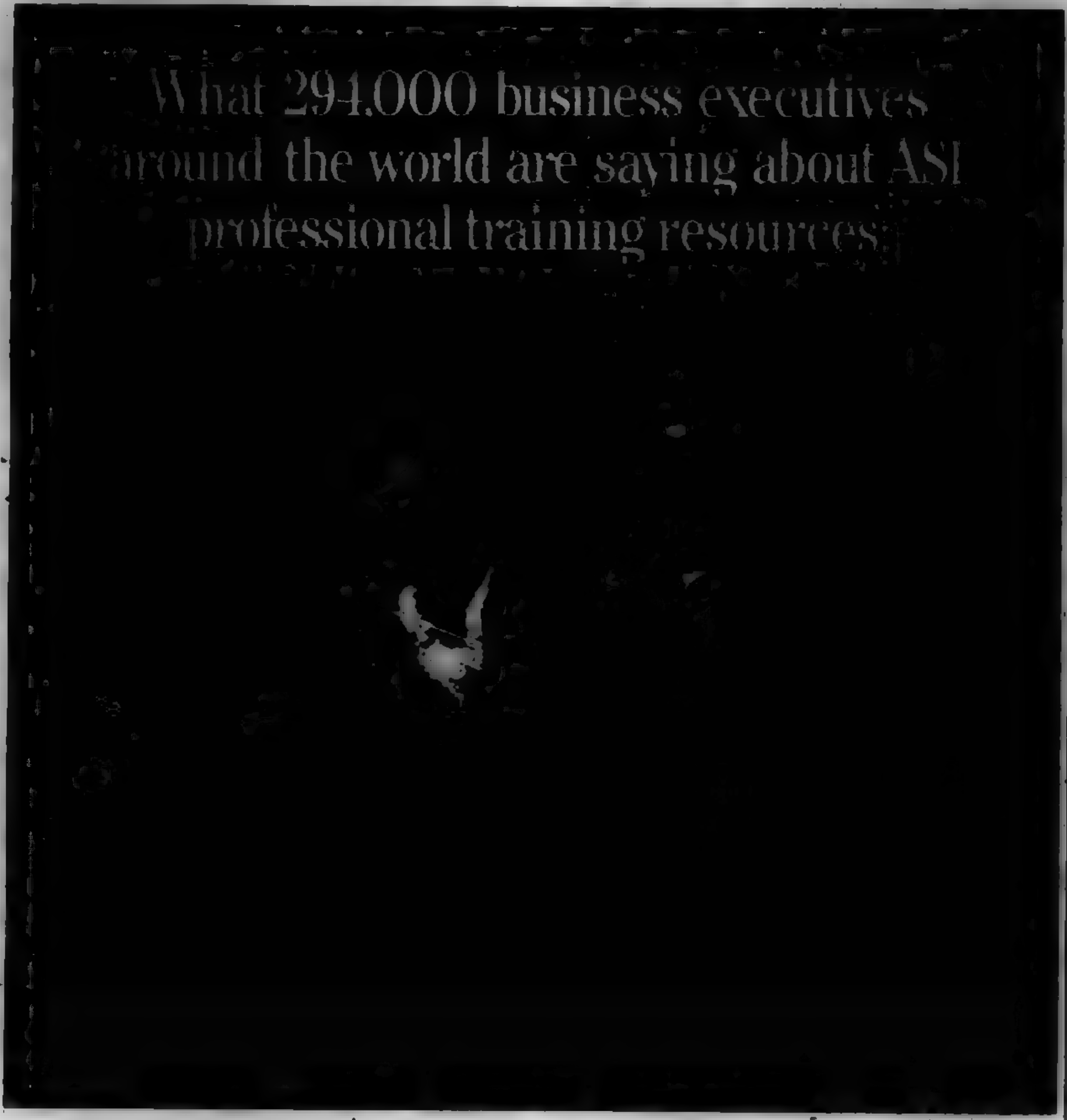
■

IPL Systems, Inc. reported a loss of $471,000, or 9 cents per share, on revenues of $520,000 for the quarter ended June 29. A year earlier, the company reported a loss of $2.3 million, or 46 cents per share, on revenue of $1 million.

■

Cambex Corp. reported a net loss of $383,000, or 20 cents per share, compared with profits of $71,000, or 4 cents per share, in the same quarter

See DIMES page 130



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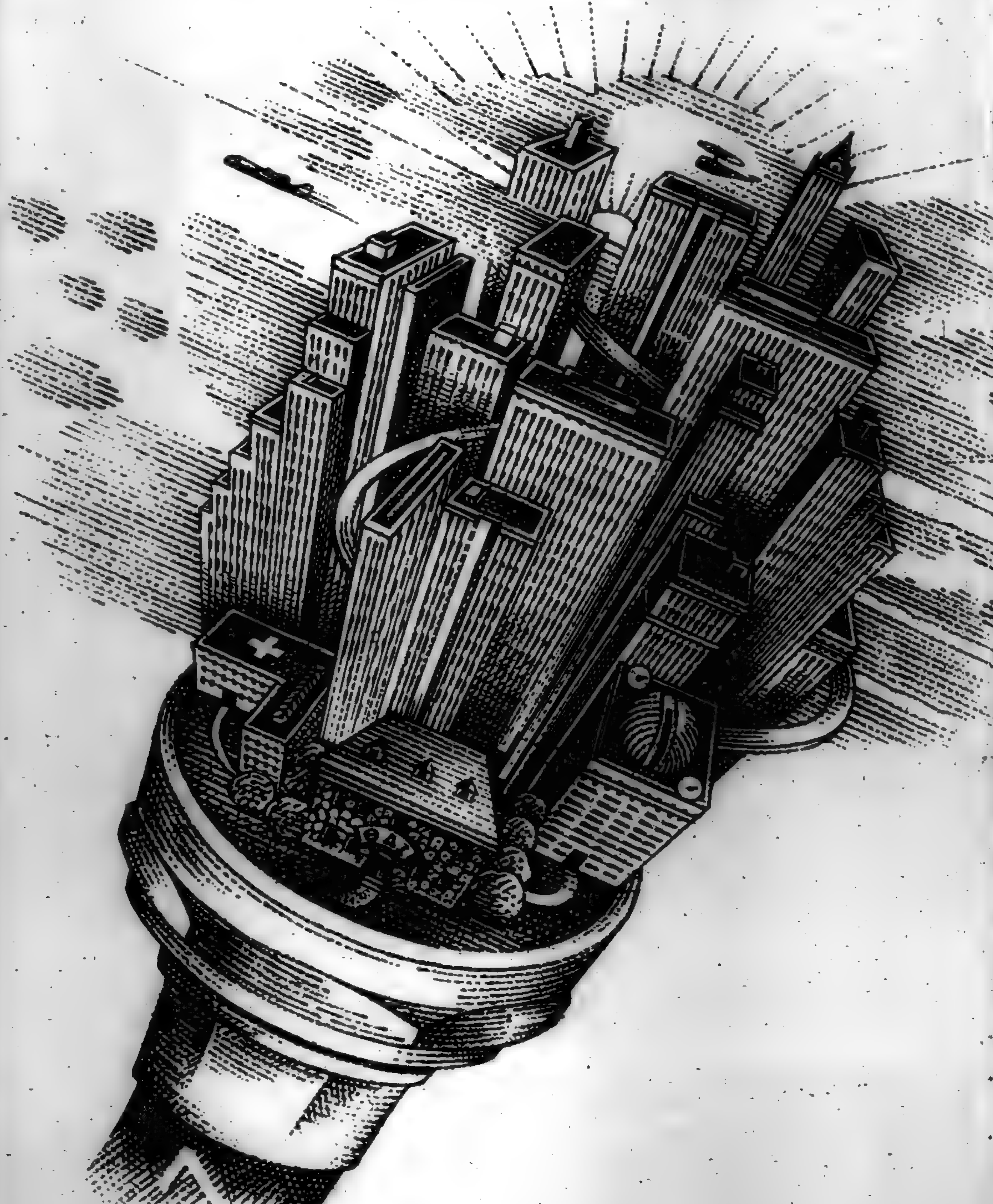

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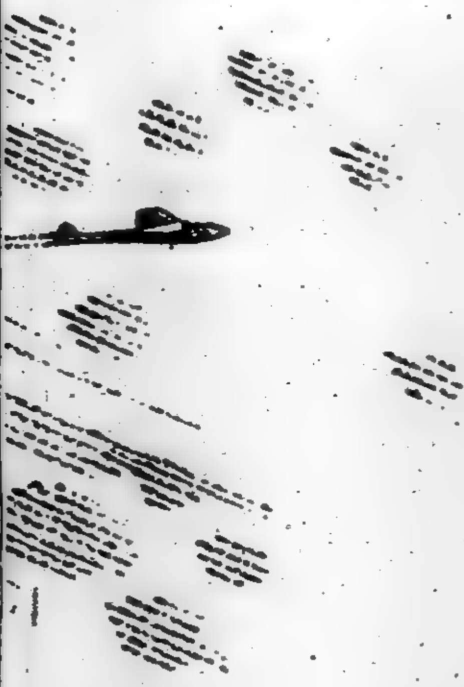

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DIMES

from page 126

last year. Revenue was $103.1 million, compared with $1.5 million last year.

■

GTE Corp. reported profits for the second quarter totaled $286 million, or $1.33 per share, compared with $283 million, or $1.41 per share, in the same quarter last year. Revenue was $3.9 billion, compared with $3.6 billion a year ago.

■

Systematics, Inc. posted revenue for the year ended May 31 of $96.9 million, compared with $78.7 million last year. Profits were $8.6 million, or 79 cents per share, compared with $6 million, or 56 cents per share, in the previous year. Fourth-quarter revenue was $26.9 million, up 30.2% from $20.7 million in the same quarter last year. Profits were $2.6 million, or 24 cents per share, compared with $1.7 million, or 15 cents per share, in the like quarter one year ago.

■

Nashua Corp. reported profits for the second quarter ended June 28 of $3.9 million, or 81 cents per share, compared with $6.2 million, or $1.31 per share, last year. Revenue was $153.9 million, compared with $146 million reported in the second quarter of last year.

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From page 115

Downturn seen in service bids

for more than two years, after the company made the strategic decision to try and capitalize on the service organization it built to maintain its own products [CW, March 5, 1984]. With hardware prices declining and equipment becoming more dependable, asset utilization requirements essentially dictate that systems vendors attain higher service force productivity by maintaining equipment sold by other vendors.

The $179 million that Bell Atlantic Corp. paid last year for Management Assistance, Inc.'s Sorbus, Inc. service division and the $177 million bid that TRW, Inc. recently [CW, Aug. 26] offered for the Intelogic Trace, Inc. service spin-off of Datapoint Corp. have added impetus to the race to build nationwide organizations that can service integrated systems incorporating equipment from many vendors.

Prices outpace value

But in Charlton's view, those prices have outpaced the value of the acquisitions. "At some point, the law of supply and demand will take hold, and the value of these deals will get back to a realistic level."

TRW's recent offer could prove to be a problem for a company that has traditionally expanded through acquisition, according to Charlton. By bidding up the cost of such deals, TRW may actually make its long-term acquisition strategy too expensive, he speculated.

Some consolidation in the burgeoning service industry is inevitable, according to Charlton. But he said he thinks greater attention will be devoted to the actual profit and loss potential of the acquisition target.

Complete service

The ultimate goal of the leading tier of service companies is to be able to establish a nationwide organization capable of offering complete maintenance service to any particular business. All major vendors — even IBM to a limited extent — are moving toward offering complete service for equipment tied into their own proprietary products.

Among the large vendors, Control Data Corp., Sperry Corp., NCR Corp. and even AT&T have moved into or are exploring the profit potential of integrated service.

Charlton said that, given the continued performance and dependability of hardware, "service companies will be transitioning to software support, networking and communications support, as opposed to hardware."

Although service of large numbers of commodity machines, such as microcomputers, will always be selected based mainly on pricing, the service of integrated information systems is increasingly selected based on the ability to obtain on-site service and keep the system running, he said.

No easy feat

Putting together a nationwide organization capable of servicing varied software in large businesses is no easy feat, however. Honeywell's approach, according to Charlton, is to build up to that capability.

One key aspect, he said, is developing agreements with value-added resellers to provide complete service for the integrated systems those suppliers provide.

In addition to third-party agreements signed with more than 40 hardware suppliers, the Customer Services Division has signed up more than 60 value-added resellers, distributors and dealers that offer their customers Honeywell service contracts. Another aspect of the Honeywell strategy is its nationwide remote diagnostic service, which is much more effective for dealing with software service than hardware service, according to Charlton.

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From page 119

Mergers, acquisitions on the rise

services and software industry's 35-year history has seen few, if any, significant failures.

There remain several thousand companies that fall into the less than $10 million revenue class. Although these smaller firms have provided a comfortable living for their founders and have continued for 15 or 20 years as reasonably stable enterprises, current market conditions are forcing drastic changes in the way these companies operate.

These firms are major acquisition targets for the last half of the 1980s, as their founding entrepreneurs begin to examine methods of achieving liquidity and diversification of their portfolios.

The industry as a whole is alive, vital and growing in importance annually. Continued consolidation through the merger and acquisition process will help keep it so for the remainder of this decade.

From page 115

Lotus position inconsistent

to selling semiconductor manufacturing and fabrication equipment overseas comes not from the Japanese, but from the U.S. government.

Because of U.S. Department of Defense security regulations, any export of new, sophisticated chip making technology requires the acquisition of a license for the particular buying country. That translates into the inevitable delays of the bureaucratic red-tape labyrinth — up to 18 months in many cases, according to Hansen. And we're not talking about sales to Libya or Iran but to France, Japan and other allies.

The DOD obviously can't regulate everybody, so it is a simple process for the buying nation to obtain similar technology from someone else — a West German vendor, for example — rendering the security risk issue essentially moot.

"When we're trying to compete against a country, Japan, whose government subsidizes its companies, the actions of our own government are really counter to our efforts," Hansen said.

●

Although Franklin Computer Corp. of Pennsauken, N.J., appears to be climbing back admirably from the depths of Chapter 11 protection under the Federal Bankruptcy Act, its unbridled press release optimism seems a little premature. In a recent public relations document, Franklin Chief Executive Officer Morton David talked about "embarking on the adventure of the second wave of growth in the personal computer market."

The adventure part seems credible enough, if adventure means not being exactly sure where those stormy seas will take you. If nothing else, the past and present computer industry shakeout should have sobered everyone into a more realistic view of future demand, growth rates and customers' real needs.

But the implication that the next computer boom is just over the horizon sounds ominously like the would-be computer gurus of the early 1980s who are busy eating their words — and going into consulting.

From page 115

GEM buoys Digital Research

to be profitable.

Rowley predicted that, in the U.S. market, Digital Research's future system software revenue figures will be roughly flat, with growth coming in the applications market. "GEM brings us right into the mainstream of the IBM environment," he said. "Our target market is the Fortune 2000."

In this arena, "an absolute trend is that the information center and the DP manager are getting control of purchasing," he noted. Digital Research currently is finalizing details for a number of site licensing options, which will be released this month.

The firm has demonstrated GEM to the 50 largest corporate users of personal computers, often in conjunction with IBM, he said. IBM's National Accounts Marketing Division "has worked closely with [Digital Research] since we introduced the product."

IBM's reported offer downplayed

Rowley downplayed recent press reports that IBM prepared to offer GEM as a third-party product and then withdrew that endorsement. The two firms have signed an agreement covering a number of software offerings, he said. "The products that do compete are [Digital Research's] Concurrent PC-DOS and Topview," he remarked. "If there's any problem, that's what it is."

The development deal announced last month between IBM and Microsoft Corp. for future Personal Computer system software products simply "reports an extension to a five-year contract," Rowley suggested. "In terms of its impact on us, that's already been felt."

At present, 17 firms have signed OEM agreements for GEM worldwide, and 65 independent software vendors are developing packages for the GEM environment. Rowley estimated that about 100 GEM applications will be available by December, with at least half coming from European firms.

Digital Research will ship two additional GEM applications, GEM Wordchart and GEM Graph, in October, while several other products are well along in development.

"The next generation of software will move heavily into the graphics enhanced segment," he said. "Data bases and spreadsheets are logical targets."

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Expanding R & D Center seeks software developer using high level languages (C, ADA, FORTRAN). Numerical and functional analysis and excellent communication skills a must. Establish discretization schemes (Time & Space) and develop algorithms. Masters or PhD in Computer Science, Math or Mechanical Engineering. 10 years +. Fee Paid. $60,000

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New York, NY 10036
(212) 221-6500

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Company in McAllen, TX seeking strong COBOL prog with HP3000. Third generation languages TRANS and ACT necessary. Some travel, great benefits. To $30,000

SYSTEMS PROG

San Antonio-based health care center seeking systems prog with exp in installation, customization and troubleshooting in DOS/VSE, VM/SP, CMS and TSO. To $35,000

PROG/ANALYST

Galveston-based firm seeking prog with life insurance bkgrd. COBOL with IMS DB/DC, OS/MVS and IBM 30XX skills mandatory. Good benefits. To $34,000

Scott McCullough
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of Austin
400 E. Anderson La. #[illegible]
Austin, TX 78752
(512) 836-0[illegible]

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ANALYST

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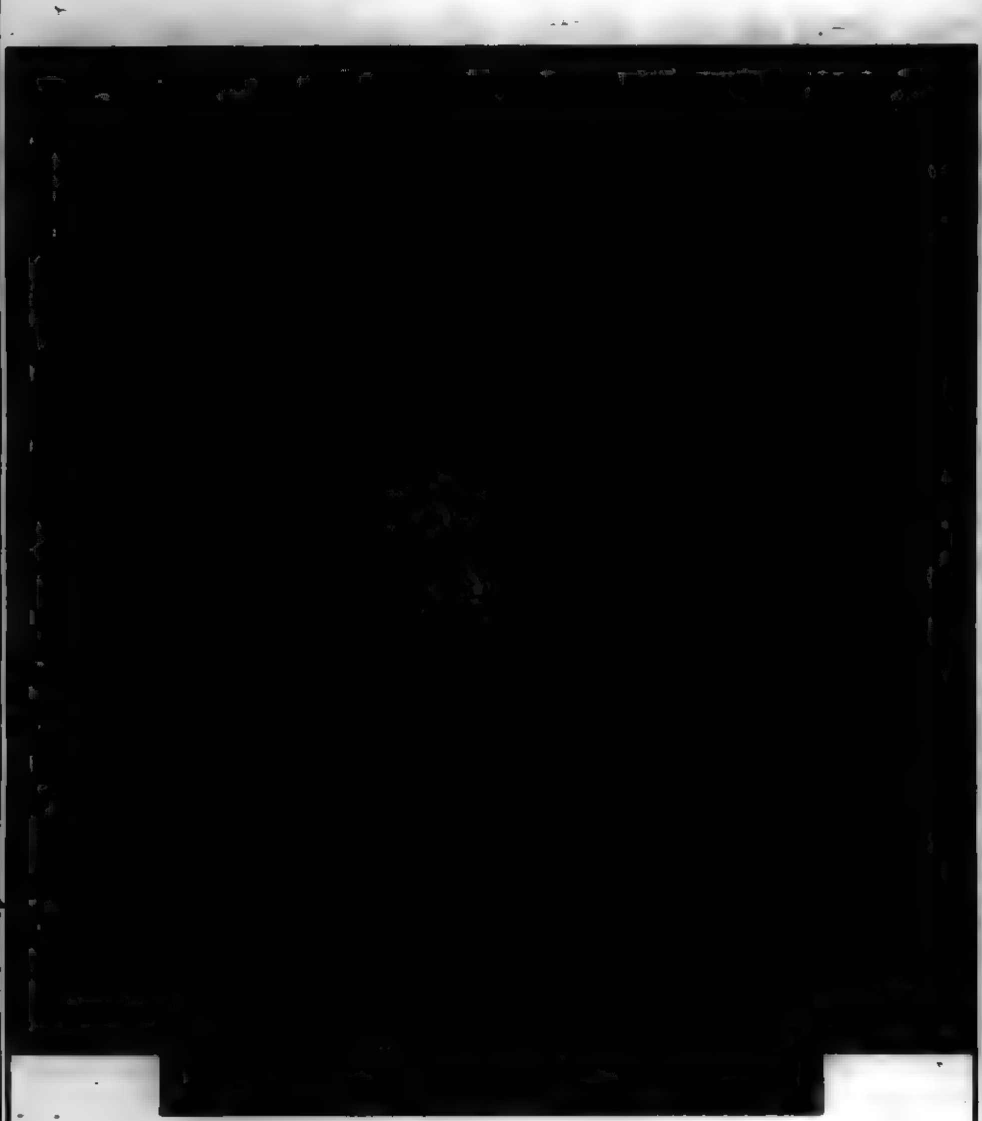

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Strong Memorial Hospital, a regional tertiary hospital and the primary teaching facility of the University of Rochester School of Medicine and Dentistry is looking for someone to direct a comprehensive reorganization of the Hospital's Information Systems Division, including not only the replacement of most existing systems but also including major development initiatives focusing on medical information and case management systems.

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The successful candidate will have approximately 5-10 years of hospital or service-oriented data processing experience; the major portion in a large, "around-the-clock" on-line IBM environment. Graduate degree preferred. Supervisory experience required. We are committed to a compensation package which is fully competitive and recognizes the responsibilities and authority of the position we are seeking to fill. Apply: Search Coordinator, Box 636W, University of Rochester, Rochester, New York 14642. Equal Opportunity Employer, M/F.

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Director
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You have technical proficiency in 8088/8086 Assembler Language, debugging at the machine language level and interfacing with PC DOS BIOS. You have experience writing PC DOS device drivers or interrupt handler routines, with 3270 emulation hardware (such as IRMA), and basic knowledge of communications hardware/software. You are familiar with the implementation of a high-level programming language, such as PASCAL, and interfacing assembler routines with it. You like to write slick, tight code.

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You have technical proficiency with IBM System/370 Assembler Language programming and debugging in MVS, XA, or VS1. You have experience with more than one of the following: SNA protocols; 3270 data stream programming; ACF/VTAM application programming; MVS supervisor and data management services; VTAM/NCP service aids; managing large-scale SNA networks; installing, maintaining and modifying ACF/VTAM and associated CNM products. You understand the purpose and function of bracket protocol, direction indicators, and the SNA bind. You like to write exits, mods, and inventive programs in Assembler.

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If you don't have a current resume, please send us a letter briefly detailing your background. We'll recognize you with or without a resume writing service. PRINCIPALS ONLY. Write to: **Bill Stair, Vice-President Systems, P.O. Box [illegible], Raleigh, NC 27622.** EOE M/F/H.

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You will need to have:

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Engineering Applications Programmers
Manufacturing Applications Programmers
Manufacturing Systems Technical Services
APT Systems Programmers
Manufacturing Programmers
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Programmers/Analysts

Administrative/Planning

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CICS, IDEAL	**To $30,000**
TANDEM	**To $36,000**
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BATTELLE, a leader in research and development, has opportunities available for experienced computer scientists and engineers in its Pacific Northwest Laboratories. The following positions require a B.S. degree in Computer Science or Electrical Engineering. An advanced degree is desirable.

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COMPUTER SYSTEMS ENGINEER – Duties include the design, development, and implementation of real-time computer systems for data acquisition, process control and C³.

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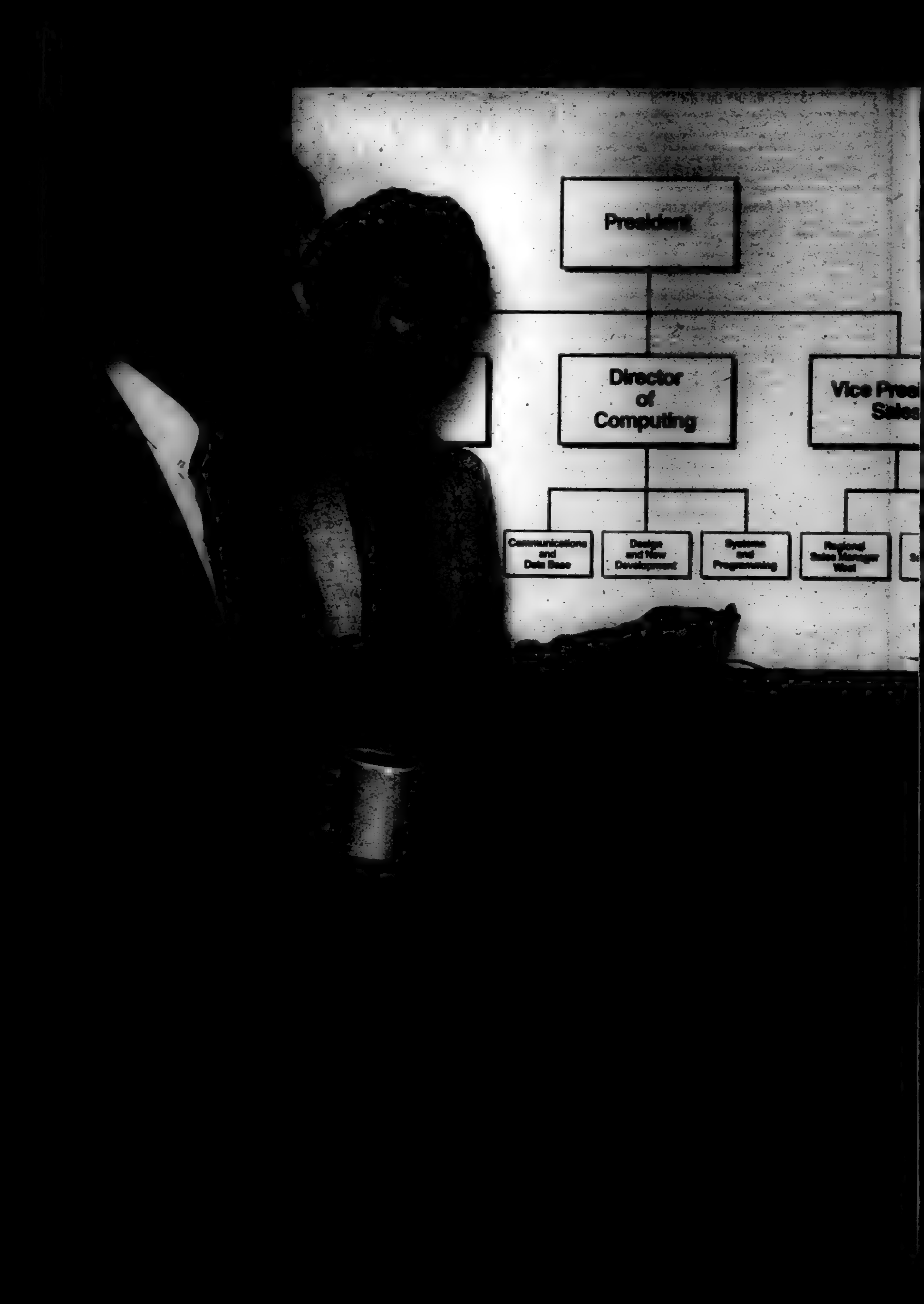
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Firms participating in the Conference represent a broad cross section of user, consulting, vendor and service organizations. They are diverse in industry, size and location, and range from the dynamic new start-up to the larger well-established, growth-oriented company. Compensation levels are outstanding.

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The Source Edp Computer Career Conference is scheduled in a city near you soon. There is absolutely no charge for your involvement or attendance since participating client companies will assume our fees. And, all inquiries are held in confidence. To ensure your reservation and to learn about Conference dates in your area, call Dave Grinnell today at 1-800-821-7700, Ext. 800B. Or write: Career Conference Director, Source Edp, Dept. C-5, P.O. Box 7100, Mountain View, California 94039. Following is a summary of the kinds of positions and compensation offered.

Applications Programming
$23,000 – $54,000

Those with two or more years experience in applications programming will have an opportunity to learn new skills while ensuring maximum compensation. Positions exist in environments ranging from the largest scale mainframes through mini and microcomputer user, consulting and vendor firms.

Positions are available using a variety of languages including COBOL, PL/1, Assembly, RPGII, PASCAL, "C" or BASIC; operating systems like OS/MVS, VM/DOS/VSE, UNIX, AOS, and data base and data communications like IMS, CICS, INFOS, TOTAL, IDMS, ADABAS, System 2000, ADDS-0 and more. Significant opportunities exist for those with solid programming backgrounds to move into systems development, software, EDP auditing or systems evaluation.

Software Development/ Software Engineering
$28,000 – $60,000

Individuals with two or more years of software design and development or software engineering experience will be able to gain experience in and develop some or all of the following: operating systems, capacity planning and performance enhancement tools (OMEGAMON, MEAGAMON), compilers (C, PASCAL, ADA), I/O and device handlers and program generation tools. This development work will take place on a variety of systems including IBM 3083's, VAX 11/780's, Tandem Non-Stop, and variety of other mini and micro systems (Motorola 68000, Intel 8080's).

Many of the companies participating in the Conference offer formal training and experience in leading-edge technology as well as day-to-day contact with some of the top technical professionals in the country. A number of opportunities with new venture companies offer exceptional growth and equity potential.

Data Base/Data Communications
$25,000 – $55,000

Many openings exist for individuals with backgrounds in database and/or data communications. Exposure to a variety of technologies is possible, including: IMS DB/DC, ADABAS, IDMS, TOTAL, FOCUS, CICS, ENVIRON/1, TCAM/NCP, SDLC, SNA, X.25 and other database and/or data communications software.

Companies participating in the Conference include major computer and software manufacturers, Fortune 500 companies, prestigious consulting firms as well as many emerging high technology firms.

Systems Programming
$24,000 – $55,000

Opportunities provided by client firms that are participating in the Conference are broad and unique. Those with at least one year of systems programming experience will be able to strengthen their skills as well as gain knowledge of some or all of the following: UNIX, CPM, CICS, IMS, OS/VS, DOS/VS, ADABAS, DL/1, modems, duplex lines, switches, and more in both mainframe and mini or micro environments. Assignments range from program development and enhancement to systems support.

EDP Auditing
$25,000 – $58,000

Exploding opportunities exist in EDP auditing. There are many openings for those professionals who have a good technical background in programming or design plus exposure to accounting applications. Large firms are expanding their EDP auditing departments and are providing specific training in auditing for Programmer Analysts—particularly those with over two years experience.

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$21,000 – $38,000

Those Technical Writers/Documentation Specialists who have writing experience with state-of-the-art hardware and software are now in a position to capitalize on those skills due to high demand. Positions range from creating technical documents for users to the development of marketing and sales brochures for new products. Because of the growth of new hardware products and new software packages, the need for good technical writers has grown rapidly. In addition to a great need for creative writing, there are also many opportunities for the more senior level writers to become Technical Writing/Documentation Managers.

Systems Development/ Management Consulting
$31,000 – $78,000

A broad variety of openings exist for persons with systems design and development backgrounds ranging from systems analysis to senior project management and/or management consulting. Many leading-edge communications and data base-oriented information systems projects are being planned by Conference client firms. In addition, a number of small to intermediate size firms are just beginning to make their initial thrusts into computing—especially in mini/micro areas—and need new applications development expertise. Several nationally-respected management consulting firms will also be represented for those persons who are interested in a variety of new development assignments with high visibility to corporate management.

Sales, Marketing and Technical Marketing Support
$23,000 – $108,000

Those professionals who attend the Conference will learn about new opportunities in computer sales, marketing and marketing support. Many alternatives exist in various product areas including mainframes, mini/microcomputer technology, terminal systems, time-sharing, facilities management, proprietary software packages, OEM's, consulting and more. Many firms are just now entering new markets and will provide exceptional career and compensation growth potential—as well as equity participation.

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The value of each Scholarship ranges from S$[illegible] to S$1,[illegible] per month (U.S. $[illegible] – [illegible] approximately) and is not subject to income tax; the actual emolument is determined by the candidate's qualifications and experience. No travel or other allowance is provided.

Research Scholars may be asked to assist in the work of the Departments to which they are attached for not more than three hours a week. They will be remunerated for the work done.

The University will help Research Scholars find off-campus accommodation.

Application forms may be obtained from:

THE DIRECTOR
NATIONAL UNIVERSITY OF SINGAPORE
North American Office
780 Third Avenue, Suite [illegible]
New York, NY 10017
United States of America.

THE REGISTRAR
NATIONAL UNIVERSITY OF SINGAPORE
Kent Ridge
Singapore 0511
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In your request for application forms, please state:
(a) the field of research you intend to undertake; and
(b) your highest educational qualification.

Applications must be received by The Registrar, National University of Singapore by 31 OCTOBER 1985.

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We currently have a job opportunity available for a Hardware Configuration Manager in the Data Processing Division, located at our Corporate Offices in Framingham, Mass.

Reporting directly to the Manager of Hardware Services, this position shall be responsible for all Zayre hardware configuration planning and review of hardware performance and capacity, along with the responsibility for making recommendations for new, or upgraded hardware.

In order to qualify you must have had at least 5+ years of solid data processing experience, with a proven track record of advancement from equipment operating through hardware planning and analysis for a large computer installation. (e.g. IBM 303x through 308x installations) Must possess strong analytical background along with both good oral and written skills.

If you feel that you can meet these qualifications and are up to this type of challenge, we would like to hear from you.

For confidential consideration, please forward your resume along with salary history to: Zayre Corp., Technical Recruiting Department, Speen Street, Framingham, MA 01701. Selected candidates will be contacted by 10/10/85. An equal opportunity/affirmative action employer.

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Memphis, TN 38116

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DATABASES	SYSTEMS PROGRAMMERS	LANGUAGES
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Send resume including salary history or apply in person to:

Employee Relations Department
BIC CORPORATION
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BIC

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IOLAB Corporation, a leader in the field of intraocular lens research and development, provides sight-restoring lenses to thousands of cataract patients internationally. We invite you to set your sights on a rewarding position as a Programmer/Analyst with IOLAB.

You should have two to four years experience on a System 36, plus three years data processing background in programming and/or systems design. Knowledge of RPGIII is essential with COBOL, dBase III and Basic helpful. PC experience is necessary. A college degree is preferred; equivalent experience is required. Excellent verbal and written communication skills are also necessary.

We offer competitive salaries and an outstanding benefits package. Qualified candidates should send their resume and salary history to: IOLAB Corporation, Attn: Personnel Department, 500 S. Village Oaks Drive, Covina, CA 91724.

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The Saudi Maintenance Corporation (SIYANCO), under contract with the US Army Corps of Engineers supporting the Saudi Arabian Army Ordinance Corps, is seeking qualified DP professionals for three immediately available positions.

SENIOR EDP SYSTEM ANALYST

Requires expert knowledge of state-of-the-art ADP hardware/software; experience in development of Data Base Retrieval systems; minimum 8 years' ADP experience, emphasis on systems analysis, strong background in automation of logistics functions, esp. military; familiarity with RPG, COBOL, Assembler, plus proficiency in JCL and CICS; IBM 37 and 4300 hardware experience; ability to manage diverse staff; US Civil Service (GS-14) or comparable experience; BS in Computer Science or Math desired, but practical experience will be considered.

EDP PROGRAMMER (HQ)

Requires expert knowledge of current EDP hardware/software develop. techniques incl. Data Base Retrieval, Modular Programming, Decision Logic Tables, Structural Programming; IBM 37 and 4300 hardware experience; proficient in COBOL, familiarity with RPG II, DL/I; CICS/VS application design and programming experience; familiarity with DOS/VSE, DOS/VSE JCL; extensive VSAM, DOS/VSE experience; US Civil Service (GS-12) level or 5 years' comparable experience; BS in Computer Science or Math desired, but practical experience will be considered.

EDP PROGRAMMER

Requires expert knowledge of current ADP software development techniques; IBM 37 and 4300 hardware experience; proficient in COBOL programming; familiarity with RPG II and Assembler; min. 5 years' ADP programming experience; CICS/VS application design/programming experience; thorough knowledge of DOS/VS and major user utilities; hands-on DOS/VS JCL experience; extensive ISAM experience with VSAM desirable; US Civil Service (GS-12) or comparable experience; BS in Computer Science or Math, but practical experience will be considered.

ALL POSITIONS INCLUDE ATTRACTIVE SALARIES AND EXCEPTIONAL BENEFITS. FAMILY STATUS

A.R.S., Inc. is the U.S. Agent for the Saudi Arabian Maintenance Corporation (SIYANCO).

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A.R.S., INC.
DEPT. CW
P.O. BOX 1154
MCLEAN, VA. 22101
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Computer Specialist
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P.O. Box [illegible]
Anderson, South Carolina [illegible]
1-[illegible]-7917 (Collect)

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Mail resume and salary requirements to the Employee Relations Department, or call 214-754-1171. Principals only please.

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[illegible] Personnel
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MCI Communications Corporation

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Cessna Aircraft Company, the leader in general aviation, has immediate career opportunities for information systems professionals for a large MRPII project. Positions in the following areas are available:

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- PROGRAMMER ANALYSTS

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These outstanding career opportunities offer an attractive benefits and compensation package befitting an industry leader. For immediate consideration, please forward your resume with salary history to:

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P.O. Box 232, Dept. CM-2
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- [illegible]
- VAX/VMS, PDP-11, [illegible]
- [illegible]
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Rand Systems Corporation has [illegible] years of experience serving clients in Southeastern Michigan. [illegible] Please call Mr. Rand at 313-[illegible]-6077 or send resume.

RAND SYSTEMS CORPORATION
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Systems Engineering

- Systems Architecture/Trade Studies
- DBMS Design, Management, Implementation
- Large Scale IBM Systems Integration
- PSL/PSA Utilization

Programming/Analysis

- IBM MVS/CICS/COBOL & JCL required
- ADR Ideal/Datacom DB & DD a plus

QA/Integration Test

- 4 years' QA & Integration Test experience
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- Large Scale Systems Design & Programming knowledge preferred

Logistics

- 9 years' experience in the technical & administrative areas of DoD LOGISTICS/SUPPLY DISTRIBUTION

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- BS/BA Education or related
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CM/DM

- CM experience in software product environment
- Familiarity with MIL-STD 480, 483; AFR 300-15; DoD STD 7935

All positions require a BA/BS degree in CS, Math, EE, or related field and 2-6 years' experience. We offer competitive salaries, excellent benefits and career advancement in a highly visible environment. Qualified candidates should send their resume with salary history in confidence to **Cathy Kimmel:**

CSC
COMPUTER SCIENCES CORPORATION

Defense Systems Division
6680 Poe Avenue, Suite 300
Dept. CW-0909, Dayton, OH 45414

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The successful candidate must provide [illegible] competence in communications network [illegible], engineering, local area network, data communications as well as demonstrated ability in the management, planning, operation, development, and maintenance of large data communications networks. Some Alaska and out-of-state travel will be necessary.

This position will remain at the Fairbanks campus, which is the state primary [illegible]. Fairbanks, located in the interior of Alaska, offers a variety of [illegible], cultural and year round activities. The spirit of adventure is still alive in Alaska.

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Interested individuals should submit a cover letter, resume and three references to:

Statewide Office
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Room 1, Bunnell Building
University Of Alaska
[illegible] Tanana Drive
Fairbanks, AK [illegible]
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[illegible]

[illegible]

[illegible], CPC ([illegible]) [illegible]

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Charlotte, N.C. 28211

PROGRAMMER/ANALYST AND SYSTEMS ANALYSTS

A medical center located in the historic Chattanooga, Tennessee area is beginning the second phase of its long range data processing plan. Several growth opportunities are available for dedicated data processing professionals interested in the professional challenge of implementing state-of-the-art, on-line data base systems utilizing COBOL programming and transaction processing technology. Our newly constructed data center includes dual 24 MEG Burroughs B7900's, mini computers, micro computers, and office automation systems. We offer the opportunity to expand your technical and professional skills in a progressive health care setting.

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PROGRAMMER/ANALYST

Assignments include detailed program design, coding, testing and debugging, as well as documentation and implementation of batch and on-line systems. You will assist in the system specifications, design tasks, and end user training. At least 2 years of heavy experience in COBOL program design, coding and testing. Familiarity with Assembler language programming, micro and mini computers a plus. Salary $26,500. (JOB ORDER # TN552718 — Be sure to specify this in letter of application).

SYSTEMS ANALYSTS

You will serve as liaison between users and the data systems department. Responsibilities include specification, design and installation of financial and patient care system. You will oversee programmer analysts with hands-on implementation experience with custom and application packages involving data base and data communications and the ability to handle multiple projects. A Bachelor's degree and programming background required. Salary $32,000. (JOB ORDER # TN55517 — Be sure to specify this in letter of application).

If you are ready for the challenge, send your resume to:

Tennessee Job Service
400 Georgia Ave.
Chattanooga, TN 37403
Attn: Minnie Hughley

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To work in systems design and implementation of transaction driven database applications. The posts are for a minimum of two years, starting early 1986. Applicants should have a background corresponding to a University degree plus suitable experience (preferably in an IDMS environment). Experience in database design and implementation would be an advantage. For one of the posts, experience in computer graphics is necessary. Net remunerations and allowances will be in accordance with United Nations rates.

Advertised posts are open equally to women and men.

Closing date for applications is 15 November 1985. Applications should quote Reference No. FMS-85-6, and should be sent to:

The Personnel Department
International Telecommunication Union
CH-1211 Geneva 20
Switzerland

which will provide information on benefits including reimbursement of travel and removal, etc., upon request.

Information on job content may be obtained by telephoning:

(41 22) 99 53 15 (FMS SECRETARIAT)

SYSTEM MANAGER-IBM VM/SP

Dartmouth College, Hanover, New Hampshire, seeks a Systems Manager to direct the installation and operation of an IBM 4381 system running VM/SP. The manager reports to the Director of Technical Services and performs such specific duties as generating and maintaining systems, troubleshooting, monitoring system performance, installing and maintaining utilities and applications packages from various sources, overseeing system administration, coordinating VM support with operations and user services personnel, and providing staff instruction and consultation.

Position requires a Master's degree in computer science or related field, with three to five years' experience on an IBM VM/SP system, or an equivalent combination of education and experience. Substantial project leadership experience and a demonstrated ability to communicate effectively, both orally and in writing, are required. Must be comfortable working as a member of a team of professionals.

Review of resumes will begin on September 15, 1985. Salary is negotiable. Please send resume to: Dartmouth College, Personnel Administration, Clement Hall, Hanover, New Hampshire 03755.

Dartmouth College is an equal opportunity employer with an affirmative action plan.

BANK SYSTEMS ANALYST

The Chittenden Bank has an immediate opportunity for an experienced professional to coordinate and support the implementation of data processing projects. This will involve working closely with all levels of management to develop technical specifications, interface with the programming department and monitor testing efforts during implementation.

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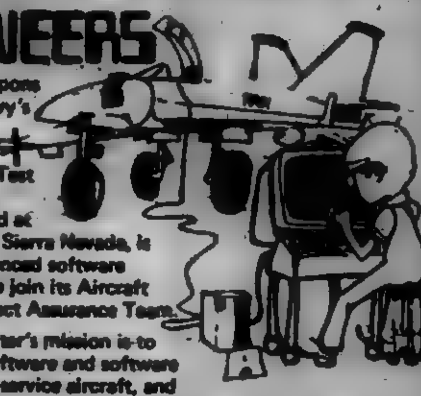
CJIS APPLICATION PROGRAMMER

El Paso Consolidated Data Processing is seeking an experienced IBM Programmer for their [illegible] Criminal Justice Information Systems (CJIS) project team. Two years CJIS or similar systems experience is required. This highly visible position has hands on responsibilities and extensive user contacts. Salary commensurate with experience. Fringe benefits include life and medical insurance, retirement plan, liberal holiday and vacation. Contact: Personnel Director, Room 221, City County Building, El Paso, TX 79901

SOFTWARE/COMPUTER ENGINEERS



The Naval Weapons Center, the Navy's major Research, Development, Test and Evaluation Activity located at the foot of the Sierra Nevada, is seeking experienced software professionals to join its Aircraft Software Product Assurance Team.

Part of the Center's mission is to develop new software and software revisions for in-service aircraft, and test and validate the software of developmental aircraft.

We are looking for candidates with BS or advanced degrees in engineering, computer science, math or other appropriate disciplines, who are interested in working with software support activities for front-line Navy/Marine Corps tactical aircraft, including the AH-1J/T, A-6E, A-7E, AV-8B and F/A-18.

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City Polytechnic of Hong Kong invites applications for the posts of Principal Lecturer/Senior Lecturer/Lecturer in the following departments which are tenable from Summer/Autumn 1986:

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Technical areas: COBOL, PASCAL, ADA, 4th generation languages, computer systems and architecture, data base, data communications, expert systems, systems analysis, design and development, network and graphics. Application areas: accounting, banking, education, engineering, finance, management, manufacturing, marketing, process control.

DEPARTMENT OF ELECTRONIC ENGINEERING

Communications, computer engineering, digital electronics, solid-state and microelectronics.

Candidates should possess a good honours degree or professional qualification in a relevant field. For senior appointments, candidates are expected to have a higher degree or an advanced specialist qualification. A minimum of 3, 8 and 13 years of relevant professional experience since obtaining the basic entry qualification, which may include years spent on higher degree studies and/or research, is normally required for appointment to the grades of Lecturer, Senior Lecturer and Principal Lecturer respectively. Experience in teaching or planning modular programmes and successful research/consultancy desirable.

Principal Lecturer:	HKD247,920 - HKD307,280 P.A. by 5 increments
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1 US Dollar: HKD7.782 (US Dollar equivalent as at 13.8.85) except for Principal Lecturer appointees who will be given an option of either a two-year or an extended four-year contract appointments will be made initially on two-year gratuity-bearing contract terms. A 25 percent terminal gratuity on basic salary received over the entire contract period is payable upon successful completion of the contract. Generous fringe benefits include medical and dental benefits, and where appropriate, leave passages, housing accommodation or housing allowance and education allowance for dependent children.

Applicants should send detailed resume together with names of two referees who should be able to comment on applicant's academic/professional suitability, particularly over the past 5 years, to: THE GENERAL SECRETARY, CITY POLYTECHNIC OF HONG KONG, P.O. BOX 30441, TSIM SHA TSUI POST OFFICE, KOWLOON, HONG KONG by 12 October 1985. Applicants should state clearly the grade on post applied for. Information regarding the polytechnic or on posts advertised may be obtained by mail upon request. Please note that applications received after the closing date may not be considered.

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Senior Systems Analyst needed for Florida University's newly created position. Individual must have strong leadership and excellent communication skills with a BS degree. 4-6 years of experience in systems analysis required. A background of Cobol programming helpful with some managerial or supervisory exposure necessary. Work experience in a higher education facility a plus. This opportunity offers excellent benefits with salary to $35,000.

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The Office of the Chancellor for the Southern Illinois University System seeks to fill a new position, Director of Planning for Computing. The Director will coordinate the development of [illegible] University.

Qualifications: A Master's degree and at least five years of related experience preferred. [illegible]

Appointment will be on a fiscal year basis. Salary range $42 - 48,000. Send resume and names of at least three references by October 4, 1985 to:

[illegible]
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Data Processing

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Union Electric can offer excellent compensation and benefits plus the opportunity for rapid advancement. If you are ready to take the next step in your career, call TOLL FREE or send your resume and salary history to: Bob [illegible], Employment Supervisor; UNION ELECTRIC COMPANY; P.O. Box 149; St. Louis, MO [illegible]. We are an equal opportunity employer M/F.

CALL TOLL FREE 1-800-[illegible] or IN MISSOURI CALL 1-800-[illegible] Station [illegible].

UNION ELECTRIC COMPANY

ASSISTANT DIRECTOR, COMPUTING SERVICES DEPARTMENT

The University of Arkansas at Little Rock has an immediate opening for an Assistant Director for Computing Services. [illegible] COBOL [illegible] University of Arkansas at Little Rock, [illegible] Little Rock, AR [illegible]. The University of Arkansas at Little Rock is an affirmative action, equal opportunity employer and actively seeks the candidacy of minorities and women.

MIS PROFESSIONALS

The Information Systems Division of HealthOne Corporation, a multi-hospital, diversified, health care delivery system, has the following key positions available for persons with appropriate experience and training.

Manager, Computer Operations, responsible for the management of HealthOne's two primary data centers through subordinate Data Center Supervisors. Will direct the efforts of approximately 30 Computer Operations, Production Control and Scheduling, and Customer Service personnel at two Twin Cities locations.

Physical environment includes IBM 4381 and 4341 host processors and numerous distributed Data General, Hewlett Packard, and Series I mini-computers. Current mainframe software includes VM, DOS/VSE with CICS, VTAM, VSAM, VOLLIE, LIBRARIAN, DYNAM-T, DYNAM-D, and ZEKE.

General requirements include a working knowledge of IBM medium to large scale systems operating under VM and DOS/VSE. Experience with MVS is highly desirable. Must have five to six years of operations experience with at least three years of management experience. A Bachelor's degree in a related field is desirable.

Manager, Patient Management Systems, responsible for management of in-house analysts and programming personnel, contract programmers, software vendors, and consultants in order to successfully manage the delivery of patient accounting systems to multiple hospitals. Application software is MEDIPAC Patient Accounting and ADT with additional systems planned for 1985 and beyond.

General requirements include experience with healthcare business office systems and IBM medium to large scale systems. Hands on experience with MEDIPAC is highly desirable. Candidates should have a minimum of five to six years of experience demonstrating substantial responsibility for management at the project level and above. A Bachelor's degree in a related field is desirable. An advanced degree would be a plus.

Senior Systems Analyst, Patient Management Systems, responsible for major systems development projects within the Patient Management Systems department of HealthOne's systems development group. Work with end user managers and end users to define business requirements. Perform analysis and design activities to support programmers with systems specifications. Evaluate vendor product offerings against requirements.

General requirements include experience with healthcare business systems and IBM medium to large scale systems. Hands on experience with MEDIPAC is highly desirable. Candidates should have a minimum of four to five years of experience demonstrating two to three years systems analysis experience with a prior background in programming. A Bachelor's degree is preferred which may be offset by additional experience.

These positions will be attractive to persons whose qualifications match or exceed the requirements. We offer these positions in a challenging environment with competitive compensation and with an attractive benefit package.

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The successful candidate will be responsible for system performance, installation of software releases, installation of new devices, and analysis and resolution of system problems.

The following skills are required:

- **Minimum 3-5 years total D.P. experience**
- **2 years systems programming experience on the HP 1000 using Fortran 77**
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Experience listed below would be considered a plus:

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- **IBM 8100 and/or IBM S/38 programming**

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Requires B.S. Degree in Computer Science. Requires two years experience with communications software and knowledge of [illegible] software and DDM protocols. Salary $2,575.00 per month.

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[illegible]

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Submit resumes to:

Mr. Dick [illegible]
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PROGRAMMER: Design, implement, code and test applications related to banking. Responsible for testing and enhancement of existing programs. Required Masters in Computer Science. Must know COBOL, CICS, PLI, BASIC, PASCAL & DBASEII. Hardware is VAX 780 & IBM 4341. $26,000 p.a. 40 hrs/5 days/wk. DOT code 020.162.014. Mail resume to NYS Job Service JO# 8013104, 485 Fifth Avenue, New York, NY 10017.

POSITION ANNOUNCEMENTS

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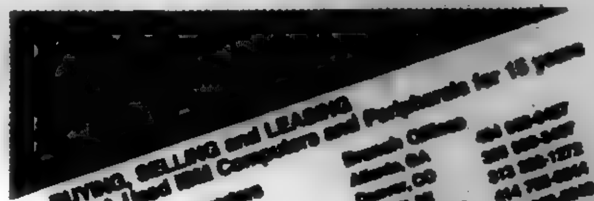

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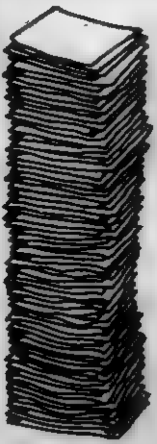

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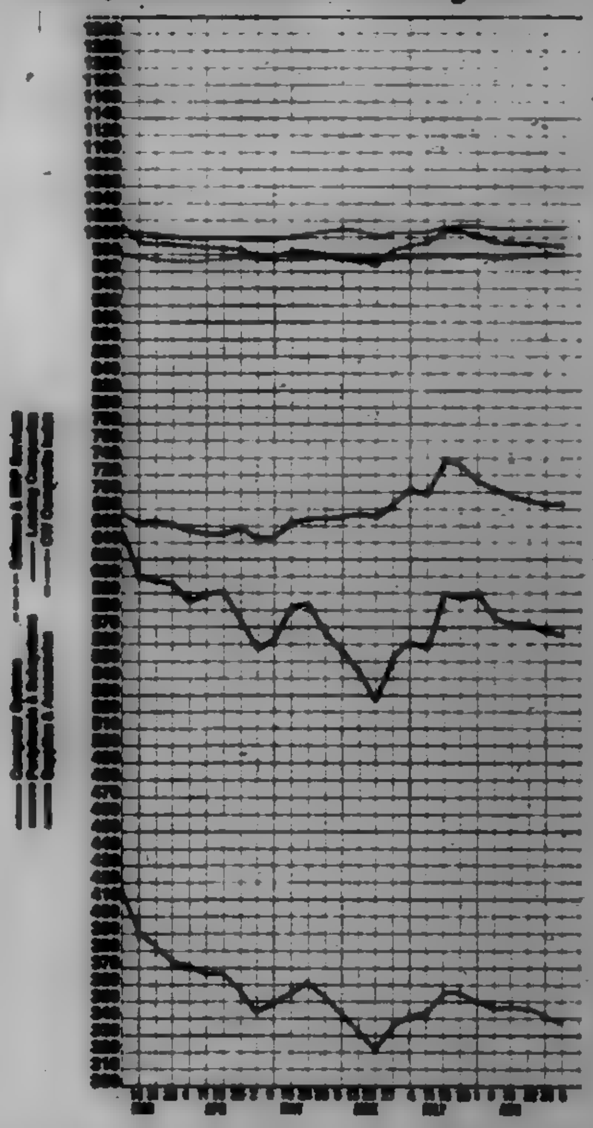

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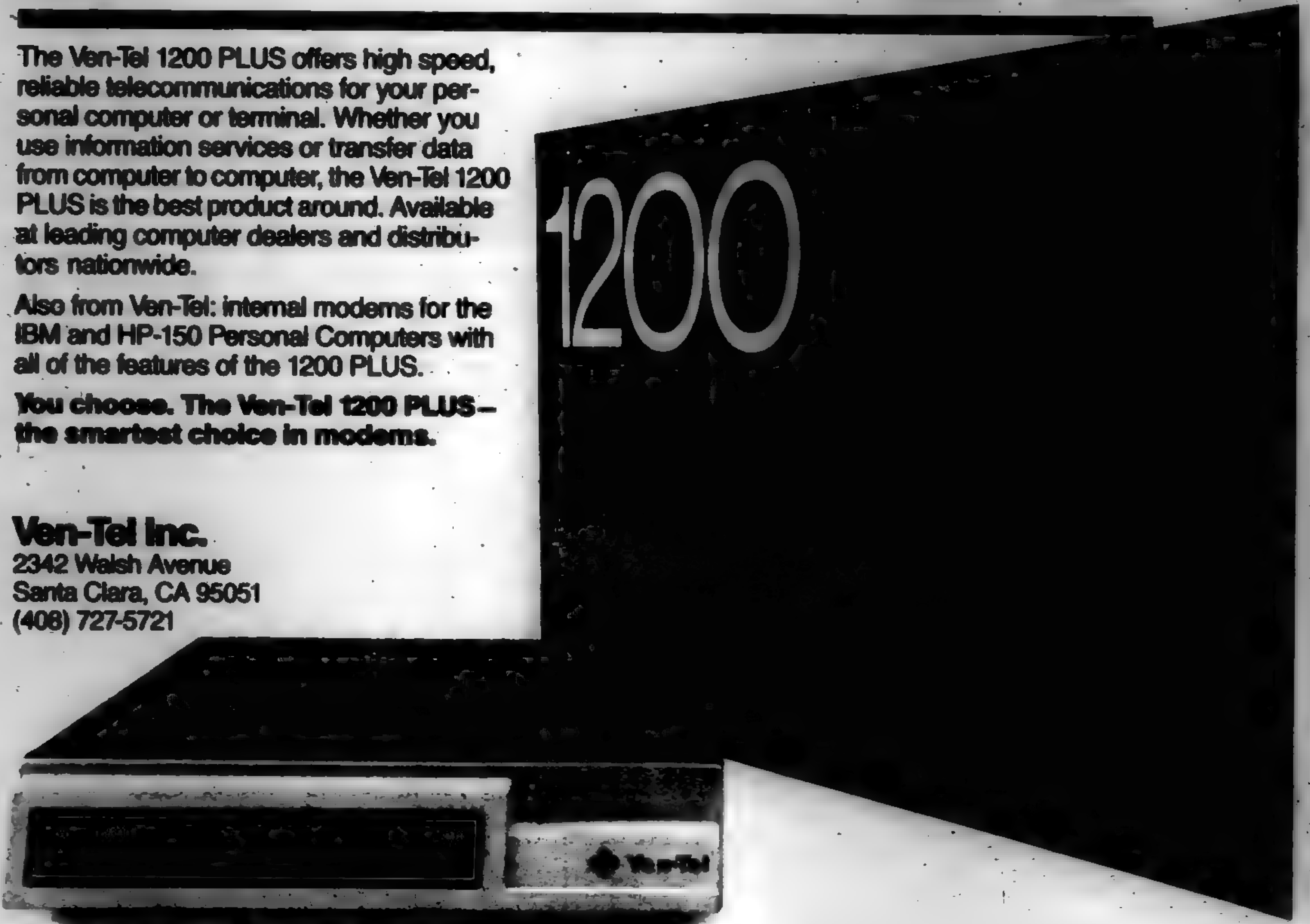

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Sperry adds to micro line

Launches AT-compatible desktop, Link software

By Eric Bender

BLUE BELL, Pa. — The Sperry Corp. Information Systems Group will roll out a host of micro products this month, spearheading its year-old campaign to become a major force in the microcomputer arena. Leading the charge will be a high-performance desktop system designed to compete head-on with the IBM Personal Computer AT.

Sperry's PC/IT personal computer, offering full compatibility with the high-end IBM micro and up to 45% greater throughput, will be announced and shipped today, said Michael Battaglia, marketing vice-president of Sperry's Americas Division. Built for Sperry by Mitsubishi Corp., the system carries a starting price of $3,650, about 10% less than that of the AT, Battaglia told *Computerworld.*

PC/IT beta user Edward Flynn, manager of concentrator and terminal software at Nasdaq, Inc. in Trumbull, Conn., said, "We've verified that whatever we can do on the AT, we can do somewhat better on the [PC/IT]." Noting that his shop has done only preliminary evaluations of the system, Flynn said that the PC/IT "is a very fast, powerful machine, and it appears to be a very stable machine."

The PC/IT will be joined in the next few weeks by versions of Sperry Link office automation software for Sperry and IBM micros, the PC/On-Line micro-to-mainframe link products, the mid-range PC/HT personal computer, enhancements to the Sperry Usernet local-area network and peripheral equipment.

Continued on page 10

DP spending slump into second year

By Donna Raimondi

FRAMINGHAM, Mass. — The growth of DP spending has slowed for the second year in a row, according to International Data Corp.'s annual report, "User Spending on Data Processing."

From a consistent 15% per year growth pattern that had slowed to a 13% growth projection in the 1983-84 budgets, this year's survey results show only a 10.9% overall growth for 1984-85.

The IDC 1985 survey was based on responses from more than 500 data processing directors representing a broad range of businesses and professions. The report provides data concerning the use of funds by different industry classes, different sizes of data processing functions and the corollary issues involved in personal computer control. The growth projections are compared with historical and current industry growth rates and include an analysis of how and why they tend to differ.

Staff expenses still account for the largest use of DP funds in all organizations, totaling more than 40% in all size categories, the report said. As a rule of thumb, $70,000 (salary plus expenses) is budgeted per person employed in a data processing department, no matter what size the organization is. There is a consistent relationship between the DP budget and the number of people employed in the department.

The second largest chunk of money consistently goes to hardware expenses, with an overall average of 29.1% of the budget.

Software and service expenses range from 8.7% in companies with a budget of more than $10 million to 16.1% in the smallest installations — those with a budget below $1 million. Part of the reason

Continued on page 10

TOP OF THE NEWS

New architectures caught the spotlight in announcements of a high-end, parallel processing supermini from Perkin-Elmer and the first product in a minicomputer line from Datapoint. Pages 2 and 4.

■

Old systems never die, they just lose support. Users react to IBM's sooner than expected announcement of the end of its System/34 support. Page 5.

■

ISDN looms. Bell Atlantic took the wraps off its version of the Integrated Services Digital Network for 1987. Page 15.

■

Security threats are posed by magnetic tape disposal techniques that MIS departments use. Page 73.

■

Revised Cobol standard near

By John Gallant

After more than seven controversy-punctuated years, the labyrinthine approval process for the proposed Cobol 85 standard is nearly complete.

With the draft language standard awaiting only final, almost perfunctory, review at the highest levels of both the international and U.S. standards bodies, an endorsed, overhauled version of the existing Cobol 74 standard may become a reality by the end of 1985.

If approved, Cobol 85 — the name that the standard will bear if approval comes this year — will have survived years of vitriolic debate, a rift between interna-

Continued on page 6

FYI

Chicago to L.A.: Arco's moving experience

By Jeffry Beeler

As part of a recently announced reorganization, a major U.S. oil company has begun the lengthy process of relocating an information center from the Chicago suburb of Harvey and merging it with a second such facility in Los Angeles.

Although both centers belong to Atlantic Richfield Co.'s Petroleum Products Division, the one near Chicago primarily supports technical applications, and the site in Los Angeles serves nontechnical business users.

Arco attributes the merger, which is scheduled to be complete by Oct. 21, to the company's recent decision to close its Petroleum Products Division's research and development and engineering site in the Chicago area.

In its heyday, the site employed approximately 350 scientists, engineers and other active users. Recent layoffs, however, have trimmed the installation's current staff to approximately 200 users, according to David Priebe, manager of the site's information management and computing systems.

By year's end, the work force will shrink even further to 120 users, Priebe said. All those remaining will relocate to other Arco installations throughout the U.S., the majority of them moving to the Greater Los Angeles area.

For the past 4½ years, the occupants of the Chicago-area research and engineering facility have derived their computing services from an information center built around two IBM 4300 series units running VM. But after the employees complete their move, the source of their processing power will shift to the Petroleum Products Division's Information Technology group in Los Angeles. In addition to performing various corporate systems functions, the Information Technology organization runs an information center of its own, according to Robert Hahn, an Arco planning consultant.

To date, the Los Angeles center has existed primarily to meet the data base query and reporting needs of some 350 nontechnical business users in Arco's widely scattered Southern California offices. But starting Oct. 21, the center will expand the scope of its services by

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NEWSPAPER

PE multi-CPU supermini bows

Firm sees parallel processing technology as 'the way to go'

By James Connolly

NEW YORK — Making a long-term commitment to a parallel processing architecture, Perkin-Elmer Corp. unveiled a multiprocessor system that company spokesmen claimed offers three times the price/performance of the Digital Equipment Corp. VAX 8600. PE's Data Systems Group announced its 3280MPS multiprocessor system at a waterborne press conference held aboard a yacht on the Hudson River last week.

The Ocean City, N.J., firm said the 3280MPS, which carried the code name Cruncher during development, represents both a high-end machine for PE's 3200 superminicomputer line and a new architecture on which to build PE's future systems. "Parallel processing is the way to go, and not just for three or four years. We are every bit convinced that it is the architecture of the future," said James K. Sims, senior vice-president of the Data Systems Group. Sims added that PE has no plans to develop uniprocessor systems in the future.

The 3280MPS, consisting of up to six tightly coupled 3280 uniprocessors, will perform 4 million to 22 million instructions per second (Mips) in a commercially oriented environment or 12 million to 60 million whetstone instructions per second in a technical environment, according to PE.

The system is said to use a four-stage pipeline design, two 8K-byte caches on each processor and an integral 64-bit floating-point processor. The four-stage pipeline was designed to allow simultaneous execution of instruction fetch, address calculation, operand fetch and execution. Memory capacity starts at 2M bytes and is expandable to 16M bytes. The system includes PE's 64M bit/sec. System Bus and uses Advanced Shottky Logic.

PE said that the 3280MPS' modular design allows for plug-in expansion. The processors share memory with a single processor acting as the central processing unit and the others acting as auxiliary processing units or as I/O processors. In the event of a CPU failure an auxiliary or I/O processor can be shifted into the CPU role, PE said.

The 3280MPS supports PE's OS/32 real-time multitasking operating system and, in uniprocessor configuration, PE's Xelos, which is based on AT&T Unix System V Release 5.2.

Some Risc concepts incorporated

Sims said the system is not a reduced instruction set computer (Risc) but that PE did use some Risc concepts by installing commonly used Fortran VII, Cobol and C instructions in the microcode. Other supported languages include RPG II, Pascal, Coral 66 and Basic II.

Sims said a key benefit is that the 3280MPS is compatible with all existing PE programs used on the 3200 line. However, the other systems in the 3200 line are not upgradeable to the 3280.

The system will be distributed through value-added resellers and system integrators. It is targeted to general-purpose computer applications; real-time transaction processing, such as financial applications; government applications, such as military simulations, data communications monitoring and management; and scientific and engineering applications.

Acknowledging that the DEC 8600 is the standard with which supermini vendors must compare their products, Sims claimed that the cost of 1 Mips of computing power in the 3280MPS is $30,000, compared with $100,000 for an 8600 in a clustered environment. He also claimed that a 4-Mips configuration for an 8600 requires 16 sq ft of floor space, compared with 5 sq ft for a 16-Mips 3280MPS.

The 3280MPS is not PE's first step into the parallel processing field. Sims said there are 300 installations using PE 3260 and 3230 systems in parallel processing configurations.

Available 90 to 120 days after receipt of order, the basic 3280MPS configuration is the 3281MPS with 2M bytes of noninterleaved memory, one 10M bit/sec. direct memory interface, eight channels, a 20-slot I/O chassis, a 64-bit floating-point processor and system console. It costs $250,000 and is discountable to $150,000 in quantities of 100. Additional processors start at $120,000.

SEC settles with Paradyne

By Clinton Wilder

LARGO, Fla. — After more than two years of bitter charges and $5 million to $6 million in legal fees, the U.S. Securities and Exchange Commission's (SEC) lawsuit against Paradyne Corp. ended last week with a dull thud.

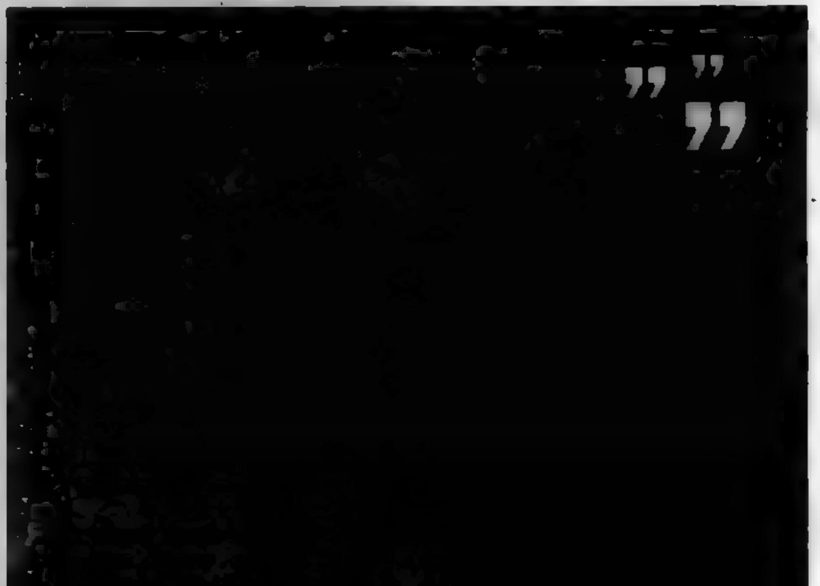
The settlement, reached just two days before the suit's scheduled trial date in federal court in Tampa, Fla., required no admission of wrongdoing by Paradyne and contained no punitive SEC action against the systems and communications equipment vendor. Paradyne simply agreed to comply with federal securities law in the future.

The highly publicized suit was one of several government actions against Paradyne, most of which remain pending. The suit alleged that Paradyne officials defrauded and deceived Social Security Administration (SSA) officials in winning a $100 million SSA nationwide computer network contract in 1981 [CW, April 4, 1983].

During the contract bid process, Paradyne employees allegedly reconfigured a Digital Equipment Corp. PDP-11/03 minicomputer and demonstrated it as a Paradyne product. The SEC further charged that Paradyne's bid included terminals and data encryption devices not yet available and that the company's prebid demonstration used "an empty box with blinking lights" for what the firm claimed was a working communications device.

Although Paradyne executives expressed satisfaction with the settlement, analyst Andy Schopick of the Stamford, Conn.-based Gartner Group, Inc. called it "a Pyrrhic victory" for the company.

"It comes too late to really help Paradyne restore its competitive position," Schopick said. "I think the damage has been done. The settlement is really a nonevent. I don't think the SEC ever had a really solid case, and it was unfortunate that Paradyne management responded in such a contentious way. Whatever the circumstances were that led up to this, I don't think the SEC had cause to be involved."



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Datapoint launches Starship line of mini systems

By James Connolly

SAN FRANCISCO — Introducing the first product in its Starship line of minicomputers, Datapoint Corp. last week announced a system using a multiple operating system architecture and offering four times the memory and twice the disk storage capacity of its previous high-end computer.

In addition, Datapoint announced a local-area network management system, three storage subsystems, an electronic mail gateway and enhancements for its Pro-Vista office automation package.

The Starship product, the Datapoint 8850, was designed to replace Datapoint's previous high-end system, the 8800, and to be the first of a series of new or enhanced minicomputers to be released in the next year and a half under the Starship program, according to a company spokesman. He said the Starship line features an architecture that integrates multiple operating environments in conjunction with Datapoint's Attached Resource Computer (Arcnet) local-area network.

The 8850 has a minimum memory of 512K bytes and a maximum memory of 4M bytes. According to Datapoint, the 8850 supports both Datapoint DOS and Datapoint RMS, which is a capability not available on earlier systems. The spokesman said the 8800 can be traded in for credit toward purchase of an 8850.

The basic 512K-byte, 24-user 8850, which will be available in October, costs $16,500.

Datapoint announced two disk subsystems for the 8850, the 9348 and the 9349. The 9348 is a 9-in. removable disk drive providing 67M bytes of storage. The 9349 is a high-performance, 9-in. fixed drive with a capacity of 268M bytes. The 9349 can be configured in a string of four drives with a total capacity of 2G bytes. Scheduled for October deliveries, the 9348 costs $14,500, and the 9349 costs $22,500.

The Mail Gateway Facility announced last week was designed to allow interchange of information among RMS-based systems, DOS-based systems, mail systems made by other vendors and customized software applications such as order entry. Now available, the gateway costs $500.

A disk and tape subsystem was announced for use with existing Datapoint 8600 minicomputers. That mid-range storage system, the 9336 Disk/Tape Subsystem, was designed to provide 65M bytes of fixed-disk storage and a streaming tape drive. It costs $14,500.

An extension drive, the 9337, providing another 65M bytes of disk space, costs $9,500.

The Datapoint communications announcements included the Intelligent Network Management Facility (INMF) and the Intelligent Hub for Datapoint's Arcnet. The INMF consists of an Intel Corp. 80186-based diagnostic and control processor and software.

The INMF was designed for large networks of 40 to 50 computers.

The Intelligent Hub is a physical connection unit that allows up to 16 devices, including additional hubs, to be linked into Arcnet. The basic INMF system costs $13,995. Each hub costs $1,350.

AT&T touts voice system

Pitfalls, potentials of speech recognition

By Paul Korzeniowski

SAN FRANCISCO — Talking computers have been a part of American folklore since Hal starred in *2001: A Space Odessey*. Last week, AT&T announced a voice system that illustrates both the potential of such a system and the technical problems that have to be overcome to make it a reality.

At the annual conference of the American Voice Input/Output Society last week, AT&T introduced the Conversant 1 voice system. The product, designed in modular fashion, works as a system controller, sitting between up to 32 telephone lines and a host computer.

The Conversant 1 comes equipped with dual 80M- or 140M-byte hard disk drives. Telephone lines are connected through RJ-11 plugs. A variety of speech peripherals can be attached to an IEEE 488 bus. A coaxial cable attaches the device to host systems supporting asynchronous, Synchronous Data Link Control and Binary Synchronous Communications protocols. With the Conversant 1 voice system, a customer could dial a number and receive information in a process similiar to dialing up a weather report.

The Conversant 1 voice station incorporates two types of speech recognition. Speaker-dependent systems are designed to be used by one or two individuals. Users enter words so that the system later will recognize them when spoken. The principal shortcoming to these systems is that they are limited to a few individual users.

Speaker-independent systems recognize words regardless of who utters them. AT&T claimed that the Conversant 1 will recognize the words "yes" and "no" and 6,000 combinations of numbers.

"Many companies claim to have speech recognition capabilities. The important item is how accurate these systems are," noted B. H. Poetsch, an independent consultant from Anaheim, Calif., who specializes in voice recognition.

AT&T claimed that its employees were invited to test the Conversant 1 system, and the result was that 19 out of every 20 items input were understood.

The company stated that the cost for each channel without speaker recognition capabilities would be between $2,500 and $3,000. Historically, speaker recognition capabilities have been expensive, and AT&T refused to provide a price range for its systems.

To market and support the product, AT&T has formed a business unit called the AT&T Conversant System, based in Columbus, Ohio. AT&T listed credit card verification, stock quoting and market research as a few applications for the product. Fidelity Systems in Boston plans to use the product to allow its 6,000 users to access stock quote data.

Wang unveils link tools

By Paul Korzeniowski

LOWELL, Mass. — Wang Laboratories, Inc. opened its arms wide and today announced five products that connect its products to those from other vendors.

The products were designed to support AT&T Premises Distribution System, the IBM cabling plan, IBM's PC Network, Ethernet and asynchronous twisted-pair wire transmission.

"Wang is attempting to hedge its bets so that its products will work with whatever networking schemes become dominant," noted Greg Caristed, industry analyst at Dataquest, Inc., a San Jose, Calif., market research firm.

The Wang-to-IBM Cable Adapter links Wang peripherals to Wang computers via shielded twisted-pair wiring used in the IBM Cabling System. Each adapter consists of a link from a Wang device to an IBM wall link. Connections are required for both the Wang Computer and its peripheral. Cable adapters, priced at $100 a pair, are now available.

The IBM PC-Net Service enables IBM Personal Computers equipped with the IBM PC Network option to attach to Wangnet, the firm's broadband network. A Personal Computer would require Wang's IBM PC-Net Adapter as well as IBM's PC Network option to work with Wang's network offering. The IBM PC-Net Adapter costs $400 and is available now.

The Ethernet attachments enable a user to configure up to five Ethernet channels on Wangnet. A Medium Access Unit connects to Wangnet and supports up to eight Access Unit Interface ports that can drive one Ethernet device. The Access Unit Interfaces are equivalent to Ethernet transceivers. The Medium Access Unit will be available in November and will cost $3,500.

The Enhanced Asynchronous Device Controller links asynchronous terminals to Wang VS minicomputers over twisted-pair wiring at speeds of 19.2K bit/sec. The product will be available in November at a cost of $2,800.

The Wang Twisted Pair Balun connects Wang peripheral devices to Wang VS or OIS minicomputers via twisted-pair wiring. A Twisted Pair Balun is required for both the peripheral and the computer, with a maximum range of 400 feet.

The Twisted Pair Balun was developed by AT&T Information Systems for Wang. No price was given for the product, which will be available in the second quarter of 1986.

CORRECTIONS

The Hardware Roundup for mainframe systems [CW, Aug. 19] included incorrect information about various Burroughs Corp. products.

For the A9-F, the listed price of $613,000 is for a 12M-byte configuration, while the correct memory range is 12M to 24M bytes, and the channel availability is 8 to 40 channels. The correct relative performance rating for the B7900E is 199 and is 700 for the B7900K. The three-year lease price for the B7900F is $86,529 and is $127,862for the B7900H. The memory range for the B7900E is 6M to 18M bytes.

The memory range for the A 15 Model F is 24M to 96M bytes. For the B1990SP, the relative performance is 19, and the speed is .27 million instructions per second. The number of channels available on the B2925 ranges from 6 to 16, and the correct price for a 1M-byte memory upgrade for the B2925 and B3955 is $12,000. The product data listed for the B5919-2 should have been listed under the title V380.

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IBM withdraws support for System/34 software

By John Desmond
and John Gallant

Members of the nearly 50,000-member community of IBM System/34 users last week expressed surprise about the timing of Big Blue's decision to withdraw software support for the minicomputer.

IBM informed System/34 users late last month that, as of Feb. 21, 1986, it will no longer support the machine's SSP operating system and a variety of other key software products. IBM has been easing out of its commitment to the System/34, which has not been sold by the company since 1984, and users said they were expecting IBM to curtail both software and hardware support sometime in the future.

But the withdrawal of software support came much sooner than expected, in a move that users and analysts said could only be interpreted as an attempt by IBM to speed user upgrades to the more expensive System/36 and to bolster the Armonk, N.Y.-based giant's fourth-quarter revenue.

"It is quite blatantly an attempt to force System/34 users over to the System/36," said Frank Gens, industry analyst with the Framingham, Mass.-based market research firm International Data Corp. (IDC). As of January 1985, IDC estimated that there were some 58,000 System/34s installed. But Gens said migrations to the System/36 have likely pared that base to more than 45,000.

IBM introduced the System/34 in 1977, and it is estimated that the machine had been installed in roughly 65,000 U.S. sites by the time the System/36 was unwrapped in 1983.

"The announcement looks like an effective way to stimulate System/36 sales in the fourth quarter. That is something IBM really needs," Gens said. "But it seems extreme for a machine that has such a huge installed base. It seems to be forcing the issue prematurely."

Tom Teresi, chairman of the Common IBM users group System/34/36 project and president of Tom Teresi, Inc., a Minneapolis-based consulting company, agreed with Gens' assessment.

"The announcement certainly came sooner than expected," he said. "IBM traditionally supports products for a longer period. But it seems [that] IBM was just thinking of itself."

Because the latest version of SSP — Release 9 — is "relatively bug free," Teresi said, the end of software support will cause few problems for current users. He said users who choose to migrate up to the System/36 can port System/34 applications fairly easily and at little cost.

"The System/34 was very popular among users," Teresi said. "It was easy to operate and easy to program for."

But, he added, "It is ironic that, while IBM dropped support, it did not lower the price for any of the software. In fact, some System/34 software product prices were increased just this June."

Norris Cox, DP manager for William T. Burnett & Co., a polyurethane foam manufacturer based in Baltimore, told *Computerworld* last week that he "does not appreciate" IBM's attitude toward its base of System/34 customers.

"The announcement does not bother me on a practical level because we have never relied on IBM's service," said Cox, whose company operates a System/34 alongside a System/36. "But it indicates IBM's attitude toward its users. They should be continuing service for a box that is so widely installed."

Several users said they had already turned to third-party maintenance firms or to independent programming contractors for System/34 software and hardware support. They said others will probably follow in those footsteps.

One such user is Framingham, Mass.-based Waters Business Systems, Inc., which relies on two System/34s to develop marketing and sales information software. Vice-president Evelyn Liffiton said, "IBM has been treating the System/34 as a nonexistent machine for more than a year. I do not think this decision will impact us because we do not require any hardware or software support from IBM."

Liffiton said the company will continue to target software products to the System/34 market. "There is no reason for us to ignore that market with so many machines out there," she said.

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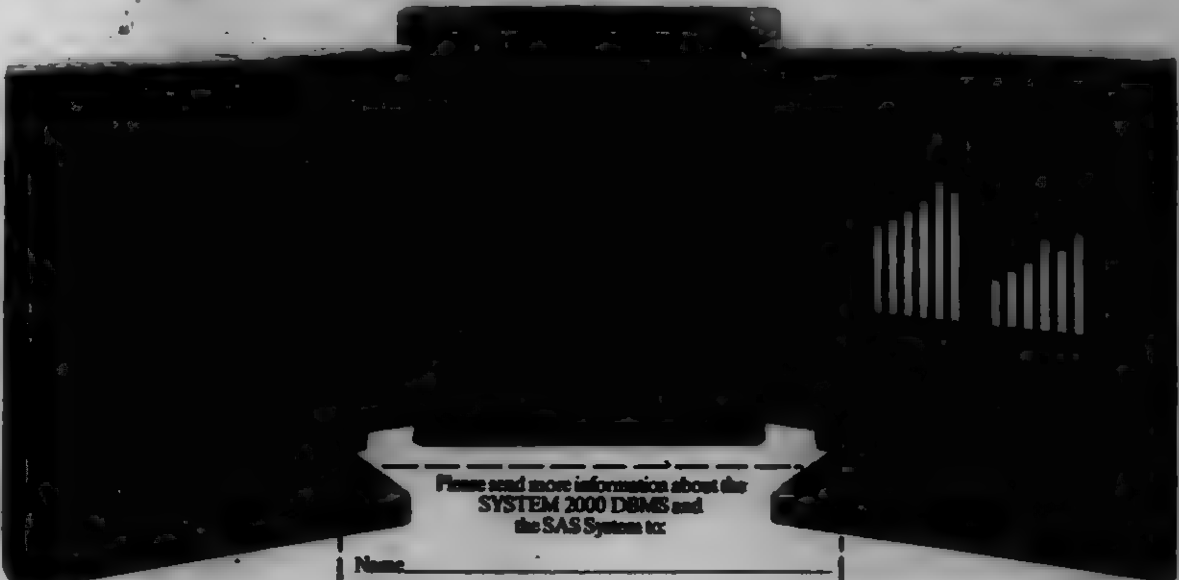

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From page 1

Chicago to Los Angeles: Moving an Arco facility

co-opting all the functions of its Chicago-area counterpart, Hahn said.

■

Although the Illinois information center's 4381 and 4341 are used mainly for technical applications, they provide a "full range of functionality," including office automation, management decision support and personal computing, Priebe said. For the first two years or so after its founding in February 1981, the Harvey center relied heavily on a team of professional applications developers to address its users' in-house computing demands. Since then, however, the users have largely weaned themselves from any professional programming support, Priebe said.

"Strictly speaking, we have no central data processing staff here in this facility," he said. "We are basically an end-user operation and dedicate our mainframes to the needs of our technical and managerial clients."

In keeping with the information center ideal, many of the Chicago facility's users have long performed most of the systems tasks that might otherwise have been assigned to computing professionals. Because many of the users already had strong scientific and engineering backgrounds, they were considerably more receptive to information systems than the average computing novice and found the technology comparatively easy to master.

"Our people, because of their highly technical training, have tended not to be afraid to dig in and use the systems" at their disposal, Priebe said.

But even the most technically adept of the information center's users fell short of complete systems self-sufficiency. So throughout much of its existence, the center maintained a staff of 10 full-time user support representatives and provided access to Focus, a fourth-generation programming language that helps clients write their own applications, Priebe said.

For more than four years, the information center and its assortment of end-user computing tools stood the Petroleum Products Division's technical operations in good stead. Then, on April 29, Arco announced a companywide reorganization aimed at streamlining its operations and cutting its overhead in the face of falling world oil prices and shrinking profit margins.

The shake-up calls for the Petroleum Products Division to centralize its nationwide resources — including its information centers — in Los Angeles and, in so doing, minimize the mushrooming cost of transporting Arco's Alaskan crude oil to market.

■

Arco recently took the first step toward relocating the Harvey information center when the company shipped a copy of the end-user computing facility's software to the Information Technology group in Los Angeles.

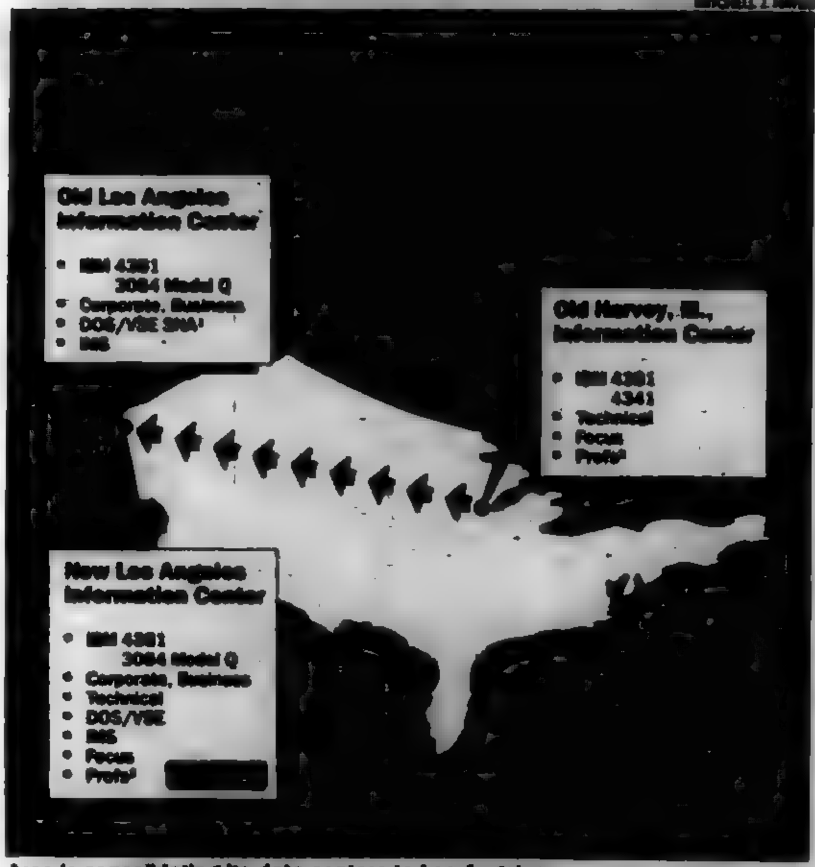
There, the programs will be merged with the West Coast information center's software. The result will be an integrated system that will be tested on an IBM 4341 Group II for three weeks, Hahn said.

In the meantime, the Petroleum Products Division will also begin to transfer the users in its Chicago-area location to their new workplaces in Southern California. The first of the transplanted employees, in fact, were scheduled to arrive at their destinations by Sept. 1, Priebe said.

During the coming four or five weeks, all the new arrivals will continue to obtain their computing services from their familiar information center back in the Midwest. But to gain access to the system, they will rely on 9.6K bit/sec. phone lines rather than the local IBM 3270 terminals they have typically used in the past, Priebe said.

At the close of business on Oct. 18, the Petroleum Products Division will permanently shut down its Chicago-area information center system and send a copy of its latest user files to Los Angeles by overnight courier. On Oct. 19, the Information Technology group will begin loading the files into the integrated information center system, which will later be moved from its test processor to a 4381 Group I that will serve as its production environment.

MITCHELL J. HAYES



Arco is consolidating its data centers to Los Angeles.

At 8 a.m. on Oct 21, the transplanted users will formally convert from the Chicago-area information center to its West Coast successor, which they will thereafter tap by means of 56K bit/sec. communications links.

Between Oct. 21 and year's end, another 50 to 70 Chicago-area users are also expected to relocate to Southern California. But before they do, they will still be able to avail themselves of the integrated information center system in Los Angeles, albeit as remote users, Priebe said.

■

But the merger of the Chicago and Los Angeles information centers involves much more than just transporting workers and shipping user files. The union will consolidate two sets of mutually complementary systems capabilities and thus enable each information center to broaden its user services by drawing upon the other's exclusive resources, Hahn said.

For the facility that will be relocating from Chicago, the merger will link users for the first time to Arco's nationwide IBM Systems Network Architecture (SNA) network and provide electronic access to the company's corporate data base. For the center in Los Angeles, meanwhile, the systems marriage will form the technological starting point for the development of both an electronic mail network and a centralized document retrieval service, neither of which the site now supports.

Most of those Arco employees who survive the Chicago site's layoffs will follow their end-user computing system to Southern California, where the two integrated information centers will share a 4381 Group I. To accommodate the expected increase in work load, the Information Technology organization plans to expand its processor to a Group II in mid-September.

The upgrade will entail little more than the installation of a few additional circuit boards and will take "only about eight hours," Hahn said. "Our parts are already on order."

■

To a large extent, the differences between the two information centers' client bases reflect a similar divergence in their installed systems resources. In Chicago, for example, users routinely avail themselves of a 50,000-item document retrieval service that depends for its existence on IBM's Professional Office System, which to date has been unavailable at the information center in Los Angeles.

On the other hand, the end-user computing facility on the West Coast supports DOS/VSE as a guest operating system under VM and thus satisfies one of the technical prerequisites for functioning in an SNA environment. The center back in the Midwest, by contrast, runs only VM, which by itself is incapable of supporting SNA.

The Los Angeles site also differs from its Chicago cousin in another important respect: Its 4381 serves as an intermediary between its customers and Arco's corporate data base, which resides in a 3084 Model Q running IMS.

"We've found over the years that IMS presents data from an accountant's or clerk's standpoint but that most of our users want to look at information from a line manager's perspective," Hahn said. "So we have a 4381-resident program that extracts corporate data from IMS, transforms it from a bookkeeper's point of view to a business point of view and downloads it through our information center to our clients."

The resulting ability to query Arco's corporate data base has hitherto remained beyond reach of the firm's information center near Chicago. But once the Illinois and California facilities merge, each will gain access to the other's systems and will be able to upgrade its computing capabilities accordingly.

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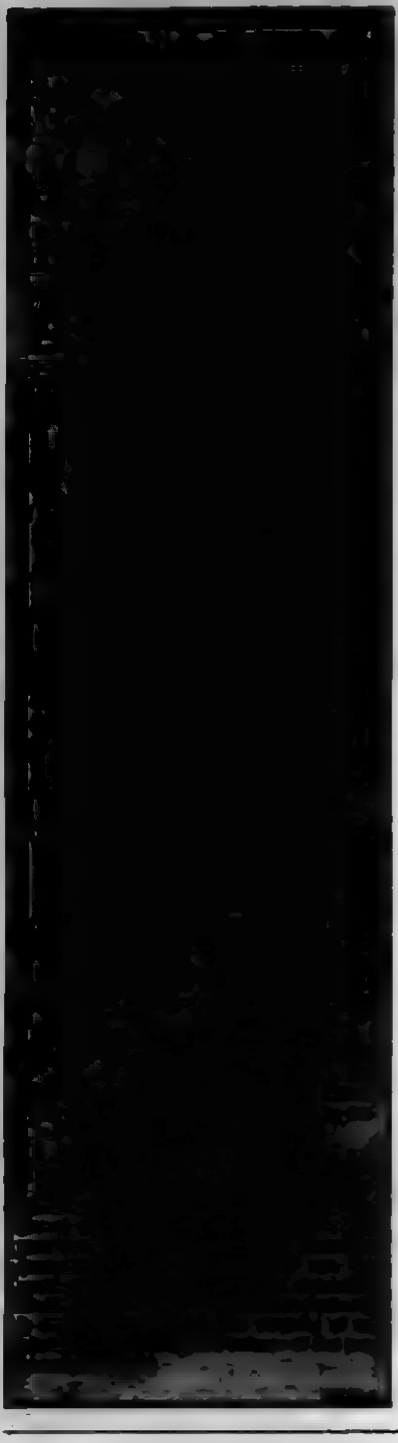

From page 1

Revised Cobol standard may be ready in late '85

tional and American standards organizations, and efforts to reform the protracted procedures for upgrading the language. The standards makers, who weathered years of intense criticism and even threats of legal action, will have achieved their goal of making Cobol a more viable modern-day systems development tool.

According to Lemuel Skidmore, vice-chairman of the American National Standards Institute's (Ansi) X3J4 Cobol subcommittee and founder of Clinton, Conn.-based Skidmore Resource Management Co., the parent X3 Cobol committee last month forwarded the proposed Cobol 85 standard to Ansi's Board of Standards Review for final approval.

Skidmore, who has acted as chairman of the X3J4 subcommittee since the resignation of former Chairman Donald Warren, said the board will review the language document not for its technical merits but to ensure that drafters have complied with Ansi procedures for standards development. The standards board is slated to meet this month and will later vote by letter ballot on the draft standard. Warren said the draft will likely be approved before 1986.

The only possible obstacle on the U.S. side, in Skidmore's view, may be the board's concern for the "sheer volume" of negative comments the draft drew when it was released for public review.

The first period of public review drew some 2,200 responses, the majority of them negative form letters in reaction to an earlier draft's incompatibilities with the Cobol 74 and Cobol 68 standards. The second public reviewing resulted in nearly 1,000 responses, the bulk of which were also negative. The final period drew fewer than 25 responses because standards makers had addressed many of the earlier concerns.

"The fact that the number of negative comments dropped precipitously should make a big difference," Skidmore told *Computerworld* in a recent interview. "Many of the former detractors felt that their concerns had been adequately addressed."

The draft Cobol 85 standard reached the Board of Standards Review only after weathering three ballots this summer in the X3 committee, which received the final document earlier in the year from the X3J4 subcommittee. Skidmore said that throughout the balloting, a representative of the Travelers Insurance Co. of Hartford, Conn., consistently cast a negative vote, citing incompatibility concerns.

That almost-wholehearted support of Cobol 85 also characterized the last days of the International Standards Organization's (ISO) Cobol efforts. According to Mabel Vickers, convener of ISO's Working Group 4 on Cobol and programming language project officer with the U.S. National Bureau of Standards, voting by key ISO-member countries on the international Cobol standard was completed in mid-July.

Vickers said only one country, Australia, voted against the international Cobol standard, primarily because of the format in which the standard was presented. Working Group 4 is scheduled to present the Cobol 85 standard to ISO's central secretariat by the end of November. Vickers said, "The central secretariat will review the manuscript to ensure that it is in accordance with ISO's guidelines and procedures."

■

Cobol 85 includes two areas of change

Experts involved in the Cobol standardization process say the changes embodied in Cobol 85 fall into two main classes: the addition of new functions designed to make Cobol more useful, especially in structured programming; and modifications aimed at resolving ambiguities in the language.

The following is a sampling of some of the features of Cobol 85. Structured programming features include the following:

- Added EVALUATE verb, which provides a means of testing multiple conditions and specifying multiple control branches.
- Added structured conditional statements, including 19 scope terminators such as END-IF and END-READ, which allow nested conditional statements to be stated clearly.
- Allowance for nested programs, so that complete programs can be contained within other programs.
- Added INITIALIZE verb, which allows programmers to initialize at one time a series of data items.
- Added DO-WHILE and DO-UNTIL versions of PERFORM that allow testing before or after execution.
- An Added CALL-BY-CONTENT command that allows users to pass data between programs while guarding data content from modification.

Data manipulation features include the following:

- A reference modification feature that allows programmers to reference a portion of a data item without having to REDEFINE the portion.
- Seven added levels of subscripting, allowing a table to have up to seven dimensions. Only three dimensions are specified in Cobol 74.
- Added relative subscripting ability that allows a variable used as a subscript to be increased or decreased.

I/O processing features include the following:

- New variable length records.
- Added I/O status codes, which allow a programmer to distinguish a variety of exceptional conditions.
- Added communications status and error keys.

— John Gallant

■

Cobol stays healthy in changing times

Predictions of Cobol's eventual demise began to be heard not long after the programming language was born in the late 1950s.

Although such dire prognostications are not new, they have in recent years taken on new urgency. Fourth-generation languages have made inroads into many mainstream data processing environments. In some cases, they have even supplanted the venerable Cobol entirely.

Fourth-generation language vendors have been able to capitalize on perhaps the two most widely shared concerns of DP professionals: increasing programmer productivity and easing maintenance work loads. Many critics contend that Cobol is not effective in solving those problems, that it is a dinosaur born in a time when both the demand for applications and programmer salaries were much smaller.

Agreeing that portions of that criticism are valid, proponents claim the nearly ratified Cobol 85 standard does much to make Cobol a more viable tool for systems development. Advocates of Cobol say the enhancements in Cobol 85 make the language more productivity oriented and aid in the development of systems that are more easily maintained.

"In Cobol 85, we added new features, such as structured programming facilities, additional verbs and new ways of delimiting statements," said Lemuel Skidmore, vice-chairman of the American National Standards Institute's X3J4 Cobol group. "We also clarified many ambiguities."

According to Jerome Garfunkel, also a member of X3J4 and founder of Jerome Garfunkel Associates, Inc., a Litchfield, Conn.-based Cobol consulting firm (see story page 41), the increasingly onerous maintenance task was foremost in the minds of Cobol 85 drafters.

"If I had to pick one area in which Cobol 85 is strongest and [name] the group it will benefit most, it would be the maintenance function and maintenance programmers," Garfunkel said. "One of the biggest lessons we learned is that we better build systems expecting them to change. There is no language I know of that is better for that task than Cobol."

"Most of the fourth-generation languages can do what Cobol does and do it more efficiently," he said. "But you have to consider why Cobol was developed in the first place. Industry needed a common, portable language. I see nothing in the way of fourth-generation languages emerging to take on that role."

— John Gallant

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Dayton	Oct 9
Denver	Oct 29, Nov 20
Detroit	Oct 22, Nov 12
Houston	Oct 31, Nov 21
Kansas City	Nov 6
Los Angeles	Oct 22, Nov 19
Minneapolis	Oct 10
New Orleans	Nov 19
New York City	Oct 10, 25, Nov 6, Dec 12
Newport Beach	Oct 17
Oklahoma City	Nov 7
Omaha	Oct 24
Orlando	Oct 15
Phoenix	Oct 9
Portland	Oct 10
Rochester	Oct 10, Dec 5
Sacramento	Oct 8
St. Louis	Nov 14
Salt Lake City	Nov 14
San Antonio	Oct 23
San Diego	Nov 7
San Francisco	Nov 5
San Jose	Oct 24
Seattle	Oct 2, Nov 26
Syracuse	Nov 7
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From page 1

Sperry boosts microcomputer line

"We're committed to becoming a major force in the micro/personal computer world," Battaglia said. He estimated that micro-based products — ranging from personal computers to Motorola, Inc. 68000-based supermicrocomputers — will represent approximately one-third of the total bookings for his division in the fiscal year that ends in March. "Obviously, that's a pretty big number."

The new desktop system is "a very concrete example" of changes that have taken place at Sperry during the past several years, Battaglia said. "First, it's a product that we're getting from outside. The 'not-invented-here' syndrome is a cadaver at Sperry."

Other new directions include the recent move to supplement direct sales with indirect channels, with a sizable fraction of Sperry's 200-member U.S. sales staff dedicated to micro products concentrating on resellers. Finally, Sperry is marketing and promoting new products much more aggressively, he said.

Based on the Intel Corp. 80286 chip running at 6, 7 or 8 MHz, the PC/IT comes with 512K bytes of random-access memory, expandable to 5M bytes; a 5¼-in., 1.2M-byte floppy disk drive; two asynchronous ports and a parallel port; eight expansion slots; Microsoft Corp.'s MS-DOS 3.1 and GW Basic; and a clock. An expanded unit with a 44M-byte, unformatted hard disk drive and controller costs $5,150. Running under Microsoft's Xenix operating system, a $995 option, the system can support up to nine users.

Standard interface for office system

The Sperry Link software for Sperry and IBM Personal Computers, scheduled for announcement later this month, will give users of those machines a standard interface for the Sperry office system, said Joseph Gariano, director of micro products marketing. "The user will always see the same screen." Base price for a package providing the Sperry Link screen and word processor is $350, and many other Sperry Link applications also will be offered.

PC/On-Line, which Sperry quietly began shipping in August and which will officially debut later this month, is a menu-driven software package that links MS-DOS-based personal computers with the company's 1100 series mainframes. The software has the following three components:

- On-Line Disk, priced at $630, gives the micro user access to mass storage on the mainframe.
- On-Line Extract, which also costs $630, permits the personal computer user to extract Mapper data from Sperry 1100, System 11, Mapper 10 or Mapper 5 machines and then manipulate the data locally.
- On-Line Transfer, at a cost of $250, handles synchronous transfer of Ascii files between Series 1100 hosts and the micro.

The PC/HT, which Sperry began delivering in August but will be officially rolled out next week, is an enhanced version of the basic Sperry Personal Computer. A base configuration costs $2,322 with monitor and 256K bytes of internal memory. A high-end system with a color monitor and a 20M-byte hard disk drive will cost $4,750.

From page 1

IDC report: DP spending slump continues for second year in a row

for the variance is that most independent software producers charge for software licenses by site, which means that a single-CPU site would pay as much for a general ledger software package license as would a large site with several more powerful computers.

There appears to be a movement toward the need for more programmer/analysts with specific applications experience as opposed to Cobol programmers who can "crank out the code." Operations and maintenance are absorbing an enormous number of the available personnel in spite of the rise of productivity tools. "One begins to fear that the picture will take on the image of a sinking lifeboat 100 feet offshore. Everybody is bailing furiously, and nobody has the time to row or steer," the report stated.

DP spending as a percentage of revenue varies widely by industry type. In banking, DP spending as a percentage of assets was 0.35%. The highest figure was for education, which showed DP spending at 2.8% of revenue. Other industries included primary metals at 1.65%, manufacturing at 1.7%, utilities at 1.1%, insurance at 2.2%, transportation at 1.35%, state and local government at 1.7% and retail at 1.2%.

According to the report, 79% of companies with DP budgets in the $5 million-to-$10 million range claim to have full control of microcomputers in their organizations, but that claim varies widely among companies. For instance, 47% of the smallest companies, having up to $1 million budgets, claim such control, and 49% of companies with budgets of more than $10 million purport to have full control of micros. Fifty-nine percent of $1 million-to-$2 million budget companies make the claim, as do 53% of companies in the $2 million-to-$5 million range. Overall, 56% of all companies surveyed said the DP department has full control of microcomputers.

An IDC study based on other research and mentioned in this survey showed that four out of five personal computers are stand-alones, and for those that do talk to others, the communication is focused on sharing the same printer and hard disk.

The report, which costs $1,500, is available to IDC's user client base and its vendor client base.

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"Quite simply, this package has so many outstanding attributes that even the worst skeptics of integrated software have to be impressed. The spreadsheet is very close to 1-2-3; the word processor combines the best thinking of WordStar, MultiMate, Volkswriter, and EasyWriter; the data base offers the functionality of dBASE II, but with many of the ease-of-use features of PowerBase; and the program offers business graphics and telecommunication. Taken as a whole, Enable surpasses the functionality of Symphony, Framework, Aura and Open Access."
IBM PC Update
December, 1984

"... as powerful as a collection of stand-alone programs, and it offers the benefits of integration to boot. What's more, it runs in only 192K bytes of memory."
ComputerWorld
March 20, 1985

"Offering true integration among all of its applications modules... [Enable is] a powerful production tool that can serve everyone in the office, from data entry personnel to the vice-president of marketing. Each module could stand as a full-powered application in its own right."
PC Magazine
February 19, 1985

"Enable is one of those programs that can be up and running with most of the features you need in a few hours. As you need more, you can get deeper into the program and learn at your own pace."
InfoWorld
January 21, 1985

Enable first in "Performance" rating—including speed and capacity of all modules tested. Enable first in "Versatility" rating—including power and functionality of all modules tested. Enable rated first in overall evaluation of the word processor module.
Software Digest Ratings Newsletter
Rating of 15 Integrated Products
December, 1984

"Enable, a five-function integrated system from The Software Group, merits a close look by any individual or organization interested in a solid package that is well balanced in all of its applications."
Popular Computing
March, 1985, Paul Golden, Raymond Head, Yoram Lirtzman, Michael Wilding

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Personal Computing
March, 1985

"Enable welds its five applications together with outstanding integrity—yet each is exceptionally full-functioned in its own right."
Business Computer Systems
January, 1985

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Business Software
April, 1985

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November, 1984

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Ashton-Tate unveils Framework II integrated software

By Jeffry Beeler

PALO ALTO, Calif. — Ashton-Tate of Culver City, Calif., last week replaced its Framework integrated software system with an enhanced version that reportedly provides improved ease-of-use features for computing novices and increased performance for power users.

Framework II, priced at $695, made its debut during a Sept. 10 press conference, where Ashton-Tate's Publishing Group simultaneously introduced two members of its Decision Maker series of integrated software support programs.

The two modules include Project Analysis, which helps managers to prepare conceptually for upcoming jobs and to allocate available resources; and Decision Modeling, which allows executives to identify and assess competing alternatives.

Both members of the Decision Maker series reportedly complement the capabilities of Framework II, which consists of two main parts — a spreadsheet and a word processor. The halves, which are tightly integrated to permit each to exchange data with the other, are said to boast improvements over their Framework I predecessors.

On the spreadsheet side, Ashton-Tate has revamped Framework II to perform financial calculations twice as fast as its original integrated software system, according to the product's chief architect, Robert Carr. The vendor has also reportedly doubled the efficiency with which a microcomputer-resident spreadsheet uses its available random-access memory (RAM).

On the word processing side, meanwhile, Ashton-Tate has upgraded the latest version of its integrated software system with the addition of an 80,000-word spelling checker, which works equally with Framework II's spreadsheet.

Supporting the product's two primary software modules are a number of ancillary capabilities, including telecommunications, graphics and data base management, all of which are reportedly integrated with the rest of the system.

Framework II is configured to accept Ashton-Tate Dbase III and Dbase II applications automatically, and other custom applications may be installed into its pull-down menus, the firm said.

Like the year-old integrated software system it replaces, Framework II runs on IBM or "100% IBM-compatible" personal computers, according to Ashton-Tate President Edward Esber Jr. Framework II requires 384K bytes of RAM plus at least two 360K-byte floppy disk units and becomes available for shipment at the end of next month.

Through year's end, users can upgrade from Framework I to II for $140. The two Decision Maker series packages, meanwhile, each sell for a suggested retail price of $69.95.

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- User-designed menu generation—tailor Enable to your specific needs with your own unique menus, help and error messages, pop-up windows, and full choice of colors.
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- User configurable—choose among 6 varied shapes from 255 rows × 255 columns to 4095 rows × 15 columns.
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Signal bows, 1-2-3 upgrade policy out

CAMBRIDGE, Mass. — Almost five months after announcing an enhanced version of its best-selling 1-2-3 productivity package, Lotus Development Corp. last week released information on its upgrade policy. As expected, separate arrangements will be available next month for corporate and single-user customers.

Separately, Lotus unveiled Signal, a $595 hardware/software combination that delivers and analyzes financial market data for personal computer users.

Upgrade kits for 99 or fewer copies of 1-2-3 Release 2 will be priced at $150 each, Lotus said. In 100- to 1,000-unit quantities, upgrades will cost $125 each, with the price dropping to $100 each for larger orders.

Lotus sales representatives will coordinate volume upgrades directly with corporate customers, the vendor said. These customers may submit purchase orders directly to Lotus and will not be required to return the original 1-2-3 disks as long as they agree to destroy them.

The vendor will mail upgrade announcement kits to individual registered users next month. Users who do not receive these kits should register for them by returning their warranty cards to Lotus. Individual users must return their system and utility diskettes to get the upgrade. All users who purchased 1-2-3 after April 23 may receive the new release for free, Lotus reiterated.

The Signal product will receive real-time market quotations broadcast via FM sideband transmission and analyze the data on a personal computer using 1-2-3 or Lotus' Symphony software.

Users will pay Lotus monthly fees, with a base fee of $80 plus $20 per exchange. They will also pay exchange access charges, said Alexander Crosett, marketing manager for Lotus' Information Services Division.

Typical users are likely to pay $125 a month and more, he estimated.

Signal is scheduled to be available the first week of October in 12 major metropolitan markets.

Reagan bans high-tech sales to South African agencies

Apartheid-enforcing groups targeted

By Mitch Betts

WASHINGTON, D.C. — President Reagan issued an executive order last week banning all U.S. exports of computer hardware and software to certain agencies of the South African government that administer its apartheid system.

In an apparent response to bipartisan support in the U.S. Congress for economic sanctions against South Africa, the president reversed his earlier opposition to sanctions and issued Executive Order 12532. The move at least temporarily kept the U.S. Senate from voting on legislation containing a computer ban and other sanctions [CW, Aug. 12].

Concerning computer technology sales, the executive order used language similar to that used in Congress' Anti-Apartheid Act of 1985. The order stated that, effective Oct. 11, the following transactions are prohibited: "All exports of computers, computer software or goods or technology intended to service computers to or for use by any of the following entitites of the government of South Africa."

The order listed the affected agencies as the military, the police, the prison system, the national security and weapons research agencies, the administering authorities for the black passbook and similar controls and any other apartheid-enforcing agencies.

Trade statutes set as legal basis

The legal basis for the order was a set of emergency trade statutes that permit the president to declare a national emergency and to issue trade sanctions. The order said the action was justified because "the policy and practice of apartheid are repugnant to the moral and political values of democratic and free societies," run counter to U.S. policies and endanger U.S. interests in South Africa.

Reagan's order also authorized the U.S. Secretary of Commerce to issue regulations that would be necessary to carry out the computer ban and to implement a system of end-use verification to ensure that any computers exported directly or indirectly to South Africa will not be used by any apartheid-enforcing agency.

The Computer and Business Equipment Manufacturers Association (Cbema), the trade group for the U.S. computer industry, announced that it will cooperate fully with the president's order.

"Our industry has long cooperated with the 1979 ban on computer sales to apartheid-enforcing agencies," said Vico E. Henriques, president of Cbema, referring to a weaker provision in the Export Administration Act. "We join all fair-minded Americans in our condemnation of South African racial policies," Henriques said.

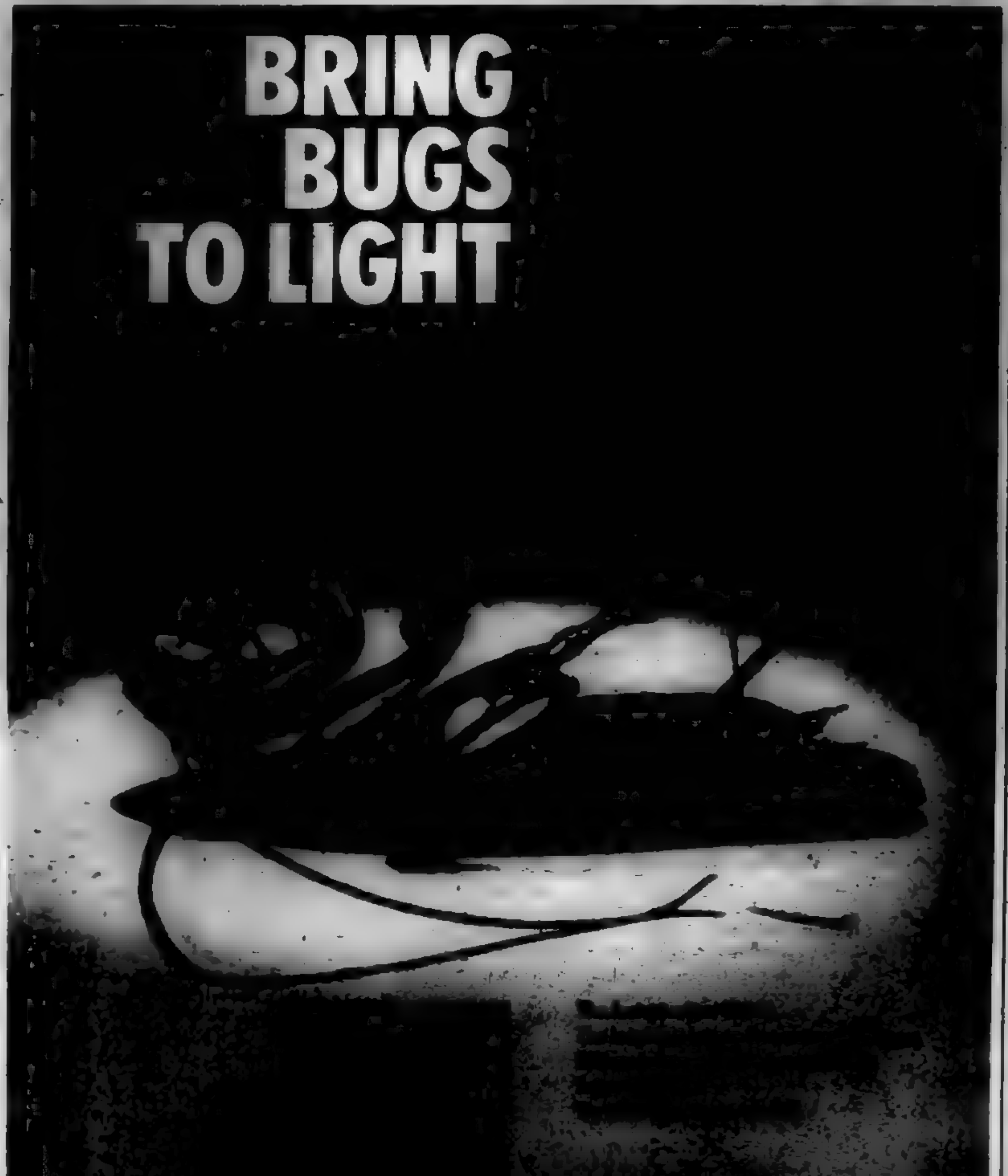
Cbema supports a ban on sales to apartheid-enforcing agencies but opposes broader prohibitions against all computer sales in South Africa [CW, June 17].

Computers used to track blacks

Congress' rationale for a computer ban was that South African agencies use computers to monitor and track blacks throughout their lives to enforce racial segregation and to identify blacks living in white areas illegally, according to U.S. Rep. Howard L. Berman (D-Calif.).

From the age of 16, all blacks in South Africa must carry passbooks indicating where they have permission to live and work, Berman explained in recent congressional testimony.

The South African government maintains extensive computerized records on all blacks — their birthplaces, employment histories, family members, residences — and this information is periodically checked against the blacks' passbooks, he said.



U.S. military to automate weapons manuals, drawings

Long-range program could create paperless Pentagon

By Mitch Betts

WASHINGTON, D.C. — A U.S. Navy official last week disclosed that the U.S. military, in cooperation with defense contractors, plans to computerize fully its weapons manuals and technical drawings.

Ultimately, the long-range automation program could create a virtually paperless Pentagon weapons operation. Technical data from the manufacturers' computer-aided design and manufacturing (CAD/CAM) systems could be fed into a central data base stored on optical disks, ready for easy updating and on-demand printing of operation and maintenance manuals and drawings.

Speaking at a special Federal Computer Conference session, William Gorham, staff engineer at the Naval Supply Systems Command, outlined the ambitious program, called Computer-Aided Logistics Support (Cals).

The Cals program was sparked by paperwork problems at the Department of Defense weapons support offices, including out-of-date manuals, incomplete and illegible engineering drawings and repositories of manuals that are "voluminous, redundant and excessive," Gorham said. With President Reagan's arms buildup, he said, "We are becoming inundated with paper and microfilm."

Furthermore, scandals about overpriced spare parts for weapons systems have pointed out that the Pentagon needs to retain even more technical data so it can encourage more competition for spare-parts contracts, Gorham said.

Recognizing these growing problems, the Pentagon and defense contractors last year conducted a six-month joint study on automating technical data about weapons systems, using the contractors' CAD/CAM systems.

Gorham predicted that the Cals program will be endorsed officially by Deputy Secretary of Defense William H. Taft IV sometime in the future.

Bradford Smith, chief of the manufacturing systems group at the National Bureau of Standards (NBS), said the Cals program "will change the way DOD does business, and by extrapolation, may affect all other government agencies."

Gorham said the key to the Cals effort will be the incorporation of data exchange and graphics exchange standards in CAD/CAM and other computer systems involved, with the help of the NBS. Pilot demonstrations in each military service are planned for the 1986-89 period to demonstrate the feasibility of the program, he said.

The transition to the fully automated system will require three phases, Gorham said, with each phase moving toward the goal of a single data base with a data dictionary.

The first phase will include the digital automation of specific types of logistics items, such as engineering drawings, operations manuals and training documents. The second phase will require consolidation of these digitized products into three major data bases, using local-area networks that link the manufacturers with the military document repositories.

Gorham said the third phase will further consolidate the data bases into a single data base that has fully interchangeable data elements and single-point updating with the help of a standard data dictionary.

The forthcoming Pentagon policy statement will officially launch the Cals program by requiring each military service to designate a major weapons system for the pilot program, Gorham said.

Oracle releases DBMS security audit features

By Mitch Betts

WASHINGTON, D.C. — Oracle Corp. of Menlo Park, Calif., announced at the Federal Computer Conference last week that the new release of its Oracle data base management system software will include a security audit facility for commercial and government users.

The software feature, part of the forthcoming Oracle Version 5 DBMS, was urgently requested by military intelligence agencies seeking the ability to conduct retrospective audits of user attempts to access data bases, according to Ken Cohen, the product marketing director..

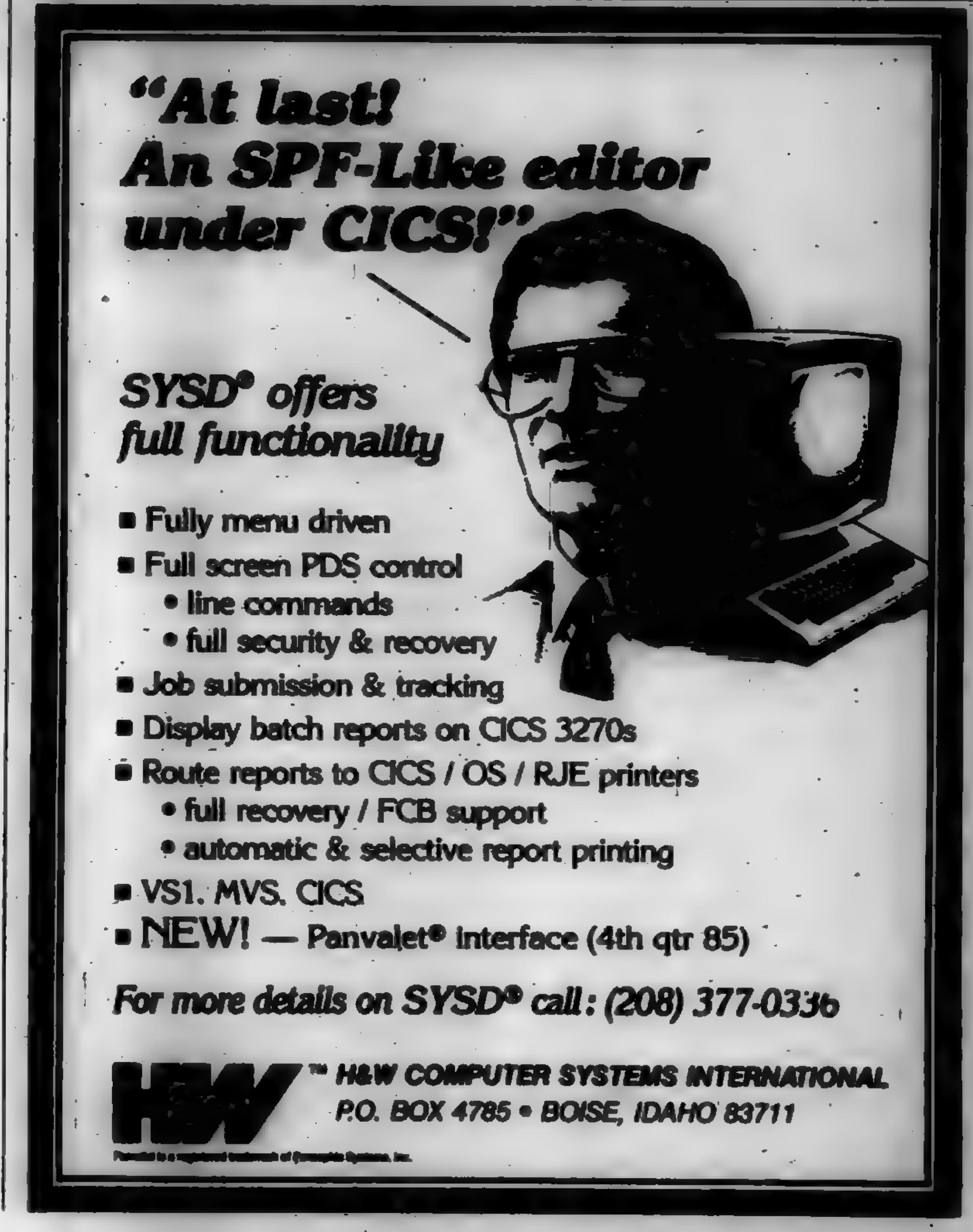
The facility provides an audit trail of the user name and identification, use or attempted use and logins and attempted logins, Cohen said. Consequently, a data base administrator or security officer can use Oracle's version of the IBM-developed SQL to produce periodic audit reports or to answer ad hoc queries about data base access, he said.

Cohen said the security facility was developed in cooperation with a U.S. Navy intelligence agency and apparently meets the audit requirements of the government's Trusted Computer System Evaluation Criteria document [CW, Sept. 17, 1984].

Oracle also announced that it will enhance the DBMS to permit administrators to restrict user access to data files based on the specific terminal from which access is attempted.

Both security enhancements will be included in the forthcoming Version 5 at no extra charge to current Oracle customers, according to Cohen.

He added that the security facilities will be released Oct. 10 for Digital Equipment Corp. VAX minicomputers and thereafter will be ported to a wide variety of hardware and operating systems, including IBM mainframes and microcomputers.



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Encore Computer ushers in Multimax supermini line

By Mitch Betts

WASHINGTON, D.C. — Encore Computer Corp. chose the Federal Computer Conference held last week to introduce formally its Multimax line of general-purpose superminicomputers and related products.

In other efforts to appeal to computer buyers in the U.S. government, Encore officials said the firm's products will use existing government communications protocols and standards in its products and will place its eastern U.S. sales and operations headquarters in Greenbelt, Md.

Encore officials touted the Multimax as the first commercial product to permit as many as 20 main processors to share a common memory in a high-performance environment.

"With 20 processors installed, we have observed 96% of the ideal, aggregate performance on memory-intensive tests, even with I/O traffic," said Russell L. Moore, vice-president of hardware development, who added that the architecture will facilitate parallel processing.

Officials of Marlboro, Mass.-based Encore said Multimax performance is from 1.5 million instructions per second (Mips) to 15 Mips, in 1.5-Mips increments. Memory capacity is from 4M to 32M bytes, and the system contains from one to 10 I/O channels. The 32-bit multiprocessor is organized around the Nanobus, the firm's own high-speed propriety bus.

System prices begin at $112,000 for a dual processor, 1.5-Mips system with 4M bytes of shared memory, one I/O channel, one 515M-byte disk drive, one 6.3K bit/in. ½-in. tape drive and one workstation or console printer. A large system configured for parallel processing applications, with 20 processors operating at 15 Mips, 32M bytes of memory and the same peripherals, costs $340,000.

The prices for both configurations include a new multiprocessor operating system based on AT&T's Unix, program development tools and a C compiler, the vendor said.

First customer shipments are planned for October and November, officials said.

The announcement also included the introduction of the following products:

■ The Umax 4.2 multiprocessing operating environment, Encore's version of Unix 4.2 BSD with parallel and distributed processing extensions, is used as the operating system for the Multimax superminis. Officials said the design allows all processors concurrent access to system data structures.

■ The Host Station family of displays and workstations, Models 100, 110 and 550, are priced at $3,495, $3,795 and $14,000, respectively, in single-unit quantities. The Host Station 100, introduced in April, offers high-resolution graphics, and the 110 adds downloading capability for custom bit-mapped fonts for the computer-aided publishing market. The Host Station 550 has an additional 32-bit processor for interactive applications requiring local computational power and operates under the Umax operating system.

■ The Annex network communications computer is said to be a 32-bit subsystem for connecting up to 16 high-speed, 38.4K bit/sec. serial ports to local-area networks. The vendor said it provides networking and I/O processing for peripheral communications, thus freeing shared computers for user tasks. The Annex family has two models, the $6,000 UX terminal server and the $8,000 MX Multimax I/O processor.

Dema meet eyes data center productivity

By Mitch Betts

WASHINGTON, D.C. — Much of the talk last week at the Data Entry Management Association's (Dema) ninth annual conference focused on the search for methods to increase the productivity at data centers.

Carol Ann Meares, acting director of the U.S. Department of Commerce's productivity center, said U.S. companies need to have strong productivity improvement strategies to compete in the international marketplace. She said productivity improvement is an ongoing, multifaceted process — not a single program — that must have visible support from top management.

"For example, make [productivity] improvement a regular discussion topic at staff meetings. Some organizations establish a high-level steering committee to guide and review improvement efforts," Meares said.

Meares also urged managers to communicate plainly their plans to prevent a rash of negative rumors that management wants a "work speedup." She said management should encourage workers to participate in making the decisions about productivity improvement and should stress the benefits for employees.

"Employees are going to ask, 'What's in it for me?' Continue to point out how they will benefit —

Continued on page 15

A word
for those
who just
bought a
Unix system.

Bell Atlantic readies ISDN for 1987 availability

By Bryan Wilkins

WASHINGTON, D.C. — Bell Atlantic Corp. last week unveiled its version of an Integrated Services Digital Network (ISDN) and disclosed its plans to make the service available to businesses in 1987 if business conditions warrant it.

The ISDN demonstration, centered on the regional holding company's primary central office switch in the nation's capital, made use of the company's existing Centrex service, which Bell Atlantic is vigorously trying to revive in the face of contract expirations by many U.S. agencies.

ISDN is the ability of the telephone network to permit users to perform telephone voice communications, data transmission from terminals and from computers to terminals, videoconferencing and facsimile transmission simultaneously and to serve as an electronic mail messaging system.

Digital switches essential

Permitting these types of simultaneous functions on the telephone network is essentially made possible through the installation of stored, program-controlled digital switches, devices that both local exchange telephone companies and long-distance carriers are putting in place despite the obstacles presented by the different interfaces in various vendors' equipment attached to the network.

Resolving standards issues to permit universal interface to an ISDN network will be critical to the pace of introduction and acceptance by customers, said Richard Eichorn, Bell Atlantic's assistant vice-president for product line management.

The Bell Atlantic demonstration connected four terminals, two of which were new integrated voice/data terminals manufactured by NEC America, Inc. Communications by voice and data simultaneously over the same line were carried on as well as facsimile machine transmission.

The Bell Atlantic demonstration permitting dissimilar terminals to carry on voice, data and facsimile communications simultaneously is dependent on a so-called terminal adapter located at the user's desk, which converts the protocols of each unit into standard language for transmission over Bell Atlantic's lines.

Ultimately, these protocol converters would be incorporated into vendors' equipment, Eichorn said.

An ongoing standard issue that is still to be resolved in the U.S. is whether to adopt the network interface system that has been adopted by most European countries that have established a universal interface to ISDN for equipment. In the U.S., some vendors are holding out for the interface to the ISDN network to take place at the telephone company switch where the protocol conversion would be performed.

Bell Atlantic last week said it supported the adoption of the European "T" standard interface. "It's impossible to overstate the importance of establishing one uniform set of standards for ISDN," said Roger Nucho, Bell Atlantic's staff manager for network architecture and standards.

From page 14

Dema meet eyes data center productivity

less frustration and fewer problems, improved working environment, more satisfying work, feelings of accomplishment, recognition and a better chance for raises in the future," Meares said.

She noted that there is a large amount of helpful information on productivity available from the government, productivity research centers, trade associations and trade newspapers. Meares said the Commerce Productivity Center in Washington, D.C., is a clearinghouse for such information.

Paul Banks, DP manager for Mitchell, Silberg & Knupp in Los Angeles, reported that an effective incentive pay program for data entry workers can increase productivity by 45%, as well as improve employee morale. He defined incentive pay as "compensation aimed at increasing production and encouraging progress toward company goals.

"It has been my experience that an incentive system can provide a significant return on investment — four to one or higher — for shops with 20 or more operators, based on wage costs alone," Banks said. He recommended that an incentive program be considered for data entry offices with more than six operators.

Increasing production rates is best accomplished when goals are understood, mutually acceptable to management and operators and supported by statistical information, added Frances Arakawa, manager of the data entry department at Combined International Corp. in Chicago.

Barbara A. Bradley, data entry consultant at Springs Industries, Inc. in Lancaster, S.C., stressed the importance of accurate job descriptions, rewarding career paths, fair performance standards and regular performance appraisals for data entry operators. These management practices encourage initiative and a sense of responsibility among employees, she said, and are strong motivational forces.

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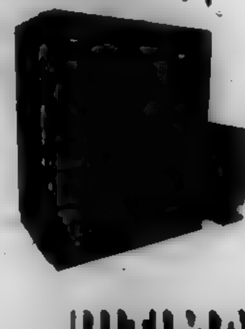

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EDITORIAL

Computers and South Africa

The turmoil surrounding contemporary South Africa has spilled over into the computer community, both here and in Pretoria. *Computerworld* interviews in last week's issue reported that members of the South African computer community decried U.S. efforts to restrict sales of computers to those agencies administering the system of apartheid, labeling such action as restrictive and punitive.

The day after publication of these comments, President Reagan officially imposed computer sales sanctions against South African government security agencies. The Executive Order, in effect, superimposed the stamp of White House decree on moves that many U.S. computer manufacturers have already taken voluntarily.

No one seriously presumes, however, that the actions of President Reagan will have appreciable effect on the workings of the South African government. The real point of the U.S. sanctions is to add to the pressure building on the South African government to institute reforms, and any move in this direction must be viewed as positive.

There is another issue involved, one that speaks to the central involvement of computer usage in this dispute. To our knowledge, this is the first time that the matter of *moral effect* has been applied to computer manufacturing: Do the people who produce machines that are used in the pursuit of morally objectionable ends share responsibility for the ultimate effect with the people who actually use them?

Whether or not this is the first time this issue has been touched upon in international political debate, we are certain that it will not be the last time. As computer technology comes to play an increasingly greater role in the implementation of controversial defense, security and social policies within the U.S. and among its allies, computer manufacturers, their officers, employees and investors can expect to be confronted time and again by opponents of these policies seeking to accrue public support.

The U.S. computer community must begin to think through the implications of this issue and be prepared to deal with its ramifications.

On the specific matter of computer sales to the South African government, we believe that the U.S. computer industry has thus far acted responsibly. Now that it has become a participant — albeit unwilling — in this political struggle, more voices must be raised in this deeply important matter. There is room for debate about the motivation for and the effect of sanctions such as these now imposed by the Reagan administration. There is no room for debate over the goal.

We join all of those who denounce institutional racism as practiced by the government of South Africa.

Notes & comments

Before it recedes too far into the past, we must make mention of *Playboy* magazine's annual "Back to Campus" guide (September 1985), and the entry under the heading of The Hot Major. It read, "Ask anyone: The hottest field for the Eighties is computer science." Does this mean no more jokes about nerds in white socks toting slide rules? We'll see. Meanwhile, our congratulations to our readers for their wisdom and foresight.

Computerworld
Proposed Congressional U.S. COMPUTER SALES RESTRICTIONS
U.S. COMPUTER MANUFACTURERS in So. Africa
CORPORATE MINORITY A$$ISTANCE PROGRAM$

Between a rock and a hard place

LETTERS

Government certification suggested

In the Reader's Platform "Certification: A gauge for computer professionalism?" [CW, July 22], the author implied some sort of national recognition for the certificates awarded by the Institute for the Certification of Computer Professionals (ICCP). Unfortunately, no such recognition exists, although the ICCP would like to believe that it does.

Achieving national certification is indeed something for which we should all strive. However, certification must be taken out of the hands of the ICCP and properly placed with the federal or state governments just as it is for attorneys and doctors.

Up to this point, I am not sure how much influence ICCP certification would have played in my hiring practices except to tell me that the candidates were able to guess correctly at a number of inscrutable questions on a five-hour test. It would certainly not have contributed to their professional, ethical or legal postures.

Peter Adams
Clifton, N.J.

For more letters, turn to page 23

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VIEWPOINT

Avoiding security disasters

MANAGEMENT MATRIX
Walter F. Cutie

"Suppose," the riddler asked, "that a flood was coming. What would you do?"

"Go up to the roof," was the answer.

"Now suppose that you knew a tornado was coming. How do you prepare for that?"

"Hide in the basement, I guess."

"But what if you prepared for the tornado, and a flood came instead? What would you do then?"

While you consider the answer to that, consider the similar problem with security in information systems. It's a matter not only of how well you prepare but also for which threat you prepare.

There have been a lot of tornado warnings in recent years. We are given images of swashbuckling juveniles baffling old pros and getting book contracts for their escapades; reports of gallant attorneys with the words "computer law" on their business cards leaping to the defense, speeches by politicians rising to the challenge with bills that could well be infringements of civil liberties. Everybody into the cellar.

Although vandals with their electronic spray cans do pose somewhat of a threat to your system, they are more of a tempest in a teapot than a full-blown tornado. Given the funds, it is easy to protect yourself. The real problem is not the juvenile genius but the poorly informed financial executive who could not see the wisdom of a callback system on the corporate computer and deleted that budget item once too often.

Think about it for a moment. If you had all the requisite technology in place, who could possibly defeat a callback system? Who could change a telephone number in a secure file without leaving a trace? Who could know the key to an encrypted file? Someone on the inside, that's who.

Here lies paranoia. Security based on universal suspicion views information as a kind of intellectual crown jewel. That begets a lockup mentality, conjuring up images of cops and robbers, guards and guns.

There are two problems with the lockup approach. One is that it puts the complete responsibility for security in the hands of a separate group that can't help but be always one step behind the group that creates the thing protected. The other problem is that, since the whole setup is all stick and no carrot, there will be a natural tendency for the programming staff to view security as a nuisance, a clumsy obstacle to be circumvented. The more the staff views it that way, the more expensive, complex and ineffective the security system becomes.

> *Who could change a telephone number in a secure file without leaving a trace? Someone on the inside, that's who.*

Even when the security procedures are followed to the letter, they may not work. There is a story about a systems operator for a lockup installation who reported a problem with a disk drive and called in a service technician. The tech said that the drive would have to "go back to the shop" and trundled it out to the door. Following official published procedures, the guard checked the tech's name, identification, time of arrival and departure. He took the trouble to log the serial number of the drive and obtain authorized signatures on a fistful of forms before passing the tech and the unit out the door. Nobody had said anything about checking for a disk pack in the drive, so 300M bytes of confidential files went out the door too.

Information can't really be locked away like a valuable jewel. So who shall guard the guardians? To a great extent, the information systems staff must guard itself. Because your systems professionals are the best qualified to breach security, scary as that idea is, they are the best qualified to maintain it.

You can do it in three steps: Set up a system with a minimum number of rules; write the rules so that it is easier to follow them than to break them; enforce the rules positively so that people will want to follow them for reasons other than fear of punishment.

To minimize the number of rules, it's essential to establish a group identity. Behavior is governed more by a sense of what it means to be a good member of the group. One way to establish this is to publicize, within the group, instances where security might have been compromised but was not because of someone's sensible actions. It takes some thought to come up with rules that are easier to follow than to break, but you can do it. Let's suppose that you require passwords to be changed monthly. You can double-check and harrass and reprimand to get it done, or you can simply modify the system so that access is denied to users with passwords more than a month old.

Positive reinforcement is more effective than negative, and enforcement within the group is likely to be more effective than enforcement from the outside. One possibility is a reward for those with unblemished security records over some period. The reward could be cash or time off. Whatever it is, make it significant. Consider the expense of the alternatives before you consider the expense of the reward.

Tornados are capricious things, but floods are predictable. If everybody works together to put in flood control ahead of time, then everyone can be safe from either in the basement. Security is everybody's business.

Cutie is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

Alternative approaches for successful prototyping

QUALITY
Wayne Smith

Too frequently, the traditionally casual development group may try to excuse its ad hoc approach to software development by claiming to be doing prototyping but with little understanding of the critical prerequisites for a successful prototyping project. When we examine the prototyping issue in depth, we see that a key point of confusion lies in the term itself. Actually, there are two distinct types of prototyping.

One is known as requirements prototyping. This approach can be helpful during rapidly changing market or business conditions or during the establishment of a new business function or department. A prototype is used to approximate an initial solution to the problem quickly, say, in one to three months.

The user operates it for a period of time, analyzes feedback and makes refinements, and the process continues until a stable set of business requirements can be established. Then the prototype is discarded, and a more conventional development process is initiated using the results of the requirements prototyping process as the actual specification. In this case, prototyping is a tool that is used for requirements analysis, leaving the remainder of the application development process intact.

The second type of prototyping is known as evolutionary development. This approach is also characterized by an initial approximation of the problem, but the prototype becomes the nucleus of the evolving system. Each evolutionary cycle adds more features. In this case, prototyping becomes a replacement for the entire development process.

The salient feature of either prototyping approach is that a tangible model or prototype is used as a feedback mechanism to help define the final system solution.

All too frequently, an organization may find that prototyping, an apparently productive tool, may lead to the wrong system, to a system that falls short of user expectations or to cost overruns and schedule delays. Prototyping failures are usually caused by one or more of the following problems:

- Not selecting the correct prototyping mode, that is, requirements or evolutionary.
- Not having the proper technical environment to support the prototyping process.
- Not having a sufficiently accommodating user. This is particularly a problem for the evolutionary development mode.
- Not having an appropriate business problem. This is almost exclusively a problem of the evolutionary development mode of prototyping.

Examining the problem categories

Let's examine each of the problem categories separately. Selecting the wrong approach stems from an MIS misunderstanding of the basic motivation for the particular development effort itself.

The requirements prototyping approach should be used when no conventional or alternative technique for requirements analysis can satisfactorily identify and validate the true business requirements.

The evolutionary development prototyping approach, on the other hand, recognizes the inherent failure of the organization and its methodologies to manage change. In other words, the evolutionary development mode of prototyping results in change via the product rather than the process.

Technical environment requirements

The second problem category concerns the technical environment within which the prototyping process is to be carried out. There is much confusion about the use of fourth-generation languages and other higher order languages as prototyping tools.

In fact, prototyping does require a fairly elaborate technical environment to be successful. An integrated and active data dictionary and directory system is often vital. An integrated data base or file management system is also important. A set of on-line development and validation functions — for example, code development and regression testing — is very helpful, if not required.

Finally, a simple control and release control mechanism can be crucial to administer the many evolutionary refinements. It can also be used to help deliver the system and its variations to the end user.

Continued on page 23

Smith is vice-president, specializing in quality, at Applied Information Development, Inc. in Oak Brook, Ill.

Blazing trails the Natural way: fourth-generation tools

READER'S PLATFORM
Daniel A. Nolan

Languages are the tools used to make computers work. Fourth-generation languages are simply the product of successive refinement of these tools. The benefit that can be derived from these languages is as great as the benefit of the missile over the spear or the steam shovel over the spade.

The outstanding example of this is Software AG's Natural, used with or without the Adabas data base management system.

With this language, systems are delivered in a fraction of the time than it takes with Cobol. Systems produced this way will operate with far greater efficiency than with Cobol.

Mathematical advantage

Mathematically, the advantage of Natural over Cobol is 400 to 1. Practically, this can never be achieved. Developers that attempt to do so immediately find themselves programming systems faster than end users can review progress and formulate specifications. What the industry really needs is recognition that fourth-generation languages and relational data base management systems exist.

Using the previously mentioned Natural language as an example, we can better put into perspective the current state of fourth-generation languages as follows:

■ Application generators do, in fact, exist. What is lacking is the generation of design and specification, hampered by the muddled definition process introduced in the 1960s to reduce the expense of errors.

Rather than attempt to eliminate the errors, we have reduced the cost of a mistake to near zero and the time it takes to discover that mistake to instantly. This way, all errors can be detected and corrected before the customer ever sees them.

■ Information generators are simply application generators with an intelligent person operating the terminal. The attitude that "We have done so much with so little for so long that we can do anything with nothing at all" is giving way to "We may have all the answers, but what we don't have are any of the questions."

■ Prototype construction is being done now and should be addressed in the present, not future, tense. Entire firms specialize in this, and those organizations that have tried modeling continue to do so. That a prototype is only a working model should not be a limitation: If it works, it should be used. The definition of the final prototype is probably that it is sound enough to serve as the basis for the eventual system.

■ Screen mappers are commonly available now, with the not-so-surprising result that other tools have demonstrated. In the proper hands, they can be of some use. Like other tools, used inappropriately, they can botch up any job, no matter how simple or complicated.

■ Specification generators are more than word processing packages specific to the data processing industry. The choice of name appears to be unfortunate: What is truly needed are specifications or standards that recognize the power of these fourth-generation tools. The name "generator" implies artificial intelligence.

■ Natural is a nonprocedural language, as described. Using Cobol terms, there is no file division or no working storage division, there are only procedures. Simple mathematics shows this reduces a programming task by 75%.

Beyond that savings, there are no instructions needed to open a file, manipulate a device or direct logic. The entire program is only concerned with the task at hand.

■ Decision support languages are probably a cruel promise. The active data dictionary in the DBMS, used properly, will assign commonly used names to data. In the hands of professionals, systems developed for users will support any decision.

So far, no responsible head of a corporation has either taken the time to do this or has relinquished this task to a computer product more than once.

■ Query languages abound. One of the primary objectives of Codasyl was that all functions could be controlled by a single language. Experience has shown that to be true. We need another computer language like we need another form of electricity.

On the other hand, many firms have sprung up that provide access to data in the customer's terms to give them ready access to the information that is lurking in the computer. Software AG's Natural and Adabas alone have accounted for a number of firms providing such services.

Those in the industry who would like to reach the destination — whatever that destination might be — as rapidly as possible are not waiting for the bulldozers. They are blazing the trails with what we have now.

Nolan is president of Heuristic Developments, Inc., a DBMS software development firm based in Annadale, Va.

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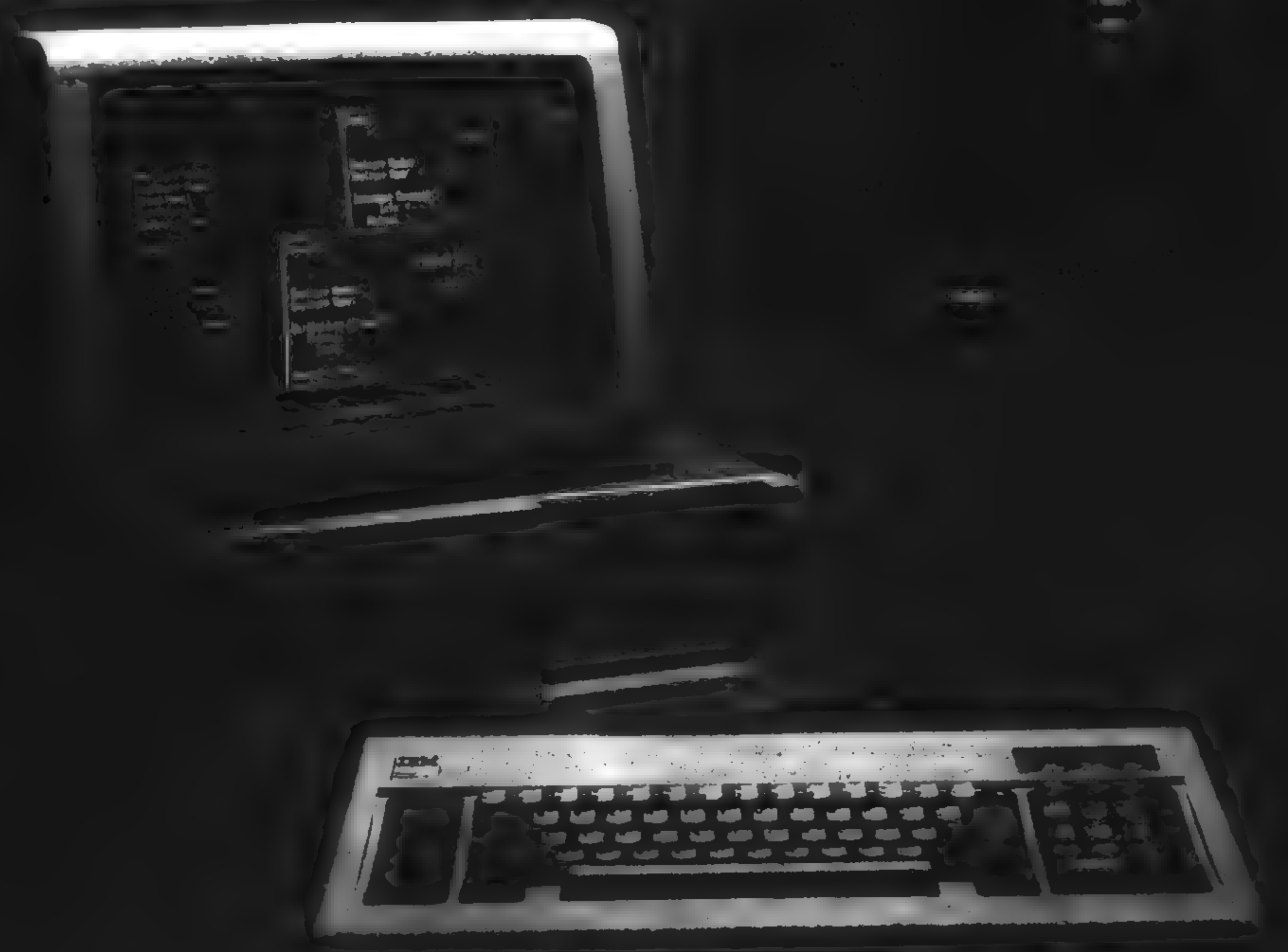

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LETTERS

U.S. gives poor show

In reference to Charles P. Lecht's article "Resting on the laurels of American technology" [CW, July 22], I completely agree with him.

I recently returned from a visit to Japan. I attended Tsukuba Expo '85, which is a grand exposition, but the U.S. exhibit was a wasteland within the midst of it. Although there were some high-technology displays, there was no cohesiveness to the U.S. pavilion.

The obscure film shown at the exhibit was received so poorly by the Japanese observers that many left before it was finished.

By contrast, the IBM Japan pavilion was outstanding. It managed to convey the image of a company on the cutting edge of technology while involving attendees in that image.

I don't know if Lecht has attended other U.S. exhibits at other expositions, but I have. The U.S. traditionally has poor displays.

It is a shame that we did no better at Tsukuba Expo '85 because we are just maintaining our already shabby reputation.

Fortunately, when it comes to delivering high-technology products, we do much better.

John [illegible]

Code prediction made

I have just read a prediction in the article, "Programming teams: On the way out?" [CW, July 29] that "we are headed to where the robots manufacture software."

It reminds me of a prediction widely made in 1963, when I first joined the profession, that automatic programming would make programmers obsolete. This was about the time the first higher level language was introduced — assembly language coding.

Of course there have been many similar predictions since then. Let me make one: within 10 years someone will predict the existence of a fifth-generation language that automates the production of code.

A. C. [illegible]
Chevy Chase, Md.

X.25 recommended

The article "IBM research center: Commitment to net standards" [CW, July 29] stated that X.25 is a CCITT standard that has been incorporated into Open Systems Interconnect (OSI). Later the article stated that "OSI in no way ensures that networks will work together. . . . OSI is a skeleton. There is no software. The software is still related to the operating system of each vendor."

OSI may be a skeleton, but the CCITT recommendation of X.25 has flesh and blood. X.25 is a complete and detailed recommendation for implementation of OSI layers one through three. Conformance to CCITT X.25 does ensure that networks will work together.

That is evident by the availability of worldwide communications to anyone running X.25, regardless of the operating system of the vendor. As a provider of portable X.25, I find the statement "there is no software" misleading.

Donald Berryman
Edina, Minn.

Reader lauds section

I have worked with a number of publications regarding coverage of the computer printer marketplace. Unfortunately, I have often found that these articles rarely contain the focused depth and objectivity necessary to be fresh and instructive.

Computerworld's Update on printers, "The paper chase: Trends in printer technologies" [CW, Aug. 5], was a welcome piece of reporting on this confusing multibillion-dollar marketplace.

I commend CW's commitment to high quality and depth in the new Update format. I compliment your Update Editor, Glenn Rifkin, on a job well done.

Maureen [illegible]
Marshfield, Mass.

From page 17

Prototyping approaches

The third category of prototyping problems — those associated with unrealistic user expectations — is especially troubling.

Many users have become accustomed to application systems that operate at high-peformance levels, have advanced features for ease of use and are intended to be a total system.

None of these are likely characteristics of a prototype nor do they tend to emerge as the prototyping process advances. Feature lists will increase as the prototype ages but at the expense of architecture, conceptual integrity and overall soundness.

The final category of prototyping problems deals with the nature of the application itself. Generally, although requirement prototyping is applicable to most applications, evolutionary development is best suited for the back-end processes. These are characterized by having an existing data base and reporting architecture. Conversely, evolutionary development is generally not suited to high-performance, highly complex, highly integrated transaction or event-driven processes.

Both types of prototyping can be clear winners if properly conditioned. The challenge to the MIS community is to fill the vacuum created by the lack of any effective prototyping management methods.

It is not acceptable to conclude that because the development process changes radically either the same management methods that we use for the more prescriptive and formal approaches will suffice or that we do not need any management because it will just get in the way.

Let's not allow prototyping to continue to be a crutch that props up and supports the old methods but rather a window through which we can see a better applications development process.

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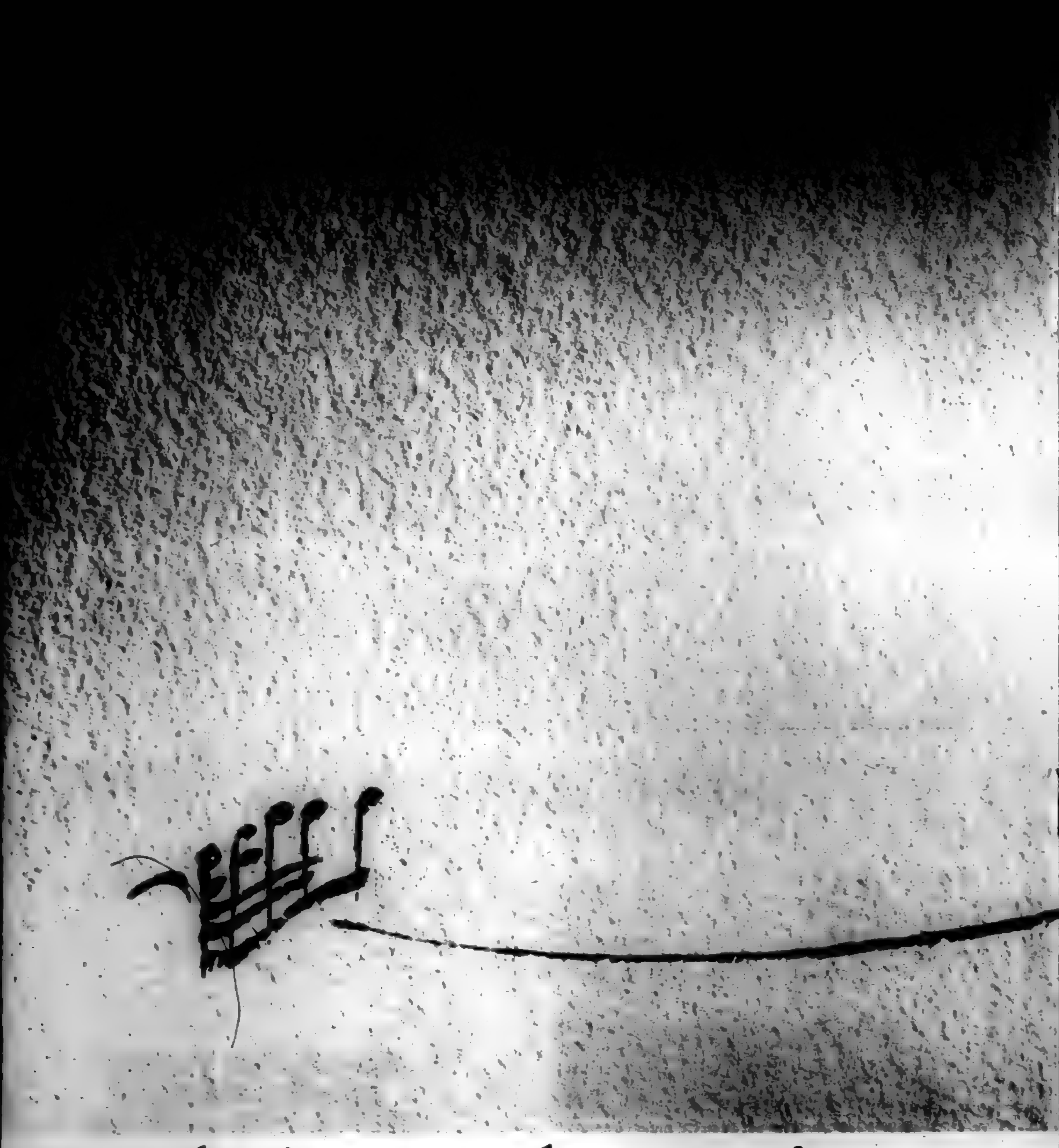

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Additionally, because Symphony Link

mainframe link.

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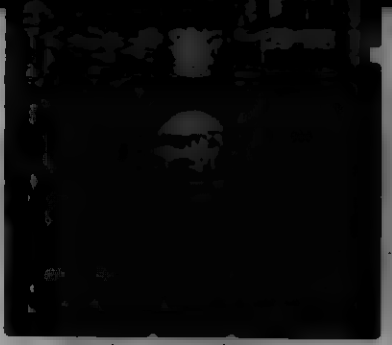

And that's precisely why you should find out about it. Call (617) 253-9172; outside Massachusetts, call 1-800-554-5501.

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House report recommends no federal VDT regulation

By Mitch Betts

WASHINGTON, D.C. — The staff of the U.S. House of Representatives Subcommittee on Health and Safety recommended against government regulation of VDTs in the workplace. Included with that recommendation, in a new report on VDTs and health, was a call for more scientific studies of the effects of extra-low and very-low frequency radiation.

"Although current scientific knowledge suggests that there are no adverse health effects from these low and extra-low frequency radio waves, further study and research in this area could eliminate, and definitely reduce, any lingering doubts," the report concluded.

The staff report — based on a series of hearings in 1984 — strongly recommended that the research be done by the National Institute for Occupational Safety and Health or by some other scientific testing agency.

The report explained that many electric appliances, including hair dryers and electric typewriter motors, emit low-level radiation in amounts that often exceed the levels emitted by VDTs.

After reviewing such issues as VDT furniture, room lighting and work breaks to relieve stress, the subcommittee staff concluded that "these ergonomic factors are not the kind that could be legislatively standardized.

"Employers and employees are in the best position to determine what is best in each individual workplace so as to reduce complaints due primarily to ergonomic factors," it added.

> ”
>
> *'Education, not legislation, is the answer.'*
>
> — **Vico E. Henriques**
> **Cbema**

The subcommittee report was immediately praised by the Computer and Business Equipment Manufacturers Association (Cbema) here.

"The report supports Cbema's long-held position that education, not legislation, is the answer to employee complaints about VDTs," said Vico E. Henriques, Cbema president.

He also supported the idea of more studies, in order to calm public fears about VDT radiation.

"We hope that the tests the subcommittee suggests will put these fears to rest," he said.

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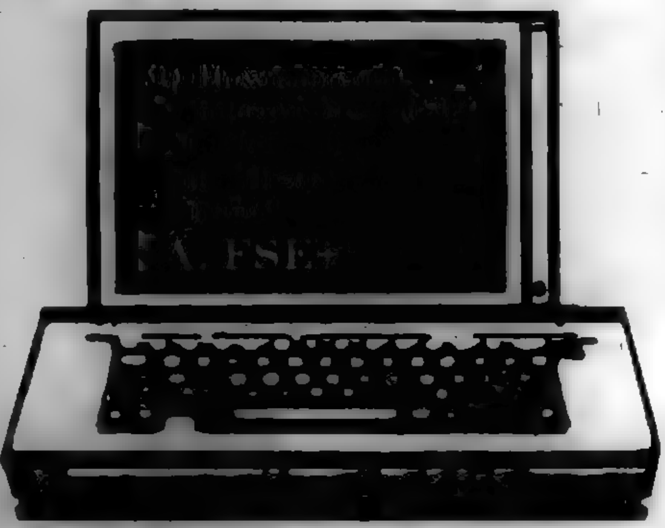

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WORLD DIGEST
CW International News Network

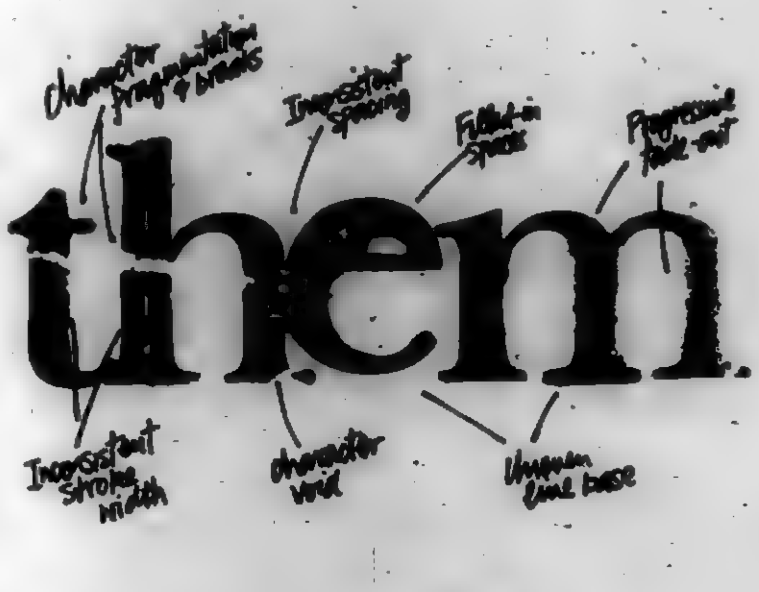
PARIS — Hewlett-Packard Co., Ing. C. Olivetti & Co. and SMT-Goupil, a French micro maker, are each preparing to launch personal computers that are compatible with the IBM Personal Computer AT, even though the future of the AT in IBM's own strategy remains uncertain. The three new machines might make their appearance during next week's Sicob.

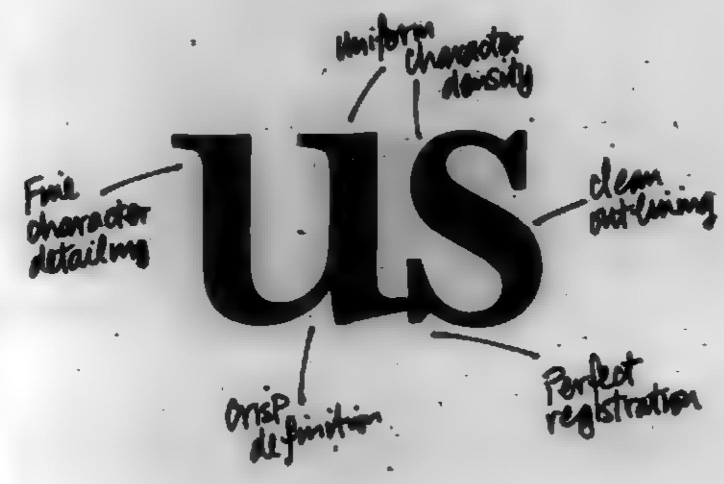
FRANKFURT — Control Data GmbH has announced receipt of a $3.4 million contract to deliver 5,000 hard disk drives to NCR GmbH in Augsburg, West Germany, for NCR Corp.'s recently introduced PC 8 personal computer. The PC 8 is compatible with the IBM Personal Computer AT and will probably be on display at the Systems Fair in Munich, West Germany, in late October.

TOKYO — Fujitsu Ltd. announced separate five-year contracts to extend technological assistance to two South Korean makers of personal computers and peripherals.

Under one of the agreements, with Daewoo Telecom Co., Fujitsu will deliver the parts necessary for Daewoo to develop and manufacture displays and keyboards for a Korean language version of Fujitsu's Facom 9450-II personal computer. Under a separate

Continued on page 28





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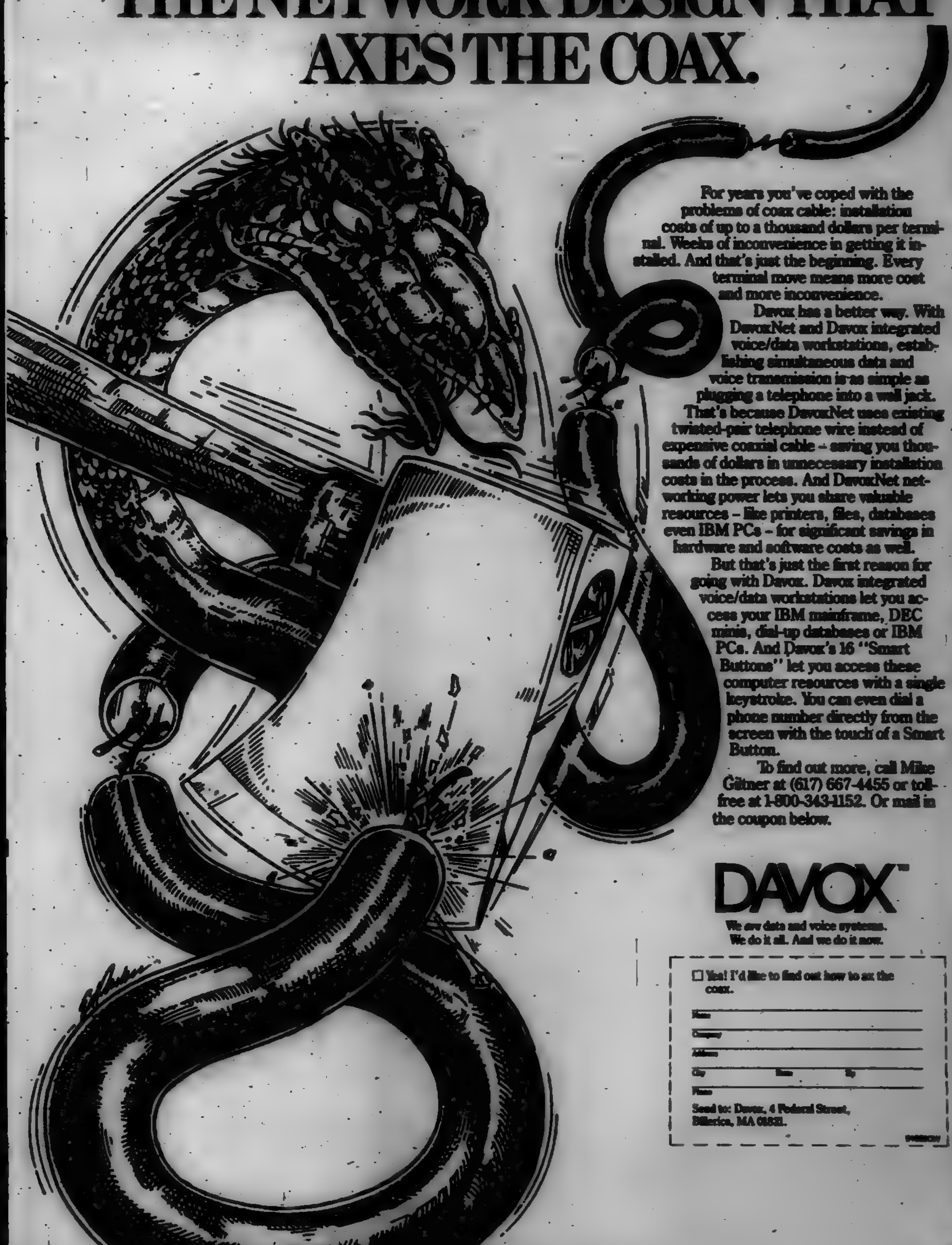

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NEWS

From page 26

World Digest

deal, Jeil Precision Co. will manufacture Korean-alphabet, 24-dot printers with Fujitsu components and technology.

LONDON — British computer firms are facing a lack of skilled DP staff as more foreign companies offer higher salaries than do firms in the UK. Overseas firms annually draw more than 1,500 of the most skilled workers, mostly data base and networking professionals with more than five years' experience, according to the recruitment agency Computer People.

TOKYO — Japan's production of mainframe systems during the first six months of this year leveled off at a weak 6,223 units, while smaller machines, including personal computers, clinched a stellar production record, according to a Ministry of International Trade and Industry report.

The report noted that the country's monthly mainframe output averaged 1,064 units during the half-year period, the same as in last year's corresponding term. As in 1984, Japan's monthly output of mainframes is expected to increase toward the year's end, the report forecast. The country's personal computer production totaled 967,742 during the first six months of 1985, compared with the 1984 yearly total of 1.5 million, the report said.

PARIS — Cimsa and Sintra, both major manufacturers of military computers in France, are involved in a merger that should finish before the end of the year. The two are subsidiaries of the same group, Thomson-CFS, but had become competitors because of the government's decision to pass Sintra from the hands of the CGE to Thomson-CFS, both nationalized firms, as part of a reshuffling of France's electronics industry last year. Increasing foreign competition and a shrinking number of military contracts began to take a toll in the earnings of both companies.

TOKYO — Nippon Telegraph and Telephone Corp. (NTT) has announced plans to reorganize its five research and development facilities into nine major laboratories. NTT will place a new stress on software production technology, a spokeswoman said.

The reorganization, effective Sept. 12, was intended to "foster close working relationships" between NTT's labs and profit centers, she said. Research by the reorganized labs is done in the areas of basic studies, telecommunications networks, information-communication processing, integrated communications, electronics components and software.

BRUSSELS — The $30 million initial implementation of a plan by the European Economic Community to develop advanced communications technology has been approved. The first phase will focus on the development of a reference model for a broadband European digital network. In the second phase, the participating companies will concentrate on the development of opto-electronics, broadband switches, software and flat video display screens.

MUNICH, West Germany — Lotus Development Corp.'s 1-2-3 tops the charts of business software in West Germany, with Lotus' Symphony and Ashton-Tate's Framework, two other integrated packages, coming in fourth and sixth on the top-10 list.

According to market research firm International Data Corp. Deutschland, the most popular software packages, behind 1-2-3, are Ashton-Tate's Dbase III, Micropro International Corp.'s Wordstar, Lotus' Symphony, Software Products International's Open Access, Ashton-Tate's Framework, Microsoft Corp.'s Multiplan, Microsoft's Word, IBM's Fibu and Bongartz & Schmidt's Word Ace, the only German product on the list.

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Language tool drives auto parts maker's progress

ST. LOUIS — When Ron Perez joined the data processing department of one of the nation's oldest automotive parts manufacturers, he was confronted by two large binders chock full of application needs — and a system still running partially on card decks.

Perez is manager of system programming for Carter Automotive Co., a supplier of new and remanufactured components for fuel, cooling, air-conditioning and electrical systems. The company also manufactures fuel and emissions systems components as original equipment.

Two years ago, Perez recalled in a recent interview, Carter suffered from "a tremendous backlog in development." Project requests for applications filled two loose-leaf binders, and no one in the department had expertise in command-level CICS programming.

Today, the company's data processing center operates with a staff of seven people and uses an IBM 4341 Group 1 mainframe with 4M bytes of memory. An IBM 3705 handles front-end tasks for communications, while approximately 30 IBM 3278 and 3279 units meet terminal needs.

When Carter was in the market for an order entry system that was to incorporate billing, inventory control and systems analysis, it considered both buying off-the-shelf software and developing in-house applications using either CICS or a fourth-generation language. The company soon determined a fourth-generation language was the best route.

When selecting the product, Carter's data processing evaluation team set five goals for an application tool: short learning curve, ease of coding, assured file integrity, elimination of on-line downtime and immediate aid for the backlog. After looking at several products, Carter settled on Gener/OL from Pansophic Systems, Inc. The product was selected because of its ease of programming and a top-down structure that resembled Cobol and Basic, with which most of the programmers were familiar, Perez said.

"Gener/OL has given us the ability to program at least five times faster than with command-level statements. That means we can program in days instead of weeks and weeks instead of months," he said.

According to Perez, programmers with some CICS background were able to begin writing programs after one day of working with the product. Others with only batch programming background learned Gener/OL in two to three days.

End users involved

Carter's programming staff now has an easier time of designing screens that allow the company to involve the end user in the programming process, he said. Data processing staff members do the initial screen design and then invite the end user to the terminal.

In the two years it has used the Gener/OL fourth-generation language, Carter developed a price analysis program that lists prices and part numbers by regions. It also contains a cross-reference of part numbers and prices for competitive companies. "We can determine the effect of a price adjustment on gross profits while still remaining competitive," Perez said.

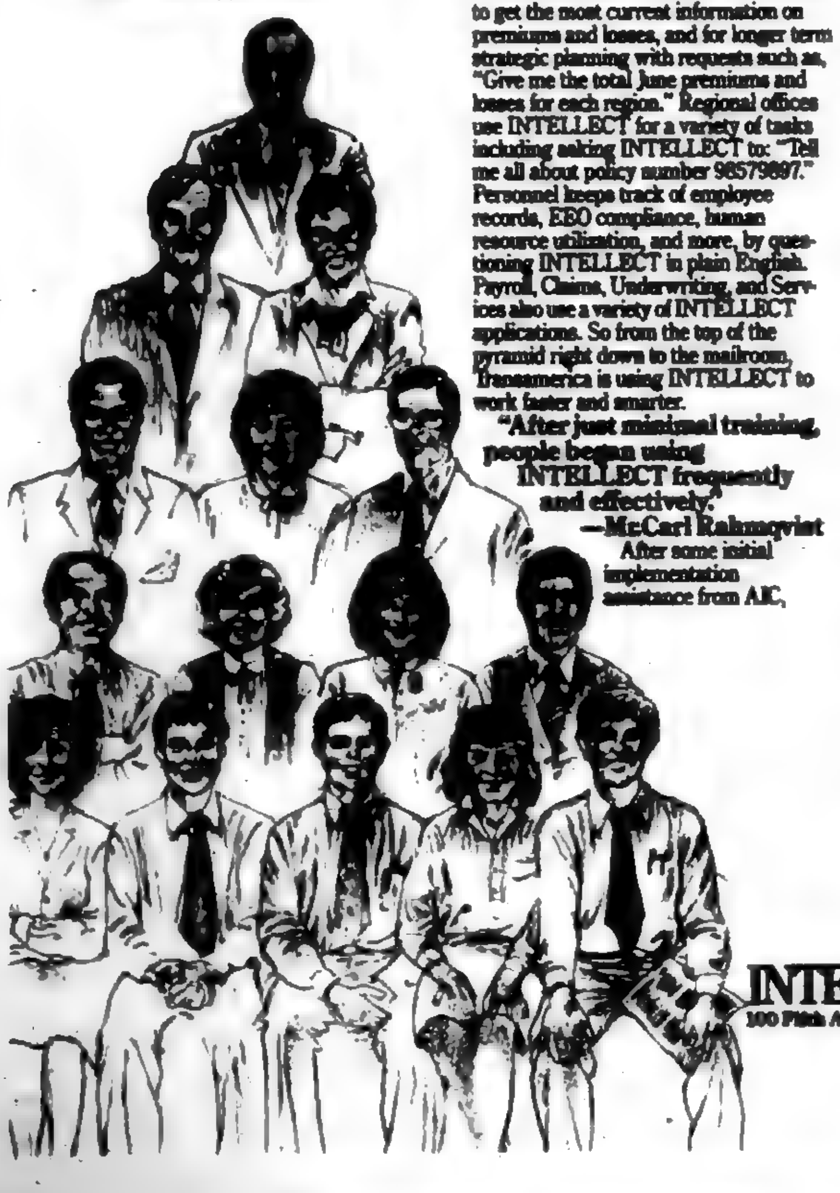
When Carter management decided it wanted to provide better customer service, the programming staff was given 30 days to come up with an appropriate application. The application gathers daily inventory information from warehouses in Arkansas and Virginia and downloads the information to Vsam files using Gener/OL. Sales people can now take a phone call from a customer and get updated information on the status of a particular part.

In the future, Perez said, the company hopes to connect its purchasing system with the customer service program.

TO INSURE THAT EVERYONE CAN ACCESS DATA, TRANSAMERICA USES INTELLECT AT EVERY LEVEL OF THE PYRAMID.

"We use INTELLECT because we want to give our users a better way to do business." —Mr. Carl Rahmqvist, Senior Systems Manager, Information Systems, Transamerica Insurance Group

Transamerica Insurance Group is recognised for the pyramid-shaped building of its parent, Transamerica Corporation, and for being one of the country's leading commercial and personal insurance companies. In some quarters, Transamerica is also recognised for its variety of innovative INTELLECT applications.



At Transamerica they see INTELLECT as more than a state-of-the-art natural language information retrieval system. They see it as a new way to do business: Giving all their end users—even those with no computer skills—instant access to more information than they'd ever had before.

"When they saw how easy, fast, and resource-effective it was to use, INTELLECT became a very popular tool." —Ms. Sandra Dahlgren, Information Center System Supervisor

One Vice President uses INTELLECT to get the most current information on premiums and losses, and for longer term strategic planning with requests such as, "Give me the total June premiums and losses for each region." Regional offices use INTELLECT for a variety of tasks including asking INTELLECT to: "Tell me all about policy number 98579897." Personnel keeps track of employee records, EEO compliance, human resource utilization, and more, by questioning INTELLECT in plain English. Payroll, Claims, Underwriting, and Services also use a variety of INTELLECT applications. So from the top of the pyramid right down to the mailroom, Transamerica is using INTELLECT to work faster and smarter.

"After just minimal training, people began using INTELLECT frequently and effectively." —Mr. Carl Rahmqvist

After some initial implementation assistance from AIC, Transamerica's Information Center took over, developing custom INTELLECT applications for each department. Mr. Rahmqvist and Ms. Dahlgren trained a group of Transamerica's "veteran" INTELLECT users to go into the field to train the company's 15 regional office personnel in using the company's many applications. Transamerica's INTELLECT Support Staff helps company personnel use INTELLECT more effectively. They've also devised several methods for enabling users to access their many INTELLECT applications. Easily understood menu screens help beginning users work faster, while experienced people can use an express mode for their application needs.

"We've found that we've saved both time and money by using INTELLECT to obtain pertinent information." —Ms. Sandra Dahlgren

Anyone who can ask a question in everyday conversational English can get the information he or she needs. Immediately. You can imagine how much time a system like that can save an information-dependent organization like Transamerica. Combine that with the ability to get more people into the system and you can see how INTELLECT has increased the pyramid's power.

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Straight talk about application software packages.

"Most application software packages are functionally rich. The problem is, that's simply not enough."

While everyone agrees that packaged applications possess great potential to save time and money, you'll hear a lot of people—from MIS directors to operations managers—tell you the ones their companies have implemented fall somewhere short of satisfactory.

Typical limitations include the fact that the packages require such extensive modification that the savings they seemed to offer totally disappear. Another common complaint is that one application package fails to integrate with another. A third shortcoming, and perhaps the most common, is that packaged applications cannot be easily adapted to reflect the changing nature of the business.

You have only to look at the architecture of most of the applications currently in use to understand why these problems exist.

Many companies today depend on applications designed with technology from the 60's and 70's. Some are 2nd generation applications built without any reliance on database architecture. Others are 3rd generation applications that provide only a generalized *interface* to a database management system; in addition, many application vendors provide a common front end user interface to mask inefficient architecture. The result is that these 3rd generation applications realize only about 10% of the power of a DBMS. *And that's simply not enough.*

Without full use of the facilities of a superior DBMS, users of application software find it extremely difficult to adapt and extend an application package to their current as well as to their future business needs. And *only* when an application is built with advanced database technology can it provide the sharing of data that leads to functional integration between different application modules.

Ultimately, what's required is software that goes beyond the conventional packaged applications approach.

What's required is 4th generation applications software—software that's rich in functionality, and whose underlying architecture is built on, and takes full advantage of, advanced database technology.

Fourth generation application software is created using a comprehensive application development facility combining a fourth generation language and end user query and reporting facilities with an integrated data dictionary. Furthermore, fourth generation application packages are functionally integrated, sharing common data between independent modules. This creates an environment to easily adapt and extend an application package, and provides realtime access to all information.

Only fourth generation application software packages enable a company to realize the full potential of packaged applications.

It is clear, therefore, that all application packages of the future will be built using this technology… because it doesn't make sense any other way.

J J Cullinane

John J. Cullinane
Chairman of the Board

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And only Cullinet offers 4th generation applications.

Simply stated, our applications are a step beyond conventional applications packages because they meet these key requirements.

1. Functional Richness

Cullinet's complete line of applications delivers leading edge functionality in all areas. Whether it's our manufacturing control system, or integrated financial reporting and cost management applications, our human resource management system, or our relationship banking system, each Cullinet application is carefully designed by knowledgeable industry professionals who have a thorough understanding of application requirements. Our integrated closed-loop, net change manufacturing, financial reporting, and cost management applications provide complete multi-company capabilities accommodating the most demanding reporting and control requirements. Our human resource management system combines complete personnel reporting and payroll processing into a single system, and our relationship banking system provides a total customer information environment for today's business executive. You can be assured that a Cullinet solution can be put into production immediately to fulfill your most pressing business requirements.

2. Functionally Integrated

Businesses today demand applications to do more than address individual functions. Businesses today need applications that recognize the interdependencies within an organization—in short, applications that can share data. For example, efficient real-time, four-way matching of invoices with receiving, purchase and inspection documents can only be achieved through true sharing of data, and this sharing of data can only be achieved with an advanced database technology which delivers that integration. Redundancies are eliminated and productivity is increased when all applications dynamically reflect the operations of the organization. By sharing an architecture that provides for optimum use of an organization's information, Cullinet's manufacturing, financial, human resources and banking applications fulfill this need.

3. Easy to Tailor

Although many businesses appear on the surface to operate in a common fashion, each, in fact, is unique. Applications must therefore be built with an optimized set of tools that permits them to be adapted to a company's way of doing business, rather than having the company have to adapt to accommodate the software. Cullinet applications are designed to accommodate change. They provide the means to personalize screen layouts, capture new information, reformat reports, resequence transactions, and change messages without impacting the entire environment. Only Cullinet's applications can provide this environment for adaptability through their integration with advanced database technology. In this way, Cullinet applications give users the independence to adapt them—quickly and efficiently—to meet the unique requirements of the business.

4. Easy to Extend

As a business changes and grows, so do its needs and requirements. Cullinet provides easy to use, menu-driven facilities that permit functional extension of an application while preserving integration. An end user can quickly react to new requirements by prototyping an application functionally, developing new reports and performing ad hoc queries immediately. MIS can efficiently develop new, associated applications sharing common data and built utilizing the existing architecture. The Cullinet architecture segments the program logic, edit and validation criteria, as well as the security and recovery process, and therefore the complexity of creating new application functionality is significantly reduced.

5. Easy Access to Information

Access to all corporate information is key to any application. Because all pertinent data must be available to the analyst and decision maker, easy access to that data, *no matter where it resides*, is mandatory. Your need for information naturally crosses applications boundaries. The ability to associate detailed information about sales orders, finished goods status, and customer credit processing before release of shipments is a prime example. Only by means of Cullinet's applications, which are completely integrated with our Information Center Management System are you provided the opportunity to create an information center that is functionally complete, meeting the information needs of the company as a whole and meeting the specific needs of the operational units of the organization. Each center of functional activity within your organization is served by the system through your mainframe or PC with GOLDENGATE software. Each has access to all corporate information. Accessibility to all information—whether it's in your mainframe, in a departmental minicomputer system, or in your personal computer—makes it readily available to you for analysis through Cullinet's complete information environment.

Manufacturing, Financial, Human Resource, Banking

Cullinet

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Print quality, speed sway firm to ion deposition system

CORVALLIS, Ore. — When a worldwide engineering company headquartered here replaced its decade-old impact printers, the new system chosen was one based upon ion deposition technology.

CH^{2}M Hill Ltd.'s computer systems — three Digital Equipment Corp. Decsystem-10s, a DEC VAX-11/750 and a VAX-11/785 with specialized software for computer-aided engineering applications — include a Digital Communications Associates, Inc. network that ties together its 35 U.S. offices. According to Stan Carpenter, Hill's data processing production manager, the systems perform engineering, scientific, technical, management and accounting processes.

"We generate many different reports for our offices around the country, and the output quality of our impact printers was just not satisfactory," Carpenter said. "They were older machines, and while we could have just replaced drums and other parts, they still were slow." The four old Data Products Corp. impact printers — a mixture of Models 2470 and 2550 — produced output on continuous three-ply forms that often required bursting, reduction to 8½- by 11-in. paper on a copier, hole punching and insertion into notebooks, he said.

After extensive research and investigation, Carpenter reported, he selected two Mercurion 1 60 page/min. printers from Southern Systems, Inc. in Clearwater, Fla. The printers reportedly cost approximately $67,000 each.

The new printers produce all originals on 8½- by 11-in. sheets, already three-hole drilled, Carpenter said. The printers also offered other features that CH^{2}M Hill will add to its DP production capabilities — logo imprinting and forms generation, he said. The company's old devices printed 900 line/min., compared with 3,600 line/min. for the new ones.

Print output volume

CH^{2}M Hill's print output volume is about 500,000 pages per month, Carpenter said. The two considerations that topped his list of requirements for new printers were cut-sheet capability and print quality. Other cut-sheet printers that Carpenter examined were either unable to print the number of copies he needed per month or were too expensive, he said. During his search, Carpenter also talked with users of the equipment he was considering.

The Southern Systems printers — installed in November 1984 — were projected to save about $24,000 per year in paper costs, but the actual paper savings has been in the $10,000 to $12,000 per year range, Carpenter said. The DP manager discovered that if he used the quality of paper that could save him $24,000 per year, it caused printer jams and none of the paper had the high-quality look that he wanted.

A big savings for the company is in maintenance fees, Carpenter said. "We sent our own staff person to the Southern Systems factory in Clearwater for a week, and we're now doing our own in-house maintenance." CH^{2}M Hill bought a $25,000 spares kit along with its new printer so that it can do all it needs to do for maintenance in-house, he said.

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Abstracts of presentations should be limited to one page and sent to Andrea Merritt, VM Software, Inc., Suite 366, 2070 Chain Bridge Road, Vienna, Va. 22180. Abstracts are due no later than Nov. 30, 1985.

THE FOURTEENTH INTERNATIONAL QUANTUM ELECTRONICS CONFERENCE
San Francisco, June 9-13, 1986

Original papers are now being accepted that have not been previously presented. Areas to be discussed are laser spectroscopy, ultrafast physical phenomena, fundamental nonlinear optics, quantum optics theory, surface effects, fundamental laser chemical physics, lasers, physics of semiconductor lasers and quantum wells, semiconductor physics, physics of phase conjungation, bistability and chaos, novel physics with lasers, fundamental physics with lasers, physics of free-electron lasers and other new light sources and laser biophysics.

The deadline for submission of papers is Jan. 6, 1986. Both original summary and the abstract should be forwarded to International Quantum Electronics Conference, Optical Society of America, 1816 Jefferson Place, N.W., Washington, D.C. 20036. For publicity information, contact the publicity chair: John W. Roy, Hughes Aircraft Co., 6165 El Camino Real, Carlsbad, Calif. 92008.

NEWS

OFF THE PRESS
George Harrar
CW Senior Editor

BOOK REVIEWS

ORCHESTRATING 1-2-3
By David Rier
and Edmundo Fine

Subtitled *Notes for Advanced Users*, this book takes on problems encountered by people who explore beyond the normal corporate use of the world's best-selling software package.

The authors are users from Dennison Manufacturing Co., and they lend a good sense of what the advanced user encounters.

The basic tenet here is that "anyone who uses 1-2-3 will sooner or later need to develop some capability of telling 1-2-3 what to do in an orderly manner — in other words, program using the macro language instructions provided within 1-2-3."

A healthy bit of the book explores macros, how to use them with ease and power and without disaster and grief.

In the "Rest of the Story" section, the authors explain saving files from within a macro, changing dates within titles, data filing and recovery and much more.

Paperback, 243 pages, $14.95, ISBN 0-201-16901-0, by Addison-Wesley Publishing Co., Reading, Mass. 01867.

THE SOFTWARE CATALOG: MINICOMPUTERS

From Elsevier Science Publishing Co., the respected international publisher, comes the latest edition of the *The Software Catalog*. This edition on minicomputers presents more than 7,000 program descriptions for all major systems.

The 450 pages of vendor listings runs from A 2 Devices to Zilog, Inc. It is also cross-referenced according to computer system, operating system, programming language, microprocessor, subject, applications and keyword indexes.

The once-a-year publication comes with a supplemental update after six months. The supplement is priced at $25.

Elsevier also publishes 1985 editions of *The Software Catalog* on microcomputers, science and engineering, business software and health professions.

Paperback, 850 pages, $125, ISBN 0-444-00962-5, by Elsevier Science Publishing, 52 Vanderbilt Ave., New York, N.Y. 10017.

THE S. KLEIN DIRECTORY OF COMPUTER GRAPHICS SUPPLIERS

The computer graphics industry has grown fourfold since 1980, at least as measured by the growth in listings contained in this directory. The fourth edition presents 550 suppliers in the computer graphics field, including computer-aided design and manufacturing, business graphics and imaging.

The directory gives bare bones corporate data, such as addresses, number of employees, person to contact and year founded. There follows a list of the types of products the company offers in the graphics hardware, software, turnkey systems and services areas.

Specific models and numbers would be helpful here, as well as some information on the model's date of introduction, target user or performance.

Paperback, 262 pages, $85, ISBN 0-914849-01-3, by Technology & Business Communications, Inc., 730 Boston Post Road, Sudbury, Mass. 01776.

Publishers wishing to have their books considered for review can direct books, prepublication galleys, press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, *P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.*

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✓ CALENDAR

WEEK OF OCTOBER 13

OCTOBER 13-16, WASHINGTON, D.C. — **Information Science Inc.'s 16th International Users Conference on Human Resource Management.** Contact: Information Science, Inc., 95 Chestnut Ridge Road, Montvale, N.J. 07645.

OCTOBER 14-15, SAN FRANCISCO — **Direct Response Marketing for Financial Institutions: Telemarketing, Direct Mail & Sales Training.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925. Also set for Oct. 21-22 in Los Angeles.

OCTOBER 14-16, PHILADELPHIA — **Managing Application Software Support Workshop.** Contact: Infosci, Inc., Box 7117, Menlo Park, Calif. 94026.

OCTOBER 14-17, NEW YORK — **Info '85 — Information Management Exposition & Conference.** Contact: Cahners Exposition Group, Client Services, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

OCTOBER 14-18, BOSTON — **Management Workshop.** Contact: Judy Trelogan, Arthur Young & Co., 1950 Roland Clarke Place, Reston, Va. 22091.

OCTOBER 14-18, NEW YORK — **Structured Systems Analysis Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 15, CHICAGO — **Transacting Business Electronically: Insights Into a Rapidly Changing Field.** Contact: Chi/Cor Information Management, Inc., 10 Riverside Plaza, Chicago, Ill. 60606.

OCTOBER 15-16, NEW YORK — **IMS Recovery Restart.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 15-17, NEW YORK — **Implementing SNA.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 15-17, WASHINGTON, D.C. — **Data Base: A Manager's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 15-17, WASHINGTON, D.C. — **The Micro-Mainframe Connection.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 15-18, HOUSTON — **CMC '85 and A/E Systems — Fall.** Contact: Conference Director, CMC '85 and A/E Systems — Fall, P.O. Box 11318, Newington, Conn. 06111.

OCTOBER 16-17, LOS ANGELES — **The Yates Second Annual Unix Market Forum.** Contact: Yates Ventures, Suite 201, 3350 Bayshore Road, Palo Alto, Calif. 94303.

OCTOBER 17-18, DENVER — **Federal ADP and Telecommunications Procurement.** Contact: International Data Corp., Washington Division, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102. Also being held Oct. 31 to Nov. 1 in San Antonio and Nov. 14-15 in McLean.

OCTOBER 17-18, NEW YORK — **VS Cobol II.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 17-18, PHILADELPHIA — **Rapid Prototyping Workshop.** Contact: Infosci, Inc., Box 7117, Menlo Park, Calif. 94026.

OCTOBER 17-18, ATLANTIC CITY, N.J, — **The Third Annual NCR Users Eastern America Conference.** Contact: Jack Hibberd, A.D.R., Inc., P.O. Box 429, Willow Grove, Pa. 19090.

WEEK OF OCTOBER 20

OCTOBER 21-23, SAN FRANCISCO — **Lamond on IBM.** Contact: Reggi Veatch, National Marketing, Suite E-1A, Standard Court East, 9160 Red Branch Road, Columbia, Md. 21045. Also being held Oct. 29-31 in Dallas and Nov. 4-6 in Boston.

OCTOBER 21-23, BOSTON — **Hammer Forum '85: Shaping the Second Revolution in End-User Computing.** Contact: Hammer and Co., Hammer Forum, 5 Cambridge Center, Cambridge, Mass. 02142.

OCTOBER 21-23, WASHINGTON, D.C. — **Controlling Software Projects: Management, Measurement and Estimation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Dec. 9-11 in Dallas.

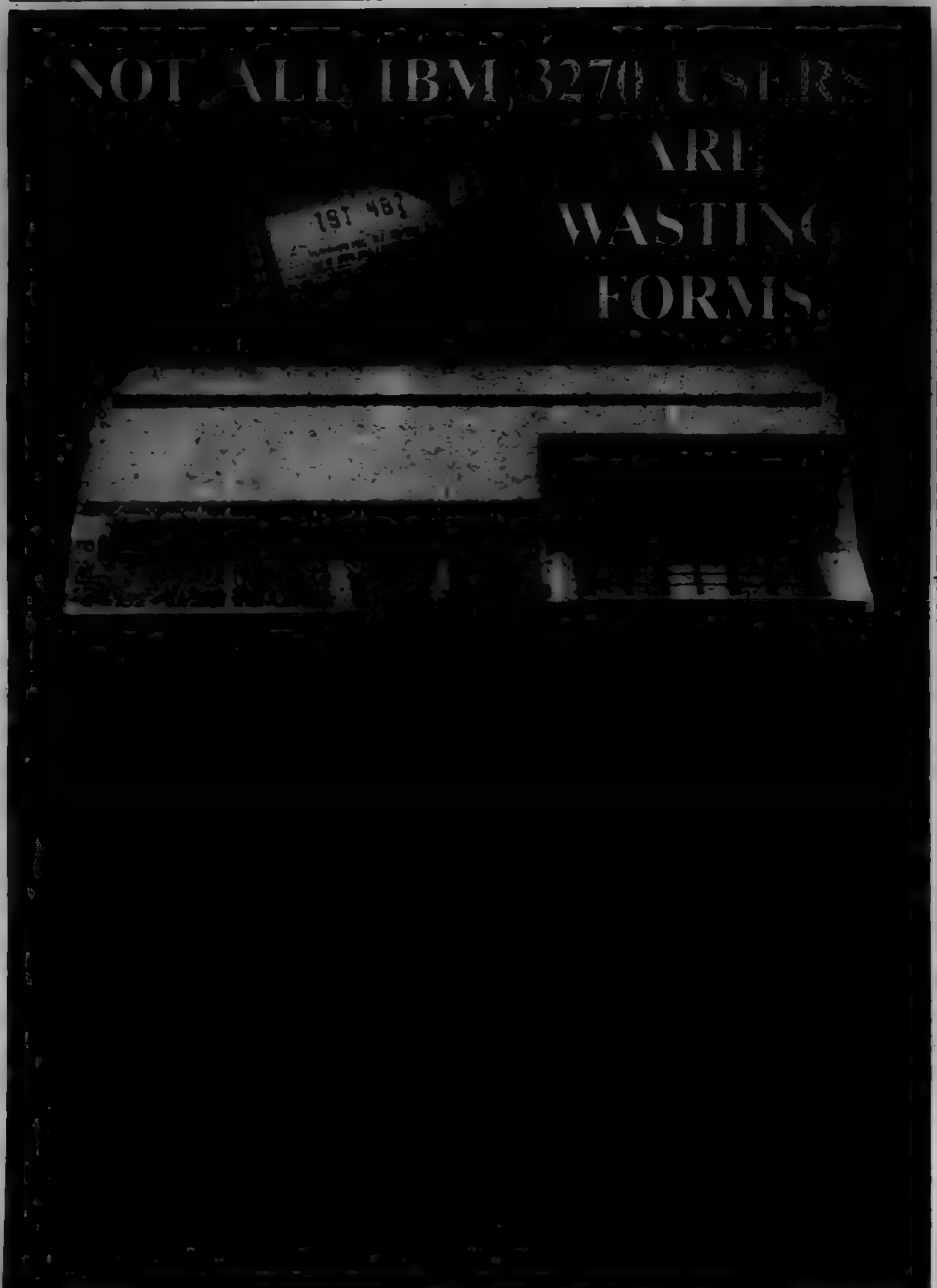
OCTOBER 21-24, CHICAGO — **Systems & Applied Technology Conference & Exhibition (Satech '85).** Contact: Satech '85, 2472 Eastman Ave., No. 34, Ventura, Calif. 93003.

OCTOBER 21-24, PITTSBURGH — **Work Measurement Techniques Workshop Series.** Contact: Institute of Industrial Engineers, Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

OCTOBER 21-25, NEW YORK — **Comprehensive Course in Data Communicatons.** Contact: *Data Communications*, Special Projects Conference Management Center, c/o Information-Breakthroughs, Inc., 445 W. Main St., Wyckoff, N.J. 07481. Also being held Nov. 18-22 in Lake Buena Vista, Fla.

OCTOBER 21-25, WASHINGTON, D.C. — **Ada Software Engineering Workshop.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Oct. 28 to Nov. 1 in Los Angeles.

OCTOBER 21-25, BOSTON — **Analysis Workshop.** Contact: Judy Trelogan, Arthur Young & Co., 1950 Roland Clarke Place, Reston, Va. 22091.



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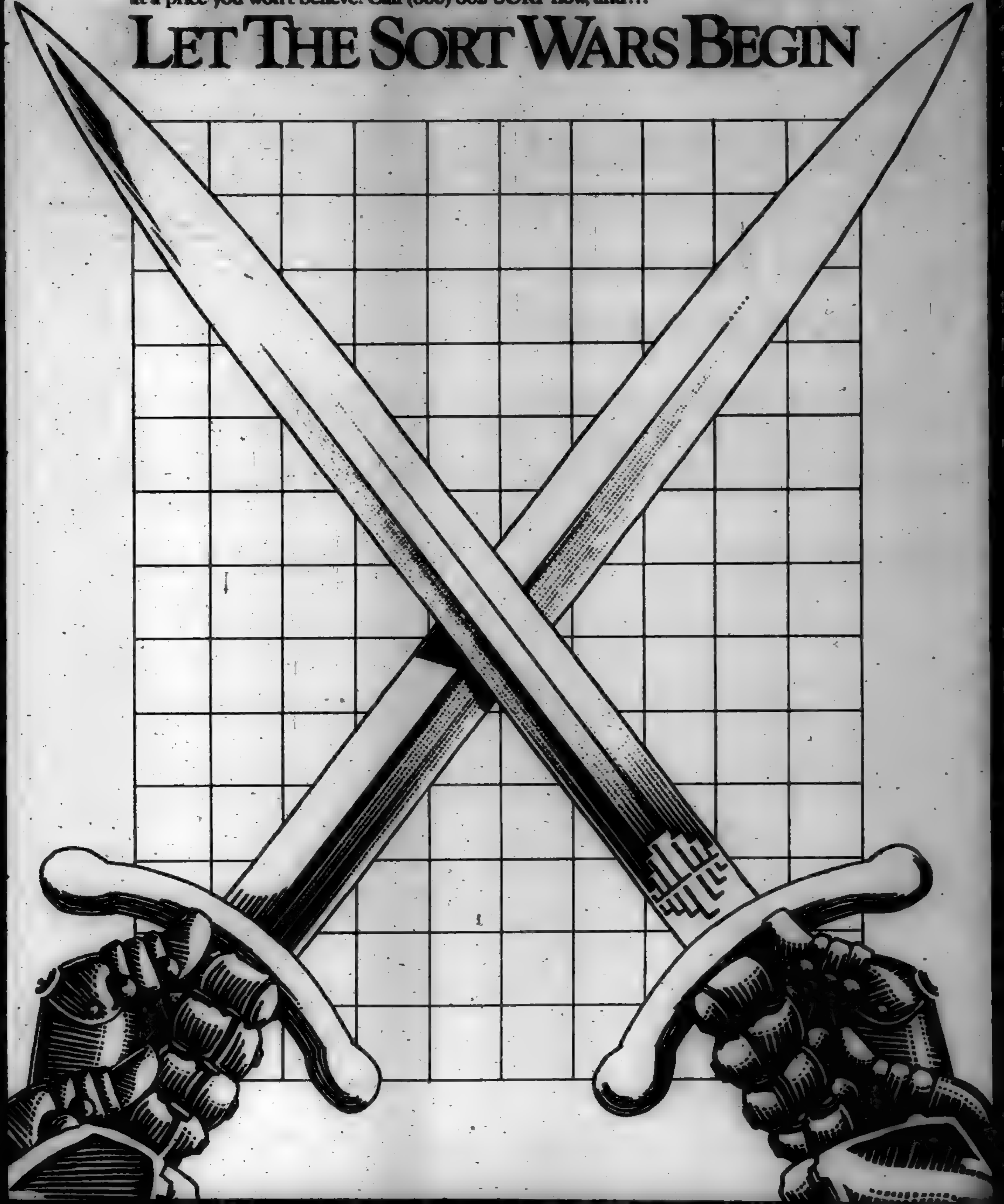

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SOFTWARE & SERVICES

- An enhanced version of the S.1 development system was unveiled by Teknowledge/44
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Computerworld *talks with Jerome Garfunkel*

Expert addresses Cobol 85 standard

If it seems as if you have been hearing about the Cobol 85 standard — assuming that the proposed Cobol standard is approved this year as expected — for a long time, you are absolutely right. Technically, work on Cobol 85 began in 1978. The proposed Cobol 85 standard is only now entering the final stages of both American National Standards Institute (Ansi) and International Standards Organization (ISO) approval. It has been the subject of intense, sometimes vitriolic, debate. A controversy stemming from Cobol 85's perceived incompatibility with earlier standards for the language sidetracked the proposed standard for years.

With the standardization process winding down, *Computerworld* Senior Editor John Gallant talked with Jerome Garfunkel. Based in Litchfield, Conn., Garfunkel is a Cobol 85 consultant who, as a member of the Ansi X3J4 Cobol committee, was a central figure in the birth of the language. He has lectured, designed, taught training courses in the use of Cobol 85 and has written extensively on the subject.

Jerome Garfunkel

What are the final hurdles for Cobol 85?
The final part of the Ansi procedures say we [the X3J4 committee] must demonstrate that we have gone out for public review and have answered it. An Ansi committee called the Board of Standards Review is the final judge to ensure that all the procedures have been followed and that this is indeed an industry standard.

How would you characterize the period of public review?
Hectic. The first round of public comment drew 2,200 comments, 1,700 of which were negative form letters; the second round produced 925 letters, also the vast majority negative form letters; the third round produced only about 25, many of them from people withdrawing their former comments.

The last one seemed apathetic, which is sort of a good thing. I don't know any language at all that has received the kind of attention Cobol 85 has. I'm glad it was a debate [in which] people got involved. I wish that they had been a little better informed, however.

How do you react to criticism that the Cobol 85 standard took too long to be drafted?
Part of me wants to be defensive because I was part of the system. But part of me says the criticism is absolutely correct. And the prediction that Cobol won't survive unless it becomes more state of the art is probably correct. I don't mean to pooh-pooh the large inventory of Cobol programs. But if Cobol is not a good application development tool and the only reason Cobol was surviving was because of its large inventory of source programs, it will only be a decade or so before the language disappears altogether.

Cobol can only survive if it continues to be a good development tool. The new Cobol language is an essential part of that.

When does the next Cobol standardization process begin?
It has already begun. We hardly got to breathe a sigh of relief. One of the major things that happened in Vienna last year at the International Conference on Cobol

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SOFTALK

Niche market vendors making comeback?

By John Gallant

In the last several years, the major applications software vendors have talked about little else than integration of their products and the delivery of so-called development or integration environments. Examples of such environments include Management Science America, Inc.'s Information Expert and McCormack & Dodge Corp.'s Millennium.

The buzzword "integration" has come to represent so many things to so many people and has been so blatantly misused by people in the industry that it has become almost meaningless. And the term "development environment" is also in danger of being rendered useless.

Those issues aside, another question comes to mind. In the rush to integrate their applications portfolios in one way or another and churn out such development environments, have the large applications software vendors forgotten something? In the drive to become one out of the handful of megasoftware companies that strives to be all things to all users, have the vendors lost sight of what those users really wanted in the first place from an applications software company?

John Landry III and Robert Weiler, former top executives of M&D, think they have. Landry and Weiler departed from M&D last month to become chairman and president, respectively, of Lexington, Mass.-based Distribution Management Systems, Inc., which, as its name implies, markets distribution management applications for the IBM mainframe and Digital Equipment Corp. VAX worlds.

The duo feels the big guys in the applications world have begun to lag in applications functionality in the quest to

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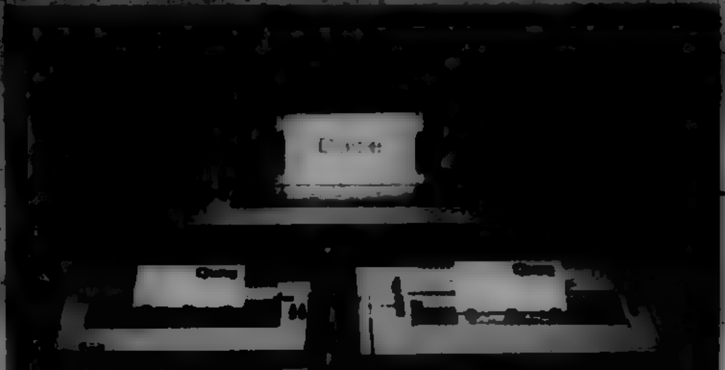

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Pyramid unveils compilers

Pyramid Technology Corp. of Mountain View, Calif., has announced optimizing Fortran 77, C and Pascal compilers for its Pyramid 90X, 90MX, 98X and 98XE processors.

The compilers work with Pyramid's Common Language Environment, a standardized high-level program development and execution environment integrated with Pyramid's OSX operating system. The operating system is said to incorporate both the University of California at Berkeley's Unix 4.2 and AT&T's System V Unix features.

The Pyramid enhanced development environment includes a source-level debugger, a fast code generator and global optimizer and runtime environment for C, Fortran 77 and Pascal. The compilers are optimized for Pyramid's reduced instruction set computer architecture.

The C optimizing compiler will be bundled and shipped with OSX. Pyramid's optimizing Pascal and Fortran 77 compilers cost $6,000.

Teknowledge's S.1 now in C

Teknowledge, Inc. of Thousand Oaks, Calif., has announced Version 2 of S.1, its development software for knowledge-based systems. The updated version has been rewritten in the C language, the vendor said.

S.1 reportedly runs on a variety of processors, including the AT&T 7300, the Digital Equipment Corp. Microvax, the Symbolics, Inc. 3690, the NCR Corp. Tower 32 and the Apollo Computer, Inc. DN320 and DN550.

Version 2 of S.1 is a combined package of software, training and support. The conversion to C was done to make S.1 available for a wider variety of processors, a spokesman said. S.1 will continue to be available for machines running Lisp, but future versions of S.1 will be built for nonspecialized implementation, the spokesman said.

S.1 has been used to develop knowledge systems for field service, plant management, engineering design and sales support, according to the vendor.

The delivery version of S.1 Version 2 will be available by year-end 1985. The full development version is scheduled for first-quarter 1986 delivery for a variety of processors running AT&T Unix or C. Prices range from $25,000 to $40,000, depending on hardware.

SYSTEMS SOFTWARE

■ **J. William Bennett Co. has announced a job scheduling utility that runs under IBM's MVS operating system.**

Jobtrac submits production and rerun library JCL. The package is capable of capturing Sysouts and supplying a tape archive. It maintains a job execution history and records Initial Program Load statistics.

The software supports Pansophic, Inc.'s Panvalet libraries for automated JCL submission and IBM ISPF editing. Jobtrac works with automatic JCL override or removal.

It runs under MVS/SP 1.1.2 and up. IBM's TSO ISPF/PDF is required for full-function TSO support.

A site license for Jobtrac is $18,500, and a yearly maintenance fee costs $1,850.

J. William Bennett, P.O. Box 96694, Houston, Texas 77213.

■ **Duquesne Systems, Inc. has released Dasd tuning software for mainframes running IBM's MVS and MVS/XA operating systems.**

The Dasdmon package is said to provide on-line information showing contention in the Dasd subsystem. The software displays path, volume, job and data set information on request. Performance-level standards are preestablished by the customer, and Dasdmon will alert the user to problems that may be slowing on-line systems response.

The Dasdmon package costs $10,000 for a 99-year lease.

Duquesne Systems, Two Allegheny Center, Pittsburgh, Pa. 15212.

■ **Boole & Babbage, Inc. has announced the CICS Manager real-time monitoring, tuning and analysis system for IBM CICS users with DOS or MVS operating systems.**

CICS Manager is intended as an aid to systems programmers in finding CICS trouble spots. The system provides on-line tuning suggestions for corrective action. Every area of CICS can be monitored in real time through overview screens. The system also incorporates a batch reporting facility for printing out and analyzing information.

CICS Manager provides a problem screen that examines areas ranging from short-on-storage conditions to transactions waiting on Vsam strings. The system also displays screens that report on activities, transactions, files, storage, terminals, programs and, for DOS environments, DL/1 activities.

The DOS version of CICS Manager costs $8,000, and the MVS copy costs $22,000. The product is available now.

Boole & Babbage, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

■ **Unitech Software, Inc. has announced the release of four systems software products for AT&T Unix systems.**

SSL is a full-screen terminal man-

Continued on page 46

VICE-VERSA

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IBM micros get building aid

Reportedly functions like ADS/On-Line

Online/Database Software, Inc. of New City, N.Y., has announced the Application Builder, a package for the IBM Personal Computer XT or AT promising the same functions as Cullinet Software, Inc.'s ADS/On-Line application development environment.

Using the Application Builder, Cullinet Software IDMS users can design, code and generate all their ADS/On-Line dialogues on the microcomputer and then upload them to the mainframe for execution. Or, users can download existing mainframe applications for execution on the micro, a spokesman said.

The product runs in IBM's PC-DOS, Microsoft Corp.'s MS-DOS, AT&T's Unix and Microsoft Corp.'s Xenix environments.

The Application Builder gives the user access to IBM DOS functions, offers multilevel password protection, data base control and Help facilities. The product includes an integrated data dictionary that supports IDMS and ADS/On-Line functions.

The on-line mapping function is compatible with IDMS on-line mapping. The dialogue generator is menu driven, and dialogue can be ported to most compatible computers, according to the vendor. The product's tutorial system features 16 lines of Help per field position and tutorials to help application developers learn IDMS and ADS/On-Line.

The Application Builder is priced at $3,500 per microcomputer for the MS-DOS and PC-DOS versions. The product is scheduled for November availability. Versions supporting Xenix and Unix will be available in the first quarter of 1986.

Analysis tool out for VAX

BBN Software Products Corp. has announced that its RS/1 data analysis package for scientific, engineering and industrial applications is now available for Digital Equipment Corp.'s VAX processors.

Release 2 of RS/1 is said to be faster and easier to use and is said to offer more functions than the previous version of the software, the Cambridge, Mass.-based vendor said.

Features of the release include an added table editor and improved graphics editor functions. Users can now customize the display features and provide form-like entry of data into tables. With improved graphics functions, users can now graph dates, times, money and text. The graphics editor can be used to create a data axis with a daily, weekly, monthly or quarterly format.

A command line editor allows VAX VMS users to correct misspelled words. Release 2's money format includes dollar signs, commas between thousands and parentheses for negative numbers. Additional analytical tools include spline fits, probability plots, histograms, principal components analysis and contour plots.

Release 2 will run on DEC's VAX and Microvax II series processors under VMS, DEC's Ultrix or the University of California at Berkeley's Unix 4.2 operating system. Release 2 costs from $6,000 to $69,000, depending on the processor.

Continued from page 44

ager and applications development system with automatic capabilities for menu formatting, screen and table handling and data base calls. The mainframe version costs $4,400, including a compiler.

SPR Super Spooler is a full-feature print spooling and batch job scheduling system featuring multiple device support, multiple queues, manual or automatic device assignments and background job scheduling. The mainframe version costs $975.

SSE is a full-screen editor for Unix developers and nontechnical end users with full text editing functions. The mainframe version costs $410.

S-Telex is a hardware and software telex communications management system that can be used as a stand-alone system or integrated with text and word processing systems. The mainframe single-line system costs $1,365; each additional line costs $280.

The products are available for most Unix versions.

Unitech Software, P.O. Box 7490, McLean, Va. 22106.

■ **Kolinar Corp. has announced an enhanced version of Kprobe, its system software for IBM VM/CMS systems.**

Kprobe is a program test and debug tool for software developers who design products for the IBM mainframe environment. The enhanced version of Kprobe reportedly includes a Snap Dump facility to capture main storage contents without interrupting program operation.

Kprobe is provided for a $2,600 annual license fee and an initial charge of $1,300.

Kolinar, 3064 Scott Blvd., Santa Clara, Calif. 95054

■ **Infocentive Systems has announced the Infoman software utility for IBM CICS users. Infoman is said to enable users to alter and ex-**

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SOFTWARE & SERVICES

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panel screen display data to create tutorials, help screens, coding schemes, security access control and data validations.

When applied to CICS applications, Infoman is said to modify the programs to user requirements. On-line tools are provided to make fixes to CICS application software.

Infoman is priced at $3,500 for DOS/VSE installations and $4,500 for OS/MVS systems.

Infocentive Systems, 10220 Lower Azusa Road, Temple City, Calif. 91780.

PRODUCTIVITY AIDS

■ H&A Computer Products, Inc. has announced the Query Report Program for the IBM Series/1 minicomputer.

Query Report Program allows nontechnical users to create reports tailored to their needs without help from a programmer.

Users can select, sort, format and retrieve data to run a report using a series of menus. Report specifications can be saved to run the report at a later date.

The Query Report Program is priced at $1,500.

H&A Computer Products, 522 Washington St., San Francisco, Calif. 94111.

■ Lawson Associates, Inc. has announced Access+, a dictionary-driven query and report writer system for IBM mainframe users. The product runs in DOS and OS environments.

Access+ provides on-line query capabilities or hard-copy report output and allows users to access multiple applications in one request, a spokesman said.

End users can design their own reports without assistance from DP personnel.

Access+ for DOS is priced at $22,000. The OS version is priced at $28,000.

Lawson Associates, 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.

■ The John Fluke Manufacturing Co. has announced the Prolink Personal Computer Program Development Package, which links an IBM Personal Computer or Personal Computer XT or AT with the Fluke 2400B Intelligent Computer Front End.

Prolink Personal Computer simplifies creation of data acquisition and control applications that execute on the 2400B.

Prolink allows the IBM Personal Computer to download its applications programs to the 2400B. The Fluke 2400B then handles all conversions, linearizations, limit checking and data buffering.

Using menu selections, an operator can create and edit 2400B measurement and control programs. Menu choices allow programs to be checked for errors and to be downloaded to and retrieved from the 2400B. Systems with up to 100 channels can be supported by the system.

The Prolink Personal Computer package is priced at $450.

John Fluke Manufacturing, P.O. Box C9090, Everett, Wash. 98206.

■ Antek Software, Inc. has announced Allegro, systems software designed to speed the processing of IBM Vsam files under DOS/VSE without requiring modifications to files, programs or JCL.

By operating as a front end to Vsam open processing, a spokesman said, Allegro allows programs that normally use the default buffer specifications, such as Cobol programs, to use more efficient values.

Allegro is available for a permanent license fee of $2,500, an annual lease of $1,000 or a monthly rental of $100.

Antek Software, 5419 Oliver Ave. N., Minneapolis, Minn. 55430.

APPLICATION PACKAGES

■ GEC Software Ltd. has announced Gecomo, a cost estimating and project management tool for Digital Equipment Corp. VAX processors and Sun Microsystems, Inc. workstations.

Gecomo provides software managers with estimates of duration and staffing profiles before the start of a project and throughout its progress. The product is said to allow managers to examine alternative scenarios for handling a project.

Once the development approach has been decided, Gecomo is said to automatically provide estimates by work activity and by phase of development.

The system is available for the DEC Microvax and VAX-11/730 through 785 under the University of California at Berkeley's Unix 4.2 and DEC's VMS. It is also available on Sun workstations.

The first systems will be available in November and will cost $16,000 on VAX processors. The price for Sun workstations is $9,600.

GEC Software, 132/135 Long Acre, London, England WC2E 9AH.

■ Mascoglia and Associates, Inc. has announced the Stat/38 statistical analysis system for IBM's System/38 and enhancements to its Stat/36 and Stat/34 statistical analysis packages for the IBM System/36 and System/34.

Stat/38 provides an external file interface that permits statistical analysis of data stored by other applications. It copies and formats data from any internally or externally defined file to a matrix file.

The Stat/38 analysis program provides a variety of data manipulation, mathematical and statistical functions with display and report output. Features of the program include interactive, command-controlled operations, on-line assistance displays describing program operation and the use of each command and user-assigned names for the columns and rows of a matrix.

Stat/38 is licensed for a one-time fee of $17,500.

The company also announced release 3.1 of the Stat/36 and Stat/34 statistical analysis systems. The enhanced versions offer improved file handling capabilities, increased flexibility and improved statistical analysis facilities. Stat/36 and Stat/34 are licensed for a one-time fee of $5,000.

Mascoglia and Associates, Suite 102, 4970 Northwind Drive, East Lansing, Mich. 48823.

■ Matra Datavision, Inc. has announced Surfapt, a numerical control application for surface milling operations. Surfapt is used in conjunction with Matra Datavision's Euclid computer-aided design and manufacturing system.

The Euclid system is based on true three-dimensional solid modeling techniques. Surfapt runs on the Digi-

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Durable, doable design characterizes sound data base

SOFTLINE
Frank Sweet

By Frank Sweet
Special to CW

The two hallmarks of a sound data base design are that it is durable and doable.

A durable design survives changes in the business environment. Managers and policies, products and styles come and go. But a data base represents millions of dollars' worth of painstakingly collected data about a firm, and it better not come and go with the changes.

A doable design is one that is easy to implement. It capitalizes on the one gift all people share — people get better at anything with each repetition — and it does not penalize a common flaw — that people never get anything right the first time.

Durable data bases survive the very applications that created them. One shop, for example, has been through two payroll systems, a now-defunct workmen's compensation system and two security systems in the past seven years. Yet its employee data base, which those applications used, has been chugging away without interruption since first installed. At the other extreme lies the painful case of a design so dependent on transitory management style that it was unknowingly wrecked by the stroke of an executive pen mere weeks after implementation.

Durability not accidental

Understand, durability is no accident. It is deliberately built into data base designs by modeling underlying business reality, making sure the resulting data base is sharable among applications and making it expandable with new data.

Modeling reality means that data structures reflect real events, real activities. They must not simply mimic records in other filing systems such as forms and documents. Specific forms can be abolished while the concepts of products, vendors, customers or employees cannot. Modeling reality means determining designs by the business processes they will support.

Sharing the data base among applications means that different people use the same data base for different purposes. Data base administrators call this avoiding redundancy, and there are three reasons why it is important.

First, redundant data implies redundant data updaters, and it is pointless to have two people doing the same job. Also, the more users, the greater the incentive to keep data accurate. Thus, the data becomes more timely and reliable for everyone. Finally, the more widely a data base is shared, the more durable it is. Its users anchor it against being blown away in one of the yearly tempests of reorganization.

> ”
>
> *A doable design capitalizes on a gift people share — they get better at anything with each repetition — and it does not penalize a common flaw — that people never get anything right the first time.*

Making the data base expandable to new data means developing the skills and tools to add fields to existing records, new records to existing files or new files to the data base without shutting down or retrofitting existing applications. Expandable data bases endure because each new application brings new data needs. Application developers will use the central data base if their needs are easily accommodated. Otherwise, each group will go its own way, and the centrally shared data pool idea will be stillborn.

The most doable data base designs are those that can be brought up faster and with less effort than comparable flat files. The worst, of course, are those disasters where the application quickly reaches 90% completion and stays that way month after expensive month. The two secrets of making it doable are to include only what is needed and to keep it simple.

Data design conceals a treacherous twist to the dilemma. It is the urge to include too much. Designing a vendor file for a payables system,

Continued on page 52

Sweet is corporate manager of data administration for the Charter Co., a Fortune 100 firm in Jacksonville, Fla. He has worked with major data base management systems since 1970 and is a former president of the national (Cullinet Software, Inc.) IDMS User Association.

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From page 41

CW interviews Jerome Garfunkel

was that the ISO Cobol Committee, which is the international version of the Ansi X3J4 committee, decided to change the process used to standardize Cobol to speed it up. The process is killing the language. If the process is so slow that it delivers what we need too late, it's contributing to Cobol's death.

So [the] ISO decided to adopt the concept of Cobol supplements, and every few years we will add [new features] to the language.

But we will make sure that the supplements are completely compatible so we won't start up the incompatibility controversy.

That controversy was mainly over incompatibilities between the new language and older versions.

Some observers were very vocal about these alleged incompatibilities between Cobol 85 and earlier versions. Have all these issues been resolved? Were these criticisms valid?

No, the issues have not all been resolved to the satisfaction of those people who held what I believe was a radical view. That is a fairly controversial word to use. I qualify it by an example.

We added a new verb called the EVALUATE verb that adds functionality to the language. I asked someone who was vocal about the incompatibility problems whether he was in favor of not adding the Evaluate verb because it was a new reserved word and technically — though we had an easy way of dealing with it — was an incompatibility. He said yes.

That is how adamant they were about causing no new incompatibilities.

When I heard that, I stopped taking that point of view very seriously. They had a legitimate point of view and they got us to pay attention to it. But we could not adopt that view to the point of killing the language.

Maintenance is one of the biggest concerns today. Do you think the reduction of maintenance work loads was a big enough concern to the drafters of Cobol 85?

Yes. If I had to pick one area in which Cobol 85 is strongest and who it will benefit most, it [would be] the maintenance function and the maintenance programmer.

The main beneficiary of well-structured code is the maintenance programmer. That is exactly what prompted many of these changes, the fact that systems maintenance was out of control. That is exactly what [resulted in] most of the important changes in Cobol 85.

The other concern is productivity. Is Cobol 85 geared to improving productivity?

If what you call productivity is application development productivity and you measure that by how fast an accounts receivable application can go from specification to executable code, then no, Cobol is not the most productive language to use.

We all know it is very wordy, and it is time consuming because it is self-documenting. It is not a speedy development tool. [It is] a practical solution to living with an existing system.

If we are going to build systems knowing they will need maintenance, there is no better language I know of for that task than Cobol.

Many of the fourth-generation language vendors claim that their products can handle the same programming tasks as Cobol and that eventually they will supplant Cobol. How do you respond to such prognostications?

The first part of that is true. Most of the fourth-generation languages can do what Cobol is doing, and they can probably do it a little more efficiently, in the sense that it takes fewer words to generate the same executable code.

The problem arises when you consider why we have Cobol in the first place. Industry needed a common language. I see nothing on the horizon in terms of fourth-generation languages emerging to challenge Cobol in that role. That is much too important for industry to give up.

What do you consider to be the most attractive feature of the new standard and the things that will benefit users most?

The main criticism for Cobol has been its lack of structured statements; if you wanted to write structured programs according to theories of the last decade, you couldn't do them well in Cobol.

That is no longer the case. Many new constructs of the language were added specifically to be in harmony with structured programming theories.

In retrospect, what would you like to have seen done differently in the drafting of Cobol 85?

I would like us to change the standardization rules so that what takes three years of normal procedures, forgetting about something like the incompatibility issue entering the picture, should only take a year.

We should be able to come up with a consensus without having to go through such fine detail of procedures as we do now.

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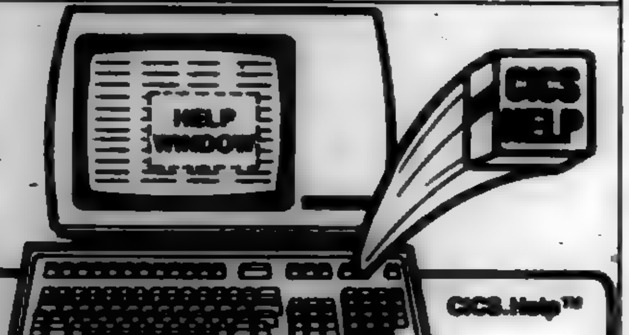

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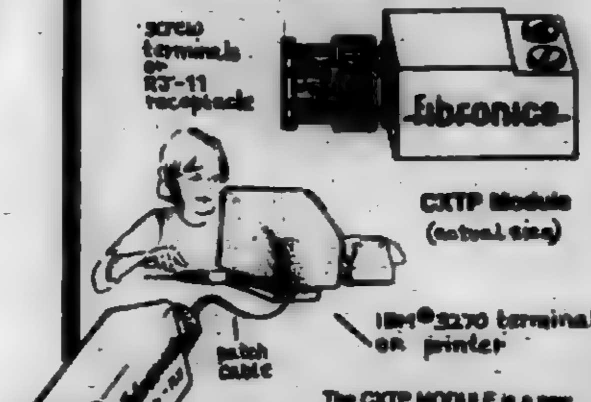
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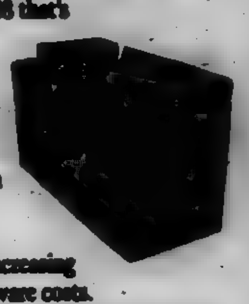
EMC has just added a feature to add-in memory for IBM's System/38 that's been sorely lacking.

Competition.



Like IBM's 1 Megabyte add-in memory, our new memory expansion card lets you boost the speed and performance of your System/38. Without increasing software or other hardware costs.

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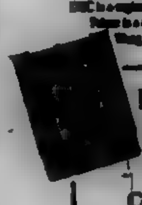

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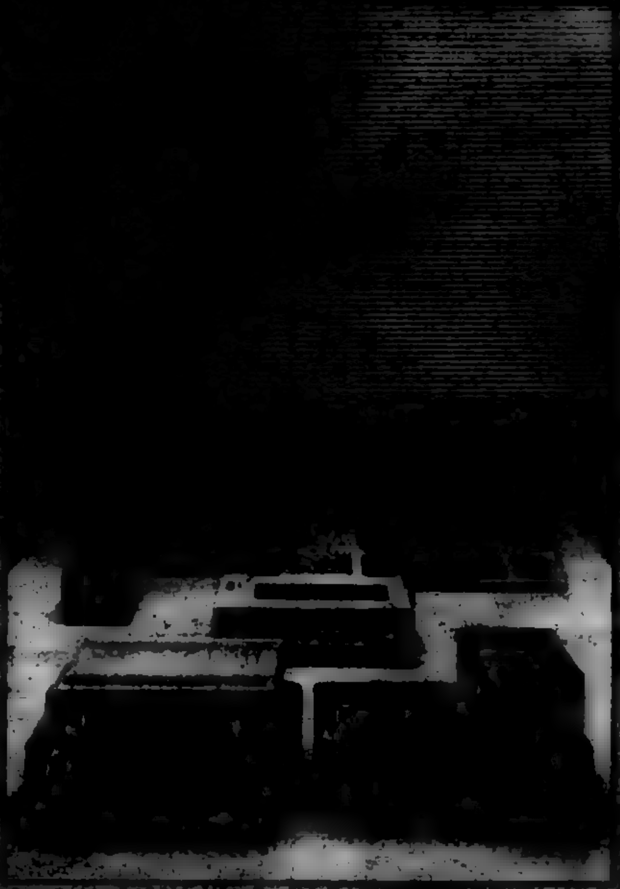
The DATAPHONE II System is a new family of high-performance data communications products—modems, data service units and diagnostic control devices—that combines data transmission with real-time diagnostics and sophisticated network management and control.

It's a modular system of [illegible], designed to keep your network up and running. And to easily grow in size, speed and diagnostic capability to meet your changing needs.

Whether you have an analog or digital network, the DATAPHONE II System offers a full line of microprocessor-based private line modems and data service units to provide [illegible]

[illegible] plans with unique [illegible]



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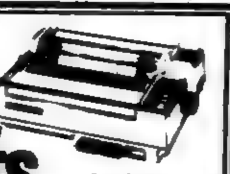

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WESTWOOD COMPUTER CORPORATION

SOFTWARE & SERVICES

Continued from page 46

tal Equipment Corp. VAX family of processors and the IBM 3030, 3080, 3090 and 4300 lines. Surfapt is priced from $20,000 to $60,000.

Matra Datavision, 30 Commerce St., Woburn, Mass. 01801.

LANGUAGES

■ Peat, Marwick, Mitchell & Co.'s Catalyst Group has announced a service that converts mainframe assembler language code programs to structured Cobol.

The Mainframe Assembler to Structured Cobol Translator (Mascot) reengineering service is said to deliver structured Cobol code, centralized mainline processing logic, isolated I/O for each program, performable routines and self-documenting code.

A spokesman said the cost of the Mascot translation service is typically $1.50 to $2 per line of assembler code. It varies according to program complexity and adherence to assembler language programming standards.

Peat Marwick Catalyst Group, Suite 2200, 303 E. Wacker Drive, Chicago, Ill.

REMOTE COMPUTING SERVICES

■ General Electric Information Services Co. (Geisco) has announced a service called Ascii-to-IBM 3270 protocol conversion, also known as IBM 3270 emulation, on its Mark Net Asynchronous Service.

The service is facilitated through Simware, Inc.'s SIM 3278 emulation software, available to Mark Net users in IBM VM, MVS/Vtam and PC-DOS versions. The 3270 emulation allows more than 50 different Ascii-type asynchronous terminals and microcomputers to function as IBM 3278 Model 2 terminals.

A single-CPU, perpetual SIM 3278 license for Mark Net users costs $15,500 for the Vtam version, $9,500 for the VM version and $7,500 for the PC-DOS version.

Geisco, 401 N. Washington St., Rockville, Md. 20850.

From page 47

Doable design key to sound data base

you may need a vendor identification number, name, address and amount owed. You should stop, but temptation draws you on.

"We're designing a data base to be shared by future applications," you reason. "Shouldn't we find out what they'll need and include it too?" The bait looks tempting — doing a thorough job — and the risk slight — a few days' extra work.

But, to do it, you would have to identify every data element, every attribute of a vendor that any user could ever want for any conceivable purpose.

The power of data base management systems with the subschema notion, like Cullinet Software, Inc.'s IDMS, is that they enable records to be stretched to include new fields as new applications arise and do so without making users track down and recompile existing programs. So, the first way to make a data base design doable is to include only what is needed at the time the data base is designed.

The second secret of doability is to keep it simple, and this implies modularity. There is really only a handful of basic data base design patterns. They are used, like building blocks, in one application after another.

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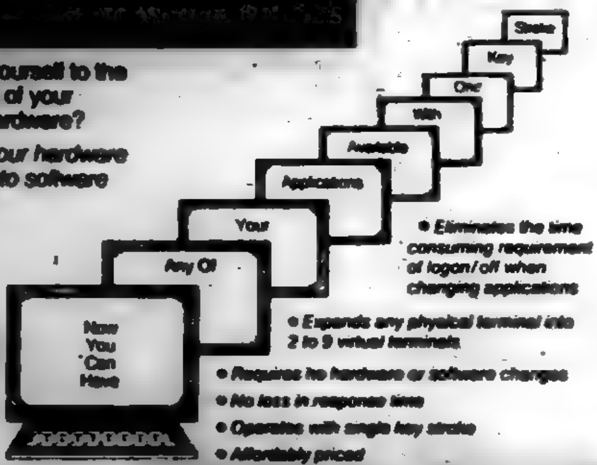

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SOFTWARE & SERVICES

From page 41

Niche market vendors making comeback?

tie systems together and offer standardized development environments. Thus, smaller vendors that work only within a specific niche market — and target their R&D efforts solely toward improving the quality of their applications — have lately been able to gain significant ground against the behemoths by addressing functionality rather than global integration.

"What happened," Landry said in a recent interview with *Computerworld*, "was that all the major players got involved in this push to integration and development environments. [M&D] was very much a part of that. But the big companies have focused almost solely on these things, and in the feature/function aspect of their applications they are floundering."

That floundering has given niche dwellers an opportunity to prosper. For example, Landry said, Sunnyvale, Calif.-based Data Design Associates has lately begun to beat up on its larger competitors in the financial software arena.

"They didn't have all the bells and whistles like the big guys," Landry said. "But they were very successful in knowing what users wanted. The large applications vendors were trying to be all things to all people, and that is just too hard to do. It will take the next two or three years for the so-called integrated applications vendors to complete all that they have said they would do. They have to live up to a lot of claims."

According to Weiler, niche, or vertical market, applications software companies are making quite a comeback.

"The niche companies got hammered hard in 1983 and 1984," Weiler said. "A lot of users bought the major vendors' pitch about integration and development tools. But now users are again checking out the niche companies, they are looking for the functionality that the big guys haven't been able to deliver. The niche guys are coming back."

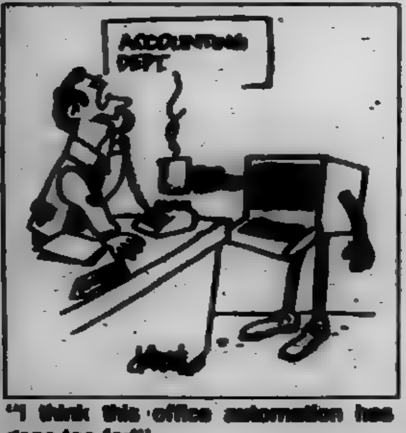
Landry's and Weiler's comments should not be misconstrued as a parting shot at their former employer or other large applications vendors. Nor are they a plug for Distribution Management Systems, undoubtedly a niche dweller — though in one of the more rapidly expanding niches.

And it must be remembered that even the biggest software companies were once niche dwellers of one sort or another and cannot be faulted solely for growing beyond their roots.

But the fact remains that the pair's views probably correspond to those of many users, those who are interested more in the quality of a particular application than in whether it can be linked to an accounts payable, manufacturing or human resource system.

Integration became a hot topic for a reason — users hoped to meld their applications into a single information resource. But integration is not the sole concern of users. In the rush to meet the demand for integrated products, applications vendors sometimes seem to have forgotten why users turned to packaged applications in the first place.

Users were looking to supplement their own development efforts with reliable systems that handled a particular business function as well, or nearly as well, as a custom, in-house application.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19,200 bps.

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The DSP19200 features an 8-channel TDM multiplexer. For flexibility, it provides a variety of data rate combinations, with individual speeds of from 2400 to 19,200 bps per channel. Additionally, a pair of data rate fallback systems selectively compensate for both line noise and bandwidth limitations.

With its integral soft-touch keypad, alphanumeric display and sixteen LED indicators, the DSP19200 lets the user

- set the strapping options for local and remote unattended modems,
- perform diagnostics and bit error rate testing with a built-in pattern generator, local/remote analog and digital loopbacks,
- monitor transmit/receive and carrier detect levels
- monitor EIA interface control signals on all eight channels.

With its superior capabilities, the DSP19200 is a compact unit that measures just 12.6"w x 3.5"h x 15.6"d.

The new NEC DSP19200, with revolutionary O-QAM technology and highly comprehensive features, offers unmatched performance over existing telephone circuits. It is the unequalled choice for saving both time and money on high-speed data transmission.

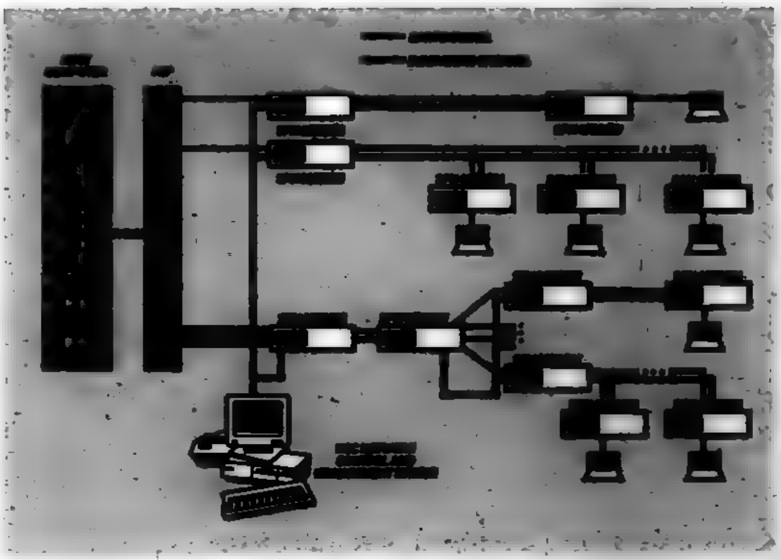
NETWORK CONTROL AND MANAGEMENT SYSTEM (NCMS).

The NEC Network Control and Management System is a powerful, user-friendly troubleshooting tool for small to medium scale networks.

The menu-driven NCMS uses high-resolution color graphics, presenting easily interpreted information on all aspects of network activity. It allows quick response to network problems, simplifies day-to-day operation, and facilitates better system management.

Based on the versatile NEC APC III Computer, NCMS operates under UNIX(R), and includes mass storage, printer, and high-resolution color display.

NCMS uses NEC SPN Series intelligent modems with operating speeds of 2400 to 14,400 bps, in a variety of configurations: point-to-point, multipoint, or tandem. And it manages from one to sixteen central site lines, providing enough control for almost any small- to medium-sized business.



NCMS offers a range of diagnostic functions, starting with continuous monitoring of eight key analog parameters, and including EIA lead status.

For measurement of error rates, NCMS provides analog and digital loopback, with multipoint, end-to-end, and self-testing. Plus automatic polling tests. NCMS even allows downline loading of modem options for easy installation and control.

Continuously monitoring the communications network, NCMS automatically alerts the system operator to problems, so they can be quickly identified, isolated and resolved. It also provides multilevel password protection for system security. And to simplify administration, NCMS generates trouble tickets and network management reports.

The NEC Network Control and Management System. The simple solution to complex networking problems.

N500A DSU/CSU

The NEC N500A is a highly efficient Digital Service Unit that operates at rates of 2400, 4800, 9600 and 56,000 bps. By using easily changed interface cards, it supports RS-232C and v.35. It offers both full- and half-duplex operation, and is completely DDS network compatible.

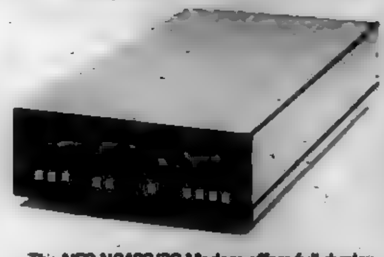
For rapid fault diagnosis, the N500A offers local and remote testing capabilities. In a multidrop environment, the N500A allows the user to address an individual DSU/CSU for testing from the central site—an industry first.

Also built in is an LCD display for front panel monitoring of equipment status, data rate, and error performance when in the test mode. Seven LEDs indicate EIA status.

The N500A ia available in both stand alone and card versions for Rack Mounting.

The New N500A DSU/CSU offers advanced technology and rapid, reliable data transmission, for the most efficient, most cost-effective system operation.

N2420/30 DIAL MODEM



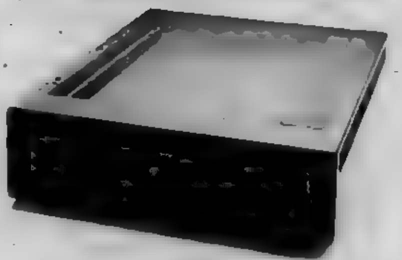
The NEC N2420/30 Modem offers full duplex operation at 300 bps, 1200 bps, or 2400 bps over two wire DDD networks. For the first time, the user can specify performance options. Including:

- Full Hayes auto-dial compatibility.
- 12 number NEC dialing with auto log-on sequences.
- Call-back security with capability for storing 96 users' codes and passwords.
- Built-in Error Control for error free data transmission.
- Synchronous dialer.

The N2420/30 modem is available in both stand alone and rack mount versions.

The NEC N2420/30 modem offers the user the ability to pick and choose performance options to meet specific telecommunications needs now and in the future.

DSP9620 DATA MODEM



The new NEC DSP9620 employs the latest in high-density LSI technology, and offer stable, reliable operation at speeds up to 9600 bps.

The auto-answer DSP9620 is compatible with CCITT v.32, v.28, v.24 and EIA RS-232C standards, and operates in full-duplex mode over the 2-wire public switched dial network or on unconditioned 2-wire leased lines. It maintains both high transmission speeds and data integrity by employing an array of innovations, including a powerful echo canceller, automatic adaptive equalization and Trellis encoding/Viterbi decoding.

The DSP9620 makes operation simple. It provides automatic fallback, easy setup, comprehensive monitoring, and a full range of diagnostics. It features eye pattern output. Plus an optional adapter for asynchronous operation.

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PRODUCT LINEUP

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Leased Line	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Digital Service	2400/4800/9600 bps 56K bps				N500A	N500A	N500A			N500A-H

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C&C Computers and Communications

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IN DEPTH

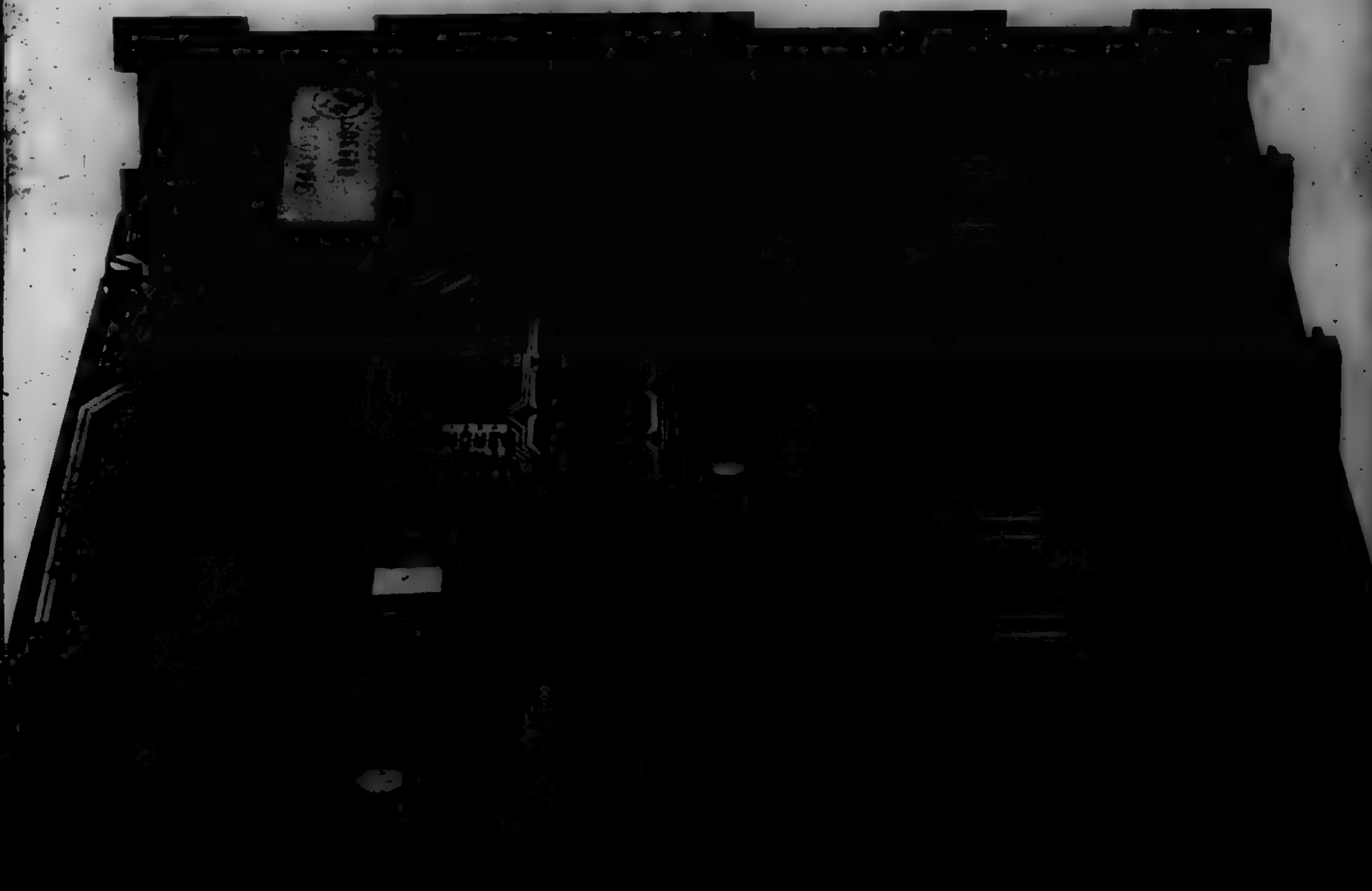
Who needs 2,400 bit/sec. modems?

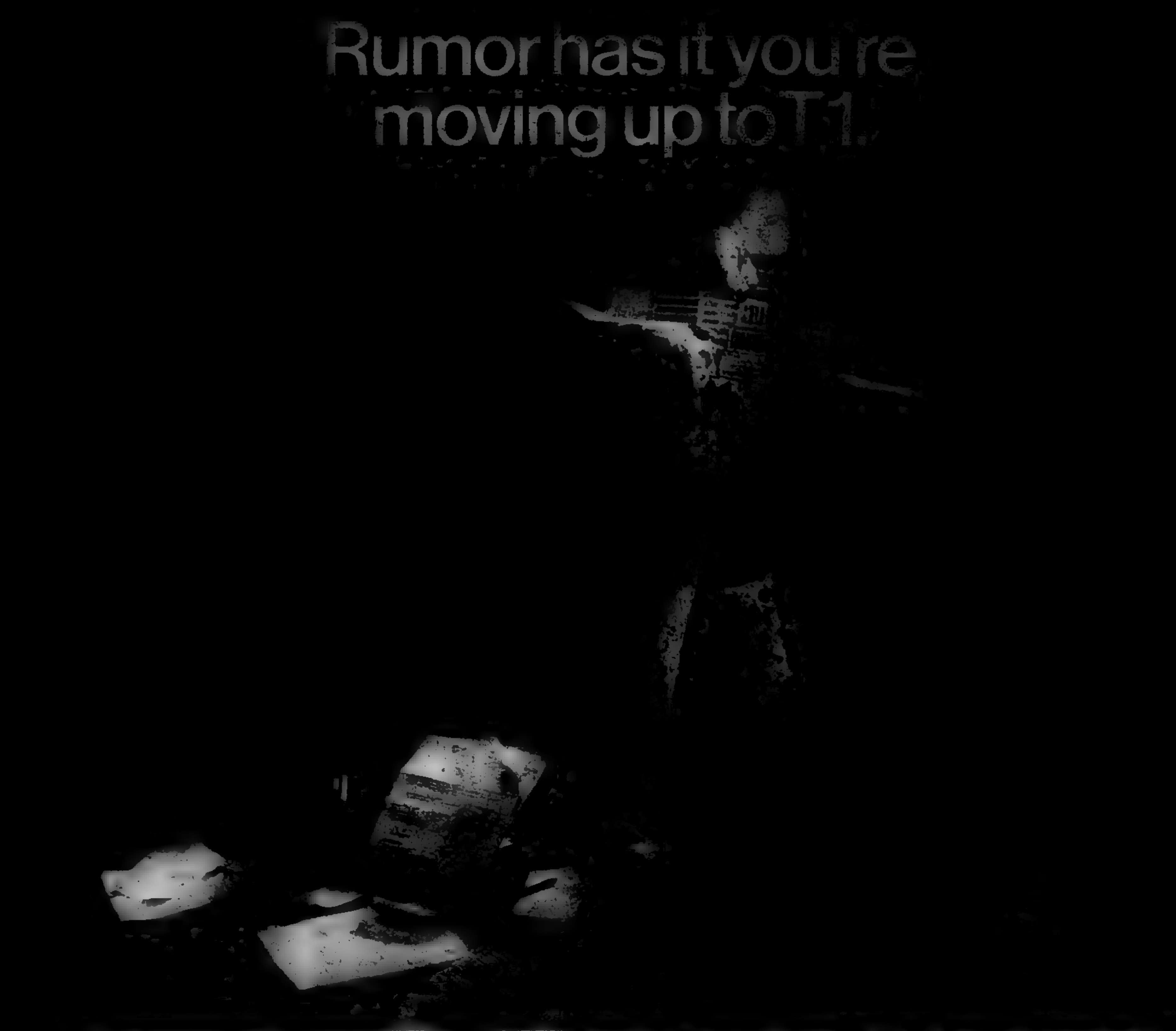
If transactions and line time are brief, you don't. But for graphics, electronic mail and lengthy file transfers, a faster modem may produce savings in a few months.

By Dale Walsh

The new 2,400 bit/sec. dial-up modems, designed to double the speed of asynchronous communications for the wide base of 1,200 bit/sec. modem users, have quickly established themselves in the marketplace. Because the price has not doubled, the faster modems have been easily cost-justified, and vendors have supplied all the hardware niceties to make the upgrade a smooth one. Complaints are rare.

Customer satisfaction is characterized by comments that the modems perform well, with none of the anticipated compatibility problems, across AT&T's U.S. telephone network. The most successful of the new products not only shine at 2,400 bit/sec. but also outperform their best-known AT&T 212A-compatible predecessors at the fall-back rate of 1,200 bit/sec., providing better line quality, easier connections and fewer errors.





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At this point, MIS and corporate DP micro managers contemplating new purchases or upgrading are no longer faced with an unproven class of products. The 2,400 bit/sec. service is expanding continually among the public information services and data networks.

Approximately 500 electronic bulletin board services presently use 2,400 bit/sec. modems, and the number is growing by more than 40 per week. Now is the time to give these products serious consideration.

The price of speed

Since the 2,400 bit/sec. devices fit easily into a 1,200 bit/sec. environment, many purchase decisions will center on cost justification. A cost/benefits analysis for high-speed modems should include these factors:

- Types of communications applications, current and planned.
- Overall performance improvement offered by 2,400 bit/sec. modems.
- Ease of transition.
- Tenure of a 2,400 bit/sec. communications standard.

For most applications, moving up to 2,400 bit/sec. yields a significant saving just on the basis of lower telephone line costs, since throughput increases substantially. The amount of the saving depends in part on distance and frequency of telephone line usage as well as type of application.

In some interactive applications where transactions (and therefore line time) are brief or where lengthy data base searches are conducted unaffected by transmission rate, savings are insignificant. But for applications that involve lengthy data transfers, the higher speed results in considerable saving, and the modems can quickly pay for themselves.

High-traffic transactions are typified by the distributed office information network and its periodic report traffic — some daily, some weekly. The sales staff reports to warehouse, inventory to operations, engineering to inventory and so on.

Applications similar in traffic volume include long-distance budget and project monitoring and electronic mail. Any corporation relying heavily on this type of communications would be a good candidate for the 2,400 bit/sec. environment.

For these users, reductions in connection charges will probably be about 30%. Users should not anticipate a straight 50% saving; although the data transmission rate is doubled, other factors, such as the time it takes to type in responses, remain the same. A firm paying $1,500/mo for long-distance data transfers might save $500/mo.

There is an additional opportunity for corporations with a large number of micro users who daily download information from external sources and services such as Dow Jones News/Retrieval or Compuserve, Inc. At the higher speed, users can expect to realise dollar savings in service connect charges, over and above line charges.

Some external services have direct 2,400 bit/sec. access, while others such as MCI Communications Corp. MCI Mail are available for 2,400 bit/sec. transactions through Tymeshare, Inc.'s Tymnet. (Compuserve will introduce direct 2,400 bit/sec. access this month in a limited number of cities.)

Users can expect most 2,400 bit/sec. services to bill a surcharge, so it is important to check that the additional charges don't offset the cost benefits of the higher speed. Source Telecomputing Corp.'s Source, for example, offers 1,200 bit/sec. service for 43 cent/min during prime time and 18 cent/min during nonprime time. Its 2,400 bit/sec. service costs 3 cent/min more in prime time, 2 cent/min more during nonprime time. MCI Mail charges an added 5 cent/min.

Figuring a payback

The estimated connection-charge savings figured against purchase costs will

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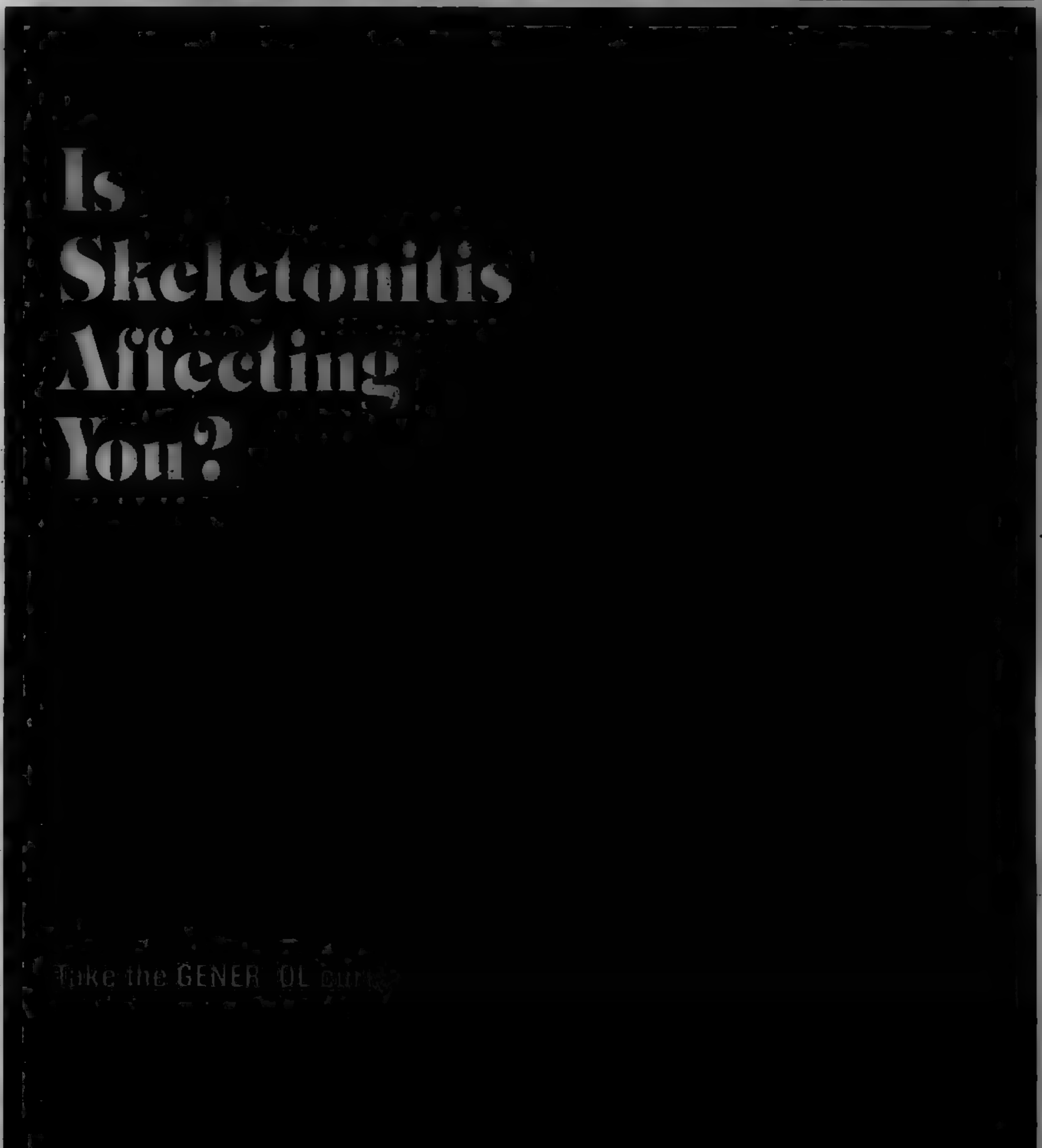
> ***For applications that involve lengthy data transfers, the higher speed results in considerable saving, and the modems can quickly pay for themselves.***



tell users when to expect a payback. Single-unit list prices for 2,400 bit/sec. modems range from $700 to $909, with a median list price of about $775. For comparison, single-unit list prices for 1,200 bit/sec. modems range from $300 to $550, with a median list price of about $450.

Actual volume prices and street prices, of course, are lower for both groups. In general, it is safe to assume an incremental cost of $200 more per unit for 2,400 bit/sec. modems than for 1,200 bit/sec. modems.

Note that this discussion has been limited to point-to-point, terminal/microcomputer applications on standard telephone lines. It has also been limited to those "intelligent" 2,400 bit/sec. modems that implement the Hayes Microcomputer, Inc. 1,200 bit/sec. "AT" command-oriented protocol.

In the end, some monetary savings — however real — cannot be measured in dollars and cents for a cost/benefit analysis, yet it must be included in the decision. Higher speed is a boon when swift retrieval of information is crucial to client negotiations, whether the client is on the scene or on the phone. Slow response time can account for lost sales from time to time, and a faster modem may make the difference.

Because it's there

True to human nature, there may be pressure from end users to upgrade just because the higher speed is available. Many people have observed that micro users are speed addicts, and in general there is an urge within us to move fast even when we spend most of our time at stoplights.

On the other hand, satisfying those who do most of their work in front of a computer or terminal screen may be reason enough to upgrade to the higher speed modems, without resorting to a specific cost/benefit analysis.

With graphics transfer and remote word processing in particular, end users must wait approximately twice as long for screens to fill at 1,200 bit/sec. Working at the higher speed ensures greater productivity and user satisfaction.

The higher speed should not be viewed as a radical departure from the norm so much as the logical next step. There is, for example, a steady migration to 2,400 bit/sec. modems among Fortune 1,000 companies whose micro-to-mainframe links also carry heavy traffic for reports, data base file retrieval, program uploading or downloading.

TRW, Inc., for example, is using 2,400 bit/sec. modems in its Information Processing Network to set up a Telephone Gateway Interface. The network provides internal data base access for TRW's CRT and micro users as well as for commercial and military links.

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> *A legitimate concern for prospective buyers is how soon 2,400 bit/sec. communications may be surpassed by even higher transmission rates.*

Users line up

Users at General Electric Co.'s Lighting Business Group in Cleveland use 2,400 bit/sec. modems to dial up information services such as The Source and, through a digital switch, to connect at 2,400 bit/sec. to 58 VAX computers, two IBMs and a Honeywell. Other organizations are expressing interest in rack-mounted 2,400 bit/sec. modems.

The emerging standard for 2,400 bit/sec. modems eases the transition for current users of 1,200 bit/sec. modems. The standard combines three familiar features. The first is the international V.22bis signaling scheme for asynchronous transmission at 2,400 bit/sec. All 2,400 bit/sec. dial-up modems currently manufactured in the U.S. are compatible with this standard. The cooperation among manufacturers in this regard has smoothed migration considerably.

The second is shared by most, but not all, of the 2,400 bit/sec. modems. The de facto standard at 1,200 bit/sec. is the command-oriented "AT" command set protocol. Compatibility with this established standard is key for

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the 2,400 bit/sec. units as well. The third is fallback to the AT&T 212A standard, defined in V.22*bis*, and optional fallback to the AT&T 103 standard.

Higher speed waiting?

A legitimate concern for prospective buyers is how soon 2,400 bit/sec. communications may be surpassed by even higher transmission rates. Clearly, the 2,400 bit/sec. rate will be the prevailing upper standard for three to four years.

It will be at least that long before affordable faster modems are available for the installed 2,400/1,200 bit/sec. user base. A major reason is the market's relationship to modem technology.

It helps to think in terms of three classes of autodial modems: 300 bit/sec., 2,400 bit/sec. and below, and 4.8K bit/sec. and above.

At 300 bit/sec., users can read faster than the data arrives on the screen. While this may once have been useful, the rate is unacceptable for today's processor users.

A rate of 1,200 bit/sec. is more acceptable to modern computer users, although 2,400 bit/sec. is still preferable, both from connection cost and user satisfaction points of view.

Manufacturing view

From a manufacturing viewpoint, the 2,400 bit/sec. modems have much in common with the 212A-type (1,200 bit/sec.) modems that are standard in this country. In particular, the signaling rates and filter systems are similarly made. Hence, their development and production are not a great added expense, making them easily cost-competitive with the 1,200 bit/sec. products on the market.

However, the move to 4.8K bit/sec. and above is a quantum leap. The 9.6K/4.8K bit/sec. modem standard, V.32, requires a design that is approximately 64 times as complex as the 2,400 bit/sec. units in terms of multiplications per second and bits of arithmetic.

In addition, V.32 in its present form does not fit well in the U.S. communications environment. Eventually, if V.32 takes off in the U.S., the result will be a "multimodem" version that falls back to the existing modem types, including 2,400 bit/sec. modems. In any case, low-cost units at these speeds are still far down the road.

A good investment

At this point, no statistically valid study has been published that examines 2,400 bit/sec. modem performance. A limited user survey indicates, however, that users can expect performance (block error rate, for example) of these modems to be as good as that of 212A-type (1,200 bit/sec.) modems.

Based on their experience with other types of hardware, many users would expect lower speed modems to perform better than higher speed modems in terms of error rates. But in this case the adaptive equalization techniques in the new modems largely offset the difference.

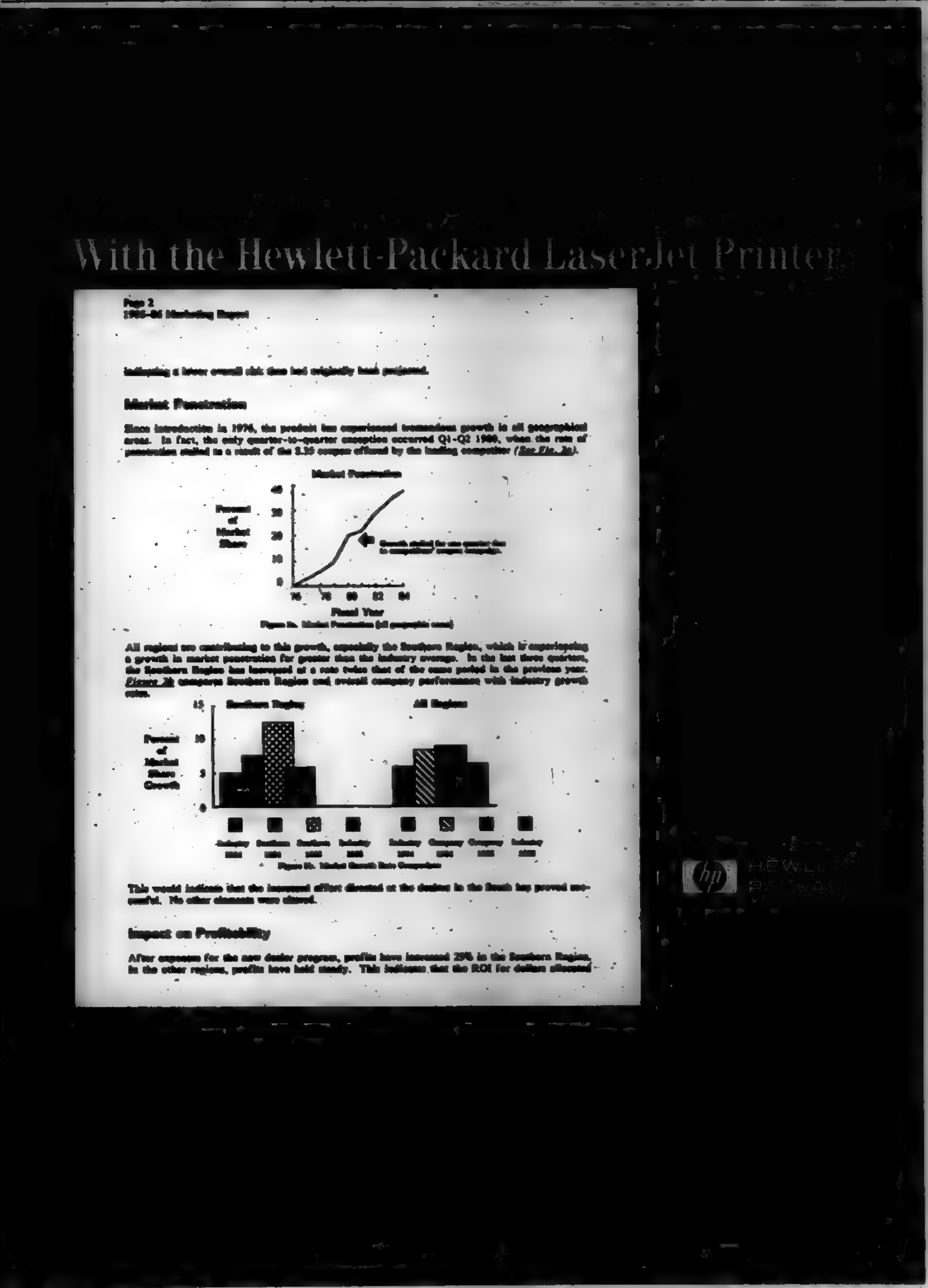
In addition, performance at the fallback rate of 1,200 bit/sec. is demonstrably better than the performance of current 1,200 bit/sec. modems and for a relatively small difference in price. The incremental cost of 2,400 bit/sec. modems may prove to be insignificant when compared with the benefits of higher speed, lower connection charges and improved fallback ability.

For existing user bases, the bottom line is that 2,400 bit/sec. modems deliver twice the speed of 1,200 bit/sec. units without any loss of already-installed capabilities. Those applications that will benefit the most involve lengthy file transfers or the repeated filling of screens. Interactive applications are harder to justify in cost-savings terms, although user satisfaction may be a decisive factor.

For new installations, the savings in connection charges and improved performance afforded by the 2,400 bit/sec. modems, at costs that are fairly competitive with 1,200 bit/sec. products, mean that for many, this is the way to go. For most applications, the accrued benefits from reduced connection charges make the 2,400 bit/sec. modems an excellent investment.

About the author

Dale Walsh is director of research at USRobotics, Inc., Lombard, Ill. He chaired the U.S. Modem Working Party, a committee of U.S. Study Group D, from 1980 to 1985.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IN DEPTH

Report from Japan:

13 Teleministers in Search of Teletopia

By C.P. Lecht

A Computerworld columnist travels to Tokyo and wonders: What joint ventures are imminent, what global communications possible? And why was John Opel really speaking at International Symposium '85?

When I first heard about International Symposium '85 (IS-85), I suspected it was going to be more than a run-of-the-mill industry event. For one thing, IBM Chairman John Opel was to speak. Certain that he wasn't in need of a speaking invitation, I wondered why he accepted this one — in Japan.

And why wasn't Charles Brown, AT&T's chairman, present? The company sponsoring the symposium, Nippon Telephone and Telegraph Corp. (NTT), is Japan's AT&T; the speakers hailed mostly from the communications industry; and the theme — "Telecommunications: Today and Tomorrow" — was more in Brown's line than Opel's.

IS-85 occurred at a time when the U.S. Commerce Department, on behalf of the U.S.' largest electronics companies, was putting the heat on the Japanese for alleged trade mischief in the international computer and communications marketplace. The symposium promised to offer one of those moments when someone calls a time-out, and a group of quarreling, even combative, contestants agrees to sit down and listen to one another's points of view.

IS-85 brought together 13 industrial, political and educational leaders from around the globe to express their views on today's world of computer and communications technologies and how they envision tomorrow's world might be.

The formal agenda was not the only one under discussion; there were many hidden agendas as well. Were the companies looking one another over for possible joint ventures? Who would be the next deregulatee?

Three months after IS-85, one can see some of the moves hinted at taking shape. The signs point to the following conclusions:

■ Hitachi Ltd. will follow the examples being set by Fujitsu Ltd. and NEC Corp. and pick a partner — McDonnell Douglas Corp.'s recently acquired Tymeshare, Inc..

■ The Mitsui group will align with AT&T's operations, selling and using AT&T's NET 1000 programmable network service.

■ The Mitsubishi group will link with IBM, selling and using the Information Network.

But these alignments tell only part of the story. The big question is, who will NTT choose as its U.S. partner, if anyone? I say it will be IBM. Why else would John Opel travel to Tokyo to speak at an NTT conference? IBM and NTT have been conducting joint research for two years on a conversion system between IBM's Systems Network Architecture and NTT's Digital Communications Network Architecture that will be announced in December.

It appears IBM and NTT will form nothing more or less than a joint venture in Japan. Together they will rule that country's computer and communications industry. For a long time to come, they will be the most powerful industrial force on the globe.

The 13 speakers at IS-85 were the ministers for Post and Telecommunications (PTT) of Japan, France and West Germany; the chairman and chief executive officer of three companies — Bell Canada, British Telecommunications plc and NEC Corp.; the chairman of IBM; and the presidents of NTT and Bell Laboratories Also present were the secretary general of the International Telecommunications Union; two educators — the senior adviser to the rector of the United Nations University and a professor of engineering from Tokyo University; and NTT's executive vice-president, the man who had organized the affair.

As the conference began, Japanese- and English-language papers were carrying stories of the seemingly endless international trade negotiations taking place in Tokyo and Washington, D.C. Headlines repeatedly featured the tough talk of one U.S. politician or another, and accompanying articles told of the consequences if some party — presumably the Japanese government — didn't clean up its act.

The Semiconductor Industry Association (SIA), was preparing a lawsuit, which it later filed, to stop Japanese imports from flowing freely into the U.S. The association was

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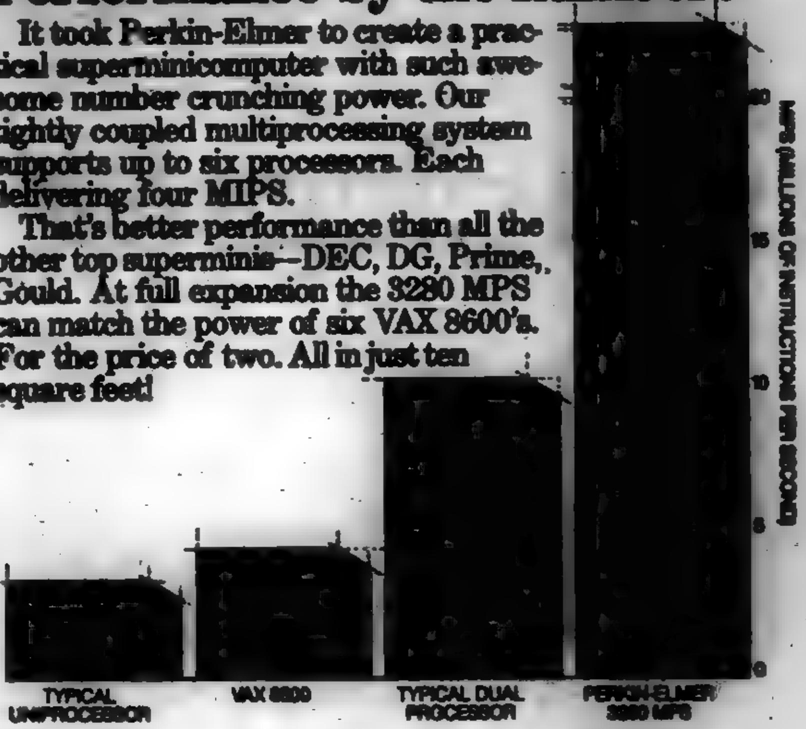

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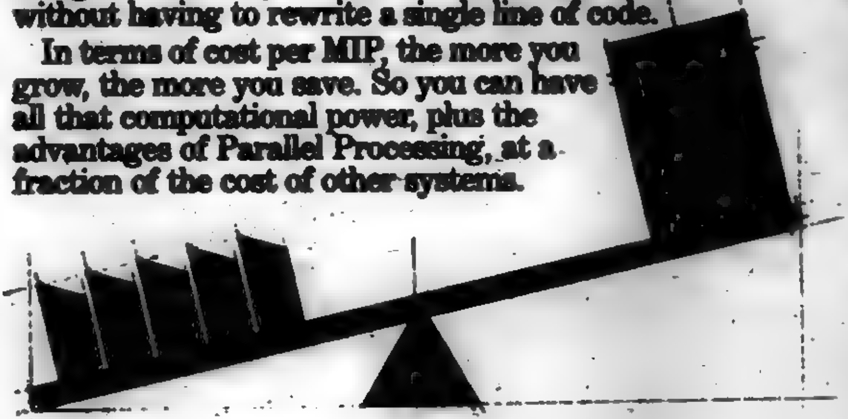

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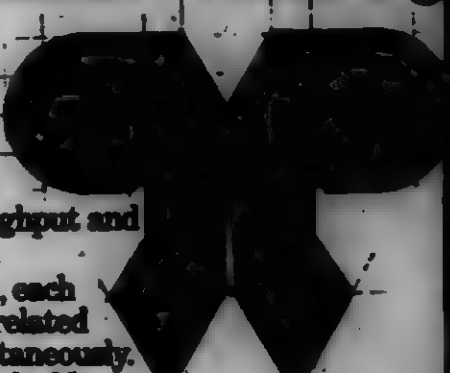

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blaming its members' ills on some sort of conspiracy by Japanese companies, aided by their government. One legislator recommended an old-fashioned boat blockade to prevent America's apparently insatiable appetite for goods manufactured in Japan.

Turning Japanese

Meanwhile, IBM was shifting more of its mid-range systems production to Japan and increasing its development of large systems there as well. Employing more than 20,000 already and doing in excess of $3 billion in business within Japan, IBM apparently couldn't transfer personnel to Japan fast enough — or for that matter, keep up with building new plants in the Japanese countryside.

Texas Instruments, Inc. (not an SIA member) was increasing its semiconductor production in Japan and transferring personnel there from places like Texas and Hong Kong. Motorola, Inc., the company authoring the full-page ads entitled "The Japanese Challenge," was buying up a storm in Japan.

Sato

In all the furor, no one seemed willing to state the obvious — namely, that Americans are not forced to buy Japanese products or to manufacture their own in Japan. In fact, the imbalance in the trade statistics offered is weighted with numbers generated by U.S. companies "exporting" their products manufactured in Japan.

Astonishingly, according to official U.S. and Japanese commerce department statistics, the total U.S. exports to Japan by U.S. companies plus the products manufactured by U.S. companies in Japan and sold there are roughly equal to the sum of Japanese exports to the U.S. by Japanese companies plus the products manufactured by Japanese companies in the U.S. and sold there.

Few seemed disposed to notice that it is illogical to presume that a smaller country should buy as much from a larger one as the latter may buy from the smaller. Or is Japan a special target? The net balance of trade between the U.S. and Canada favors Canada by more than a billion dollars per year, a fact rarely in the news. Japan-bashing is in vogue.

Inside the IS-85 conference hall, Teleminister H.E. Megumu Sato spoke on, "Toward the Realization of the Highly Advanced Information Society — The Telecommunications Policy of Japan." The minister of PTT said that Japan, and presumably all nations, were moving away from an industrialized society to one "which permits access at all levels, individual, corporate and governmental, to the the information flow."

Did he mean that free access to information was not possible in an industrialized society? Whether his statement was a sociopolitical one — meaning that information was restricted out of necessity — seems far less likely than that it was just a simple observation of the times.

Sato pointed out that NTT's role as a communications company would change dramatically now that its deregulation had been accomplished as of April 1. Previously, its main occupation had been eliminating telephone application backlog and handling service. Unlike AT&T before deregulation, NTT was prohibited from actually manufacturing anything. Now it is to become a full-fledged design, development and manufacturing organization while it continues, for the time being, to operate most of Japan's communications facilities.

While Sato specifically referenced "telecommunications" as NTT's business, this term means the computer systems business, too. Today the two are inseparable.

Teletopia

He spoke of Japan's new telecommunications plans for creation of a "teletopia," — "a highly information-oriented society linked nationally, and in the future internationally, through the introduction of communication infrastructures such as the two-way CATV and Captain systems." Thus, he emphasized his country's conversion to a society in which the barriers preventing access to information would be dismantled, replaced by high-speed telecommunications pathways.

The speakers preceding John Opel spoke of their hopes for the future. The IBM chairman addressed current times, injecting realism into the symposium. His point was that aspirations may not be realized if current problems in international cooperation were not overcome. Coming from America's highest high-tech envoy, this message served as a reminder that what was happening in the home countries of all in attendance was not that supportive of the intentions and goals of those within the conference hall.

Opel's remarks were not devoid of hope. He observed that the merging of the information processing and

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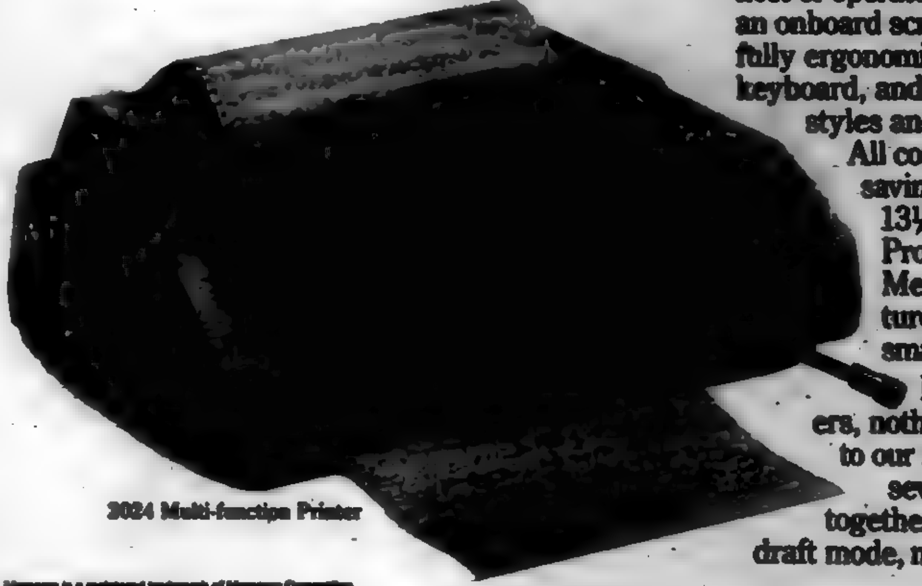
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communications industries "is creating a new era of technological progress to help with the world's work" and that it holds enormous promise. The realization of this promise will be directly influenced by "how national governments approach the public policy question of regulation vs. free market competition," he said. "International competition offers the best hope for the end user as the information era unfolds."

> *Foreign companies wishing to enter the U.S. and avail themselves of AT&T's facilities while they are here may find it more than convenient to play ball with AT&T at home first.*

The teleministers from France and West Germany voiced identical out-of-touch-with-the-times viewpoints. Not unexpectedly, French Teleminister Louis Mexandeau spoke of achievements: "In France, digitalization and integration of networks have already enabled the offering of many services which herald the information society of the 21st century." Then he catalogued all the things left to be done.

Christian Schwarz-Shilling talked of starting to do in Germany what his French compatriot claimed had already been done in France. Then he also spoke of problems yet to be overcome.

Together, the two presented viewpoints of a vanishing breed of politicians who felt that today's world hadn't really changed — that it was just a matter of changing polemics or, should I say, speechwriters. Rather than offer views on how their countries intended to cope with change, they spoke of the new era as if it were nothing more than the result of historic necessity.

Universal information

The conference offered refreshment in the remarks of Teleminister Ian M. Ross, president of AT&T Bell Laboratories. His speech, "U.S. Telecommunications and the Evolution of Universal Information Services," portrayed vividly what was happening in the AT&T world of telecommunications.

After achieving its goal of offering universal telephone services to U.S. customers, AT&T is now targeting its resources toward the realization of universal information services. This system would allow customers everywhere to access any kind of voice, data or image service in any place, at any time, with maximum convenience and economy. This is a new ball game for AT&T; until it was deregulated in January 1983, it did little of its $75 billion-a-year business abroad.

Since many countries are now deregulating their communications industries and allowing foreign competition, AT&T, the first deregulatee, will doubtless throw its hat into the international ring everywhere it can. And AT&T will do much better than most people surmise, even at roughly half its former size.

Foreign companies wishing to enter the U.S. and avail themselves of AT&T's facilities while here may find it a bit more than convenient to play ball with AT&T at home first. In fact, since AT&T is IBM's largest customer, it could not have escaped the attention of foreign high-tech companies that playing ball in AT&T's field on its side might bring even greater rewards than those obtainable by achieving mere customer status. As the symposium was taking place inside the conference hall, Fujitsu was wooing AT&T outside of it. AT&T is Amdahl Corp.'s biggest customer; Fujitsu owns 47% of Amdahl.

Teleminister Ross also spoke about the new technologies AT&T was working on in microelectronics, software and photonics. He presented his views of industry trends, emphasizing systems networking and integration, the deployment of stored program-controlled systems, computerized programmable digital networks, projected increases in packet and wide-band packet-switching systems, light-wave transmission allowing for increases in information-carrying capabilities, a growing use of software-based services provisioning (and we can only assume software provisioning, too) in the networks and greater customer control over services facilities.

Universal information services would be achieved, Ross said, in three stages: the development of overlay networks; the achievement of a true Integrated Services Digital Network (ISDN) that featured integrated access to the overlay networks (voice, data and image); and the provision of integrated access and transport systems with dynamic bandwidth allocation to permit large-scale network sharing by many different services.

If anyone on this globe deserves the title of teleminister, Koji Kobayashi — chairman and chief executive officer of NEC Corp. — does. His international outlook is unparalleled. Intensely loyal to his homeland, yet understanding and sympathetic to others, he is at once a scientist, philosopher and businessman. He is a true samurai — knight of all that counts.

Kobayashi began his talk, "Toward an Information Infrastructure Connecting the World," by stripping

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Kobayashi, left, with the author

himself of titles, saying simply, "My name is Kobayashi." He moved swiftly to talk about NTT's step into the competitive communications world.

He congratulated NTT and offered his best wishes for their future. He may have been thinking, "They'll need such wishes now that NEC is able to compete with them head-on."

NEC is a formidable rival in the newly deregulated Japanese marketplace. Like Fujitsu, NEC is expected to align itself with a U.S. company to exploit the opportunity. In this case, it will be General Electric Co., with its long-established ISDN embryo, General Electric Information Services Co. (Geisco).

Modern communications

Kobayashi went on to say he was reluctant to apply the word "modern" to communications and that he'd done so the first time at an MIT alumni meeting in 1983. He defined modern communications as the combination of computers and communications — "C&C" is NEC's equivalent of NTT's Information Services Network and AT&T's ISDN. All mean networks imbued with intelligence. There is no doubt that his company is racing to gain part of the ISN/ISDN marketplace in Japan and wherever else it can under the C&C slogan.

Kobayashi separated the communications world into three parts — information delivery, generation and storage — then noted that modern communications meant the integration of all three in a configuration capable of handling a world of multimedia. His was another way of describing the world spoken about by his predecessor, AT&T's Ross.

Noting that his idea of a truly modern communications environment was indeed a difficult one to describe because of its multilayered, multifaceted nature, Kobayashi said that he would attempt to do so using a matrix that blocked its functional aspects against its applications environments.

Environmental aspects

The functional aspects were subdivided into three categories: terminals; networks; and information service centers. The first, the one Kobayashi said was most visible to users, would require delicate human engineering in both hardware and software.

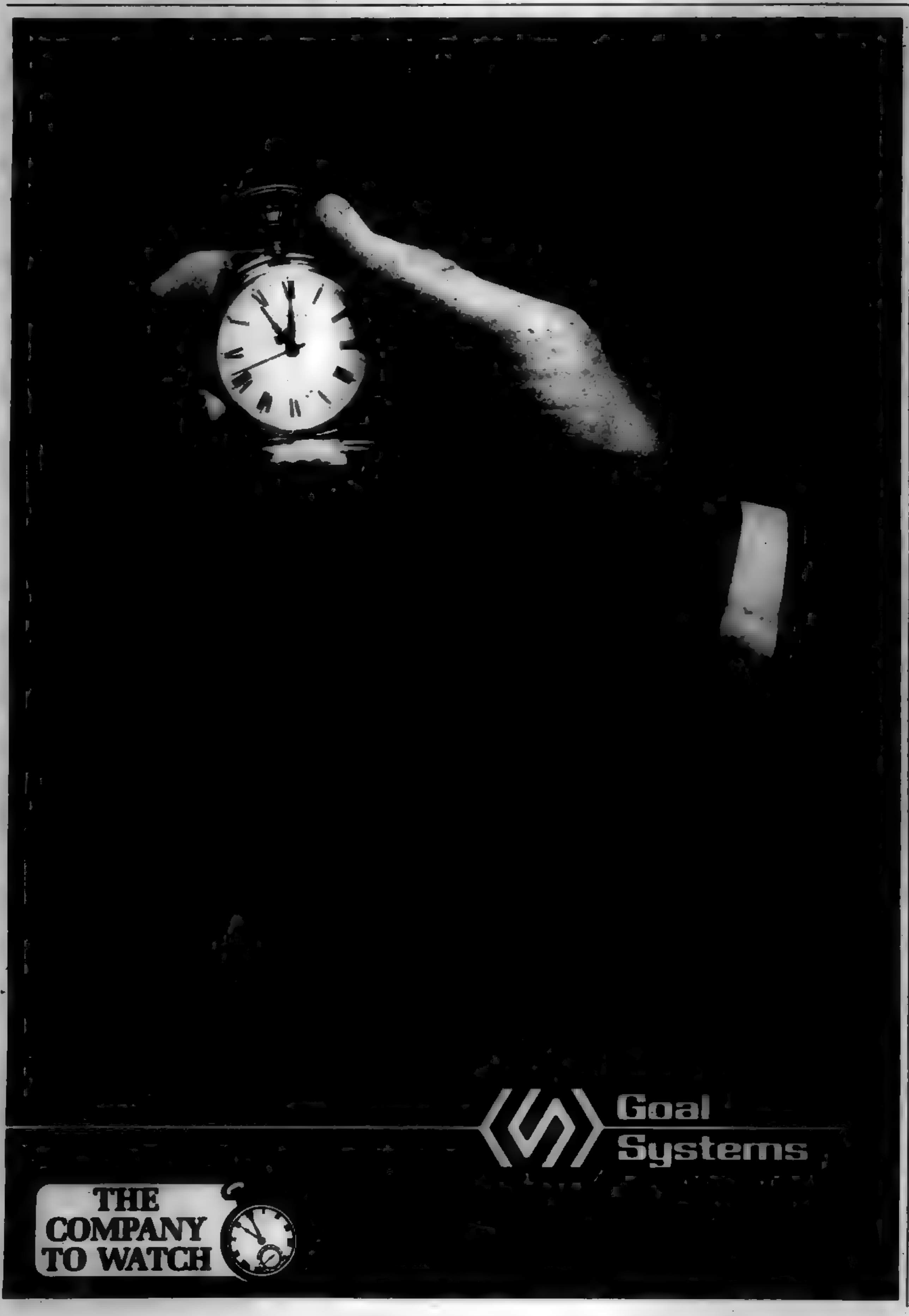
The second (the value-added networks, wide-area networks and so on) would be viewed as little more than a black box.

The third, like the first, would have deep user interest. The potpourri of services to be found in the information service centers will span the spectrum of human C&C invention from alarm (less than 10 bit/sec.) to video (billions of bit/sec.) and everything in between — including on-the-fly processing of data into information, teletext, videotex and so on.

A basic human right

Kobayashi divided the applications environment into three sectors; public access networks; business networks (NET 100) and home networks (Source Telecomputing Corp.'s Source, for example). He noted that the first could not be overlooked because it constituted the infrastructure that could spell the difference between an underprivileged society and one that was privileged.

He avowed his belief in the inalienable right of people to have open access to information — "a basic human right," he called it — and declared that only the public networks could serve



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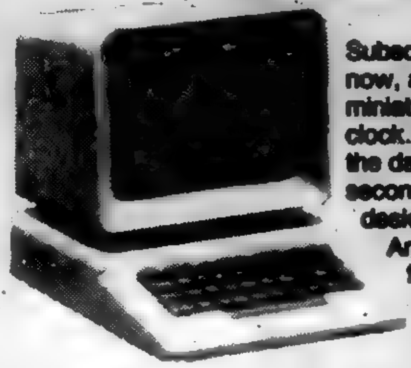

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the interests of that right. He said the provision of public networks could not be driven by economics alone and that governments had to be responsible for maintaining the high quality of public networks because they constituted infrastructures on which societies must depend for development.

Kobayashi concluded his technical discussion by speaking about the home, the place where individual preferences must be served. ISN/ISDN/C&C (call it what you will) must provide CATV wide-band optical-fiber cables to deliver high resolution to the home for better entertainment; "home work and home security" systems would also be needed.

Kobayashi ended on a note of optimism. He said it was natural for people to want to see and talk to each other and to expect a free exchange of information. There should be no hindrances to this, he said. "The international imbalance of information must be rectified. Language barriers must be broken down by development of telephones that translate conversations on the fly."

If Kobayashi's words were the kind of thoughtful fare we love to hear, those of the Canadian Teleminister Albert Jean de Grandpre were words we cannot bear to hear but must.

Veiled fears

The Canadian teleminister spoke eloquently of his country's plans and those of his soon-to-be deregulated communications company. He outlined the geopolitical and socioeconomic factors that led Canada, a country of vast land areas but small population, to develop one of the world's most technologically sophisticated telecommunications networks.

De Grandpre's words seemed a thin veil over his fears for the future. Countries such as Canada cannot hope to create and maintain a modern communications network without intense international cooperation.

As a country politically divided, burdened with inflation and unemployment and located next to a rich and united neighbor, the future of its communications industries (and thus, computer industries) cannot be judged bright.

The wolf at the border?

The problems Canadians face typify those which most nations will encounter as the new ISDN era emerges. How can a country protect its domestic communications industry from decay if it is located next to a country whose systems are far superior in price/performance? What rationale can a government come up with to prohibit its industry from taking advantage of the cost saving achieved by abandoning its home systems for those of its neighbor? How can a country preserve its own communications systems if its communications revenue must decline as the ISDN technology of its neighbor improves?

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As ISDN technology in the U.S. matures to offer every conceivable communications and computing service in increasingly cost-efficient ways, Canadian companies may find the temptation to dash southward to proves irresistible. The automation of U.S.-supported Canadian industry is forcing some Canadian distributors to remain on-line because the supplier's information center contains the data that may prove crucial to a Canadian company's ability to win a bid.

With perhaps as much as 80% of Canadian industry owned by U.S. companies and financial institutions, the Canadian government has little choice but to allow some companies to remain on-line 24 hours a day, in direct violation of laws prohibiting such connections without special and costly arrangements made through the government-controlled communications company. Canadian companies have been meeting away from the public eye to lay plans to hook up their data processing centers to those of their U.S. suppliers.

For example, Albertan companies bidding against each other for delivery of heavy equipment to a construction site in northern Canada are known to be plugged into the data bases of American firms such as Caterpillar Tractor Co., Ford Motor Co. and Sperry Corp. If data can traverse the lines from south to north, so payments may be electronically transferred from north to south. Once they are in the U.S. networks, Canadian companies cannot help but notice the enhanced services available to them.

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Your Connection to Industry Networks

There are also cases where an industry benefits from the efficient exchange of information.

In the property and casualty insur-

The U.S. can do little but sympathize with the Canadian government's problems in trying to create a telecommunications policy that prevents the siphoning of much needed revenues. If Canada does allow its industry essentially open communications access to U.S. corporations, it is faced with another problem: How can it control what uses Canadian companies may make of the below-the-border networks?

Canada doesn't have enough Royal Canadian Mounted Police to police the visible border to the U.S.; how can it be expected to police the invisible telecommunications boundary? And should the U.S. be blamed for creating so enticing a communications/computer environment for its own citizens that Canadians are lured away from using their own?

It follows that a country in Canada's position must face a decline in the revenues that derive from its own communications industries. It is not hard to see how this decline could lead to a diminishing capability to create a home-controlled communications system. Without such control, this situation could ultimately lead to the capture of one nation's economy by another — electronically.

One might suspect that many who attended IS-85 were motivated in part by this fear of the future of communications services. They found there that they are not alone.

Tariffs — the bottom line

When Yasusada Kitahara, NTT senior executive vice-president, offered the keynote address, "INS — Study on Network and Tariff Structure," nothing could have been more appropriate. Someone had to talk of tariffs, "the bottom line."

He said that an INS pilot plant had initiated service on Sept. 28, 1984 in the suburbs of Tokyo. Another pilot facility began providing service at the Tsukuba Expo '85 science fair. While both were experimental (non-revenue-producing), Kitahara forecast that INS commercial revenue-producing services would be initiated in Tokyo, Osaka, Nagoya and Tsukuba this year.

Kitahara presented his company's plans to replace current analog communications facilities, both voice and data, with digital devices. He said this change, along with integrating existing networks, would reduce costs. Thus, an integration of all of Japan's existing telegraph, telephone, telex, data communications and facsimile systems would occur. Until April 1, NTT was authorized to offer these services as a monopoly.

The cost reductions would also result from the introduction of a bit-based tariff system, fiber-optic communications and a large-capacity satellite communications system. While no one doubts that these three things could indeed yield these identified areas of cost reduction, just how much a reduction might be realized was still under study as was, presumably, the form this might take.

In view of the fact that Japan is now allowing competition in communications, I wonder if we might not see a repetition of today's U.S. scene wherein cost reductions in high-volume data transfer from coast to coast were accompanied by cost increases in local voice and low-volume data transfer.

The symposium brought together 13 teleministers in search of a path to the teletopia described by Sato. Only the American and Japanese participants seemed aware of the past, present and future of telecommunications industry. The future of the rest seemed hopelessly contaminated by political unrest, if not just plain hopelessness. IS-85 confirmed my belief that if the world of open access to communications was to survive, its only chance was through American/Japanese leadership.

Kitahara

As I listened to some speakers present the possibility of an Orwellian future instead of a Utopian — teletopian — one, I could not help but wonder if anyone would conclude anything but that the new era of improved communications would offer a positive quantum leap in the quality of life.

Professor Shumpei Kumon spoke of the "games" we may well expect to be played in our coming teletopia — but were these games any different than those currently being played? The players he posited would be "sovereign states," "corporations" and "research teams." According to the professor, either the research teams would win out, or they would so influence the others that all would survive.

Microcosm to macrocosm

The second concurrent session provided a brilliant display of creative thought on how the INS network services would be instrumented. It was also a showplace of NTT know-how. Topics ranged from those in the ISN microcosm — large-scale integration chip technologies to be

ance industry, for example, the IBM Information Network improves communications between major underwriters and independent agents.

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found in the network infrastructures — to the ISN macrocosm and the design of its structural forms. On the conference hall screens, the embryo of a single globe-girdling computer system was shown.

Imagine a chip. Now imagine a cluster of chips, some alike, others not, but each linked to one or more chips in the cluster by wire and wireless communications. Further imagine that each of the chips in the cluster is dedicated to fulfilling a specialized purpose, such as providing memory, doing scalar computations, performing device control and so on.

Now imagine a network of such clusters, some as large as you wish them to be, others as small. Imagine a lattice of these networks, some of which vanish into the microscopic world — we cannot see them because they are too small. Others vanish into the macroscopic world — we cannot see them because we are too small.

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> *The underlying principle of an INS/ISDN is nothing more or less than that of a common computer system possessed of uncommon power spread over the country. It is a system that, because of its open-ended architecture, is capable of at least connecting, if not integrating, all the processes we may care to automate with incredible economy of scale.*

Now superimpose the requirement that the entire lattice operate according to a set of rules that synchronizes its operation to achieve some set of goals. Finally, provide users of the lattice with the means to program it to achieve these goals.

If what I've described seems suspiciously like a computer system as we conceptualize it today, you are right. But instead of occupying the space available on a desktop or the floor of a room or even that available in a good-size building, its components are more likely to be spread in value-added network form across a city or a state, even a country.

Thus, the underlying principle of an INS/ISDN is nothing more or less than that of a common computer system possessed of uncommon power spread over the country. It is a system that, because of its open-ended architecture, is capable of at least connecting, if not integrating all the homogeneous and heterogeneous processes that we may care to automate with incredible economy of scale. The more encompassing the INS/ISDN functionality, the broader its deployment and the more that may be done with it.

That all the symposium speakers envisioned the first applications in their networks as addressing problems that have been unsolvable so far is only natural. Its application in the handling of natural and man-inspired disasters is urgent. But so are the wider application areas, such as helping the hearing impaired, the sightless and others who are severely disabled.

A global lattice

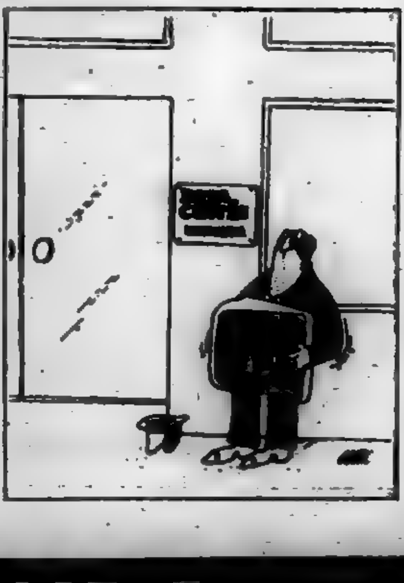
INS/ISDN uses will be extended to touch virtually every corner of our lives. Individual citizens can have their own home-based information center, process control and environmental monitoring systems. Artificial intelligence or expert systems facilities could be made available to everyone.

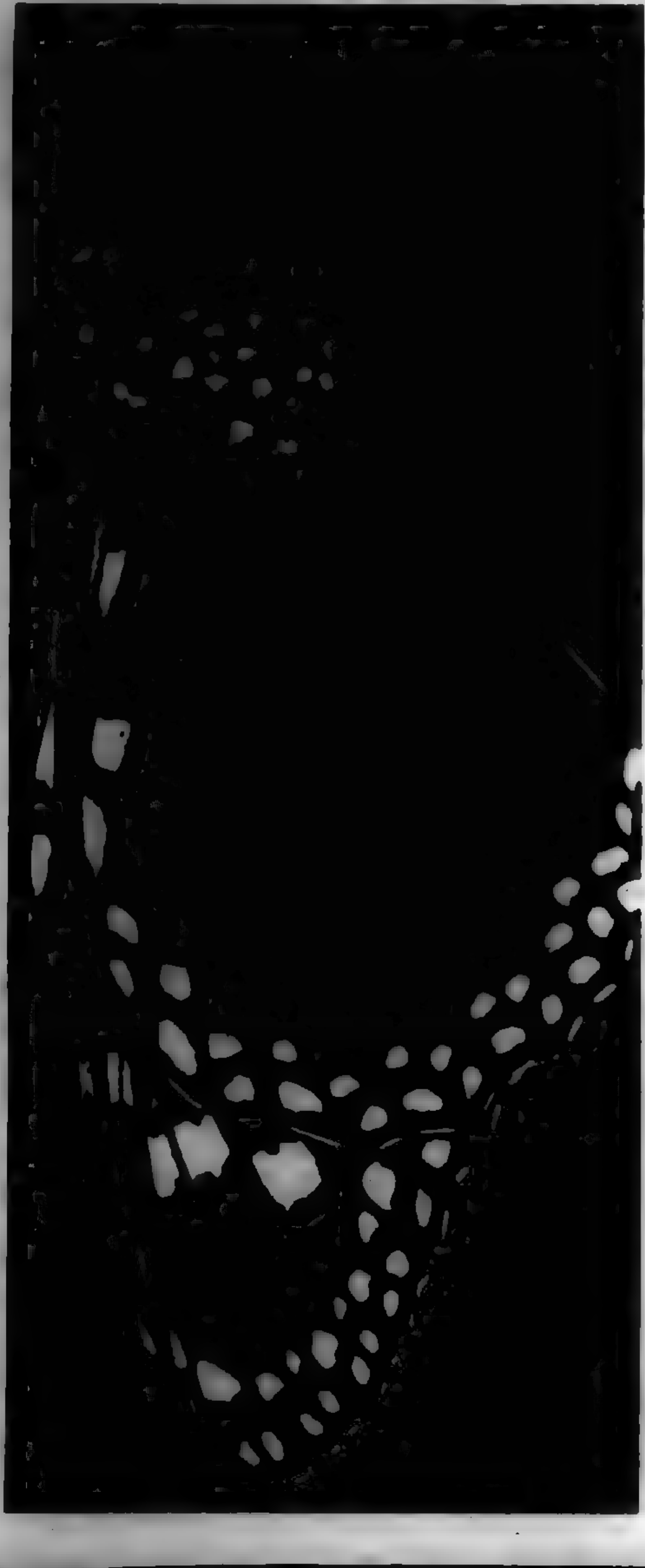
When capable of carrying a holographic image load, artificial experience systems will emerge, systems through which we may learn by experience, the simulation of which is so real we may never forget its message. The mind boggles at the possibilities ISN/ISDN systems may one day offer in their ultimate forms — globe-girdling lattices.

That AT&T did not initiate IS-85 may indicate what is lacking at home and contributing to the U.S.' international trade deficit problem. Of course, it may have been more difficult in these times to get Teleminister Opel to speak in Bedminster, N.J., than in Tokyo. And without Opel, would men like Kobayashi have come?

About the author

Charles P. Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies. He is a regular Computerworld *columnist.*





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MICROCOMPUTERS

Graphics software debuts

Adds free-form visuals to Graphwriter, 1-2-3

Software for the IBM Personal Computer that reportedly expands the capabilities of other business graphics programs and permits nonartists to add free-form visuals into charts and graphs has been introduced by Graphic Communications, Inc., of Waltham, Mass.

The package, Freelance, reportedly includes more than 200 predrawn symbols that can be used to construct diagrams, flow charts, maps and other customized graphics. The program can also create and store symbols such as company logos.

Freelance runs on the IBM Personal Computer line and reportedly can be used to enhance graphics created with either Graphic Communication's Graphwriter package or Lotus Development Corp.'s Symphony or 1-2-3 packages. It may also be used as a stand-alone graphics product.

Using Freelance, word charts reportedly can be created directly on the screen or imported from word processing programs as Ascii files. Words can reportedly be combined with charts, illustrations and symbols as well.

Also included are custom grids, rules and drawing tools. With those tools, shapes can be moved, replicated, rotated, sized and edited for color, location and individual line points, Graphic Communications said.

Freelance, priced at $395, reportedly supports a variety of printers, including the Epson America, Inc. FX-80, MX-80 or RX-80 and the Hewlett-Packard Co. Laserjet. Among the plotters supported are the HP 7470, 7475 and 7550A. Several 35mm slide recorders are also supported, including the Polaroid Corp. Palette.

Freelance requires a Personal Computer with at least 256K bytes of memory and either an IBM Color Card, IBM Enhanced Graphics Adapter or Hercules Computer Technology Co. Graphics Card.

Net version of business series out

Offers supports for five IBM PC Network users

IBM's Information Systems Group in Rye Brook, N.Y., has introduced a local-area network version of its Business Management software series for the IBM Personal Computer.

The Business Management series Local-Area Network Access Edition reportedly supports up to five users sharing programs and files on the IBM PC Network. It also monitors concurrent tasks and notifies users of conflicting requests.

The network version of the software reportedly supports applications for general ledger, accounts payable, accounts receivable, payroll, order entry and invoicing and inventory accounting.

A single Business Management series application license is required for the network's server micro, and a license is required for each of up to four remote micros.

The server must be a Personal Computer XT or AT with 640K bytes of memory, a double-sided, double-density diskette drive, an 80-col. monitor, an IBM PC Network adapter card and a compatible printer supporting 132 characters per line.

Each additional Personal Computer, Personal Computer XT or AT requires 512K bytes of random-access memory, one double-sided drive, a network adapter card and a monitor. The network version of the software also requires an IBM PC Network Translator Unit. Both the server and remote micros must run PC-DOS 3.1 or higher and the IBM PC Network Program software.

A license for each remote micro costs $245. Each of the six Business Management series programs costs $695.

■ Microsoft introduced document design software for the Apple Computer Macintosh/60

■ Texas Instruments enhanced its Personal Consultant software/61

■ Benchmate software for facility maintenance was unveiled by Rantac/61

■ A new version of Uniform Software's The Connector debuted/64

INSIDE

Software/64

Board ties AT&T, IBM micros

By Edward Warner

MORRISTOWN, N.J. — In a move that could at last bring a plethora of IBM Personal Computer software to the software-starved AT&T Unix PC, AT&T's Computer Systems Division announced that it will exclusively market a board that gives the Unix PC IBM compatibility.

The board, developed by Alloy Computer Products, Inc., includes an Intel Corp. 8086 microcoprocessor, the same as that used in the AT&T 6300 personal computer. The 6300 is not fully IBM compatible, however, in part because of differences between the 8086 and Intel's 8088 microprocessor, which powers the IBM machine.

The DOS-73 board's 8086 would override the Unix PC's Motorola, Inc. 68010 processor to permit the machine to run such IBM-compatible software as Lotus Development Corp.' 1-2-3 and Symphony, Computer Associates International, Inc.'s Micro Products Division's Supercalc3 and Multimate International Corp.'s Multimate word processor. AT&T said the board will be available in the fourth quarter of this year but did not announce a price.

Dealers said the Unix PC has been experiencing sluggish sales, largely because of the lack of Unix software available for it. An AT&T spokesman, however, said that he was unaware of sales problems with the machine and denied that the machine was in need of additional software. He also denied that the DOS-73 board marks AT&T's capitulation to the world of IBM compatibility. Alloy, of Framingham, Mass., develops and markets tape backup units, storage subsystems and expansion devices for personal computing.

Micro users groups provide freewheeling information

By John Vacca
Special to CW

Users groups, a feature of the DP landscape since the early mainframe days, have changed somewhat in recent years. Where once they were supported primarily by large corporations — such as IBM's Guide and Share and Burrough Corp.'s Cube — now they also exist for those working with personal computers. Where the large groups were once noted for the parade of vendor representatives and attendees passing through them — all with limited social contact — the microcomputer-focused groups are providing a freewheeling exchange of information and advice between members and sometimes the vendor.

Like a wagon train in the days of the old west, the microcomputer users groups permit members to pool their resources while gaining protection from the hazards of their journey. The groups can help members identify the programs they seek and alert them to potential problems and clinker products.

There are many different types of users groups, but all are either formal or informal. The formal groups, such as Guide, commonly support large mainframe organizations. Informal groups, meanwhile, largely focus on personal computing and consist of local and special interest groups, both of which have enjoyed enormous success.

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> *The group's purpose should be adhered to, explicit and written down. Purposes and goals have a tendency to change unless they are well documented.*

Though microcomputer users groups are popping up and thriving everywhere, all must meet certain requirements to succeed in each new and uncharted territory. Among these requirements are a stated purpose, group understanding of that purpose, a leadership structure, an orientation and a sensitivity to the attention span of members.

There are, no doubt, other guidelines that the group should follow, including the issuance of publications, the receipt of nonprofit status, the acceptance of donations, the gaining of a meeting place and establishment of relationships with vendors. However, for a users group to be successful, it should first follow the five guidelines cited above.

The first guideline, maintaining the group's purpose, is essential. The group's purpose should be adhered to, explicit and written down. Purposes and goals have a tendency to change unless they are well documented.

The second guideline, that all members understand and agree with the group's purpose, means that the purpose should arise out of group concensus. It also means that written goals and guidelines should be distributed to newcomers.

Meanwhile, a leadership structure that reflects a group's purposes and size should be created. Most users know that leaders require and appreci-

Continued on page 66

Vacca is a writer and consultant on information management and computer security. He also serves as Planning and Design Coordinator for the Federal Home Loan Bank in Topeka, Kan.

Firm offers graphics aid

Business & Professional Software, Inc. has introduced its 35mm Express software for the IBM Personal Computer line and AT&T 6300 personal computer.

When used in conjunction with either a Polaroid Corp. Polaroid Palette slide film recorder or the Magi Advertising Group's Magicenter network of service bureaus, the software permits users to produce slides of business graphics, according to the vendor.

Charts created using the software may be drawn in two or three dimensions, according to the Cambridge, Mass., vendor.

Multiple images may be displayed on one slide. Line, pie, adjacent or stacked bar, area and tabular charts may be created.

User-specified elements

Users are also said to be able to specify a chart's color, font size, spacing and highlights such as drop shadows.

The software reportedly features an icon-based menu and supports the IBM Graphics Printer as well as the Epson America, Inc. MX-80, FX-80, MX-100 and FX-100 printers.

The software is priced at $695, according to the vendor. An interface to the Magicenter network, which will enable users to communicate charts via modem, will be available shortly, a vendor spokesman said.

Tool ports Apple programs

Abaton Technology Corp. of Santa Monica, Calif., has introduced a hardware and software product said to translate programs written for the Apple Computer, Inc. Apple II line into software that will run on the Apple Macintosh.

The $1,995 Abaton Transform software will be sold only to programmers, who reportedly will be able to use the product to port programs in between 15 minutes and six hours.

The product consists of a sealed add-on card for the Apple II and software on both 5¼-in. and 3½-in. diskettes for the Apple II and the Macintosh respectively. To port an application to the Macintosh from the Apple II, a cable from the add-on card is connected to the Macintosh, and the software is run on both.

A 512K-byte Macintosh is required for porting. Most resulting applications will run on the 128K-byte version of the Macintosh, Abaton said.

The porting is done at the object-code level. Once ported, the application cannot be copy protected.

To transfer an Apple II application without use of the Abaton Transform could take up to eight man-months and cost $20,000 or more, Abaton said. Further enhancements to the product, to permit programmers to add enhancements to the application they are porting, will come in several months, the company said.

Microsoft offers document design tools for Macintosh

Microsoft Corp., based in Bellevue, Wash., has introduced document design software, called Typographer, and announced an upgrade of its Macenhancer product, both for use on the Apple Computer, Inc. Macintosh.

The Typographer permits users to produce documents of any length, limited only by disk space. The software also permits free-form placement of text and graphics and the use of indented, staggered or overlapping regions of type.

Typographer users reportedly can preview each page or page spread on the screen, with accurate scaling. Instead of using word wrap, the software maintains a true line count and adjusts word spacing across the entire line. The software's hyphenation meets accepted composition standards, Microsoft said.

Typographer is said to contain several editing functions, including global search and replace, block move and insert and delete. It also can read files directly from such Macintosh programs as Microsoft Word, and Apple's Macwrite and Macpaint. Users can paste text and graphics from Microsoft Excel, Microsoft Chart and Microsoft File, among other programs, the vendor said.

Version 2 of the Macenhancer software reportedly supports additional printers, such as the Hewlett-Packard Co. Laserjet, and offers a scaling function that can set graphics and text output to the correct size for use on various printers.

The scaling function supports the Apple Imagewriter, Epson America, Inc. FX-80, FX-100, LQ-1500 and MS-100, among others.

Macenhancer, which supports multiple peripherals on the Macintosh, reportedly already includes three additional IBM-compatible ports, one parallel and two serial.

Typographer runs on both the 512K-byte Macintosh and the 128K-byte version of the machine and is priced at $195. It will be available in October.

Macenhancer works with either the 512K-byte Macintosh or the 128K-byte version of the machine. It costs $249. Current users may receive Version 2 of the Macenhancer software at no charge.

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Lotus Concerto bows

Offers Basic programming

Lotus Development Corp. of Cambridge, Mass., has introduced Concerto, software for the IBM Personal Computer that reportedly permits developers to program in Basic language as they design add-ins for Lotus' Symphony.

Symphony add-ins, programs that can be attached to Symphony to operate as part of the larger product, could previously be developed only in assembly language, Lotus said. The add-ins can be used to enhance one of Symphony's five functions or to provide a link to other software programs or computers.

The $99 Concerto, developed by Leblond Software, Inc. of Indianapolis, reportedly includes several ready-to-run applications for use with Symphony, including one called goal seeking. Goal seeking permits a spreadsheet to be solved in reverse, allowing a user to work from a target profit back to the sales required to reach that target, for example. Also included are Basic routines to permit linear regression analysis and to covert Micropro International Corp.'s Wordstar files into a Symphony format.

Using the product's configuration program, users can adjust the amount of Concerto that resides in the Personal Computer's memory.

Both Lotus and Leblond will market Concerto.

Maintenance management tool out

Rantac of Bellevue, Wash., has introduced its Benchmate software for automated maintenance management at factories, hospitals, universities and other facilities.

Benchmate, for the IBM Personal Computer, reportedly can handle work orders, preventive maintenance, equipment data and history, job scheduling and a spare parts inventory.

Its scheduling module permits managers to send workers to jobs where they are needed and to create "what-if" scenarios.

Its reporting capabilities are said to include work and cost histories, jobs scheduled, projected preventive maintenance, past due preventive maintenance, completed jobs and other functions. The package is intended for use in maintenance shops with up to 75 workers.

It costs $5,000, which reportedly includes 16 hours of on-site instruction and one year of support.

TI offers Personal Consultant version

Texas Instruments, Inc., based in Dallas, has announced a second-generation version of its Personal Consultant knowledge system development software said to offer extended knowledge representation features, increased rule capacity and an enhanced user interface.

Personal Computer Plus, which runs on both TI and IBM personal computers with 512K bytes of internal memory, is priced at $2,950 and will be available in the fourth quarter.

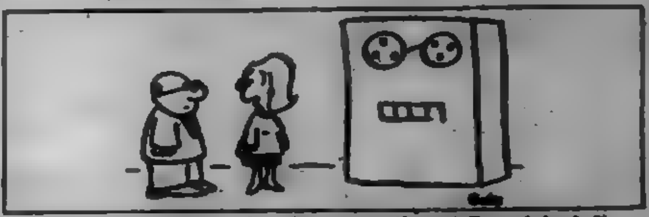
The package enhances the Personal Consultant product by incorporating extended knowledge representation capabilities such as frames, procedural functions, access methods and meta rules, TI said.

Additionally, a Lisp compiler speeds operation and allows the package to handle more information, the vendor said. Personal Consultant Plus can develop and deliver applications of up to 2,000 knowledge base elements.

During creation of knowledge systems, an interactive dialog reportedly prompts the developer only for essential information, with many default values selected by the system. The rule specification language has been expanded to provide direct access to more system features, and a full-screen editor handles modifications to any information field, according to the vendor.

The user interface also has been upgraded, with pop-up windows showing menu items and Help information.

TI also dropped the price of the original Personal Consultant to $950 from $3,000. The $950 cost can be applied toward the purchase of Personal Consultant Plus if the user decides to upgrade.



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IBM micro gets net tool

Management program allows users to switch

Computer Associates International, Inc.'s Micro Products Division of San Jose, Calif., has released a network management software program for IBM Personal Computers running Novell, Inc. Netware or 3Com Corp. Etherseries software.

Easyplus Network Manager reportedly supports up to 10 windows, each simultaneously running a network user's application. The windows allow users to switch between programs, transfer data, size and position the windows and send text to a file, screen or printer.

The product is said to provide full local-area network support for the vendor's Plus series of accounting, word processing and other programs.

For data security, Easyplus Network Manager uses local-area network semaphores for record and file lockout, preventing users from writing to the same file at the same time.

The system requires a network server with a minimum of 512K bytes of memory, a hard disk drive and remote user stations with a minimum of 256K bytes of memory.

Easyplus Network Manager is priced at $395 for a four-unit version and $595 for an eight-unit configuration.

Connector lets IBM AT run Lotus 1-2-3 under Xenix

Uniform Software Systems, Inc. of Santa Monica, Calif., has announced a version of its The Connector software that reportedly permits Lotus Development Corp.'s 1-2-3 software to run on the IBM Personal Computer AT under Microsoft Corp.'s Xenix.

The Connector for Xenix and Lotus' 1-2-3 reportedly allows 1-2-3 to run in the protected virtual address mode of the Personal Computer AT under Xenix, offering the spreadsheet access to more than 800K bytes of memory. Under Xenix, the Lotus product can run in the foreground while other programs run in the background simultaneously.

When running under The Connector, 1-2-3 operates as it would when running under IBM's PC-DOS operating system, Uniform said. Since 1-2-3 requires use of the Personal Computer AT's console, only one user can run 1-2-3 at a time.

The Connector for Xenix and Lotus 1-2-3 is priced at $149 and is available immediately. It is one of a series of The Connector products from Uniform, others of which include The Connector for Venturcom, Inc.'s Venix and The Connector for IBM's PC/IX.

SOFTWARE

■ **Hewlett-Packard Co. has introduced Executive Card Manager (ECM) software for its Touchscreen personal computers.**

The ECM integrates a data base and telephone number filer in a system reportedly able to file the equivalent of four type-written pages of information on any record. Up to 64,000 records can be stored, HP said.

Also announced were ECM: Templates, which are said to provide ECM users with form and report layouts that can be customized.

ECM will permit the the transfer of information between ECM and other applications such as Ashton-Tate's Dbase II and Dbase III, Lotus Development Corp.'s 1-2-3 and HP's HP Access, the latter for communication with HP 3000 systems, according to the vendor.

ECM requires 256K bytes of memory and costs $295. ECM: Templates is $125.

HP, 300 Hanover St., Palo Alto, Calif. 94304.

■ **United Software Industries, Inc. has announced word processing software for the IBM Personal Computer, Personal Computer XT and PCjr.**

Einstein Writer reportedly includes automatic formatting, single-keystroke commands for the Personal Computer's 10 function keys, a split-screen mode and a 65,000-word spelling checker. Single-keystroke functions include move, copy, delete, find, replace, save, print, repeat and restore.

Other features include on-line Help screens, a 64-char. additional comment line to add detail to saved files and 125-char. text lines.

The software requires a minimum of 128K bytes of memory and one or more single- or double-sided disk drives as well as IBM's PC-DOS 1.1, 2 or 2.1.

Einstein Writer costs $169.95, the vendor said.

United Software Industries, Suite 300, 1880 Century Park E., Los Angeles, Calif. 90067.

■ **Softcorp has announced software that reportedly allows enhanced sideways printing of Ascii text files from the IBM Personal Computer.**

Continued on page 66

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Continued from page 64

Sidestep reportedly allows users to select from 18 combinations of font sizes and print qualities for sideways printing applications.

Users can rotate an entire document 90 degrees.

The product can be used for printing files from spreadsheet programs such as Lotus Development Corp.'s 1-2-3 and from project management programs such as Softcorp's Advanced Project 6.

The software is said to be compatible with most dot-addressable dot matrix printers, such as the IBM Graphics Printer and Color Printer and the Epson America, Inc. MX, FX and JX series printers. It requires PC-DOS 2 or later.

Sidestep costs $60.

Softcorp, 2340 State Road, Clearwater, Fla. 33575.

■ Goldata Computer Services, Inc. has announced a local-area network version of its Goldatabase data base management software for the IBM Personal Computer.

Goldatabase Version 6 reportedly includes compatibility with 24 different local-area networks, including the IBM Personal Computer Network and offerings from 3Com Corp. and Corvus Systems, Inc. Features include record and file locking for multiple users, user-defined menus and computerized input screens.

Goldatabase Version 6 is priced at $595 for the single user, with the local-area network version price dependent on the number of concurrent users. A typical four-user local-area network license costs $1,487.50. The upgrade cost from Version 5 of the Goldatabase is $50.

Goldata Computer Services, 2 Bryn Mawr Ave., Bryn Mawr, Pa. 19010.

■ Datamate Co. has announced software that reportedly allows users of the IBM Personal Computer and Personal Computer AT and the Hewlett-Packard Co. 150 personal computer to create typesetting formats on the HP Laserjet printer.

Jetset II is said to consist of two utilities, one menu-based and one text-based, that allow formatting changes without the use of escape codes. Other features include text justification, centering and flush-right printing.

The menu-based utility reportedly supports all HP font cartridges and converts the user's choice of typeface, lines per inch and margins into escape codes, which are sent directly to the printer.

Jetset II is $99.

Datamate, Suite 128, 4135 S. 100th East Ave., Tulsa, Okla. 74146.

■ Radian Corp. has announced enhancement of its Rulemaster expert systems development software to include a new user interface. The interface reportedly simplifies the development and maintenance of expert systems.

Rulemaster, available in versions for several personal computers and minicomputers under Unix, reportedly will ship in the fourth quarter. Its new interface is said to offer screen and menu handling features, an editor for structuring applications and an editor for generating files of examples in order to create rules.

A unit license for Rulemaster is priced at $15,000 for the IBM Personal Computer AT running Microsoft Corp. Xenix, the AT&T Unix PC 7300 or the Tektronix, Inc. 4404.

A version of the software, priced at $25,000, is available for Unix-based minis.

Radian, P.O. Box 9948, 8501 Mo-Pac Blvd., Austin, Texas 78766.

■ Hypergraphics Corp. has announced four software programs in its On-Line Encyclopedia (OLE) series of instruction packages for the IBM Personal Computer, Personal Computer XT and AT.

The programs, titled Data Communications, AT&T Unix, Computer Literacy I and Computer Literacy II, reportedly reside in memory alongside IBM's PC-DOS, Basic and most applications software programs. Each OLE is organized alphabetically and by subject, allowing access and exit with a single keystroke.

The vendor also announced the OLE Tool Kit, applications generator software that allows users to create and maintain up to 80 of their own encyclopedias. The software includes an authoring graphics system, computer objects library, tutorial, encyclopedia manager and utilities to convert an encyclopedia and to create an index.

The Data Communications and Unix courses cost $69.95. Computer Literacy I and II are priced at $39.95. The OLE Tool Kit carries a one-time licensing fee of $5,000, including support and a one-day user seminar.

Hypergraphics, P.O. Box 50779, Denton, Texas 76206.

From page 59

Micro users groups provide forum

ate all the help their followers can provide, but the willingness to volunteer is diminished when someone else is in charge.

Because of this, the group might want to structure itself as a self-help organization that needs everyone's participation.

As for orientation, the users groups should be oriented toward newcomers, who provide new ideas, questions and a source of volunteers. Without new volunteers universal burnout comes quickly.

Lastly, the group should be sensitive to the attention span of its members. Groups should not be bored with hours of printer talk; formal presentations should be kept to 15 or 20 minutes.

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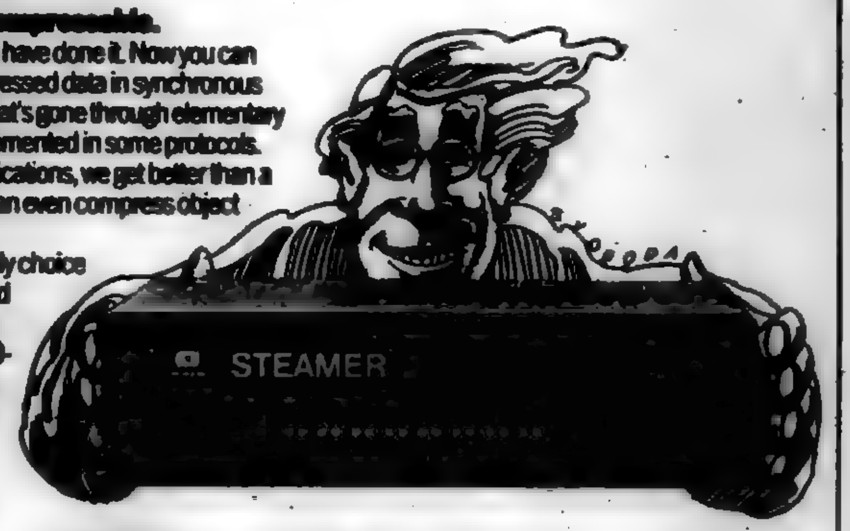

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COMMUNICATIONS

Devices reconfigure T1 channels

By John Dix

Use of a new type of switching device for high-speed digital communications facilities will enable telephone companies to offer enhanced services and may also benefit companies that operate large private networks.

Generically referred to as digital cross-connect systems, the devices are used to reconfigure channels within T1 digital communications links. T1 facilities operate at 1.54M bit/sec. and are typically segmented by time division into 24 individual channels, each of which operate at 64K bit/sec.

Traditionally, if channels within a T1 link had to be routed to different locations, the digital signal had to be broken down into 24 individual analog signals, put through a type of patch panel and then taken back up to a digital signal, according to Ralph Genss, product support manager with Microtel Ltd., a system manufacturer in Atlanta. This requires the multiplexing devices, called channel banks, to be configured back-to-back.

Digital cross connects facilitate that operation and do away with the need for one channel bank. They support multiple inbound and outbound T1 links, enabling any 64K bit/sec. channel within an incoming T1 to be routed to any outgoing T1 link.

Although digital cross-connect technology is not new, it is only now becoming cost effective, according to Ian Sugarbroad, general manager of digital network cross connects at Northern Telecom, Inc. The cost reduction is attracting the attention of telephone companies and some companies with large private networks.

Telephone companies, hoping to capitalize on the explosion of interest in T1 facilities since AT&T's divestiture, are looking to digital cross connects as a means to provide new services. One such service, according to John Mahala, department chief of transmission product management with AT&T Network Systems in Burlington, Mass., is customer-controlled virtual private networking.

Digital cross connects will help "blur the distinction between private lines and message services," Mahala said. Customers will be able to rearrange the destination of circuits within a T1 trunk in a matter of minutes on a periodic or scheduled basis, he said.

Such capabilities would enable T1 service customers to configure the link for "voice message traffic during the day and at the end of the day have it automatically reconfigure itself to dump a lot of data to another facility," Mahala said.

Although telephone companies represent the largest market for digital cross

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■ MCI Communications has reduced the rates for its Terrestrial Digital Service and Digital Data Service/66

■ Atlantic Research has added an IBM Systems Network Architecture protocol trace feature to its Comstate II protocol analyzer/66

■ Datastream Communications announced a protocol converter and a network management system designed to work with IBM 3705 or 3725 communications processors/66

IBM to offer matrix switch

IBM, in Rye Book, N.Y., has announced the availability of a matrix switch that industry sources say is being provided to the mainframe maker by Bytex Corp. of Southboro, Mass., the leader in the matrix switch industry.

The IBM 3728 Communications Control Matrix Switch, like Bytex's Autoswitch product family, is intended to sit between modems and communications processors, or between modems and outgoing telephone lines. The switches enable any incoming port to be routed to any outbound port.

Matrix switches are most typically used in front of communications processors to provide sparing for networks that require high availability. In the advent of a processor failure, the switch can redirect all incoming lines to a backup system.

The IBM switch, like Bytex's Autoswitch 240, is available as a stand-alone or as a base unit that supports up to 15 exten-

Continued on page 72

NCR upgrades cut upkeep fees

NCR Comten, Inc. of St. Paul, Minn., has announced system upgrades for two communications processors that result in reduced maintenance fees. The company also announced a new lease-to-purchase conversion option that enables customers to purchase currently leased systems at substantial savings.

Users who own Comten 3650 Model X4 or 3690 Model X5 communications processors can upgrade their machines to 3650 Model X9 and 3690 Model X8 processors, respectively. The enhanced packaging and design of the new models results in a reduction of monthly maintenance charges by 34% to 44%, the company reported.

Comten customers currently leasing these processors must purchase the products before they can upgrade to the new models and reduce their maintenance fees.

To encourage that migration, Comten's lease-to-purchase conversion option allows users to apply more of the fees

Continued on page 72

Comsat adds satellite unit

Communications Satellite Corp., more commonly known as Comsat Corp., recently announced it will market a 56K bit/sec. data communications terminal and satellite dish at a $12,000 average price per unit.

Comsat, in Washington, D.C., said the unit will be initially available in the fourth quarter of 1985 and announced that it has signed a contract with Halliburton Co. of Dallas, to supply 120 dishes and a central switching control hub. The Halliburton contract is worth in excess of $1.5 million, according to Comsat Technology Products President A. William Perigard, and will also include the satellite facilities of American Satellite Corp. of Rockville, Md.

Perigard said the satellite dishes, either 1.2 or 1.8 meters in diameter, are capable of handling voice and videoconferencing communications. He said the voice quality will not be the equivalent of standard terrestrial lines. "Our data terminal repre-

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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis, and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from mainframes to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

■ **Why not Cullinet, ADR or Focus?** There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as *the* standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language - each one painting the user into its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few shops nowadays run only IBM mainframes. Why, then, even consider a database solution that runs *only on IBM mainframes?* Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE *are* identical.

FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

■ **Why not just go with DB2 or SQL/DS?** A relational DBMS simplifies but does not by itself eliminate application programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are somewhat unlikely ever to run on another vendor's system). ORACLE runs on more IBM hardware and operating systems than do IBM's relational products.

■ **What about Goldengate, dBase III, Symphony or Framework?** PCs need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload.

ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350.

Converter, net system work with IBM 3705, 3725 devices

Datastream Communications, Inc. of Santa Clara, Calif., has announced a protocol converter and a network management system designed to work with IBM 3705 or 3725 communications processors.

The 8010 protocol converter supports eight to 32 asynchronous ports at speeds up to 19.2K bit/sec. Devices can emulate 3278 terminals and 3287 printers.

The device also has two synchronous ports that support speeds up to 19.2K bit/sec. for IBM's Synchronous Data Link Control protocol or 9.6K bit/sec. for IBM's Binary Synchronous Communications protocol.

The 8030 network management system supplies the same protocol capabilities as the 8010. In addition, it records network activity at physical and logical levels for attached devices. The network management system monitors up to 32 asynchronous ports and includes a 10M-byte hard disk drive for statistical storage.

The network management system records user identifications, logical unit or device addresses, and port and synchronous line activity.

The 8010 costs $9,900, and the 8030 sells for $14,900.

MCI lowers service rates

Digital transmission costs cut 2%, 15%

MCI Communications Corp., headquartered in Washington, D.C., has cut the rates for its Terrestrial Digital Service and Digital Data Service.

Terrestrial Digital Service, a dedicated digital T1 service that operates at 1.54M bit/sec., will decrease in price by an average of 2%. A New York-to-Washington, D.C., route, for example, would have previously cost $4,100 to install and $8,856 per month. With the new rates, installation is set at $2,286, and the monthly rate is $8,807. The service is available in 69 cities.

MCI's Digital Data Service is a digital, full-duplex, synchronous service that supports transmission speeds of 2,400, 4,800, 9.6K and 56K bit/sec. The service's monthly rates will fall by approximately 15%. The installation cost of a New York-to-Washington, D.C., line will rise from $650 to $1,300, and the monthly service charge will drop from $1,772 to $1,474.

Firm adds IBM SNA protocol trace feature

Atlantic Research Corp. of Alexandria, Va., has added an IBM Systems Network Architecture (SNA) protocol trace feature to its Comstate II Protocol Analyzer.

The feature decodes SNA protocol for an operator who enters information using menu-driven commands, the vendor said.

The tracer reportedly decodes all frame identifier types and displays frame, transmission, request and response headers.

Bind commands are expanded and sense information is displayed whenever a sense data indicator is set, the vendor said.

A user can select whatever data he wants to display, for example, frame address, origination address field, destination address field, sense data indicator bit, response-type indicator bit and exception response indicator bit.

The option costs $800, according to the vendor.

From page 67

Comsat adds satellite unit

sents an application that stresses four areas: interactive data, electronic mail, high-speed facsimile transmission and thin-route voice."

According to Perigard, the product is the first to be able to make necessary high-speed satellite protocol conversion in an IBM environment, providing an interface to systems incorporating IBM's Systems Network Architecture/Synchronous Data Link Control.

He said the principal sources of competition for the interactive data communications satellite dish will be Equatorial Communications Co. of Mountain View, Calif., and M/A-Com Linkabit, Inc. of San Diego.

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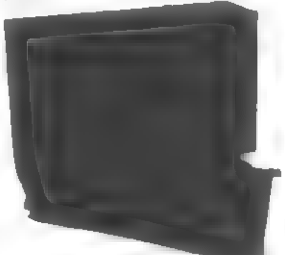

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Digital Communications Associates, Inc.

[illegible]

From page 67

IBM to offer matrix switch

sion units. A single switch frame has 15 card slots that can be configured with a variety of interface types, according to the vendor. Interfaces that support high speeds reduce the overall number of ports available on a given switch.

A single-unit IBM system supports 240 four-wire analog ports, or 120 CCITT V.24/RS-232C ports at speeds up to 19.2K bit/sec., or 60 CCITT V.35 interfaces at speeds up to 76.8K bit/sec. or a combination of the above.

Multiple unit systems can support 3,840 four-wire analog ports, 1,920 CCITT V.24/RS-232C ports or 960 CCITT V.35 interfaces.

A switch node can consist of one or more units — up to 16 — and be networked with up to 61 3278 Communications Control Matrix Switch systems, IBM reported.

Each 3728 must have at least one control terminal. That terminal can be a switch control console consisting of an IBM 3161 Ascii Display Station or equivalent and an IBM 4201 Proprinter with an Asynchronous Serial Interface Module; or a support processor, a dedicated IBM Personal Computer XT running the 3728 Support Processor licensed program. The XT must have at least a 10M-byte hard disk, a 320K-byte diskette and 640K bytes of random-access memory.

The 3728 Support Processor Licensed Program, which does not require DOS or any other operating system, can control all local and remote 3728s in a networked configuration.

The support processor provides a storage logging facility to trace network events, an editing function for creation of command lists, automatic execution of command lists, a security subsystem and an on-line Help facility.

The 3728 Control Mode provides control over the matrix switch, including switch initialization, line configurations and alarming for controller ports or groups of ports, according to the vendor.

Available beginning in December, the 3728 costs $15,800 and carries a $81.50 minimum monthly maintenance charge.

Interface cards that support a varying number of ports range in price from roughly $1,200 to $2,609. The 3728 Support Processor Licenced Program has a one-time charge of $12,000.

From page 67

NCR upgrades cut upkeep fees

paid during the lease toward the purchase price of the system.

Under the new option, the accrual rate and the maximum limit at which lease fees can be applied toward purchase of the systems have been increased.

The combined effect of the lease-to-purchase option and the system upgrade enables users to purchase and upgrade their X4 and X5 models at reduced rates, the vendor reported.

Users with X4 or X5 machines under two-year leases can purchase and upgrade them to the X9 or X8 model for roughly 90% of the purchase price of the those models, according to Comten.

From page 67

Devices reconfigure T1 channels

connects, manufacturers of the devices said they have had inquiries from many other large users. The systems, however, are expensive — roughly $1,200 to $1,500 per T1 port, according to Sugarbroad at Northern Telecom — and typically have a minimum of 16 or 32 ports. Northern Telecom's DNX-100, for example, has a minimum of 31 T1 ports and a maximum of 248. AT&T's digital access cross-connect system ranges in port size from 32 to 128 T1 ports.

AT&T's Mahala said there is a trend under way to downsize digital cross connects. But even today the systems will appeal to companies with at least "a dozen T1s going through their network," according to Microtel's Gana.

Private industry can take advantage of the systems in a number of ways.

"If you had a few locations feeding a hub point from which you were going to route to a long-distance carrier, the capacity from each subtending location could be packed on the [T1] at the hub," Mahala explained. "You would get higher fill over the long-distance net," thus optimizing that link.

Another application would be to use a digital cross connect in a campus environment to interconnect all company facilities. Instead of having point A connected to B, all locations could be connected to a central cross-connect hub, Mahala said. Channel capacity between locations could thus be rearranged as needed.

The hub in this scenario could also act as the point of interface for long-haul carriers, providing the optimizing consolidation capabilities.

A third potential application for digital cross connects in private industry, according to Mahala, is in disaster recovery. Companies can use a switching system to act as a bridge between a primary data base facility and a recovery site. In the event of a catastrophe, the cross connect, housed at the recovery site, could redirect user traffic to standby equipment.

Although telephone companies have the capacity to use the digital cross connects that are currently available — from which users will benefit — the technology will probably find a niche in private industry as vendors scale down their products.

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SYSTEMS & PERIPHERALS

HARD TALK
James Connolly
CW Senior Editor

Please enter your cobfiuk

Monday mornings can be tough enough, particularly when they involve returning from summer weekends to face a string of project deadlines. So a person doesn't need a computer to kick off the week by calling him "Scumbag," or to start the next week with the salutation "Fatarse."

But that is what a Digital Equipment Corp. Microvax I did to Mark Welsh recently, finally hitting him with "Forize" on the third Monday morning. "My spectacles were steamed up worse than when I unload a just-finished dishwasher," recalled Welsh, a senior systems software engineer for Ex-Cell-O Manufacturing Systems Co. in Rockford, Ill.

The mysterious slurs that Welsh endured were a few of the bizarre passwords generated by an apparently creative Microvax that he shares with five other users in a networked environment. Many of the other passwords weren't insulting; they weren't even pronounceable or memorable, Welsh said.

Welsh laid the blame on an engineer or someone else involved in developing DEC's VMS 4.1 operating system.

"It's not impossible that it could have happened, but it is so highly improbable as to make you wonder," DEC spokesman Steven Kallis countered, suggesting that Welsh may have been the victim of a coworker's practical joke.

Whoever was to blame, the result was that the Microvax spewed out strange passwords through an optional VMS feature that periodically generates new pass-

Continued on page 80

'Erased' tapes present potential security threat

By Donna Raimondi

If you sell or throw away your used, erased magnetic tapes, you may be tossing your corporate information up for grabs.

All the warnings that manufacturers package with magnetic media — about not spilling coffee on the tape, not exposing it to airport X-rays and metal detectors — may lead operations people to believe the media is delicate and easily erased. It is not.

Although little evidence exists that corporate spies have lifted data from degaussed magnetic tapes (reels placed in an intense magnetic field in order to erase them), a recent paper raises questions about what to do with old magnetic tapes that might still contain valuable information.

With all these rumors of instability floating around, it is hard for people to realize just how stable and long lasting that magnetically recorded information really is, according to physicist William Manly in his paper, "Data Security and Used Magnetic Storage Media," written in July 1985.

"If you value your information, don't sell your used magnetic tapes or disks; give them away, or throw them in the trash," Manly warned.

Manly is an independent consultant with HMI Consulting in Arlington, Texas. He is not in the tape erasing business but wrote his report for two clients who were worried about the proper disposal of sensitive information.

When a file is deleted from tape, the

Continued on page 78

Sun unwraps workstations

Emphasizing that it is maintaining its open systems architecture, Sun Microsystems, Inc. of Mountain View, Calif., has introduced a family of workstations, programming environments, file servers and a floating-point accelerator.

In an announcement last week, Sun said the three Sun-3 workstations and other products are, like the earlier Sun-2 product line, based on industry-standard software and hardware components designed for full integration and future upgrades. The company said that those standards include Ethernet for local-area networking and Sun's version of the AT&T Unix and that software that runs on Sun-2 workstations is compatible with Sun-3 products.

The workstations and two file servers are based on Motorola, Inc. 68020 16.67-MHz microprocessors with a 12.5-MHz Motorola 68881 floating-point coprocessor and a full 32-bit VM-based architecture.

Sun claimed that the Sun-3 products provide twice the speed of a Digital Equipment Corp. VAX-11/780 in desktop systems for technical professionals.

The products are targeted at applications that demand high-performance graphics such as computer-aided design in the electronics and mechanical engineering fields and in architectural uses such as facility planning and landscaping.

The workstations include the Sun-3/160C color workstation, featuring eight color planes and the ability to display 256 colors simultaneously; the Sun-3/

Continued on page 74

- Memorex targeted better access time and data availability in announcing a dual path feature for its 3690-2 disk subsystem/74
- Distributed Logic released a disk drive interface for DEC small systems/74
- Spur Products announced an adapter to let Prime Computer minicomputers drive IBM printers/80

INSIDE

Data Storage/74
Terminals/74
Printers/Plotters/74
Graphics Systems/80
Power Supplies/80

Design, numerical control tools bow

Series of Prime systems target entry-level, mid-range mart

A series of computer-aided design and computer-aided numerical control programming packages have been introduced by Prime Computer, Inc. of Natick, Mass., to the entry-level computer-aided design and manufacturing systems markets.

The products are configured to provide new CAD and numerical control programming users with entry-level and mid-range systems that can be expanded to grow with programming needs, according to a Prime spokesman.

The CAD Starter Packages are single-user, two-dimensional systems based on the Prime 2250 minicomputer with controller. They are available with Prime's Medusa design drafting software and are offered in 50Hz or 60Hz configurations, depending on local power requirements. They include Prime's PW153 CAD terminal and the Prime PT200 graphics terminal. They are available in three configurations, priced from $35,000 to $55,000.

The Expanded CAD Packages are two-seat configurations based on the Prime 2550 minicomputer with controller and software, including Medusa, Prime's information data management/application development, supersyntax and variational geometry. Also available in 50Hz or 60Hz configurations and with the PW153 CAD terminal and PT200 graphics terminal, they are priced from $95,000 to $125,000.

The Entry-Level Computer-Aided NC Programming Packages are single-seat, stand-alone numerical control tape preparation systems based on the 2250 minicomputer. They include controllers and Cadcentre, Ltd.'s GNC 2½-axis programming software. They cost from $45,000 to $55,000, according to Prime.

The Expanded Computer-Aided NC Programming Packages also are based on the 2250 minicomputer with GNC programming software, a tape generator postprocessor program and the information data management/application development software.

They are available with the Prime PT200 graphics terminal and the Prime PGT4109 CAD terminal. There are three configurations, priced from $80,000 to $90,000.

According to Prime, all of the systems include the required cables and can be configured according to U.S. and international requirements.

Parallel processing mini introduced

A start-up company has added its first product to the growing number of parallel processing minicomputers. International Parallel Machines, Inc., of New Bedford, Mass., has unwrapped its IP-1 that runs under the company's Runix operating system.

International Parallel was started five years ago with $2 million worth of seed money from relatives and friends, according to Robin Chang, president and treasurer. No institutional investors are involved in the project, he added. The IP-1 is the company's first product.

The company uses local memory and multiaccess memory modules that are said to act like multiport memories to allow simultaneous access by different processors. An intelligent disk interface is said to allow data transfers while the processor runs at full speed.

A basic configuration for the turnkey system includes nine processors with interconnection switches, 10M bytes of main memory, 150M bytes of on-line disk storage, more than 50 I/O ports, a terminal and the Runix operating system. The basic system costs $49,950.

DATA STORAGE

■ Distributed Logic Corp. has released an enhanced small disk interface controller that is said to allow the attachment of one or two Winchester disk drives to Digital Equipment Corp.'s Microvax, Micro/PDP-11 and LSI-11 computer systems.

The DQ656 controller's universal formatting system is said to allow systems integrators to mix drives with different performance characteristics without having to specifically configure the controller board. The controller plugs into any standard DEC Q-bus quad slot. It is compatible with 5¼-in. Winchester disks drives made by Control Data Corp., Maxtor Corp., Micropolis Corp., Siemens AG, Hitachi America, Ltd. and Fujitsu America, Inc.

The DQ656 costs $1,115.

Distributed Logic, P.O. Box 6270, 1555 S. Sinclair St., Anaheim, Calif. 92806.

■ Memorex Corp. has announced a dual-path feature for its existing 3690-2 disk storage subsystem that is attachable to a Memorex 3680 or IBM 3880 storage control unit.

The feature, a 3699-2 alternate string controller, is said to improve data storage acccess time and increase data availability by doubling the number of access paths available to each disk drive in a 3690-2 string. It permits read/write operations to take place on two different drives within the string at the same time.

A minimum dual-path 3690-2 subsystem consists of a 3693-2 primary string controller and a 3699-2. Each unit provides 729.8M bytes of storage capacity. The system costs $35,480 for the 3693-2 primary string controller, $26,600 for each 3690-2 disk drive and $38,990 for the 3699-2 alternate string controller with the dual-path feature.

Memorex, San Tomas at Central Expwy., Santa Clara, Calif. 95052.

TERMINALS

■ MSI Data Corp. has announced its PDT III portable data terminal.

The PDT III comes with a memory size of either 32K or 256K bytes. The hand-held unit measures 6.7 in. long by 3.8 in. wide by 1.3 in. deep and weighs less than 18 ounces, the vendor said. It has a 51-key color keyboard that shifts to include all 128 Ascii characters. An optional scanner — either a wand or light beam gun — can be plugged directly into the terminal for scanning bar codes.

The PDT III with 32K bytes of memory costs $1,060 and with 256K bytes of memory costs $2,010.

MSI Data, 340 Fischer Ave., Costa Mesa, Calif. 92626.

PRINTERS/PLOTTERS

■ Western Graphtec, Inc. has released an eight-pen plotter for sale to OEM users.

The MP 2000 flatbed B/A3-size plotter features a speed of 10 in./sec. in the drawing mode and 16 in./sec. when the pen is raised. Five types of pens are available for the MP 2000:

Continued on page 79

From page 73

Sun Microsystems unwraps workstations

160M monochrome workstation; and the Sun-3/75M desktop workstation.

The workstations have a standard 2M bytes of main memory with expansion capability to 16M bytes, except for the Sun-3/75M, which has a maximum memory of 8M bytes. The three workstations were designed to operate as diskless nodes in a network or, with the addition of local mass storage, as stand-alone systems.

The basic Sun-3/75M costs $12,900, the Sun-3/160M costs $20,900, and the Sun-3/160C costs $31,900. Optional mass storage and backup systems start at $8,500 for the Sun-3/75M and at $7,900 for the Sun-3/160M monochrome and color workstations. Mass storage can be configured to provide from 71M bytes to 1.5G bytes, using multiple 380M-byte drives. Upgrades using 68020 microprocessors were announced in June for Sun-2 workstations and cost $4,000.

The two file servers announced last week were the Sun-3/160S, a pedestal-style model, and the rack-mounted Sun-3/180S. The file servers feature 12 slots and can be configured with one or two 71M- or 130M-byte drives and up to four 380M-byte disks and a ¼- or ½-in. tape. The pedestal-style model costs $17,900 without mass storage, and the rack-mounted version costs $18,900 without mass storage.

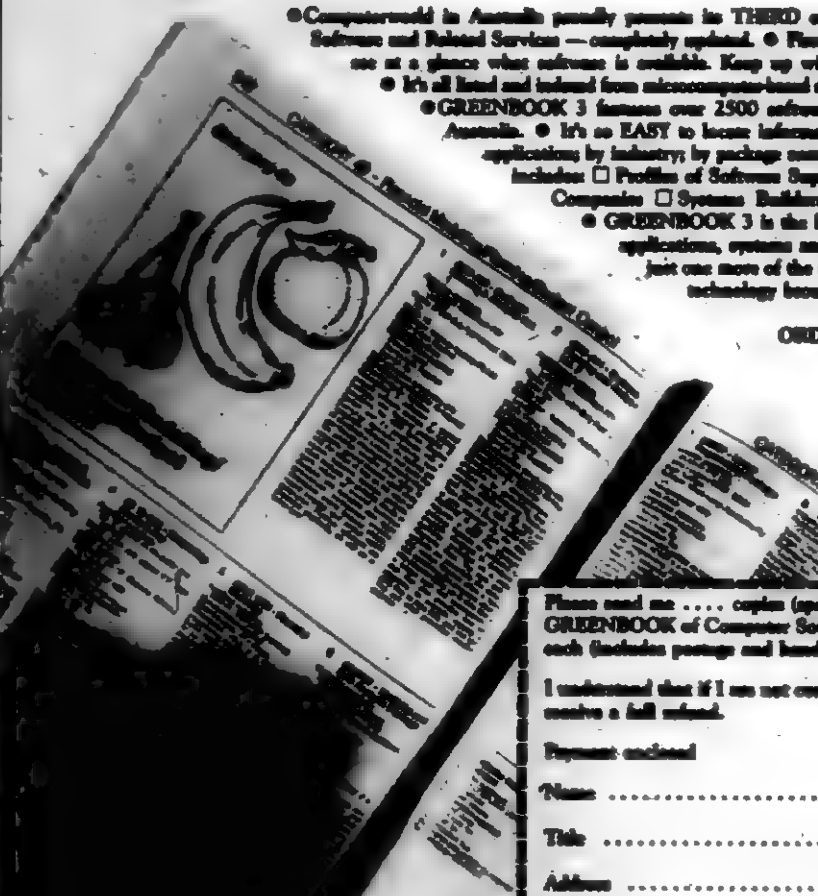
The Sun-3 workstations and file servers are available now.

Sun also announced an optional floating-point accelerator board for the Sun-3 line. It was designed to increase floating-point performance four times over the baseline performance. It costs $4,900 and will be available in the first quarter of 1986.

The two software products announced last week were the Sun Programming Environment (Sunpro) and Sun Visual/Integrated Environment for Workstations (Sunview). The products are bundled with Sun's version of Unix.

Sunpro is said to support rapid prototyping. According to Sun, once a user is satisfied with the functions of a prototype, a program can use Sunpro utilities for performance testing and tuning.

Sunview reportedly uses interface tools like windows, scroll bars, pull-down menus and pointing devices to help software engineers construct flexible, powerful user interfaces.



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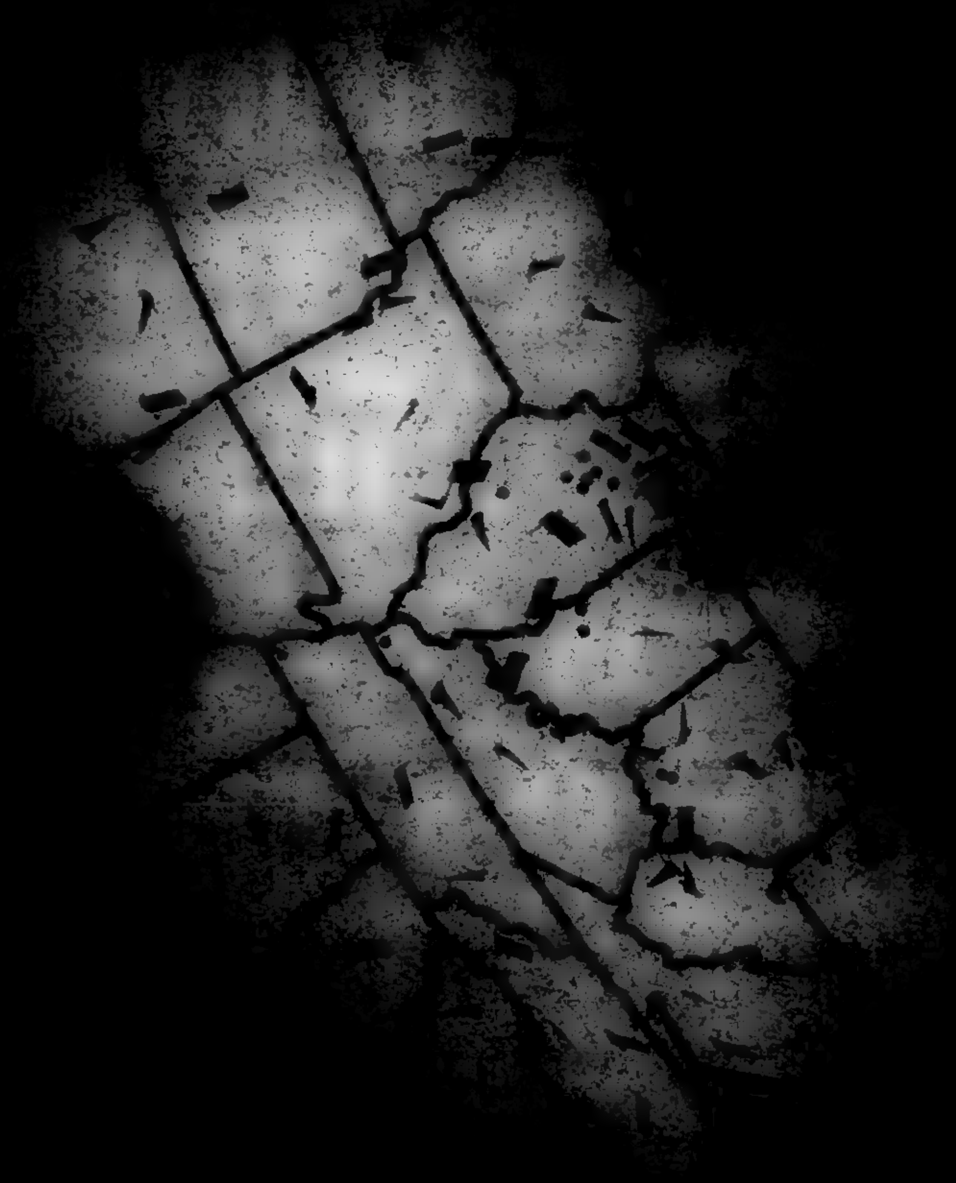

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SYSTEMS & PERIPHERALS

Continued from page 74

water base and oil base fiber tip, water base ballpoint, ink and water base ceramic pens. It is equipped with dual ports for either RS-232C or Gpib-IEEE/488 interfaces and has a 6K-byte memory buffer.

The unit costs $1,290 in quantities of more than 250.

Western Graphtec, 12 Chrysler St., Irvine, Calif. 92714.

■ **Dataproducts Corp. has released its CP-1800 check-printing system designed for branch banking, real estate, insurance and corporate cash management applications.**

The unit combines a Dataproducts CP-40 magnetic ink character recognition (MICR) printer with an IBM Personal Computer XT in a cabinet. A $500 word processing option allows the user to flip a switch and, after changing the ribbon and print wheel, use the printer as a word processor.

The system includes check-printing software and prints from eight to 15 char./in. At 12 char./in., it operates at 55 char./sec. The system will produce 15 checks per minutes at 8 char./in., printing three lines of text and one line of MICR code. In MICR only, the system will print 30 checks per minute.

The CP-1800 costs $15,950. An automatic cutter/handling option, which cuts and bundles starter check sets, will be available in the first quarter of 1986 for $2,000.

Dataproducts, 6200 Canoga Ave., Woodland Hills, Calif. 91365.

See PRINTERS page 80

From page 73

'Erased' tapes present potential threat to companies' security

only thing that usually happens is that minor changes are made in the file header so that the file is ignored. Erasing the file by applying direct current through the head as the file passes by does not do the job either, Manly's report said. The signal in such a case is reduced by about 20 db, which leaves a solid 10% of it still recoverable with only a few possible errors, according to Manly.

Even a good demagnetizing bulk erase, in which the tape is removed from the drive and put into a demagnetizing machine, does not completely do the job. Demagnetizing — or bulk erasure — is a good way to begin the elimination of data from a tape, Manly's report said, but it should be considered only the first step.

As a second step, users should write random bits on the full length of the media, avoiding recognizable patterns. Then the media should be stored for about a week at about 100° Fahrenheit to imprint the random bits firmly on the media. Tapes should be carefully wound before storage, and all media should be well supported so that distortion is unlikely, the report added.

> ❞
>
> ***Demagnetizing — or bulk erasure — is a good way to begin the elimination of data from a tape, but it should be considered only the first step.***

Checks should periodically be run on each step of the process to ensure that they are working, the author advised. A wideband noise measurement after each bulk erase process will tell whether the erase is working, with residual signals showing up as periodic peaks in the noise spectrum. Temperature and sight checks should ensure that the tape is not curling in the warm space, he added.

The final procedure is to bulk erase again. There will still be a residual signal, but it will be of the random bit pattern, not the original signal, the report said.

Not everyone agrees that degaussed tapes can still be read. "We've had 1,600 cases [of breached computer security] since 1958, and none like that that I can recall," said Don Parker, senior management systems consultant at the not-for-profit computer security research and consulting firm SRI International, Inc. in Menlo Park, Calif. There is residual information left on a degaussed tape, Parker added, but finding even partial data would take a tremendous amount of work and equipment.

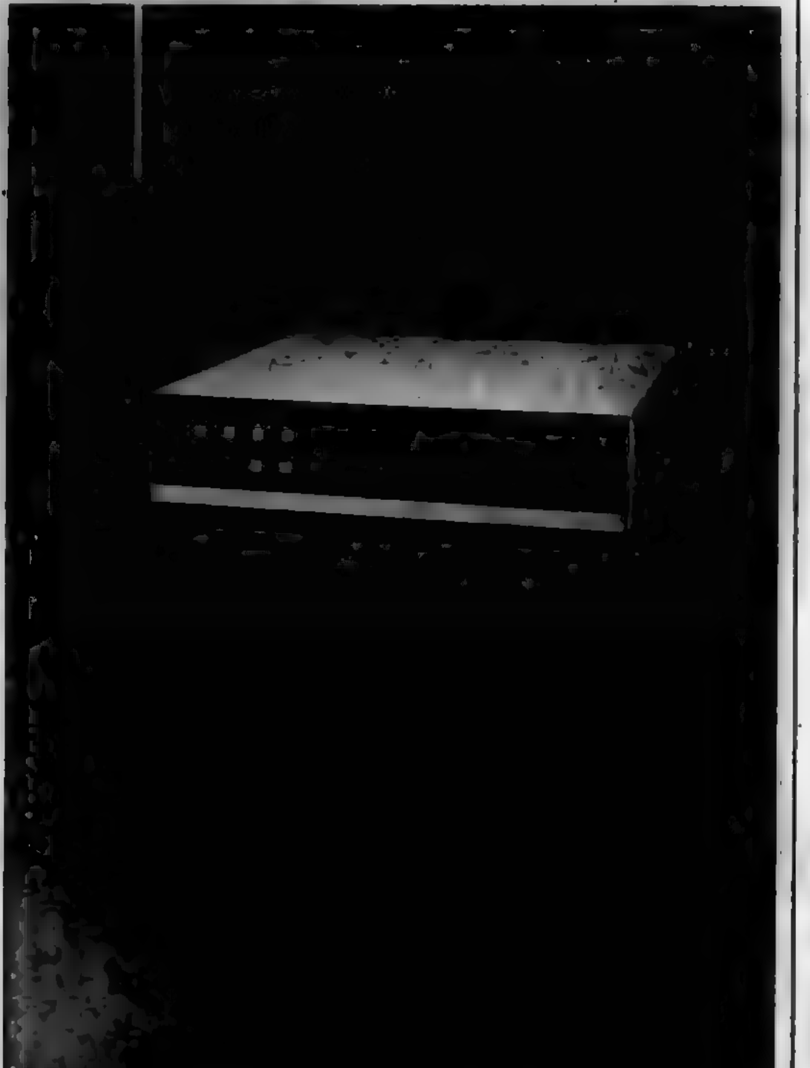
Raymond Freeman, who publishes the "Computer Tape Outlook" analysis and forecast newsletter in Santa Barbara, Calif., has not come across the problem either. "I haven't spent time being concerned about it," Freeman reported. "There are people who recover accidental erasures [the National Security Agency]. I'm not familiar with the results." Freeman did not know of any commercial services that recovered residual data from tapes.

The Social Security Administration's (SSA) tapes are degaussed at its National Computer Center in Baltimore whether or not they will be reused, according to Deputy Press Officer John Trollinger. The tapes are then reused at the SSA or declared surplus and sold by the General Services Administration (GSA) to anyone who wants to buy them.

The SSA tests random samples of the tapes that will be auctioned off by the GSA and has never found one with readable data on it, Trollinger said.

Herb Schantz, a vice-president of Graham Magnetics, Inc. in North Richland Hills, Texas, said he believes residual data is a problem. He said many of his customers have taken to destroying their old tapes with band saws to avoid expensive procedures to save them. Very large companies can justify the cost of the time, equipment and space required for making old tapes reusable, but most shops should just incinerate them, Manly said.

Media service bureaus are not set up to clean tapes as thoroughly as they need to be. If a user finds a bureau that promises to follow Manly's guidelines, the user should also make sure the service bureau can maintain security during the process, the report added.



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Commodore World, is a monthly publication with a circulation of 22,000. Editorial targets the Commodore user with reports on all aspects of Commodore operations.

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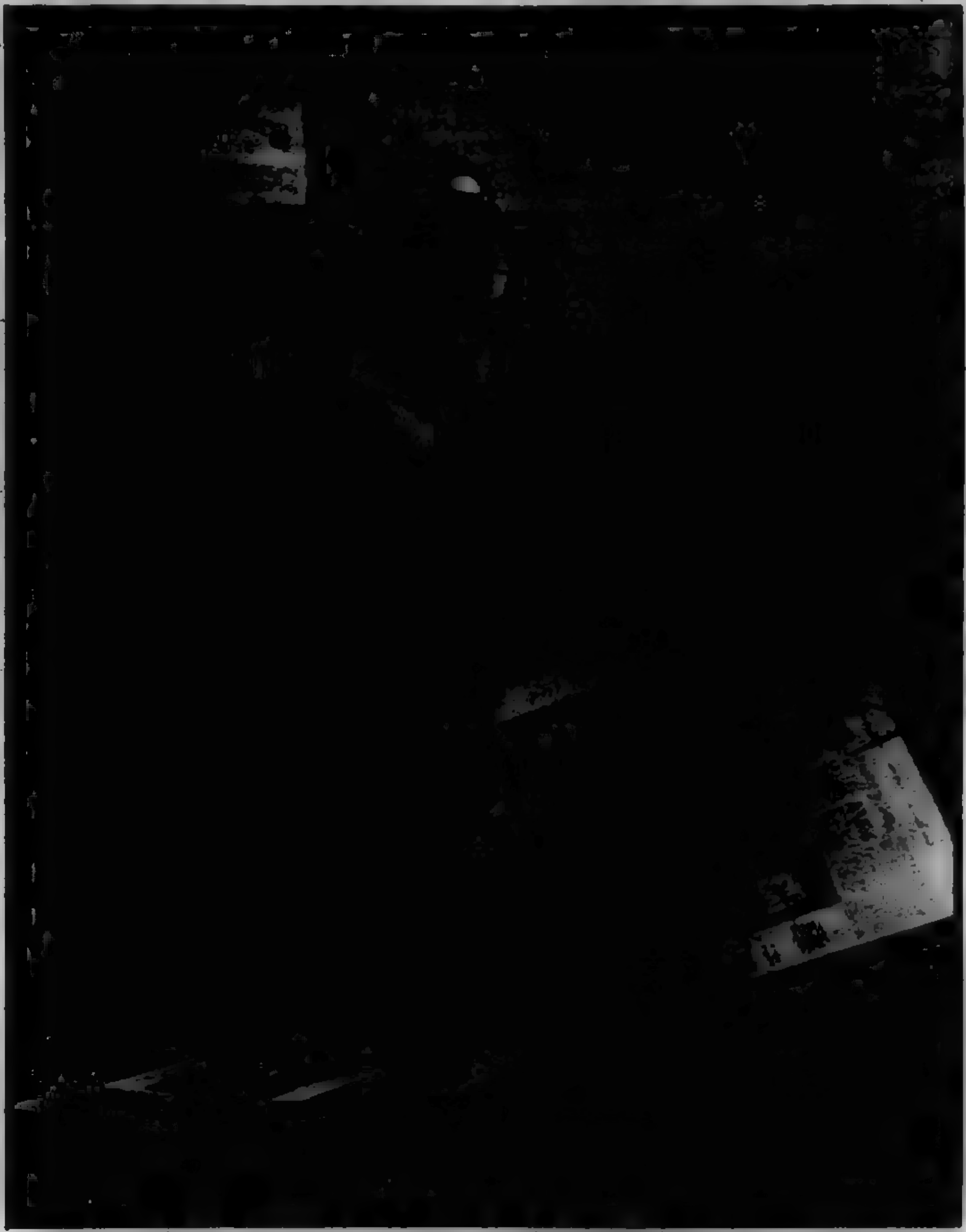
“Two ads in Computerworld Focus flooded us with inquiries on our new micro product, EnerConnect.”



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Randy T. Andes, Director of Marketing, Enertronics Research, Inc., St. Louis, Missouri.

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PRINTERS

from page 78

■ Spur Products Corp. has released an adapter that is said to enable any Prime Computer, Inc. minicomputer to drive IBM 3211 printers, Storage Technology Corp. (STC) impact printers or Xerox Corp. laser printers.

The USA/Prime Universal Subsystem Adapter is said to give the system the capability of printing up to 3,000 lines of shaped char./min with an STC printer or up to 18,000 line/min. of dot matrix nonimpact printing with a Xerox 9700 printer. Used with an IBM 3211, the unit enables Prime users to have printer functions such as a slew speed of up to 80 in./sec. and interchangeable print trains, the vendor said.

The USA/Prime Universal Subsystem Adapter for the Prime minicomputers costs $6,000.

Spur Products, 13469 Beach Ave., Marina Del Rey, Calif. 90292.

■ Versatec, Inc., a subsidiary of Xerox Corp., has released an interface board that is said to support output to Versatec electrostatic plotters from Digital Equipment Corp. Q-bus computers.

The Model 126 with software driver supports output from the Microvax I and II to any Versatec monochrome or color printer/plotter. The model offers long line plotting capabilities of up to 1,000 ft. The interface and driver support 22-bit addressing for the Microvax machines and 18-bit addressing for other VAX series systems.

The Model 126 costs $2,000.

-Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

GRAPHICS SYSTEMS

■ KMW Systems Corp. has announced its VP-200 graphics element processor that is said to convert vector data to raster form for use by printers.

The processor is said to be suited for controlling electrostatic, laser magnetic and ion deposition imaging devices. It supports both color and intensity-modulated devices.

The VP-200 features 512K bytes of raster memory that is expandable to 8M bytes, plug-in card modules that permit configuration of up to three output devices and optional IBM channel and mini interfaces.

The VP-200 with a parallel interface costs $12,900 to start, with the price increasing depending upon additional memory or interfaces.

KWM Systems, 8307 Highway 71 W., Austin, Texas 78735.

POWER SUPPLIES

■ Elgar Corp., an operating unit of Onan Corp., has announced an uninterruptible power system (UPS) targeted at IBM System/34 and 36 users as well as at a variety of other systems, including Digital Equipment Corp. VAX-11/730 and VAX-11/750 machines.

The T series UPS provides both 120V and 208V ac single-phase output power. It comes in either 5 kVA, 7.5 kVA or 10 kVA sizes.

Prices range from $11,500 to $18,000, depending upon the configuration.

Elgar, 9250 Brown Deer Road, San Diego, Calif. 92121.

From page 73

Please enter your cobfiuk

words for users. The option, available throughout the VAX product line, lets users select a password from approximately five generated randomly.

"It says, 'Choose a password from this list or hit return to get a new list.' We've had to hit return several times to get an acceptable password," Welsh said. "Forize" may have been an exception, Welsh added, noting that most passwords were unusable. He reported that a sample list gave him options such as "ropnaha, cobfiuk, ekgefwyk, ogudave and garmion."

"We reached the point where what people were going to start doing was writing their passwords down, which is a bigger problem than having them choose their own," Welsh added.

> *But the mystery remains: Who did it?*

Choose their own password

So Ex-Cell-O officials disabled the password option and went back to choosing their own passwords, such as "[their] Aunt Millie's favorite preserves, an obvious breach of security," Welsh reported.

But the mystery remains: Who did it?

Officials in DEC's Microvax group said they wouldn't have done it. They said that if they had done it, Ex-Cell-O's problems would have shown up in other users' systems. The password feature is in the operating system itself, not in the individual machines, according to DEC.

No other complaints

Kallis noted that there had been no other complaints about such rude words from users with any VAX machines.

Kallis reported that the password feature was designed to avoid words that users might find offensive, and that the system shouldn't present any of 90 nasty words on a list that DEC compiled.

If neither DEC nor the Ex-Cell-O programmers are to blame for the glitch, could the insults Welsh received have been mere coincidence? That may never be answered. At least the computer worked although Welsh criticized the Microvax I for its poor response time.

Some bugs bog down entire systems, Welsh said.

Just in case the culprit is found, Welsh has a suitable punishment: Assign that person the password "Flogme" and hope the perpetrator's coworkers act on that "very sage advice."

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COMPUTER INDUSTRY

No big changes foreseen for Sterling acquisition

Yet buy-out heralds exodus of Informatics execs

By Clinton Wilder

No further upheaval is expected in the internal organization and product lines of Informatics General Corp. in the near future as Sterling Software, Inc. moves to finalize its acquisition.

That is the view of Sterling executives and software industry analysts. However, most of Informatics' top executive staff departed prior to final approval of Sterling's buy-out proposal.

Sterling will "absolutely continue to support" Informatics' older software packages such as Mark IV, according to Phillip A. Moore, Sterling's senior vice-president of business development. Although Sterling is weighing alternatives to make Informatics more profitable, no relocation or liquidation of any product divisions are planned, Moore said.

"We are taking a look at where there would be potential synergies between Informatics' products and ours," Moore said. "We have not planned any consolidation because that implies moving one group to another location. Each division will continue to operate — with certain changes."

Moore declined to elaborate on what those changes will be, but so far, most of the change has occurred at the top. As expected, Informatics Chairman and President Walter H. Bauer resigned Sept. 1, leading the exodus of 65 of the 70 Informatics executives based at corporate offices in Woodland Hills, Calif. The Woodland Hills office will close by Nov. 1, with all top executive functions moving to Sterling headquarters in Dallas.

The only top Informatics corporate officers to remain with Sterling in their former positions are Richard C. Lemons, exec-

Continued on page 90

Datapoint saga a real cliff-hanger

By Peter Bartolik

The unceasing soap opera of Datapoint Corp. continues, and determining a logical ending may prove to be tougher than figuring out who shot J.R.

One clear point is that New York financier Asher B. Edelman has been with the company much longer than anyone expected after he won effective control in March.

ANALYSIS

Everyone expected to see an encore of his winning strategy at Management Assistance, Inc. last winter, when he browbeat the board of that company into accepting his plan to sell off parts of the company — the Sorbus, Inc. service division and the MAI/Basic Four manufacturing division — for a greater amount than the trading value of the company's shares.

Two weeks after taking over, Edelman said he was going to continue to operate the company, but analysts saw that as a bluff intended to obscure the widely held belief that Edelman's asking price — some $300 million — was more than a fair market value for the company.

Well, the service arm was spun off into a new company, Intelogic Trace, Inc., with the stock distributed to Datapoint shareholders, and already one bid, by TRW, Inc. for $177 million, has been turned down. And Edelman has offered to raise $100 million to buy the remainder of Datapoint and take it private.

For customers, this must be the worst of times. Figuring out exactly where the company is going is no easy task.

The buy-out plan was received with much skepticism by analysts who said it is probably the best deal shareholders will ever get, but countered that Edelman merely wants to capitalize on some $200

Continued on page 90

- The recent failure of a Dallas bank could cost Flexible Computer $250,000/86

- Compugraphic joined the crowd of vendors that has cut costs by cutting employees/86

- Semiconductor manufacturer Micron Technology fired off another salvo against Japanese competitors with the filing of an antitrust suit/87

Japan to sell high-tech patents

By Takahiko Kondoh
Special to CW

TOKYO (CWN) — Japan is stepping up a campaign to boost sales of government laboratories' research and development results and patents to cope with growing foreign interests in its high technologies.

Leading the way is the Agency of Industrial Science and Technology (Aist), the Ministry of International Trade and Industry (Miti)-affiliated organization overseeing 16 state-run research labs.

The nonprofit Japan Industrial Technology Association, the exclusive nonprofit licenser of Aist's industrial properties and expertise, recently decided to send a 28-member mission of industrialists to Sweden, the UK, Ireland, France and West Germany during October.

During a two-week stay in the European countries, the Japanese group will demonstrate part of Aist's 18,000 or so high-tech patents at seminars for local entrepreneurs, academicians and government officials.

Broad areas of those patents include new materials, electronics and bioengineering. In electronics, emphasis will be placed on the amorphous silicon solar cell, isothermal capacitance transient spectroscopy for semiconductor defects and the YAG laser.

The progressive Japanese move to open

Continued on page 87

Ashton-Tate earns 407%

CULVER CITY, Calif. — Ashton-Tate last week announced second-quarter profits of $3.4 million, or 37 cents per share, up 407% from year-earlier profits of $682,000, or 7 cents per share.

Revenue for the quarter was $27.5 million, a 43% increase compared with revenue of $19.2 million in the second quarter a year ago.

The firm said the large increase in revenue and profits was due largely to sales of its Dbase III product.

International sales surged in the second quarter, compared with a year earlier, and the company said it will continue to place major emphasis on international sales. "The international market is growing more rapidly than the U.S. market, and we plan to capture a large share of that market," said Edward M. Esber Jr., president and chief executive officer.

Sperry hitches its wagon to Unix star

By Peter Bartolik

After decades of cultivating and captivating a mainframe customer base with proprietary products, Sperry Corp. last year decided to hitch its wagon to the concept that AT&T's Unix operating system would become an industry standard.

To a company that had watched IBM capture the lion's share of the mainframe market, the possibility of a standard evolving outside of IBM's control certainly holds allure. In fact, literally hundreds of companies have grasped at the prospect that Unix may someday provide users with the ability to port existing applications across vendor lines, thereby breaking the stranglehold of proprietary architectures.

That is not to say Sperry is in any hurry to relinquish its own mainframe installed base. At that level, the company offers a Unix-based SX 1100 product running as a guest operating system under its proprietary OS/1100 operating system.

But last year, Sperry attempted to shake off its image as a mainframe vendor with an array of microcomputer-to-superminicomputer products based on versions of the Unix operating system.

In the fiscal year ended March 31, Sperry boasted a 16% revenue increase and an even heftier 32% increase in profits. During the quarter ended in June, while many systems vendors experienced lagging sales, Sperry posted a 20% revenue increase and a 23% increase in operating profits.

According to two executives of Sperry's microsystems group, the new products contributed substantially to the increased bottom line. But, they added in a recent interview, that was not accomplished by selling much-needed lower end products to existing mainframe customers. "Only 10% to 20% of the new products went to installed-base customers," according to Joseph E. Garliano, director of micro products marketing, Americas division.

If anything, said Neal M. Waddington, director of product strategy, microsystems, Sperry "really has not emphasized the installed base" in its nonmainframe sales strategy. That, however, will soon change as the company educates its mainframe salesmen on the need to sell a full line of systems to existing customers, the executives said.

Sperry is selling itself as a systems integrator that can pull together many pieces to serve customer needs. It has taken that role literally, depending on other vendors to supply the actual hardware. "If you take a strictly proprietary approach, you can't keep up with the technology," Waddington said. He added, however, that even when it purchases a box from another vendor, Sperry usually has a comparable machine in devel-

Continued on page 86

DEC vs.
The Contender is a

In this corner: DEC, with the VT 100/220*–real heavyweights, listing at more than $1500 and $1095. Over there, the contender: Ampex, with its fully protocol compatible 219 and 220, both weighing in under $750.

How does the competition measure up?

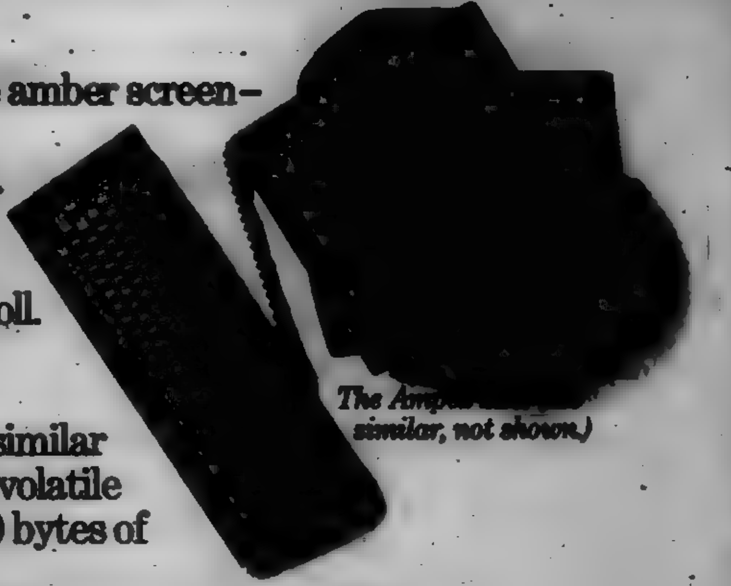
DEC's 12" green screens are 33% smaller so visibility's limited. (Ampex offers 14" amber or green screens at no extra cost.) Ampex's moves include tilt and swivel, while DEC only tilts.

Ampex's low-profile keyboards adjust for slope; DEC's cannot. DEC's VT-100 keyboard layout is similar to Ampex's 219, but handicapped by its function keys: the VT-100 has none, our 219 has 16.

Instead of the VT-100's two resident character sets, Ampex's 219 has nine–so it can adjust easily to performing in foreign arenas.

And our 219 offers two 80-column pages of display memory standard plus two more as an option. But that's not all that makes Ampex an odds-on favorite.

DEC's VT-100.



The Ampex [illegible] similar, not shown.)

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The Ampex 220's keyboard layout is similar to DEC's VT-220. But instead of 256 bytes of volatile memory for its function keys, Ampex has 400 bytes of nonvolatile memory.

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Trade secret laws protect software concepts, ideas

THIRD IN A SERIES

By Jerome Roberts
and Michael Brownell
Special to CW

Trade secret protection extends to an area not covered by copyright protection and, therefore, must be looked upon as an important, indeed often critical, complement to copyright protection. Copyright protects only the expression of the idea and not the idea itself. Trade secret status protects the idea in addition to its expression.

Trade secret protection is not afforded under a federal statute as is copyright protection but rather has been developed over the years as part of the common law that has been codified in several states that have adopted the Uniform Trade Secrets Act. Consequently, the availability, applicability and scope of trade secret protection is less certain than copyright protection.

Only information (for example, software logic, design concepts and coding) created or discovered by the business, not generally known and that provides the owner thereof with a competitive advantage over its competitors who do not know of or use it, is eligible for trade secret protection. Thus; the essence of such protection is a competitive advantage dependent upon secrecy.

The requirement of a competitive advantage is not subject to precise definition and must be assessed in light of the facts of each case. Software elements need not be novel in the sense of a patentable invention. However, concepts that have no independent economic value will not likely constitute trade secrets.

As a general proposition, software that satisfies the secrecy requirement discussed below should be considered to contain trade secrets to the extent that knowledge of its logical composition would be of value to the owner's competitors. Often this value is evidenced by the ability of a competitor acquiring trade secret information to eliminate its own independent software development activity and, thereby, obtain a marketing advantage. It should be noted, however, that unlike patent protection, two parties can independently develop and own a trade secret.

SECRECY REQUIREMENT

Secrecy is an essential element of a trade secret. Because maximizing the value of a trade secret normally requires some disclosure thereof (that is, to employees, consultants, customers and so forth), the law does not require absolute secrecy but, rather, "relative secrecy." There is no clear prohibition against revealing a trade secret through reverse engineering unless such a prohibition is contained in a contract between the parties. Therefore, a critical issue concerns the procedures implemented by a software owner to create such a relationship upon disclosure and thus protect the confidentiality of its trade secrets, both within its organization and upon distribution of the software.

Secrecy must also be maintained in the user environment. Written contracts in the form of licenses and, where appropriate, separate confidentiality agreements, must be used. All software intended for commercial distribution should be licensed pursuant to a carefully drafted license agreement, containing adequate restrictions on use, duplication and disclosure, and all evaluation presentations should be preceded by each potential licensee executing a confidentiality agreement. Source-code distribution as well as distribution of other materials that may explain software trade secrets should be avoided, and reasonable physical measures such as code, encryption, machine serialization and so forth are strongly recommended.

MICROCOMPUTER SOFTWARE

The existence and protection of trade secrets in mass-distributed microcomputer software is a difficult and much-debated issue. Some commentators feel that mass distribution of software, combined with the relative ease of extracting the logic thereof, terminates trade secret protection. Others argue that through written contracts, including shrink-wrap licenses, trade secret protection can be maintained even in the context of mass-marketed software.

Ultimately, the courts will have to strike a balance between the rights of the licensee, the rights of the software owner and the desire to promote commerce in this industry.

TRADE SECRET REMEDIES

The legal remedies available to an owner upon learning that its trade secrets are being wrongfully used include requesting a court injunction to prevent or restrain further wrong-

Continued on page 87

Roberts and Brownell are attorneys with the law firm of Berman, Roberts & Kelly in Chicago. This firm's practice deals with legal issues relating to procurement, development, distribution, management and protection of computer resources.

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Japanese consortium set

Trio seeks support for AI development

By [illegible] Kondoh
Special to CW

TOKYO (CWN) — Three firms are putting the finishing touches on plans to set up a Japanese consortium for late this month with the ultimate goal of establishing trilateral cooperation between Japan, the U.S. and Europe in artificial intelligence development.

The trio — Nissin Software Co., Structural Planning Institute and JGC Corp. — will eventually be joined by seven other Japanese firms, according to Nissin President Kazuro Fujimoto, who refused to identify the seven firms.

The planned joint venture, tentatively named Intelligence Engineering Research Institute (IERI), will be staffed by approximately 30 specialists from member companies. Its charter will pursue overall research and development on AI and explore ways to commercialize AI software, Fujimoto told CW Network during a recent interview.

On behalf of IERI, Nissin, Structural Planning Insitute and JGC are also reportedly negotiating technological cooperation with unspecified U.S. organizations.

Fujimoto said IERI will soon finalize ties with the German Center for Computer Science, West Germany's semigovernmental institute specializing in AI and other information science. A spokesman said that under the terms of this agreement, the center will provide IERI with support software for an AI development, called Babylon, a tool for designing expert systems.

Details of the German Center-IERI cooperative agreement have not yet been disclosed, but Fujimoto said that it will call on the Japanese group to supply its AI application expertise to the German Center and to initiate and enlarge joint efforts in commercializing these applications.

Fujimoto stressed that bilateral collaboration between the German Center and the Japanese jointly founded firm should grow into an international cooperation that will involve U.S. AI leaders.

Kondoh is international editor/Asia for CW Network.

National Semi arranges nine-day fall shutdown

SANTA CLARA, Calif. — The bad news continued for employees of National Semiconductor Corp. when the hard-hit chip maker recently informed its workers that it will shut down its U.S. and European operations for nine nonconsecutive days this fall.

The furlough, which affects 8,000 to 9,000 of National Semiconductor's 12,500 worldwide employees, is a continuation of the cost-cutting plan announced by the company in August. The shutdown will reportedly take place during National Semi's second quarter, which runs from Sept. 22 to Dec. 15.

National Semiconductor ordered a similar five-day furlough during the current quarter. Last June, the company laid off approximately 1,300 employees.

National Semiconductor is mired in the worst quarter in its history, and company President Charles E. Sporck has said he sees no signs of recovery in the near future.

The firm posted an operating loss of $44.3 million in the first two months of the current first quarter, and the total loss for the quarter is expected to be even greater.

Bank failure hits Flex/32 maker

DALLAS — The recent failure of the Parkwest Bank could mean a quarter-million dollar loss for Dallas-based Flexible Computer Corp. However, the company said the setback will not have a significant impact on operations.

Flexible Computer, maker of the Flex/32 parallel processing superminicomputer, reported its funds on deposit at Parkwest exceeded the amount insured by the Federal Deposit Insurance Corp., which shut down the bank at the close of business Aug. 22. The bank reopened under new ownership the following week.

Company spokesman Ron Hammond said the funds, which were letters of credit required by lessors of capital equipment to Flexible Computer, included up to $250,000 in unrecoverable funds.

Hammond said that amount is the company's maximum exposure and represents approximately 5% of Flexible's cash assets as of June 30. "We are making an effort to recover all of those funds," Hammond said. "The final result will be reflected on our financial statements when appropriate."

Flexible Computer reported sales of approximately $200,000 for the quarter ended June 30.

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COMPUTERWORLD

Wang appoints top executives

LOWELL, Mass. — Wang Laboratories, Inc. recently announced the resignation of one top officer and the promotion of two others.

Executive Vice-President Jon F. Kropper, who formerly directed Wang's worldwide manufacturing operations, will leave the company Oct. 1 to become president and chief operating officer of Hadco Corp. of Salem, N.H. Hadco is a major supplier of printed circuit boards used in Wang products.

Replacing Kropper at the executive vice-president level is J. Carl Masi, who will continue to direct Wang's international sales and marketing.

An 11-year Wang veteran, Masi has become increasingly visible since former President John Cunningham's departure, leading observers to consider him the leading candidate outside the Wang family for the presidency.

Frederick Wang, the son of Chairman An Wang, is also an executive vice-president.

The office automation company also announced the promotion of Ian Diery to senior vice-president for European, African and Middle Eastern operations.

Chairman Wang assumed the president's chair when Cunningham departed in July to head Computer Consoles, Inc. of Rochester, N.Y.

Firm cuts staff by 5%

WILMINGTON, Mass. — Compugraphic Corp. recently announced a layoff of 250 employees, or about 5% of its total work force, in an attempt to reduce expenses.

The company said it has experienced a slowdown in orders for its graphics communications equipment and that the layoff was needed to balance expenses with the current revenue level.

Affected employees included both salaried and hourly workers. The company said it will provide out-placement services to assist those employees in finding new jobs.

The action reduced the company's total work force to approximately 4,700 employees.

From page 81

Sperry hitches its wagon to Unix star

opment. "If we can compete favorably, we will take our own products to market," he said.

Waddington said that the company believes that despite problems, Unix is effectively becoming a standard to which all vendors must offer links. Sperry, he said, wants to be first with a complete line of Unix-based machines.

However, the company offers Microsoft Corp.'s Xenix version of Unix System 3 on single-user microcomputers, AT&T's Unix System V on supermicrocomputers and System V and another Unix version, University of California at Berkeley's 4.2, on superminicomputers.

But Waddington said the company is confident that Microsoft's promised update of Xenix will be compatible with System V.

Like other mainframe vendors, Sperry sees the influx of networked workstations and minicomputers as leverage to increase sales of mainframes. "The mainframe is a very important backbone to networks of systems," Waddington said. "We see the mainframe as more the keeper and dispenser of data and less of an application machine."

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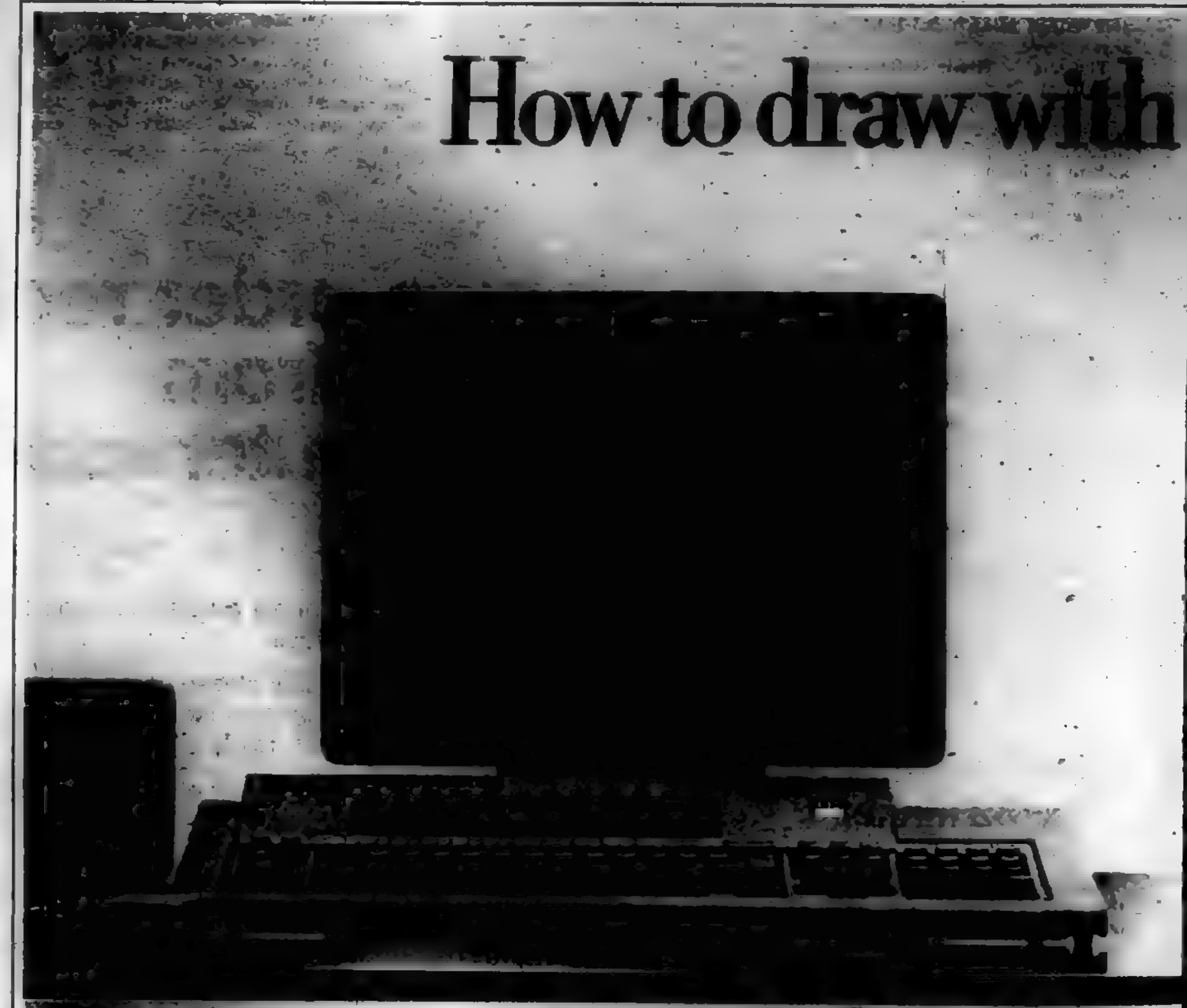

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Chip maker files antitrust suit

BOISE, Idaho — Micron Technology Co. fired another salvo in its battle with Japanese chip-making competitors recently by filing a $300 million federal antitrust suit against six companies. The suit is considered the first civil litigation against Japanese firms in the semiconductor industry.

Micron claimed antitrust and chip-dumping practices by Hitachi Ltd., NEC Corp., Toshiba Corp., Mitsubishi Electronics Corp., Oki Electric Industry Co., Fujitsu Ltd. and their U.S. subsidiaries. Micron charged that the six firms conspired to monopolize the chip industry, individually used predatory pricing tactics and sold their products in the U.S. below their manufacturing cost.

The lawsuit came after a recent favorable preliminary ruling by the U.S. International Trade Commission on Micron's antidumping petition [CW, July 8] to the U.S. Commerce Department against the same companies and Matsushita Electric Industrial Co. On Aug. 2 the commission voted unanimously to continue the investigation.

From page 84

Trade secret laws protect software

ful use of the trade secret, including the marketing of products based upon such a trade secret; and recovering damages from the infringing party equal to the actual loss suffered by the owner or the profits wrongfully received by the infringing party, whichever is greater. In some states, criminal sanctions may be available.

It is of critical importance to commence appropriate legal action immediately upon learning that a trade secret has been misappropriated. Failure to do so will inevitably result in the loss of trade secret protection because the secret will be passed to innocent third parties, thereby losing its status as a "secret," and because the availability of an equitable remedy such as an injunction depends upon making a timely request.

From page 81

Japan to sell high-tech patents

its technological door to foreigners coincided with Miti's recent agreement to allow IBM to use all the computer patents held by Aist.

A basic agreement, reached at the end of July, ended IBM's request for full access to the Japanese government's computer patents.

A Miti source, who asked not to be identified, said that the agreement, covering the period from 1986 to 1990, called on Aist to provide the U.S. maker with an all-inclusive right to execute related Japanese rights. Approximately 430 patents are initially subject to the IBM-Aist pact, the Miti source said.

Part of these patents apparently relate to joint developments between Aist labs and Japan's six largest computer builders, including Fujitsu Ltd., NEC Corp., Hitachi Ltd. and Toshiba Corp.

Some opposition

Some Japanese electronics executives oppose the computer patent agreement, claiming it will set a precedent for an uncontrolled outflow of Japanese technological know-how and will have serious ramifications involving piracy.

The October mission will be the third of its kind. A similar delegation was sent to France, Sweden and West Germany in 1983 and to the U.S. and Canada in 1984.

In an interview with CW Network, Hiroshi Tagaya, general research manager of the Japanese Industrial Technology Association, said that he hoped the association's patent and sales tours would help to improve the reception of Japanese industries abroad.

"Such efforts may spawn ties between Japanese and foreign firms, increasing the chance for [Japanese] firms to shift to overseas users when home markets get saturated," he said.

Traditionally, Japan had depended heavily on advanced foreign countries for innovative technologies, a fact that forced its outward technology transfer to remain at low levels.

Kondoh is international editor/Asia for CW Network.

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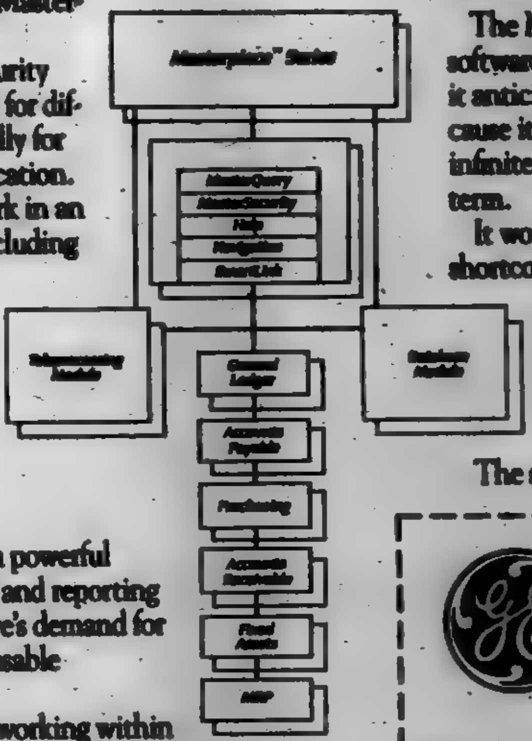

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From page 81

No big changes foreseen for Sterling acquisition

utive vice-president of systems, and Vice-President Jeannette Meier Zacker, the company's top legal officer. Lemons has moved to an Informatics office in Canoga Park, Calif., while Zacker has moved to Dallas.

James R. Porter, applications executive vice-president and No. 2 man behind Bauer, resigned to become president of Triad Systems Corp. in Sunnyvale, Calif., [CW, Aug. 19].

Sterling spokesman Ray Hannon denied industry rumors that Bauer received a special financial incentive for resigning. "No special arrangements were made," Hannon said. "It had been foreseen from the very beginning of the attempted hostile takeover that he would leave. He was entitled to the same consideration as all employees who left, with compensation based on salary, position and senior''y. In most cases, it was Sterling's policy to improve upon the normal Informatics severance package."

Final stamp of approval

Informatics shareholders met last week to put the final stamp of approval on Sterling's $27 per share buy-out package. Informatics agreed to the offer in June [CW, July 1] after months of fighting against it when Sterling's unfriendly takeover price was $26 per share.

"The operating philosophy of Sterling is to run as decentralized as possible," said Informatics spokeswoman Carol Hays. "It appears there will not be major changes in areas such as marketing and research and development."

Analysts who follow the two software houses agreed that it is in Sterling's best interest to disrupt the Informatics user base as little as possible.

"Sterling has been eager to acquire new clients, and [Informatics'] Mark IV and Mark V are as widely installed as any products out there," said Ann Morley, a software analyst with International Data Corp. in Framingham, Mass. "The attraction of those accounts was a big factor in Sterling's interest [in the acquisition], so I don't think they will make drastic changes."

Morley said consolidation of research and development and marketing efforts for some products, such as Sterling's Dylacor and Informatics' Answer/DB, is likely. "It would be silly to maintain a fragmented marketing and R&D organization for similar offerings," she said. "Informatics has been pretty inconsistent in marketing in the past."

But Sterling is expected to take a hard look at each of Informatics' businesses in an effort to raise cash quickly. "Sterling will be looking to reduce the debt, and the way to do that is to enhance profitability or sell other parts of the business," said John Turo of the Houston investment firm of Rotan Mosle, Inc.

A likely candidate for sale may be Informatics' professional consulting services business, which has been profitable but has little synergy with the company's product offerings. "Clearly the existing consulting business is too large," IDC's Morley said. "Informatics' determination to be a multiproducts and multiservices vendor contributed to its fuzzy image."

Informatics reported a $579,000 loss on $55.4 million in revenue for the quarter ended June 30 [CW, Aug. 12] although the firm attributed the decline to $2 million in costs for its proxy fight during the early stages of Sterling's hostile takeover bid.

From page 81

Datapoint saga real cliff-hanger

million in assets that Datapoint encompasses. Edelman said in a recent interview that reaction to his moves has always been skeptical "since I've been in the business of acquiring companies." He added, "The only way to deal with that is to do what I'm supposed to do when I get there."

Now that $277 million has been bid for the Datapoint entities — just shy of the original $300 million asking price — it is somewhat inconsistent to impugn Edelman's motives.

But the guy is also representing investors in his arbitrage partnerships, and his modus operandi to this point suggests that his business goals depend on being able to liquidate his initial investments quickly and at a substantial profit.

Craig Symons, an industry analyst with the Gartner Group, Inc. of Stamford, Conn., noted that Edelman bought two million shares in Datapoint for an average price per share of $17 but that the current per-share trading prices of both Datapoint and Intelogic Trace totaled only about $15. In Symons' view, Edelman's previous plans "haven't worked out for him because he didn't understand what he was getting into."

Datapoint posted a $28 million loss in the third quarter and, according to Symons, must still be losing millions on a revenue base that isn't increasing. The company recently said it will be several weeks late posting financial results for the fourth quarter and fiscal year ended July 27.

Edelman said, however, that the fourth quarter was ahead of plan. And he argued that taking the company private will enable him to make it more efficient; he has previously implemented some streamlining. He also promised that products introduced in recent weeks will be delivered on time. Both factors should encourage existing customers, he said.

That may be so, but customers certainly have to be concerned about the changes in strategy outlined so far this year. There are still a great many skeptics who think that, in Symons' words, "This is just another chapter in the continuing saga — or maybe tragedy is a better word for it."

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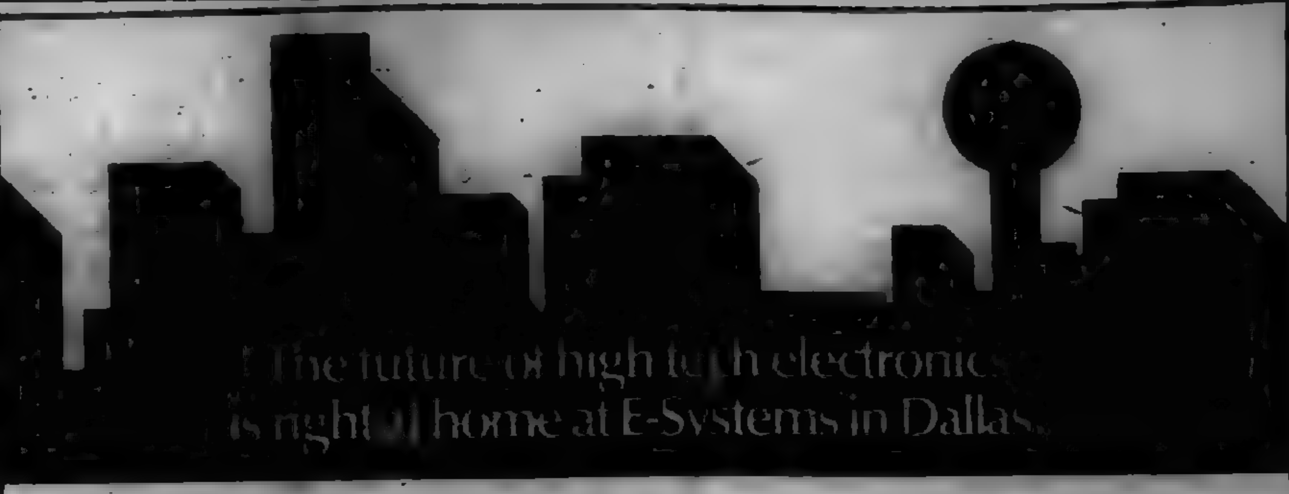
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The Information Systems Division of HealthOne Corporation, a multi-hospital, diversified, health care delivery system, has the following key positions available for persons with appropriate experience and training.

Manager, Computer Operations, responsible for the management of HealthOne's two primary data centers through subordinate Data Center Supervisors. Will direct the efforts of approximately 30 Computer Operations, Production Control and Scheduling, and Customer Service personnel at two Twin Cities locations.

Physical environment includes IBM 4381 and 4341 host processors and numerous distributed Data General, Hewlett Packard, and Series 1 mini-computers. Current mainframe software includes VM, DOS/VSE with CICS, VTAM, VSAM, VOLLIE, LIBRARIAN, DYNAM-T, DYNAM-D, and ZEKE.

General requirements include a working knowledge of IBM medium to large scale systems operating under VM and DOS/VSE. Experience with MVS is highly desirable. Must have five to six years of operations experience with at least three years of management experience. A Bachelor's degree in a related field is desirable.

Manager, Patient Management Systems, responsible for management of in-house analysts and programming personnel, contract programmers, software vendors, and consultants in order to successfully manage the delivery of patient accounting systems to multiple hospitals. Application software is MEDIPAC Patient Accounting and ADT with additional systems planned for 1985 and beyond.

General requirements include experience with healthcare business office systems and IBM medium to large scale systems. Hands on experience with MEDIPAC is highly desirable. Candidates should have a minimum of five to six years of experience demonstrating substantial responsibility for management at the project level and above. A Bachelor's degree in a related field is desirable. An advanced degree would be a plus.

Senior Systems Analyst, Patient Management Systems, responsible for major systems development projects within the Patient Management Systems department of HealthOne's systems development group. Work with end user managers and end users to define business requirements. Perform analysis and design activities to support programmers with systems specifications. Evaluate vendor product offerings against requirements.

General requirements include experience with healthcare business systems and IBM medium to large scale systems. Hands-on experience with MEDIPAC is highly desirable. Candidates should have a minimum of four to five years of experience demonstrating two to three years systems analysis experience with a prior background in programming. A Bachelor's degree is preferred which may be offset by additional experience.

These positions will be attractive to persons whose qualifications match or exceed the requirements. We offer these positions in a challenging environment with competitive compensation and with an attractive benefit package.

To be considered for these positions, please submit your resume, with recent salary history to:

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Position Announcements

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data processing

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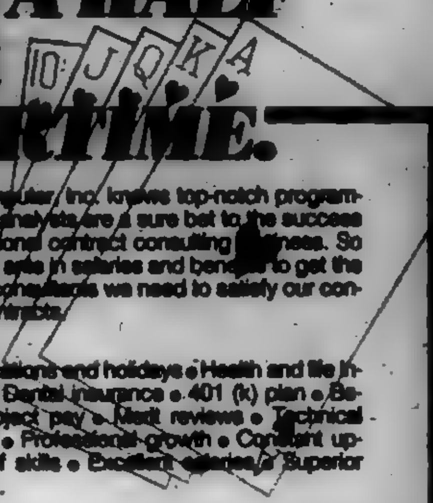

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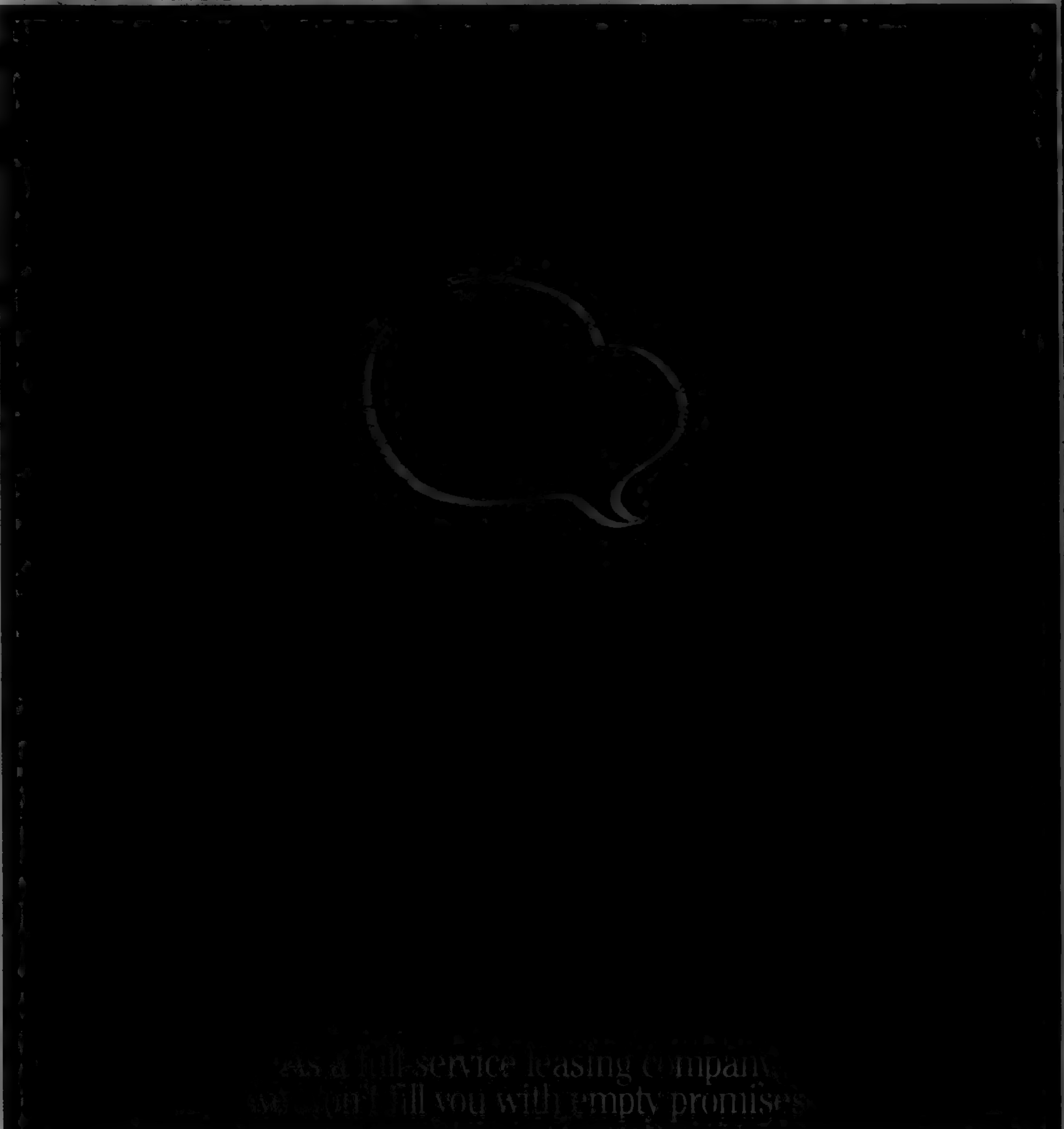
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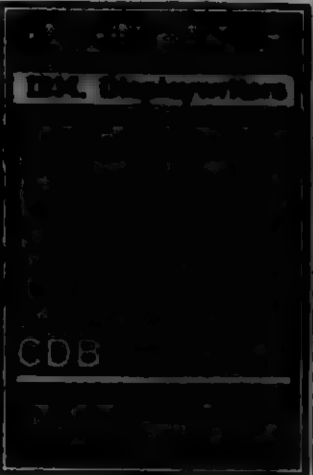

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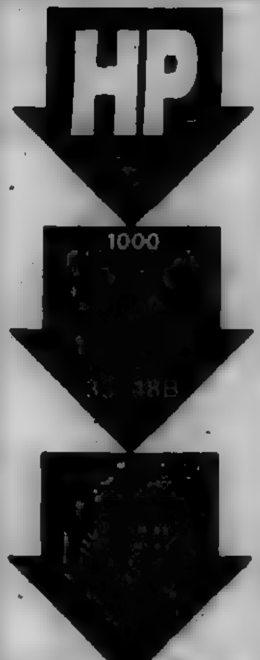

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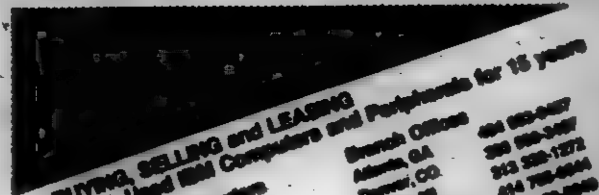

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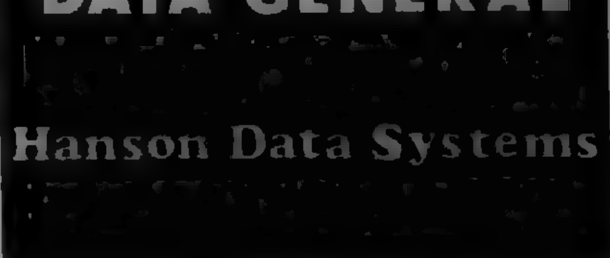

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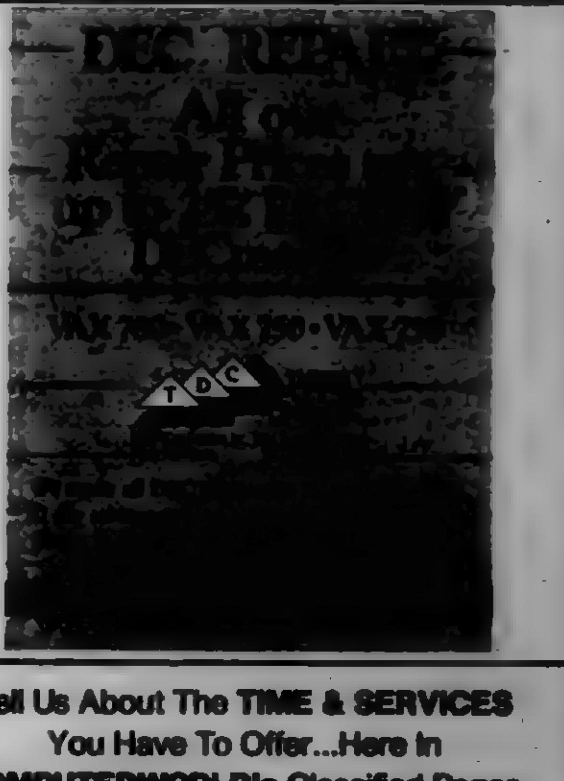

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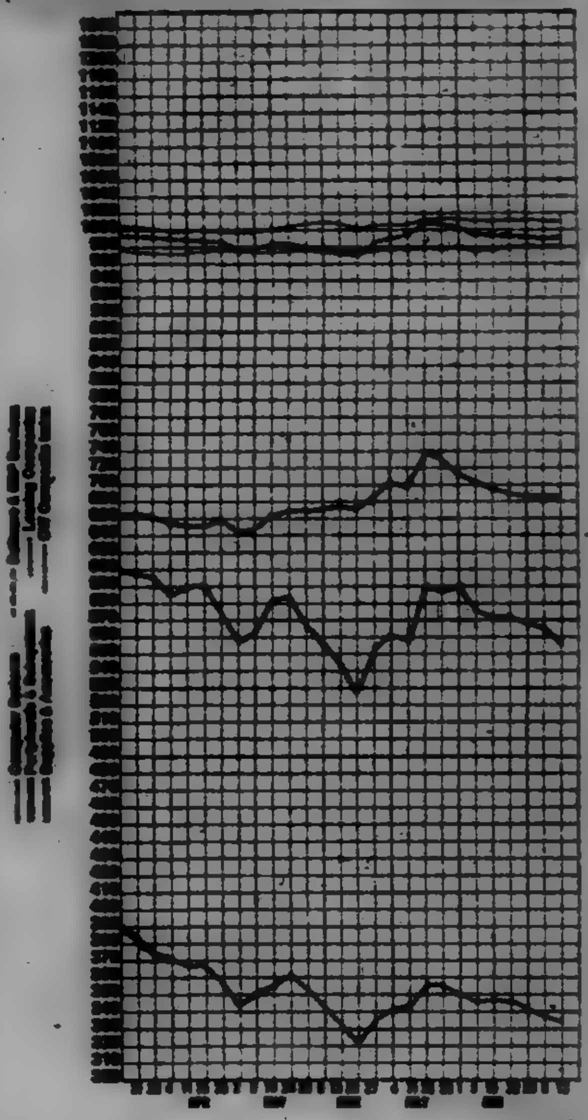

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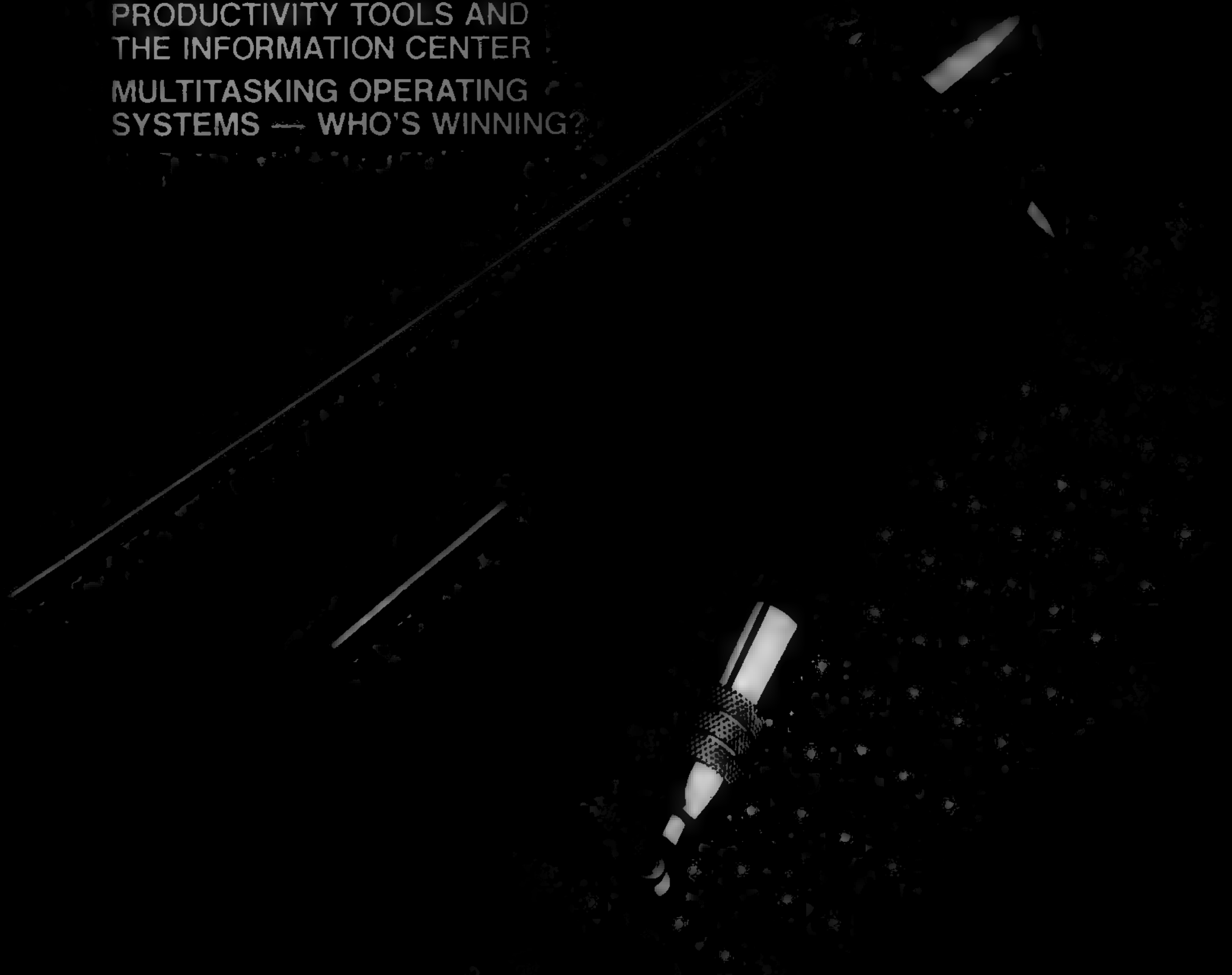

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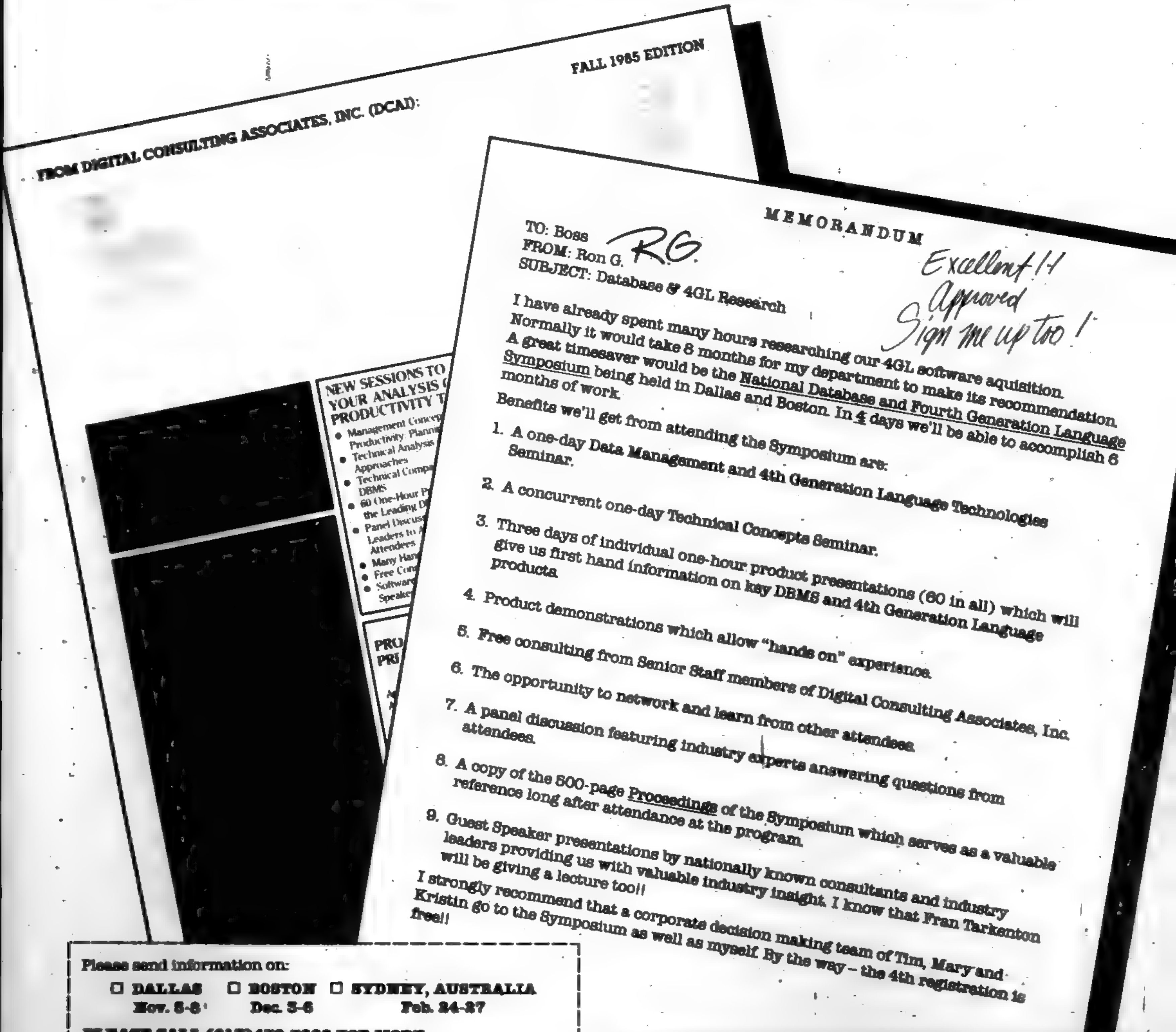

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About our cover: M. Steinert & Sons Co., Inc. graciously allowed us the use of their Boston facilities, and Tuner's Supply Co. of Somerville, Mass., loaned us the piano tools. John Owens took the photo.

Editorial

Demands and Costs Soar

The demand to get maximum mileage from the data center's mainframes has never been stronger. This time, however, hardware is not at issue; instead, the issue is the growing cost of systems software.

In the last few years, many data centers have turned to packaged software rather than developing software in house. More often than not, companies found it cheaper and faster to purchase utility software that had been tested, debugged and used successfully by other installations than to develop their own. This may no longer be the case if purchased software costs keep rising.

IBM MVS and VS users have seen their systems software prices more than quadruple since 1980. Estimates indicate that this year IBM 3090 mainframe users will spend about 12.5% of their total three-year major operating costs on systems software. In comparison, the 3033 user in 1980 paid out only 6.5% of his major operating costs for systems software.

The days of "free" systems software are long gone. When software and support charges were no longer included in hardware prices, the potential for cost escalation was introduced; now those charges are rising with a vengeance.

The software market is undeniably important to IBM: Estimated 1984 software revenues for IBM reached $3.2 billion. IBM has begun implementing different marketing and pricing tactics with some of its new products to provide greater pricing flexibility. One of these new tactics involves its new version of Unix. For the first time, IBM will charge a license fee dependent on the extent of the software's usage.

In a move that will stabilize and stimulate the market, IBM is also trying to strengthen its software credibility in its micro-end products. IBM's recently announced partnership with Microsoft to jointly develop future operating systems and systems software products was welcome news to most of the industry. Users and vendors alike were worried IBM would move away from DOS and adopt its own proprietary operating system that would lock systems and applications vendors out of IBM's product line at the same time it locked users in.

The U.S.Commerce Department has projected that the software industry will become a $55 billion market in 1987. This rapid growth will result in larger shares of the MIS budget being spent on systems software.

If it hasn't already, MIS needs to become aware of this escalating cost factor. Double-check your vendor's marketing agreements to make sure you understand all hidden or future costs. And, most of all, be aware that getting the most for your money in systems software is going to get harder.

Insider

From Data To Intelligence

By Damian Rinaldi

How does one measure the value of data or information? Is it good because it's new? Or is it good because it's accurate? What turns information into intelligence?

An old story relates how a youth searching for meaning and inspiration in his life hears of a great man and leaves his own city to find him. He travels for a dozen years or more, has many wonderful adventures and endures many hardships. But in each place he visits, he hears more of this great teacher who lives in a far-off land and moves on to find him. The young man, grown stronger in body and spirit after all his travels, finally finds himself near his home; he returns, only to discover that the teacher he sought was the old friend living right next door who had sent him on his quest.

Like all good stories, this story has many levels of meaning. But it does illustrate the value of the right intelligence at the right time. The person who finally became the young man's teacher might well have been known to him for all his life. Also, the young man may have been given good information and guidance by the people he encountered, but without the experience of his own efforts behind him, he could not recognize the teacher who lived right under his nose.

A complex challenge confronts those responsible for selecting the right vendors and products for your organizations. You have to develop a flexible strategy for information management and build upon it so that unanticipated requests can be met easily. Information from all parts of your organization must be made available in an appropriate form to people who need the competitive edge intelligence provides.

This challenge has two aspects: technical and organizational hurdles are presented by the partial solutions you have embraced, the hodge-podge of systems and products acquired by individual departments whose requirements you were unable or unwilling to satisfy and the resulting mess you now have responsibility for cleaning up. The problems are compounded by the very simple fact that they are not separable and need to be addressed at the same time they are evolving.

There is, however, a glimmer of reason. The major and most influential, vendors are not quite so insistent that theirs is the *only* acceptable solution and not so intolerant of the coexistence dictated by the flexibility you require. Most encouraging, a growing collection of upstarts have positioned themselves and their products to bridge the gaps between the discrete solutions already in place.

Which piece of information is the right one? Whose advice is best? What strategy is most likely to bring me closer to my goal?

As MIS managers or chief information officers, your obligation is not to provide to your end users the single piece of correct information or intelligence that results in their success or failure. It is your responsibility to provide the tools they need to find their own solutions. Some of those tools exist today. Typical of them are products like Linkware from Linkware Corp., Waltham, Mass. or Framework II from Ashton-Tate, Culver City, Calif. The benefits both products offer are similar, despite their differences in application. Each vendor has recognized that different, incompatible systems are in wide use and that the ability to move information from one strange environment to another creates the opportunity for the end user to turn raw data and unconnected, unrelated information into solid competitive intelligence.

Linkware's universal translation capabilities, as well as the vendor's flexible pricing strategy make it easy for users to experiment and then expand or not depending on their own experience. Framework II's import/export capabilities from industry standard packages and the ability to extend those capabilities as new standards emerge provide the flexibility of response users are and should be demanding.

The integration of user experience and information management technology into knowledge management and expert systems that can result in better intelligence will occur most easily where the barriers against flexibility are broken down.

Access to information and the knowledge that good information is an invaluble asset is spreading like wildfire. Like a wildfire though, it can be guided, and it can make room for new growth. As facilitators or as guides and teachers, information systems managers share the risk that, uncontrolled and unguided, the information management revolution, if not well guided, will burn past and bring down their companies.

■

Rinaldi is director, software and services information program, International Data Corp. in Framingham, Mass.

dB
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Computerworld Focus

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Manager's Corner

By Jim Young

Every time I think about systems software, I am reminded of a particularly applicable cartoon. It showed an automat where, in an attractive surrounding, customers were conveniently removing food from the compartments. On the other side of the device, an army of workers crawled over one another to stock the empty slots, fix the food and keep the equipment going. This may be a humorous and exaggerated criticism of automation, but it speaks truthfully for today's systems software environment and its dependence on people.

For years, operating systems were supposed to be getting more automated, more embedded intelligence, less tailoring, less intervention and better users of the hardware (which would do its part by increased use of microcode). And, in fact, much of this happened. Unfortunately, however, it did not result in a simple, people-free environment. Simultaneously, function and complexity have increased dramatically. Broader integration has become more necessary; performance has become more critical. People are still required — many more people than have been saved by selected improvements. The result is a situation with accelerated demands on the systems programmers and the telecommunications, software and data base analysts. As computer systems play a greater role in company operations, these people become increasingly important. To quote the sports writers, they are the "straw that stirs the drink." Creating a productive environment for these people is of paramount importance to today's data processing manager.

Technical decisions are not unimportant. Selection of operating system, utilities, performance tools, spooling packages, library management tools and so on is still an integral part of today's DP environment and can still have fatal repercussions. Fitting these selections into a long-term strategy, ensuring compatibility between various packages and controlling costs all can lead to many an ulcer or sleepless night. Nevertheless, the most critical factor for success in this environment is the people who maintain these products.

I am also not emphasising systems software people management and ignoring other DP professionals. It's just that most traditional organizations have come to understand the role played by computer operations, applications development and other people whose jobs can be directly related to products delivered to today's perceptive users. However, the role played by people managing systems software is still obscure. The old perception as backroom specialists dealing with arcane toys or as ugly ducklings intrigued by obscure technology still exists. You can almost see the thick glasses and white lab coats. The image may have some historic justification, but it cannot be allowed to continue without jeopardising the foundation on which today's applications rest and placing at risk company operations and future performance.

To allow systems software professionals to make strong contributions, a productive, supportive environment can be created in the following areas:

- **Salary:** While the laws of supply and demand more than correct any discrepancies in starting pay, it is a sin for people to have to change jobs continually to be fairly compensated. By permitting this situation to continue, companies are needlessly losing critical skills as well as proprietary knowledge. DP managers must ensure salary structures that allow improvements within an organization. Job hopping has somewhat abated, but an absence of good internal programs could cause it to become an epidemic again at the first rays of economic sunshine. These salary scales even today can be easily justified by the criticality of system software in company operations.
- **Careers:** Salary programs should be accompanied by a plan of upward mobility — additional job positions to reflect increasing responsibilities. Just offering more money for similar performance is treating systems software professionals as mercenaries, an attitude that breeds the fickle loyalty of all soldiers of fortune. True careers allow on-the-job training, which expands responsibilities and allows systems software people to improve and broaden their skills. Simultaneously, they will be increasing their contribution to an environment for which they will build a sense of ownership. A happy consequence is that as systems software environments evolve, the transitions are consistently controlled by these long-term employees.
- **Development:** To complement this upward mobility, skill development programs will be necessary to prepare people for the new jobs. Increased requirements for people skills, planning skills, budget management skills and so on are essential to eliminate the old stigma of technical mechanic and to integrate system software methods into the rhythm of the management process. These skills are more critical than ever in today's environment with long lead times, more complex far-reaching impacts and more intricate coordination for systems software.
- **Recognition:** Although positive recognition of the systems software staff is an essential first step, educating others is also necessary. Today's DP managers have almost exhausted their ability to flatter, cajole and motivate. Technical professionals know their role transcends internal DP issues and they are becoming insensitive to traditional blandishments. Others must also join in to emphasize the broad dependence on this technology. This includes key user managers, human resource management and, ultimately, company executives.
- **Involvement:** As job responsibilities and job skills expand, systems software professionals will be able to get involved as equal partners, not servants, on major company plans and programs. This is the level where all the previous groundwork pays off by having adequately rewarded, motivated, trained professionals that have developed their skills over a period of years and now understand both technical capabilities and the company's climate and ultimate direction. People with the right technical background and business perspective will appreciate the importance of the critical decisions made by DP. With their participation, those decisions can assure the right foundation for future growth and productivity. Ongoing implementation then becomes a natural extension of the process, a commitment and not a management mandate.

Maybe a company's heavy dependence on people with specialized skills to manage the technical environment will disappear eventually. Maybe technology will absorb their responsibilities or restructuring will spread out the dependence on systems software. Maybe. But in the meantime, a weak systems software staff is the sword of Damocles hanging over an unsuspecting company's future.

The job of today's manager is to prevent this danger by improving the environment of systems software professionals and turning them into a company strength.

■

Young is management information systems director and responsible for user technology at Wright Line, Inc., Worcester, Mass. He has worked in the industry for 15 years.

Q&A

Burt Rubinstein is vice-president of Research and Technology at Index Technology Corp. in Cambridge, Mass. He helped to develop Excelerator, an integrated workbench of tools for systems analysts and designers. Rubenstein shared with Computerworld Focus *his views on how workbench tools have changed and will continue to change the way traditional data processing professionals support companies' business needs.*

What systems development problems do workbench tools target?

Five or 10 years ago all the tools were programmers' tools — like compilers, editors and debuggers — even though the research at the time was really saying a lot of the payback could be improved if people did a better job up front. In the old days, it was 20% analysis and design, 80% code and debug. Realistically, now it is probably 40% analysis and design and 60% code and debug.

Did the percentage change because it had to change or because with new technology it could change?

A combination of the two. People were becoming more sophisticated. There was five to 10 times more work to do and more complex systems needed to be built, but there were only 10% to 20% more people. They were ripe for new techniques. But the new techniques were burdensome. People had to become much more formal in the way they did analysis and design. Because of that, the whole area of tools really opened up maybe three or four years ago.

Can you define these workbench tools?

There is a classical waterfall life cycle where you finish one step, have everything signed off by the user and you go on to the next step. An ideal workbench would be sitting down with the computer and talking to it about your requirements; then out the other end would come a system all fully coded and complete with user documentation. Obviously we're nowhere near that goal yet. Workbench products are attacking the front end with the intention of attacking more over time — how do you look at an existing real world system? How do you decide what is in it, and then how do you design a first cut at what the computer system is going to do with it? How do you integrate all that together? Over time, one would hope these workbenches would go more toward the real front end of feasibility and business needs and toward the far end of making a good strong link to the actual coding and debugging of the system.

Are you talking about a fifth generation beginning at the front end?

When the workbench tools really meet their potential, yes. When you do the whole thing it might be even beyond the fifth generation. Over time, the different categories of people building systems, like analysts and programmer/analysts and programmers and maintenance coders and systems programmers will really become two: the analyst/builder, who might actually be the user; and, at the other end, the people who provide the tools the analyst/builder uses. Hopefully, the number of tools providers will shrink so that all you have are analysts/builders who are actually the end users.

Will these products alter the makeup of the DP department?

Workbench products combined with techniques, methodologies and concepts of system design will. Good programmer/analysts who can work with users will become the analyst/builders, and really good systems programmers will become the tool providers. We hope to provide at least five or 10 times productivity improvements for the development life cycle. It has to drastically change the makeup of the DP organization.

Will people within the DP organization have an easy time adapting to these changes?

I don't want to sound elitist, but the

(Continued on Page 9)

In the News

Reports Cite Potential In Aftermarts

The microcomputer software industry might not be as bleak as the press makes out, according to separate reports issued by market research firms International Resource Development, Inc. (IRD) of Norwalk, Conn., and Venture Development Corp. (VDC) of Natick, Mass.

According to the IRD report, "Key Vertical Markets for Microcomputer Software — Financial, Legal and Real Estate Segments," the real profits in microcomputer software lie in the software aftermarket, which it defined as training, consulting, software enhancements and support and business forms and supplies. The report indicated that aftermarket sales are now shooting past initial software package sales revenues and by 1995 will account for fully 84% of total microcomputer software industry sales.

The report also noted that the number of small firms is rapidly shrinking in some industries such as banking, drying up a primary market for smaller software firms. Ironically, though the aftermarket is booming, many software vendors are ignoring the market, concentrating on initial sales. This is a strategy, the report pointed out, dangerous to these firms in the long term.

Both the IRD report and the VDC report entitled "Distribution of Microcomputers to OEMs and VARs: A Strategic Analysis," emphasized the strength of the microcomputer vertical software market.

"Whereas horizontal application packages automate specific tasks such as accounts receivable or inventory control," the VDC report stated, "vertical applications software can automate an entire small business." The report also predicted that vertical market micro software sales in the U.S. will reach nearly $2 billion by 1986.

Among the businesses the VDC report said would offer excellent growth opportunities for vertical software over the next five years were medical and dental practices, pharmacies, legal practices, contracting and construction firms, insurance agencies and wholesale/retail distribution. Vertical markets already represent, the VDC report noted, as much as 50% of the entire microcomputer marketplace.

For further information, contact International Resource Development, Inc., 6 Prowitt St., Norwalk, Conn. 06855 or Venture Development Corp., One Apple Hill, P.O. Box 9000, Natick, Mass. 01760-9904.

Ashton-Tate Stakes Claim To Multimate

The planned takeover of Multimate International Corp., East Hartford, Conn., by Ashton-Tate of Culver City, Calif., might provide Ashton-Tate with the extra guns it needs to become Number One in the beleaguered U.S. microcomputer software market.

First, the purchase of Multimate International will give Ashton-Tate combined revenues of over $100 million for fiscal 1985, second only to the $157 million in revenues registered by Lotus Development Corp. of Cambridge, Mass. It will also provide Ashton-Tate with another software product winner in Multimate, the successful word processing package, which Multimate International claims has captured from 30% to 35% of the U.S. market for WP software within corporate micro installations.

Multimate, in combination with Ashton-Tate's very successful Dbase III data base management system and its Framework integrated software package, give Ashton-Tate a strong triad of products going into the latter part of the decade. Multimates's solid Fortune 1000 customer base will also give Ashton-Tate a greater avenue into large corporations.

"What we are seeing is a further consolidation of software companies in the U.S. micro software market," explained George Colony, president of Forrester Research Inc., a Cambridge, Mass., market research firm. "Ashton-Tate is adding a strong WP package to its products, trying to preempt a move by Lotus (Development Corp.) into that same area."

Colony said he views the Ashton-Tate/Multimate acquisition as part of the final phase of what he termed the "closing-off" of the first-generation micro software marketplace. In Colony's estimate, the first-generation market, represented by the IBM Personal Computer, has been won by a few large software houses represented by Lotus (which recently purchased Software Arts, Inc. of Wellesley, Mass.), Ashton-Tate, Software Publishing Corp. of Mountain View, Calif., and Microsoft Corp. of Bellevue, Wash. According to Colony there is now little hope for new, innovative software companies to enter and survive in this market.

Where Colony did see hope, however, was in the budding second-generation micro market represented by the IBM AT,

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MANAGEMENT SUMMARY

FDR (formally known as Fast Dump Restore) is a dump and restore utility designed to reduce the time required to produce a dump and restore the data. FDR replaces all standard IBM dump/restore utilities, supports all VS1 and MVS (XA) environments, and can be used with most IBM and compatible disk devices.

FDR uses three method plans in attaining input/output efficiency: 1) the use of increased blocking factors, 2) the elimination of redundant and unnecessary data, and 3) the use of cylinder orientation to minimize delays due to physical rotation, arm movement, and so on. FDR also offers a performance option (BUFNO=MAX) that increases the number of buffers FDR uses during the dump operation, and is designed to decrease elapsed time and save system resources. FDR has a full-volume disk-to-disk feature.

FDR includes a *Stand-Alone Restore* (SAR) program. This program allows restoration of a full-disk volume when, due to the unavailability of a VS1 or MVS operating system, FDR cannot be run. SAR can also be used to restore partial volumes and to clip a volume. SAR also aids the operator by issuing prompting messages on the console and error messages on the console, printer or tape whenever a problem is encountered during the restore. SAR also permits the Restore of specific tracks.

Recent enhancements to SAR include support of stand-alone operations in MVS/XA mode, a standalone backup capability, and support of backup and restore functions under VM.

A no-charge option available to FDR users is the *Data Set Functions* (DSF) subsystem. DSF allows the user to dump and restore individual data sets on a pack and to dump and restore by absolute tracks. It can also be used to restore data sets from full-volume FDR backup tapes and allows the user to rename a data set when restoring it. Password protection is provided, and can be activated on either a volume or data set basis.

Compaktor (CPK), an extra-cost option, is a disk management utility used to reorganize direct-access volumes using the FDR methodology. It reduces space fragmentation, merges data set extents, aids in positioning data sets, and offers several other solutions to frequent disk pack organization problems.

Automatic Backup and Recovery (ABR) is another extra-cost option that manages disk space on direct-access volumes. Disk volume and data set backup can be automated based on the last reference date and update characteristics. Data sets that have not been used for a time period can be automatically archived, freeing the disk space for more productive use. Reports can be tailored to user specifications. A Data Set Not Found Exit permits the Automatic Restore of data sets that have been archived without user intervention. The vendor recently released extensive ABR panels for TSO users. The panels provide complete dataset and volume reporting, thus permitting end users more direct control over their datasets. ABR is designed to operate with both the DSF and Compaktor subsystems.

FDR provides enhanced support for VSAM files which are cataloged into an ICF catalog. These data sets are also relocatable with DSF and ABR.

COMPETITIVE POSITION

While the packages listed on page one of this report compete with the FDR/Compaktor/ABR products, the only competition for FDR itself is IBM's DF/DSS. FDR is more efficient than the IBM product. This, along with its reliability, account for FDR's very extensive user base.

The other products listed as competition are disk space management packages and thus compete with ABR. The main competition includes Cambridge's ASM2 and Sterling's DMS/OS. While both of these products were introduced several years before ABR, neither has as large a user base. In addition, they are both more expensive than ABR.

The FDR/Compaktor/ABR family of products holds a very strong market position that is likely to continue. The family provides outstanding performance and reliability, and the vendor has earned a reputation for quality control that is equalled by few in the industry.

ADVANTAGES AND RESTRICTIONS

FDR, as its name implies, is a fast method for dumping and restoring data. The package is faster and more efficient than similar IBM utilities, and achieves a high performance level, reducing elapsed time and saving system resources.

A major advantage is the Stand-Alone Restore program. The ability to backup and restore disk volumes without an available operating system is critical to disaster recovery. The automatic restore to unlike devices and the automatic restore of archived files are additional advantages.

Another major advantage is the outstanding reliability of both the product and the vendor, as attested to by the rating in Table 1 and the wealth of comments from users. Many consider FDR the most reliable software package they have ever used, with never a bug to be found. Another decided advantage of FDR is the free 90-day trial offering.

USER REACTION

Twenty-three users of FDR responded to an independent Datapro survey. The average age of installation was 4½ years. The utility was running on various IBM mainframes as well as on an Amdahl 5860 and three NAS models. All but one were running under MVS, MVS/SP, or MVS/XA. Not every respondent rated all categories. Six did not rate User education, explaining that none is available.

TABLE 1.	Excel.	Good	Fair	Poor	MAUR*	CA**
Reliability	23	0	0	0	4.00	1
Efficiency	19	4	0	0	3.83	1
Ease of installation	20	3	0	0	3.87	1
Ease of use	12	10	1	0	3.48	1
Troubleshooting	19	3	0	0	3.86	1
Documentation	10	9	3	1	3.22	1
User education	5	4	6	2	2.71	2
Vendor's maintenance	14	7	0	0	3.67	1
Overall satisfaction	17	5	0	0	3.77	1

*Mean Average User Rating, on a scale of 4.0 for Excellent.
**Cluster Analysis—the range of average user ratings attributed to each cluster for each category, where Cluster 1 is the highest and Cluster 4 is the lowest. (See Report [illegible] for individual category Cluster delineations.)

These users overwhelmingly stressed the advantages of FDR. All 23 said the package performed as promised by the vendor. Many comments were made regarding the outstanding reliability of the package, with long-time users saying that they have never had any problem with FDR. They consider IDP the most reliable software firm they have ever dealt with, with one commenting: "I wish some of the big name software folks took some lessons in quality assurance from Innovation." This is also reflected in the table above, with reliability receiving a very rare 4.00 rating.

Twenty users said FDR saves system resources, 18 said it saves staff time, 12 considered it inexpensive, and 16 said that using FDR resulted in financial savings for their companies. Fourteen considered the package simple to operate and 10 said it is flexible in its capabilities, allowing different device migration, archiving, single dataset restore, and global functionality.

Several users praised the vendor for providing excellent technical support. IDP is very responsive to problems or questions and the support staff is very well trained with thorough knowledge of the internals of FDR and MVS. In addition, IDP is quick to upgrade their product as soon as IBM announces any new hardware or system modifications. Furthermore, the vendor is continually improving and enhancing their products' capabilities.

Few restrictions were mentioned. Two users considered FDR complex and one said it is inflexible, while another said that the migration facility for data set movement to unlike devices is slow. One user said the documentation is poorly organized, while the user who rated documentation poor commented that there is no overall description of how all the components of the package fit together. As a result of this, much time is spent flipping through the manual to determine what is needed to carry out a requested function. A vendor spokesman explained that reorganization of the documentation is difficult because some users have only one component of the product. While there are no major plans for changing the documentation, the vendor is currently adding more examples of how to use the product. ☐

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In the News

IBM AT compatibles, "the PC2 when it arrives" and all the Intel Corp. 80286 processor-based systems now appearing and offering multitasking, multiprocessing and windowing capabilities.

"There are great opportunities opening for networkable software and multitasking applications," Colony explained. "The 80286 is creating a whole new second-generation market for software entrepreneurs which the major players in the IBM PC market will not be able to get into [in force] for awhile. They have simply too much money and development tied to the old [IBM] PC market."

Neither Lotus nor Microsoft would comment on the Ashton-Tate/Multimate merger.

Software For Micros Now MIS Turf

If there were any doubts about management information systems (MIS) in large U.S. corporations taking in the reins of microcomputer software purchasing from end users, studies such as the one recently conducted by the Omni Group in New York, N.Y., set the record straight.

According to Milburn Smith, senior consultant with the Omni Group, decision-makers representing 304 of the top 4,000 U.S. manufacturing and service companies were asked if they had put in place approved purchasing lists for microcomputer software. Of those companies interviewed, 44% said they had put such lists in place and were enforcing them. Of those companies with lists already in place, fully 76% listed MIS as the most influential group in putting the approved purchasing lists together, 8% had office automation committees handle the lists, 6% used administrative services departments and a mere 4% had user departments draw up their own purchasing lists. "This study indicates," explained Smith, "that users play a much larger role in purchasing micro software in smaller companies."

A second study by the Omni Group asked these decision-makers which micro applications software fell short of fulfilling their goals. Smith said 51% of the respondents chose micro-to-mainframe software as the most disappointing, primarily due to the complexities and crudeness of data conversion and formatting. Another 11% had an axe to grind with data base management systems, 10% had it in for software communications with outside data bases, 8% took issue with word processing packages, and 3% said electronic spreadsheets still had a way to go. Only 18% had no complaints.

For further information, contact the Omni Group at 115 E. 57th St., New York, N.Y. 10022.

Data Transfer Hot Topic For NUA

Two growing areas of electronic data transfer are being addressed by the Network Users Association (NUA) of Alexandria, Va. NUA subcommittees are being established to deal with the separate issues of electronic data interchange (EDI) and electronic document exchange (EDE). NUA distinguishes between the two by saying that with electronic data interchange, users take and use the transferred information as is. With electronic document exchange, users intend to revise the transferred documents and place them into their own information systems for their own use.

Marvin Rahm, telecommunications consultant with Dow Chemical Co., Midland, Mich., and chairman of several of the NUA subcommittees, said a number of large U.S. companies are demanding true electronic data interchange, whereby invoices, purchase orders, inventory and other information is made available by vendors for customers.

"At Dow Chemical, we have pilot projects under way to exchange electronic purchase order, accounts payable and receivable information with General Motors Corp. and some of our other large customers and clients," Rahm said.

Rahm added that he hoped these pilot projects would reach the operations stage in three or four years. The company would first have to iron out several problems with the complex coding of the accounting systems. At the end of this period, however, Rahm expects the interchange operations to be "completely paperless," he said.

The big problem for Dow Chemical and other companies working on EDI is data security, an issue being addressed by an NUA subcommittee.

With electronic document exchange, the NUA is focusing on the issue of such standards as IBM's document interchange architecture (DIA), IBM's document content architecture (DCA) and its distributed office support system (Disoss).

"It's important to establish standards when you're dealing with voice, data, text, image and graphics," Rahm explained. "Users have to be able to utilize combinations of these, but without com-

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FOURTH GENERATION PROGRAMMING TOOLS MOVE JOBS THROUGH PIPELINE QUICKER AT WASHINGTON NATURAL GAS

John Rowlands, Manager of Data Processing Applications at Washington Natural Gas Company in Seattle, feels that too many managers in data processing are waiting for future programming tools rather than making use of the excellent application generators already available.

"At Washington Natural, rather than waiting for predictions about fantastic future software tools to come true, we decided to realize the potential provided by fourth-generation productivity aids available now."

The tools chosen by Washington Natural were MARK IV® and MARK V®, Application Development Systems from Informatics General Corporation for generating batch and online applications, respectively.

When Washington Natural, the largest distributor of energy in Washington, wanted a new general ledger system, "We looked at a half-dozen different products, including packaged systems," Rowlands explains. "We then proposed to senior management that instead of buying a package we should buy MARK IV and develop a general ledger system in-house. We said we could do it with half the people, in half the time, using MARK IV rather than COBOL.

"Management said to go ahead, and we started training the information systems staff," Rowlands continues. "We had two programmers, together with a consultant from Informatics, working on the general ledger system — and during the next two months, I became quite concerned. They weren't doing anything the way a COBOL programmer/analyst would.

"They were designing output when a COBOL programmer would be flowcharting, and they were designing input when a regular programmer would be coding. They were designing processes when a regular programmer would still be coding. They started coding when a COBOL programmer would be recoding.

"Then came the big surprise," Rowlands adds. "They started printing reports when a COBOL programmer would be printing core dumps! The whole system worked, and they never had a single core dump. And management was shocked, because we came in on time, within budget."

Washington Natural Gas has also developed a personnel and payroll system, a sales prospect system, several resource management systems, and a contractor management system. Rowlands points out that these systems all utilize the very powerful file maintenance functions of MARK IV.

Of all the programs now in production at Washington Natural Gas, 44% are written in MARK IV. "We've trained most of our programming staff on MARK IV, and we recommend its use for new batch application development wherever possible," Rowlands says. "I feel that MARK IV significantly improves productivity. Our programmers tell me that it can cut development time by 60-90%.

"I also like the fact that MARK IV forces structure," he adds. "People with very little MARK IV training can easily follow the logic of complicated MARK IV programs. I've also found that MARK IV can be taught to non-data processing people — and it improves morale because programmers can finish a job and get on to the next one more quickly.

"MARK IV gives us the ability to preview, create, and change reports very quickly. It also improves testing. Creating test files and testing systems is done automatically — and because of this, programmers tend to really test their systems."

ONLINE APPLICATION DEVELOPMENT

In 1984, to meet a burgeoning demand for new online systems, Washington Natural Gas purchased MARK V for online application development in its CICS environment. The company uses an IBM 4381 mainframe running the DOS VSE/VM operating system. Their online network includes approximately 200 terminals, scattered throughout seven offices and three warehouses.

"I felt that online systems development should be done using nonprocedural languages," Rowlands explains, "and our success with MARK IV gave me a good deal of confidence in Informatics. Furthermore, MARK V is similar in many ways to MARK IV, and I felt that this should enhance the learning curve and acceptance of the product by our programmers.

"I particularly like the way MARK V allows you to easily prototype new systems — so that users can approve parts of the system as you develop it," Rowlands says.

"The prototyping we can do with MARK V lets us sit down with users at a terminal and show them exactly how a screen will look and how one screen flows into the next. And we can immediately change things they don't like. It's really joint development, done with the users in real time."

Rowlands cautions that adequate mainframe memory size is a "must" when using development tools like MARK V. However, he notes that "on a transaction-by-transaction basis, MARK V compares favorably with COBOL in its memory requirements.

"We are planning a conversion from DOS to MVS in the near future," he adds, "and I chuckle to myself every time I think how easy our conversion is going to be, compared to shops that are primarily oriented to COBOL and assembler programming.

"As a manager, I'm pleased with the way MARK IV and MARK V are improving our programmer productivity and raising department morale," Rowlands concluded.

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In the News

patibility, document exchange between equipment and systems from different manufacturers isn't guaranteed."

Joseph V. St. Amand, senior network architecture consultant at Wang Laboratories, Inc., Lowell, Mass., and also a member of some NUA subcommittees, said the problem for users is not data interchange as much as it is the gateways that connect the IBM Systems Network Architecture (SNA) mail systems. Amand explained that users are looking for a common definition or set of protocols for electronic data interchange that will provide an international foundation for store-and-forward messaging systems.

"On the bright side," Amand said, "a number of vendors who belong to the Computer Communications Industry Association have been meeting together and considering funding the joint development of the [International Organization for Standardization] Open Systems Architecture to IBM's Systems Network Architecture."

Q&A

(Continued from Page 5)

good people will. The good people were the first to hop into structured programming and structured design and the first to look at formal analysis techniques. The good people can work with the user and get the requirements out in a very succinct form. On the other hand, the average or below-average programmers who are just translating what has already been done will fall out or become enlightened.

Do you see this in an information center context?

Very much so. The concepts of understanding what the requirements are and being able to specify those interactively to a system are the same in a development center or information center. There seems to be a convergence on ideas bottom up from the development center and top down from the information center.

Are workbench tools revolutionary products?

A little bit of revolution and a lot of evolution. If we had the perfect solution right now, it would probably take five years until everybody embraced it. But it will grow in three areas: the breadth of what it does, the depth to which it goes and, finally, integration.

Will project time be shortened?

Project time can vary from one or two months for a very simple system to more than three years. After three years a project might be canceled because the needs changed before the system could be delivered. Workbench tools not only produce the systems more efficiently but more effectively in that they'll allow a system to be built that will actually have a very high chance of meeting the needs much more quickly. And as these tools develop, more users will be able to build the systems themselves. The users will become more systems-oriented, systems people will become more user-oriented and everybody will become less computer-oriented.

— *Lee White*

System/36 To Run Pick?

IBM watchers make a living predicting what the computer giant will do next. Some speculation now has IBM adopting the Pick operating system from Pick Systems, Inc., Irvine, Calif., for their System/36 computers. Rich Lauer, vice-president of marketing for Pick Systems, added fuel to the fire by stating that "we are waiting for a firm commitment from IBM on the System/36."

The fact that IBM might have Pick on its System/36s is not earth-shattering; Pick already runs on all IBM mainframes using the IBM VM operating system as well as the Series/1, the IBM PC, the IBM XT, and, scheduled for this October, the IBM AT. What would make porting the Pick operating system to the System/36 unique, however, would be the necessity of IBM exposing to Pick Systems the microcode and other proprietary features of what until now has been a very closed machine.

"Other IBM computers are not nearly so proprietary," Lauer explained. "IBM's microcomputer line was made purposefully open for vendors to produce add-ons. Same with the Series/1. The IBM 4300 series and the 30 series are not as proprietary because the VM operating system allows access to certain machine information. The System/36, however, has always been a closely-controlled architecture."

Frank Petyak, Pick Systems national sales manager, has stated that Pick Systems has been under pressure for some time to make their operating system compatible on the System/36.

"Even if IBM balks," Lauer said, "it's hardly the end of the world for Pick Systems. We have over 40,000 Pick installation sites around the world, and we've just delivered the latest version of Pick to the English market. It won't be a great disappointment."

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DBMS Systems: How Will The Newcomers Fare?

A new kind of [illegible] both MIS and [illegible] help create data [illegible] a variety of programs [illegible] potential is still to be [illegible]

By Stan Kolodziej

Data base management systems (DBMS) are no longer entirely in the hands of programmers and data processing centers, but are beginning to appear as tools of middle management. A big catalyst for this change is the raft of fourth-generation languages that have appeared in the marketplace, trailing a string of development tools in their wake.

On the input side, these software tools give a user the means to create data dictionaries, to model data bases and even to analyze data bases. On the output side, fourth-generation [illegible] generators, one can create a host of customized query and report programs and decision support aids ranging from spreadsheets to multidimensional data analysis, goal-seeking and expert systems.

One such product is Sperry Corp.'s Mapper fourth-generation language, currently in its thirty-first enhancement and long part of this self-help movement toward end users. Sperry managers have themselves used the system for some time, sitting at their Sperry Personal Computers or terminals and creating their own data base programs to help [illegible] production and [illegible].

Dudley Smythe, Sperry's director of franchise marketing, explained that "Mapper was developed for users by users. We understand what they need." Using the Mapper Kit, a set of application tools, and the Mapper Tutor instruction package, non-DP employees can be up and creating customized data base programs in four hours, Smythe claimed. In fact, Sperry thinks Mapper is good enough to franchise. Smythe has been assigned to sell service bureau franchises that will offer the Sperry 1100 [illegible] microcomputer. Mapper [illegible] time-sharing basis.

Another veteran player in the fourth-generation arena is Software AG of North America, Inc., Reston, Va. Software AG has [illegible] Super Natural, which the company claims is a major improvement over Natural, its fourth-generation language [illegible] DBMS builder. "[illegible] Natural [illegible] to be [illegible] ," Chuck [illegible] product manager at [illegible] AG, said. "We've also [illegible] delivers a subset of Natural into the hands of IBM PC users." Riegal added that Super Natural can also be linked to micros.

The Waltham/Weston Hospital, located in Waltham, Mass., is a Natural user. In 1983, Don Cotton, the hospital's director of MIS, began looking for a DBMS and easy-to-use programming language to create a replacement for what he termed the hospital's inadequate Report Program Generator (RPG) system running on an IBM System/3. The MIS plan called for heavy user demand, according to Cotton, who was surprised to discover that many of the hospital's personnel, especially the nurses, expressed an interest in using the system to track patients' medical data and generate patient reports.

Software AG's Natural and Adabas (an acronym for A Data Base), were chosen primarily for their easy software maintenance, Cotton said. Various DBMS applications such as patient billing and medical history were soon produced. Though the applications were written by professionals in the MIS department, Cotton pointed out, input was culled from the eventual users about what they personally wished from the system. This information played an important roll in how the various DBMS were structured. Over 90 nurses are now on-line to the system, which resides in an IBM 4300 series mainframe, with plans that eventually include the 150 staff doctors.

Using Super Natural, a menu-driven, data base query system, nurses view updated patient files. They can then combine data from these files with data from other files and produce individual reports. Users communicate with the system through English-like commands and icons, Cotton said.

He added that the system's fourth-generation language tools make it easy for nurses and other staff members to develop their own programs.

Most fourth-generation software tools provide nonprocedural, display-driven interfaces to create and update a personal data base. Nonprocedural is one of those terms carrying just about everything but an easy definition. The definition given by Doug Mahugh, however, a Chicago-based writer and programmer, is a little more eloquent than most: "A nonprocedural language is a programming language that allows the programmer to state goals to be achieved, rather than the specific procedures necessary to accomplish them." In contrast, Mahugh said, third-generation languages such as C and Fortran allow the programmer to specify how the program will run, as well as what it will do.

Fourth-generation languages make it easier for end users to program in English-like statements. So-called English-like statements range from languages sounding like stilted English, to something more like machine code. Generally, the best of natural language interfaces use English-like statements that resemble everyday conversational English. Through such statements, fourth-generation languages are giving nontechnical users the ability to program and access their programs without abandoning their native tongue.

Oracle, a fourth-generation language produced by Oracle Corp., Menlo Park, Calif., is an example of the changing user interface. Oracle is based on IBM's Structured Query Language (SQL), a fourth-generation relational data base language. Oracle currently provides three levels of interfaces catering to the expertise (or lack of it) of Oracle users. One level, called Easy, features several Macintosh-like interfaces, such as a mouse and pop-up menus. The emphasis with Easy is on the use of icons to create simple data base query and report applications. A higher level, the SQL Interface, features programming through English-like syntax. At this level, nontechnical users are expected to be up and running quickly, creating some interesting relational data bases and applications dealing in English-like communications.

The third level, the Pro Interface, is for serious programmers who still want to write reams of programming code. Oracle, like other fourth-generation languages and tools (Focus from Information Builders, Inc., New York, N.Y., and Ramis II from Martin Marietta Data Systems, Inc., Greenbelt, Md. for example) began its commercial life on mainframes (in Oracle's case on Digital Equipment Corp. VAX minicomputers). Now, however, microcomputer-based versions of their software are offered at prices generally ranging from $1,000 to $3,000.

Despite the advances such fourth-generation tools bring to end-user involvement in DBMS, not everyone is a fan. "It used to be said that fourth-generation would be the way of bringing computing to the consumers," Norman Agin, vice-president of Martin Marietta Data Systems, Inc., explained. "My view is that fourth-generation languages are really ideal only for systems analysts, not end users. For one thing, the breadth of fourth-generation language features has grown enormously, so much so that it's not a simple tool anymore."

When Agin wears his other hat, he is president of Martin Marietta's IT-Software Division. This division has created a product called Keep-IT, a $450 relational DBMS tool that is the core module of a series of 10 IT software packages designed for IBM Personal Computers and IBM-compatibles. Agin described Keep-IT as "about as easy to use as any data base manager you'll find," emphasizing

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MULTIPAK/VM was written to assist users at all levels of experience. The package offers a trove of features that will benefit the most experienced VM/CMS programmer as well as the non-technical, inexperienced VM user. In fact, we developed MULTIPAK/VM for our own use based upon our years of IBM and VM experience from our ACF2 product line. SKK is a leader in IBM mainframe software products, with over 1,800 user sites worldwide.

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the pop-up menus and Help screens and the fact that the system does not "allow" a user to put in an incorrect answer. "Keep-IT is a great product for end users to make and manage data bases," Agin claimed, "but about 80% of Keep-IT users use only about 20% of its features. That's probably the case for many fourth-generation software languages." Share-IT, a multiuser version of Keep-IT, has just been released by the company.

"Fourth-generation languages are driving DBMS today," said John McCarthy, research manager at Forrester Research, Inc. in Cambridge, Mass. "But those languages are not that easy to learn. You still have to be a bit of a techie to program." Other observers are just as reluctant to credit fourth-generation languages as meaningful programming tools at the large systems level. Though nearly every DBMS uses some kind of fourth-generation query language, the creation of DBMS with these same languages does not necessarily follow.

An English language capability will benefit amateur programmers in clerical and middle management more than mainframe programmers.

English language capability will benefit those amateur programmers in clerical and middle management areas more than it will mainframe programmers. If fourth-generation languages break down, it's in program documentation. Using English to write powerful mainframe-based programs could be just as complicated as describing those same programs in English. It is not unusual for programmers to use several pages of English to describe the operation of a single page of code.

If anyone is to gain from fourth-generation software tools in the short run, however, it will be DBMS end users. One company slating its product at just such users is Artificial Intelligence Corp. (AIC), the Waltham, Mass., producer of Intellect. Intellect is a natural language that Jane Eisenberg, AIC's director of OEM and product marketing, was quick to describe as a "fifth-generation language," in what has become a more frequent effort by companies to differentiate their products from others in a crowded market. Intellect was forged by AIC's president, Dr. Larry Harris at Dartmouth College, N.H., in the early 1970s. Harris improved Intellect over the years after he founded AIC in 1975. First brought to market in 1981, Intellect was developed for IBM mainframe computers, and a version for Digital Equipment Corp. VAX computers has just been released.

AIC spokesmen pointed out the stress Intellect places on its fourth-generation language interface with users. "Unlike many other language interfaces, Intellect is a true natural language; it's what the user speaks and writes naturally," Eisenberg said. One Intellect user is the Hartford Hospital in Hartford, Conn. Dick Edlund, director of data systems, has been using Intellect since 1981 to build data bases and data base applications ranging from medical histories to human resources and patient billing.

More than 100 users are now on the IBM 4300 series-driven system, most without previous DP experience. Sitting at their IBM terminals, Edlund said, users (many of whom are doctors and heads of hospital departments) can create their own relational data bases and reports using the Intellect Interactive Lexicon module. This module is a data dictionary that translates a user's individual programming terminology into a format usable by the software. The lexicon is immediately updated as the user writes more applications.

In tandem with Intellect/SX, a data base development tool, users have what Edlund described as a "forgiving" set of DBMS builders. This fact was instrumental in the hospital's selection of Intellect over IBM's SQL/DS relational data base language. Edlund said the hospital was simply not comfortable with the number of commands the IBM system required.

Large DBMS systems and tools will continue to be written in third-generation, procedural languages such as Cobol and Pascal, the stuff of old-line programming. Third-generation languages have a huge base of supporters that tend to regard anything fourth-generation with suspicion in relation to DBMS. Still, fourth-generation languages are making some headway in MIS as a quick way of satisfying a growing demand from corporate America's middle management for more end-user programming.

Fourth-generation software tools such as English from Mathematica, Inc., Princeton, N.J.; Clout and Clout2 from Microrim, Inc., Bellevue, Wash.; and Ramis II/PC from Martin Marietta Data Systems, Inc. are putting some DBMS power on micros and proving that DBMS don't always have to be spoon-fed from MIS. The success of such programs will continue to be a direct barometer of end-user involvement in DBMS.

■

Kolodziej is a senior writer at Computerworld Focus.

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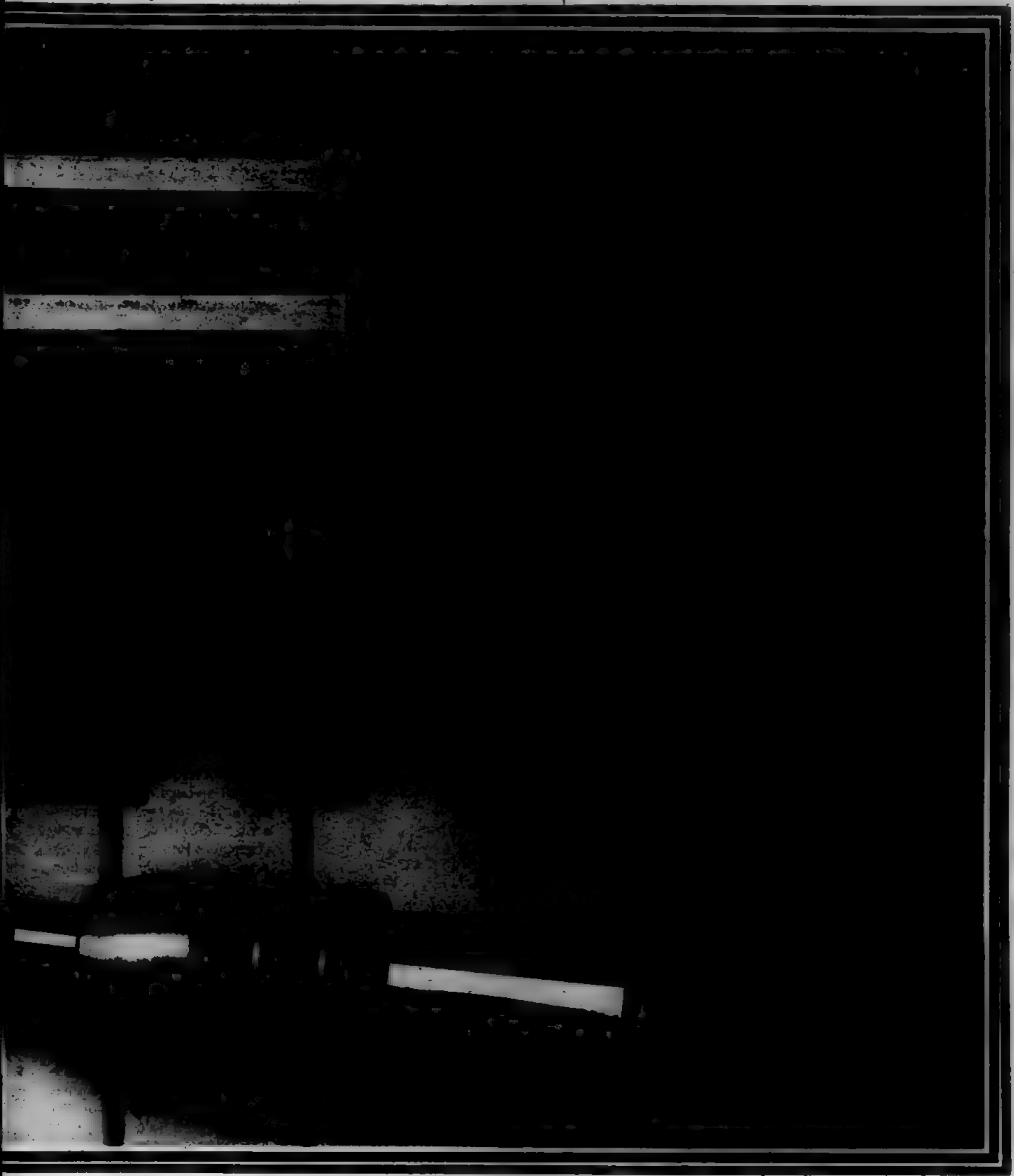
The Information Center And Productivity Tools: Working in Harmony

By Shaku Atre



The formal information center has celebrated its fifth birthday, and it can now be said that at least some of its promises have been kept. Because of the information center, users have, at least to some extent, become more self-sufficient. Their productivity, particularly in the area of decision making, has been bolstered. What have we learned in those five years? What should an information center offer if it is to increase users' productivity by making them more effective and efficient?

Information centers function within organizations as consulting and service facilities that enable departmental end users to access their data. Information is the analysis and synthesis of data, and company data is stored on hardware of many different shapes and forms. Mainframes, minicomputers and microcomputers all participate in making an information center a success, but the microcomputer is the major piece of hardware present in all information centers. Disguised as a personal computer, the long-sought-after multifunction workstation has arrived, and many experts are having trouble recognizing it. The workstation of today and tomorrow is not just an intelligent terminal — it is a brilliant one, and it will replace the dumb terminals in no time at all.

Meanwhile, however, the proliferation of 200 personal computer manufacturers, 800 models of personal computers and 30,000 software packages continues. For users, the old saying still holds true: "More is not necessarily better and less may sometimes be more." Today, three to four white-collar workers share one workstation, but by 1990, if predictions hold, the ratio of workstations to white-collar workers will be 1:1. In anticipation of that time, managers should make sure their information centers provide productivity tools in the form of hardware, software and applications to make workers more effective and then more efficient in their use of the workstation.

The many types of data processing that exist in organizations are there to make the organization more productive and, we hope, more profitable. Three levels of organizational support systems are depicted in Figure 1, Page 19. Today, the aggregate computing capacity of all personal computers now installed already exceeds by a wide margin the computing capacity of all installed IBM, Digital Equipment Corp., Burroughs Corp., Sperry Corp., Honeywell, Inc. and other mainframes. That statement, however, is only half the picture. Mainframes are used more than 90% of the 24-hour day, but most personal computers are used only discontinuously between the hours of nine to five. One simple way to increase return on investment is obvious: Promote sharing of partially idle personal computers.

Among the major productivity tools will be a mainframe-to-micro connection and, by the same token, the micro-to-micro connection. Software and communications (both remote and local) will provide more effectiveness and efficiency in addition to the powerful hardware at the workstation level. Remote communications, in the form of IBM's Systems Network Architecture (SNA) and X.25, will be an important ingredient, as will the local-area network. The compound electronic document of tomorrow will have as its major components data, text, image, graph and also voice.

With software and communications pulling in tandem to provide increased productivity, integrated software will become essential, and its key ingredients include financial software, word processing, record keeping, graphics, communications, educational programs and project management.

Why the need for software integration? How will it improve end users' productivity? In spite of the ever present talk about software integration, not everyone agrees on exactly what benefits are provided by integration. Three major areas of software integration stand out:

- Provision of a uniform user interface that makes the software easier to learn and use.
- Easier passage of data from one application to another so a minimum of redundant data needs to be stored and no cumbersome interruptions are necessary.
- Easier switching from one application to another (a poor person's parallel processing).

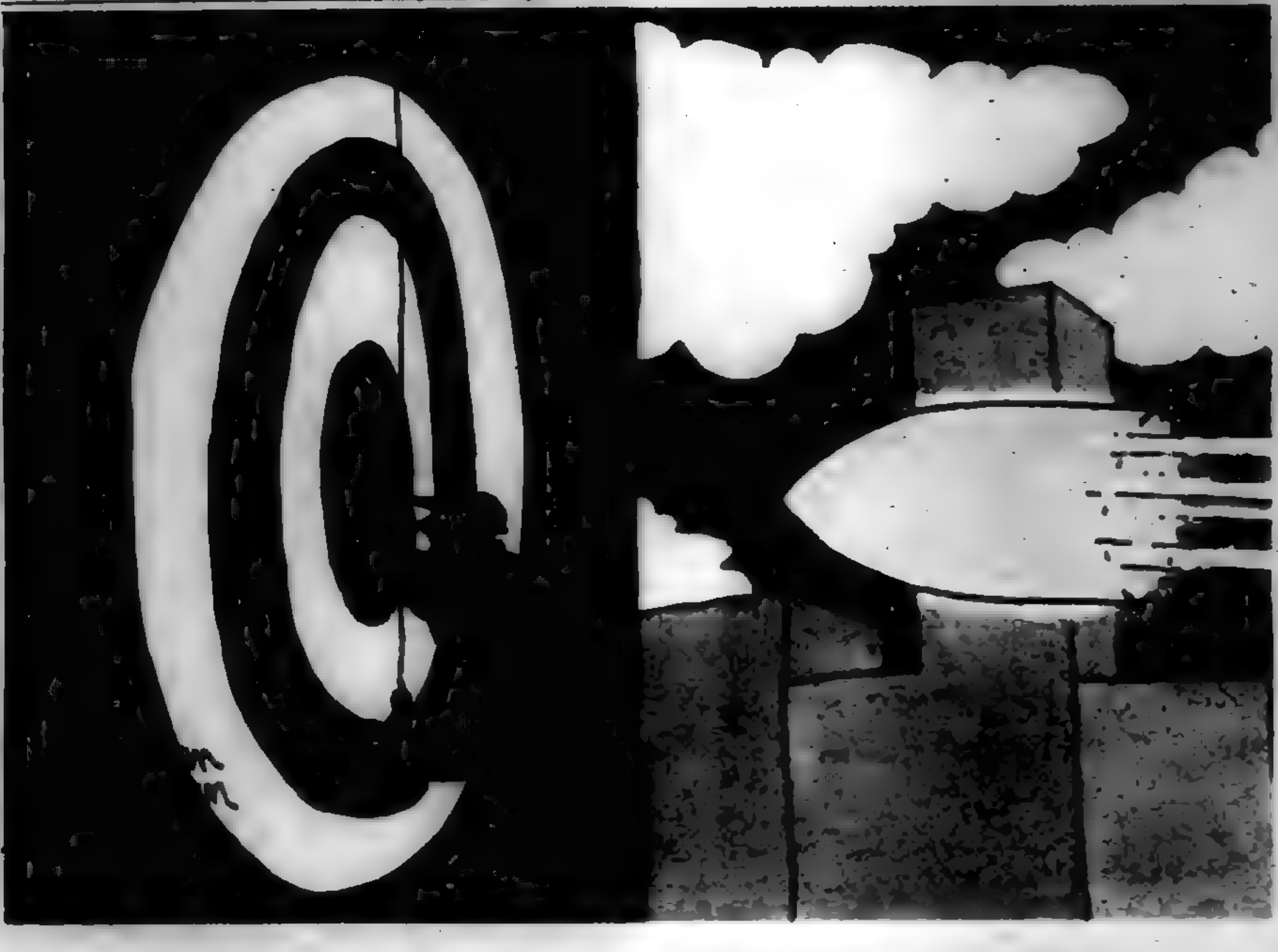
One simple way to increase ROI is obvious: Promote sharing of partially idle personal computers.

These communication powers will let an end user on one personal computer access data from another personal computer as well as from the mainframe. In future, personal computers are going to drive today's minicomputers into anonymity, obscurity and, finally, extinction. Data bases stored on mainframes and personal computers are competitive weapons for end-user productivity, if the data bases can be interrelated.

Data to be shared by various user groups should be stored in a data base, a collection of selected data about an enterprise with multiple users. The major theme of a data base management system (DBMS) is, then, the interrelatability of data. The question then becomes how the personal computers installed in an organisation can help the information center users gain access to interrelated data.

The architecture depicted in Figure 2 on Page 19 is one solution that can be implemented today. The customer master file (data base), which resides on the mainframe, could be managed by a mainframe DBMS, such as one of the following: Applied Data Research, Inc.'s Datacom/DB, Cincom Systems, Inc.'s TIS, Computer Corp. of America's Model-204, Cullinet Software, Inc.'s IDMS/R, IBM's IMS and DB2, Information Builders, Inc.'s Focus, Martin Marietta Data Systems, Inc.'s Ramis II and Software AG of North America, Inc.'s Adabas.

Extracts could be taken from the mainframe-based customer information file using the various data base vendors' corresponding products. The data



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filing, document sharing,
communication with other processors

Workstation Level
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- Remote data access (downloading and uploading)
- Numerical analysis (spreadsheet)
- Sorting and searching of data (DBMS)
- Memo and report writing (word processing)
- Business graphics
- Project management

Figure 1. Organization Support Systems

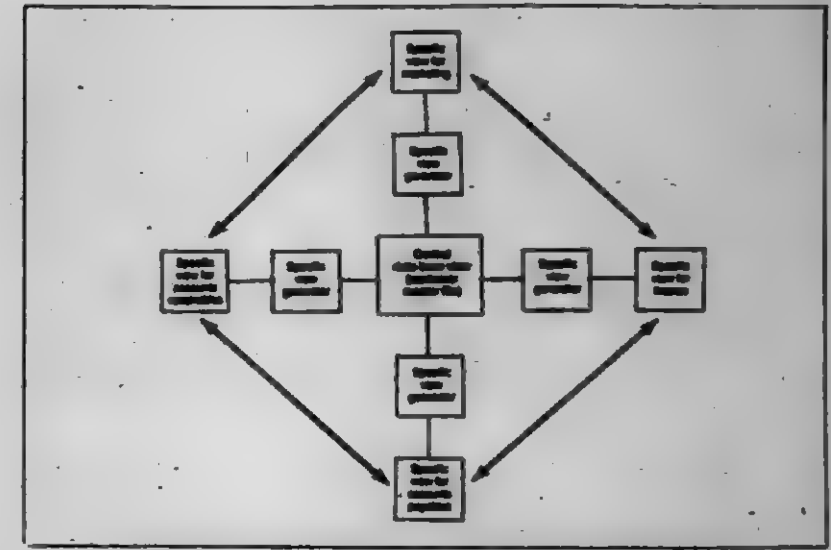

Figure 2. User-Accessible Subset of Central Data Base

extracted from the file and downloaded from the mainframe can then be formatted for use within other personal computer products, such as Lotus Development Corp.'s 1-2-3 or Symphony. Users could then work with the data on their own personal computers, using products with which they are familiar.

Compatibility of the downloaded mainframe data with the personal computer products varies from vendor to vendor. The selection team from the information center will therefore have to be cautious in finding out whether any programming is needed to make the downloaded data compatible with spreadsheets and other types of software users have on the personal computer.

The promise of distributed DP made in the '70s can be delivered with today's personal computer architecture and the software made available for it in the organizational structure of the information center. User groups from finance, marketing, accounts receivable and accounts payable should be able to transfer data and applications between the mainframe and the personal computers without needing to know where their data is stored and how it is accessed.

One of the major concerns in the data base area is that redundantly stored data will have different updates on different personal computers. Triggered by IBM's certification that two types of DBMS (IMS for production and DB2 for end-user computing) are better than one, corporations have started exploring alternatives and/or supplements to their production DBMS. If no guidelines are set for duplication and access of data, the environment will come into disarray; data base, the productivity tool, will instead become data base, the menace.

The incompatibility of hardware and software on the levels of the mainframe and micro combined with the presence of multiple DBMS in a corporation means that environmental independence must be provided by some front-end facility. The front end to the various DBMS or different hardware systems should be designed to route requests — for data and responses — transparently between application programs. A single system image must be provided. Isn't that really a distributed data base environment? Which data base technology will provide all these capabilities?

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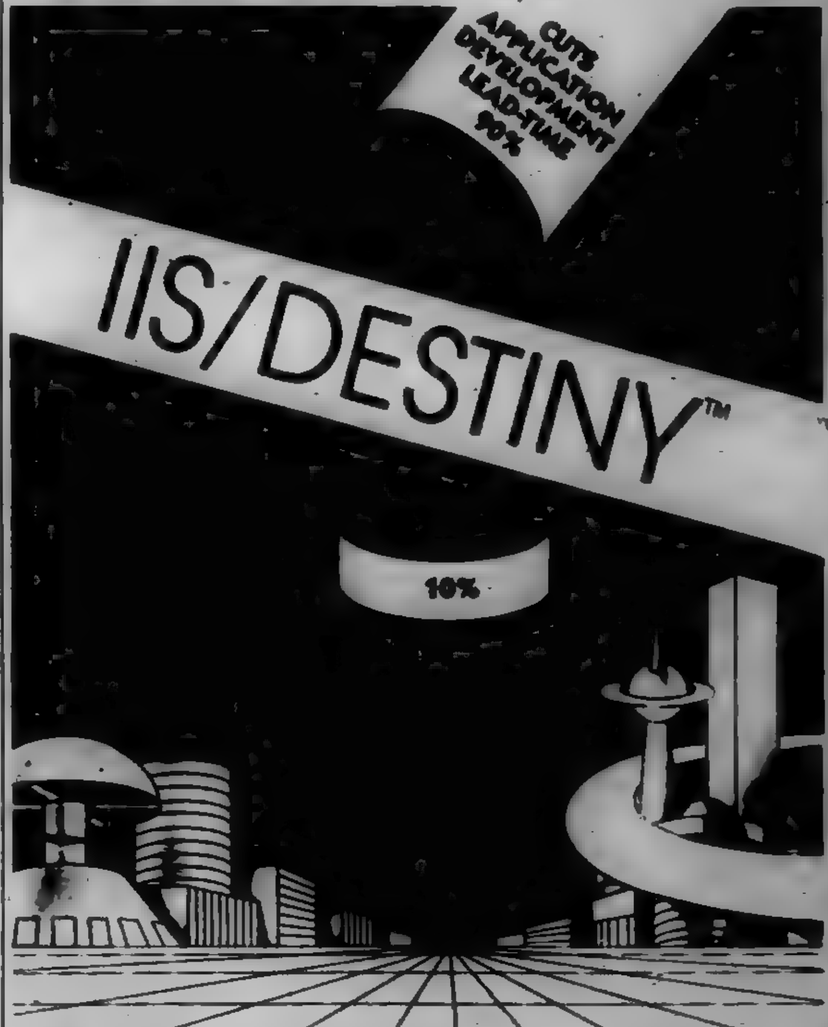

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data base technology. Relational systems offer the most flexibility in responding to the unanticipated requests of end users as well as the capability of implementing the never-ending changes of the business world. The integrated tool that will provide the most productivity to the end user will consist of a number of technologies, as depicted in Figure 3.

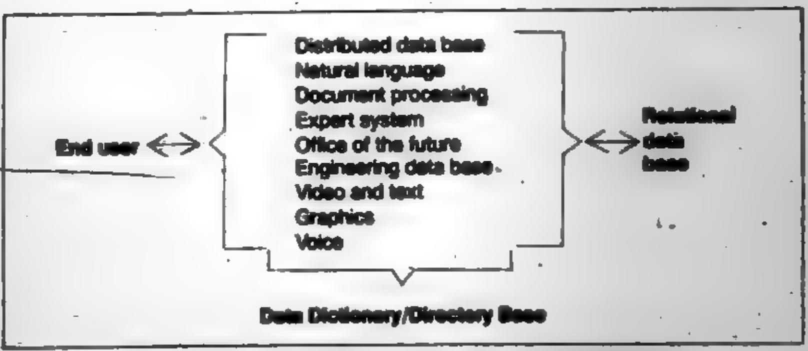

Figure 3. Integrated Productivity Tool For End Users

With the distributed data base technology to achieve the productivity gains to the fullest extent possible, the following guidelines should be established for mainframe-micro connection:

- Microcomputing is not a fad. It is here to stay. Establish guidelines for acquisition of microcomputer hardware, software and applications. An in-house computer store may not be cost-effective.
- Capacity planning for mainframes will be a losing game. Establish charging guidelines.
- Downloading and uploading of data is still in its infancy. Establish guidelines for volume of data to be transferred as well as the time frames for transfer.
- Establish backup, recovery and security guidelines for floppy diskettes as well as for downloading and uploading.
- Establish guidelines for providing integrity of data on mainframes if the downloaded data on microcomputers will be stored redundantly.
- Acquire workstations with communications in mind for mainframe-micro connection as well as micro-micro connection.

In summary, the types of productivity tools that should be provided in the information center are the following:

- A menu-driven professional office management tool that allows for sending and receiving notes; comparing, proofreading and distributing documents electronically; scheduling meetings with other users; accessing information center announcements; maintaining a personal calendar; and performing many other management activities.
- Analysis, design and validation tools for application development.
- A data dictionary directory supporting all phases — design, coding, testing and production.
- A full-screen editor integrating graphics and WP.
- Management tools for project planning, control and teaching.
- An on-line data base of software designs and programs.
- Multiuser support.
- Computer-based training with an attractive medium like interactive video disk.
- Prototyping capabilities.
- Spreadsheet software that puts checks in the results for validity and prepares documentation.
- Comfortable keyboards (some companies like Key Tronic Corp. and Wico, for example, have made more advanced keyboards).
- High-capacity hard disk (if the end user thinks 10M bytes is more than plenty on a PC-XT, just wait six more months).
- Charge-back software (not too complicated).
- Electric-surge preventer.
- Backup utility
- Correspondence quality and graphics capabilities in one printer
- Office desks (with personal computers in mind) with special construction for personal computers, hard disk and keyboard — and above all, designed with aesthetics in mind so that cluttered wires can be hidden.

One warning about purchasing these productivity tools: the software is advertised only with buzz words. Some industry buzz words that seem to be used for most microcomputer software are *integrated*, *user-friendly*, *relational*, *data base management system*, *menu-driven* and, of course, *PC-compatible*.

The explosion of personal computer technology will not only bring us application programming without application programmers, it will have another effect. We are all going to be application programmers — just as we have all become telephone operators. Firms developing information-based products must choose application development environments that satisfy conflicting demands of easily operated software for end users and application development power for programmers. DP professionals will do applications programming side by side with end users, but on micros instead of on mainframes.

The information center, which will be a utility facility, will be taken for granted, in the same way we now take for granted electric power and water.‡

■

Atre is president of Atre International Consultants, Inc., a Rye, N.Y.-based firm that provides consulting and training in information centers, data bases and data communications.

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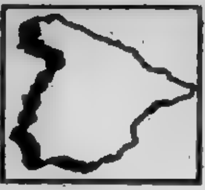

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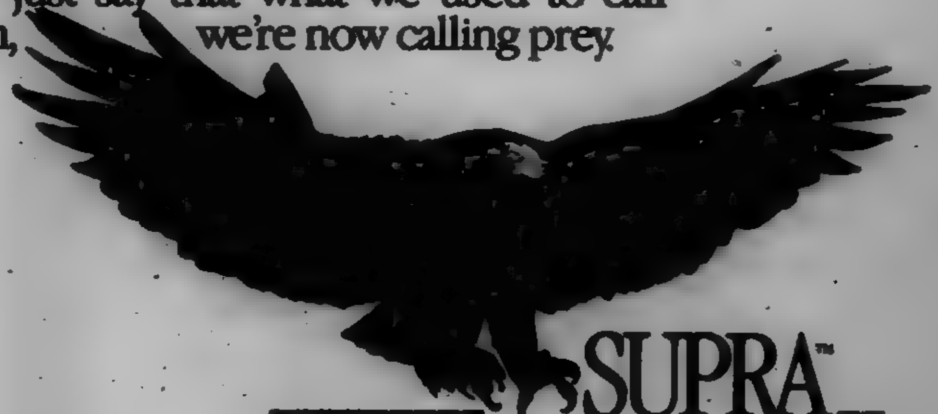

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Transforming The Data Center

Systems software is changing the data center's capabilities, just as the data center changed companies' information needs. The new role for the data center will help everyone.

By Russel M. Artzt

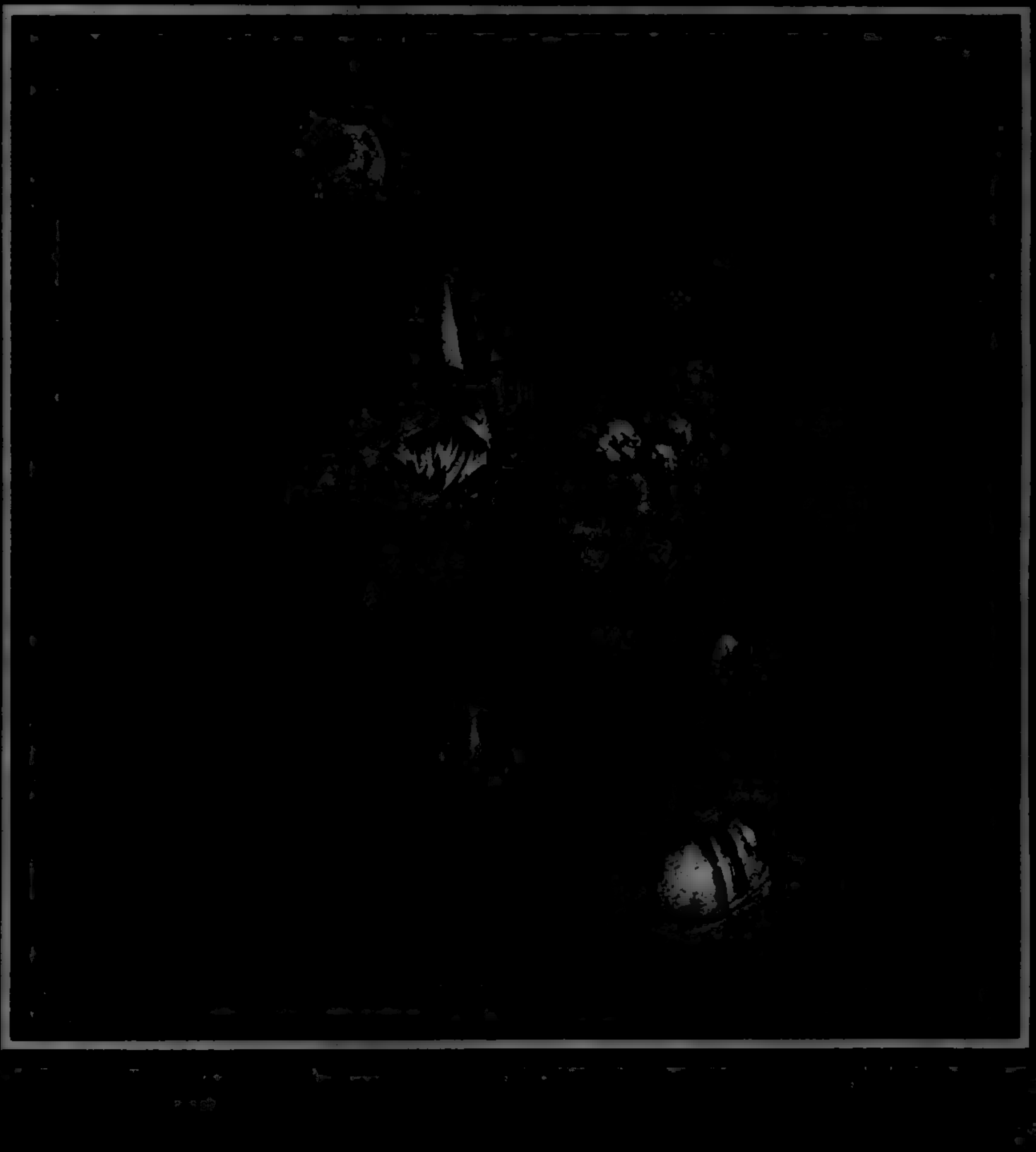
Get ready for another transformation. A movement is now under way to automate the data center and, if it's successful, it will transform the way the data center operates, just as the data center's automation of the corporation transformed the way companies do business. This time, however, the catalyst will be advanced systems software.

Although sophisticated software programs have been used to automate user departments, even the programming departments of many data centers have yet to adopt specialized software to improve their own operations. Jobs are initiated, scheduled and controlled manually from input to output, causing a tremendous loss of time and increasing the chance for errors. The data center's two most valuable resources — computers and people — are wasted.

Data center efficiency is an intrinsic part of the corporate competitive edge, and automation can sharpen that edge. The increasing complexity of data processing, economic constraints on the corporate DP investment and the corporation's own dependence on the data center require sophisticated management solutions and the technology to support those programs.

There was a time when management — and even the DP department — did not realize the importance of the DP function. That attitude was reflected in the way the data center operated. Today, however, data centers across the nation are responding to more advanced needs, both within the center and from the corporation. Today's systems software should meet those needs by offering the data center the same capabilities — streamlined service, support and training — that applications software offered to end users.

Although it has taken vendors many years to produce the right kind of systems software to automate the data center, the concept is not new. The first software for operations, in the mid-1960s, addressed questions such as: How do



we avoid wasting CPU time? Why must processing operations stop while the operator loads another tape? How do we avoid destroying vital data?

These questions gave birth to the concept of multiprogramming, designed to maximize machine usage. However, hardware vendors most often addressed this problem by adding more hardware at a time when mainframe hardware costs were extremely high. The systems software vendors did develop to provide the interface between man and machine came bundled with the hardware.

Independent vendors' existence depended on good software, and they helped users understand the additional freedom and power purchased systems software could give them in designing applications and streamlining the data center. When hardware vendors unbundled software from hardware pricing in 1969, the concept of automating the data center began to grow, as did independent systems software vendors.

On the applications side, independent vendors were successful in end-user departments because of the economies realized through using packaged software. Nevertheless, the data center was not viewed as a user department. The inital steps toward automating the data center took the form of filling the gaps left in the operating systems with systems software designed to solve immediate problems.

Software systems must be designed as one comprehensive package that would let data center managers anticipate and plan work loads.

Before the advent of packaged programs for these areas, data center managers' choices were limited: maintain the status quo and lose all opportunity to gain control of data; hire more people to execute these tasks manually; or develop software internally to manage these functions, a prospect that could take many staff years before it would be able to be fully operational.

The first software packages produced by independent vendors in the early 1970s addressed these problems individually and narrowly. The real impact on software development didn't occur until the mid- to late 1970s, when several events began the process of automating data center operations:

- Drive to maintain competitive positioning: Business needed a more immediate access method to enormous amounts of data to maintain a competitive position. When on-line processing was introduced, the problems of disk space availability and managing that space became important.
- Need for data security and management accountability: Federal laws and regulations made top management in companies directly accountable for the proper use of data, and data security measures then became critical needs.
- Growth of concern by senior management: Corporate management no longer regarded DP as magic. As executives became aware of the risk and impact of poor data center management on their businesses, they began to promote professional management techniques in the data center.

Several key technological events also contributed to the development of systems software, which puts the DP manager in control of data center resources. Introduction of on-line processing spurred growth of the permanent disk to hold current information. Corporations have recently expanded direct access storage device (DASD) capacity by more than 50% annually. Although managing DASD space has become a necessity, it is still handled manually, resulting in misused and wasted resources. In addition, transferring data from disk to tape for storage creates file management problems.

Software has been developed to provide efficient use of DASD and often helps to delay or avoid the unnecessary purchase of additional disk packs or conversion to larger hardware systems. Time formerly spent on manually allocating disk space can now be spent on more productive tasks, increasing operator efficiency. By integrating DASD management with tape library management, software allows data sets that aren't used frequently to be archived, providing better security and increasing usable DASD space. Among the benefits systems software packages brought to disk space and/or tape management systems are the following:

- Up to 30% of the disk space capacity in a disk-oriented installation has been freed, and tape processing throughput has been increased by as much as 30% in tape installations.
- Data files have been made more secure by protecting them against accidental loss of vital data and preventing unauthorized access to sensitive files.
- Management of peripheral resources has been improved by eliminating reruns, freeing up tape drives and increasing usable DASD space.
- The manual process of tape library and disk storage management has been replaced by fully automatic functions.

By providing the means to understand exactly how the DP resources have been and are being used, management can examine the performance of each hardware component that makes up the computer system and analyze the performance of all jobs being run.

Performance measurement tools promote greater control of hardware resources by providing historic data on computer use; providing an on-line computer job accounting facility and the ability to bill corporate departments for services rendered; serving as a diagnostic tool to see inside the computer to see how jobs compete with each other for resources; and enabling the user to diagnose the performance of an individual program. Other factors also influenced the creation of systems software to automate the data center. Corporate concern for disaster recovery spurred contingency planning by data center managers and software development to address this need. The DASD and tape/disk management facilities fill some requirements for disaster recovery by automatically ensuring that critical data files are backed up in a vault or off site.

Job documentation in advanced software should automate disaster recovery by creating vital operational documentation that would take hours by any other means. It should automate the process by centralizing job documentation and offer full support for disaster recovery plans.

Recent software developments not only provide an additional level of security in addition to the usual passwords and access codes to protect resources, they also audit access to them. These packages should allow a user to place any desired level of security on any of the data center resources, terminals, files or tape volumes.

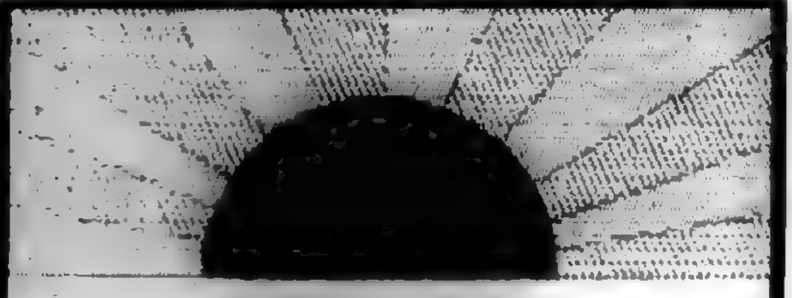
Today, a single piece of software can plan and schedule the production work load automatically, forecasting potential bottlenecks and evaluating alternatives to use the resources better. Scheduling software that has been designed to communicate with other areas of the operation, such as disk space management, can play a role in preparing data needed for upcoming jobs.

When initially introduced, most of the systems described here were aimed largely at solving critical problems in a mutually exclusive way. The industry is now moving into an era where software systems must be designed as one comprehensive package that would give data center managers the means to anticipate and plan their work loads and achieve new levels of productivity.

A few intangible features are still required to complete today's state-of-the-art products. These features are automated service and support, more effective education and training techniques and closer ties to software vendors. Service and support constitute a very large issue for data center managers. Vendors in the business of providing to clients a product as important as information accessibility will find that service has to be a major component of the product mix. It is as important as any line of code.

Computers and software are obviously the effective way to track and maintain such an extensive service operation. Vendors will have to become more responsive and innovative in providing service and support, as corporate management increasingly recognizes the importance of the data center's role in total corporate performance.

Artzi is senior vice-president for development at Computer Associates International, a software firm in Jericho, N.Y.



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Multitasking Operating Systems - Is The Contest Already Over?

The tug-of-war among vendors of multitasking operating systems seems to be reaching its end. Is Unix the big winner for the '80s? Perhaps the real question is: Is there a contest?

By Lee White

The tug of war taking place among operating systems and their various proponents may soon be at an end.

Not all operating systems are involved in the contest, of course. In the large mainframe/management information systems world, operating systems are defined by the vendor, with the user silently acquiescing. Examples of vendor-defined mainframe operating systems are IBM's VM and MVS and Digital Equipment Corp.'s VMS. In the stand-alone microcomputer arena, the now accepted standard is Microsoft Corp.'s MS-DOS. The third category is the networked microcomputer or supermicro. Its operating system, and the only battle left, really, is Unix.

What differentiates the third category from the other two is the fact that it is user-driven. According to Frank Zehna, president of AIM Technology, Inc. in Santa Clara, Calif., the driving forces behind the Unix standard are the scientific/engineering community, the federal government and the aerospace industry. Now that Unix has become a big player, bid specifications name Unix as the operating system. Vendors that cannot offer Unix-based hardware are effectively cut out of the bidding process, which most can ill afford.

Zehna even takes the Unix standard a step further; he insisted the Unix that will drive the marketplace will be AT&T's Unix System V. This would seem contrary to DEC's direction; DEC has released the revolutionary Microvax II, which runs Berkeley Unix (also known as 4.2). Zehna had high praise for the Microvax II but suggested DEC will probably change direction from the Berkeley version to System V. "DEC is in the same position every other supplier is in. In order to bid [on federal contracts], you have to bid what's compatible, and that's System V." In fact, the next release planned for System V (February 1986) will include most of the Berkeley enhancements, according to Zehna, which in his opinion further fosters the migration path toward one standard. "You can't fight that. You can try, but you're going to lose," Zehna explained.

Katie Klosterman, market research supervisor at International Data Corp./Yates, said that, from the pure Unix standpoint, there won't be any fight to lose. In many ways Unix is the answer to a maiden's dream. As far as vendors that sell products to the Unix environment, switching from machine to machine, even among different Unix systems, takes at most a day to port. "Although the marketplace is standardizing now on System V, it's kind of a moot point." Klosterman said. She cited Apollo Computer, Inc.'s Domain/IX workstation, which runs its own proprietary operating system, Berkeley 4.2 and System V alongside each other. "You can actually run a program that calls for commands in 4.2, then calls for commands in V, and it will recognize either one. If [the user] likes a couple of 4.2 commands but knows V intimately, [the user] can use those 4.2 commands and still work basically in V," Klosterman said.

Klosterman sees more compatibility down the road, but tempered her comments with some realities. Among her predictions was the demise of Berkeley Unix. Even California-based Sun Microsystems, Inc., whose Bill Joy is the father of Berkeley Unix, has come out in support of System V recently, she said. Sun is about to announce 4.3, which Klosterman has heard is not even compatible with the 4.2 version.

Mark Hatch, Unix product manager at Apollo, agreed that eventually System V will be *the* Unix, having borrowed more and more features from Berkeley 4.2.

He predicted that when AT&T comes out with the next release of System V, it will contain heterogeneous networking capabilities that will "leapfrog Berkeley." Hatch cautioned, however, that Berkeley is a large force in the engineering community, and its demise is unlikely in the short term.

The end will probably come because of AT&T's superior funding. "When that time comes, 4.2 will probably fade into the sunset," he said.

What is not expected to fade off into the sunset is Microsoft, Inc.'s Xenix, a Unix-like system that IBM has chosen as the multiuser, multitasking operating system for the IBM Personal Computer AT.

According to Bruce Steinberg, marketing communications manager for The Santa Cruz Operation in Santa Cruz, Calif., there are more Xenix installations worldwide than all the Unix installations together. Steinberg described Berkeley 4.2 as "a kind of utility. It's just there. It's been there for a long time; places that already have it will probably stay with it."

Giving Berkeley its due as a "niche" Unix, users are still left wondering whether the real tug of war, when and if it comes, will be between Unix System V and Xenix. Not a chance, according to Steinberg, who explained that

(Continued on Page 29)

. . . And In This Corner . . .

When Unix hit the streets, users rejoiced at the prospect that compatibility and portability might be, at least to some extent, just around the corner. It now appears, however, that instead of compatibility, vendors are modifying, refining, even reinventing the wheel. Most often the reasoning behind such actions is the creation of a better product.

Such was the case with Multi Solutions, Inc., of Lawrenceville, N.J., creators of the Unix-like S1 operating system. Brought to the market in early 1984, S1 claimed portability across 8-bit to 32-bit microprocessors, support for up to 256 parallel processors, the ability to read and write files to and from most microcomputer operating systems and machine independence.

S1 was written in a high-level language called SL, developed by Robert R. Knight, a former professor at Princeton University. According to Patricia McMahon, marketing support manager at Multi Solutions, Knight came from a heavy mainframe environment but did most of his consulting work on the Z80 microprocessor. Knight knew the Z80's days were numbered. He also wanted the mainframe functionality he was used to.

Knight began work on a language he hoped would lead to an operating system that would provide the advantages of the mainframe, the better facets of Unix and none of the disadvantages of existing microcomputer operating systems. "He took the ideas of C and refined it to what I think [the developers] were trying to make C," McMahon said.

Knight's SL made possible the creation of S1. In addition to the features of portability and compatibility, McMahon claimed that with S1, a system can be running on a totally new chip architecture within six months. Among the distinguishing features of S1 are the interfaces within the self-contained modules or subsystem which have no necessary interdependence upon each other. This is particularly important, McMahon said, to the computer hardware manufacturer interested not only in the business market, but also in the engineering/scientific and home computer communities.

Multi Solutions and other Unix-like development organizations must answer two questions that are much more interdependent than the subsystems within S1. The first question is just as important to Microsoft and AT&T as it is to Multi Solutions: Is Unix going to become the operating system of choice for more than the engineering and academic world?

The second question? In the face of standardization on System V, which seems a fait accompli, is there a place for the maverick multitasking, multiuser operating system?

In November 1984, Multi Solutions entered into an exclusive five-year agreement with Computer Engineering and Consulting Ltd. of Tokyo to license and distribute the S1 operating system to Japanese companies. This agreement will guarantee Multi Solutions a minimum of $40 million over the life of the agreement.

The same month, Multi Solutions announced it had signed a licensing and distribution agreement with Entronix AB, a Swedish company and member of the Ventronic Venture Electronic AB group. Under this three-year agreement, Entronix B would market the S1 operating system with its line of VME Bus 68000 computers worldwide. However, to date, no major computer hardware companies in the U.S. have adopted the S1 operating system.

McMahon is sure that Multi Solutions and its S1 operating system have a long and profitable future. She cited its superiority to Unix as the key to its success. "Unix doesn't have the real-time capability in any one system and it doesn't have the networking capabilities that are necessary, either," she insisted.

Management at Multi Solutions has taken its confidence a step further and has formed a company that will write applications software for S1.

Whether the upbeat mood at Multi Solutions continues depends to a great extent on whether true Unix itself becomes a standard operating system. If so, specialized Unix clones, even incompatible ones, might find their niche markets.

By Lee White

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(Continued from Page 28)

bringing a Unix-like system on board involves two steps: certification and verification. If a piece of software is multiuser and multitasking and has all the functionality of System V, it fits the System V verification definition. Certification, on the other hand, means that an operating system is true Unix. Within a month, Steinberg said, Xenix is going to be System V.

Steinberg sees a coming together of the Unix/Xenix camps. Xenix, which was based on Unix System III, is merely a refinement of the original, he said. If there was confusion, it had to do with the fact that AT&T put large amounts of money into advertising System V, while not acknowledging that Xenix ran on its own 6300, he added.

The phrase Unix war is a concept to be avoided at the risk of alienating users, according to Steinberg. "It was more like a crusade which was not exactly circumvented by the approach to the market taken by AT&T and Microsoft and a whole bunch of other vendors that were still trying to find a market niche for their own systems. Historically, the lack of definition tended to fragment the market."

But is the glorious visual of AT&T and IBM locked in passionate embrace enough to give microcomputer users everywhere that warm and toasty feeling? Hardly. Some very hard questions still remain unanswered.

The first question has to do with Lotus Development Corp.'s 1-2-3. There are millions of Lotus files out there in corporate America, happily residing on floppy and hard disks on IBM PCs, PC XTs, PC ATs and PC-compatibles running MS- or PC-DOS 2.0 through 3.1. What happens to all these Lotus files with a new operating system?

A high-level manager at an organization whose mission is to develop Unix applications stated that his group is well aware that Lotus drives the micro market right now. "The issue is not whether you're dealing with Lotus 1-2-3 but whether you're dealing with 1-2-3 functionality, whether you're dealing with systems that can read 1-2-3 files, whether you're dealing with a system that has exactly the same interface as 1-2-3. That issue is fully acknowledged, but it's a little sensitive right now."

The second question is whether marketers in Unix-land can overcome objections to Unix as an unfriendly operating system. Steinberg sees this objection as a smoke screen, stating only people who came up through the system really care about operating systems, anyway. DOS was seen as a friendly system only because it was accompanied by a lot of friendly applications, he said. Unix "has allowed itself to wallow in its reputation of being a very deep and arcane system. A good operating system will be invisible to the user and will be very friendly to the application," concluded Steinberg.

The third and final question, and one in the mind of most MIS professionals, may be the most important of all. What, in the near- and long-term, will Unix contribute to making computing easier and better, resulting in a bottom line strategic and competitive edge? If a Unix or Unix-like operating system will allow MIS departments to switch hardware on a ad hoc basis; decrease the amount of programming time necessary to develop and refine applications; and at the same time allow the micro-, mini- and mainframe computers to function as a unit in a true networked environment, then Unix will indeed succeed.

It would seem that Microsoft and AT&T's mission would be to listen to the user community and respond to that group's needs. Things really aren't too bad on the end-user computing front right now. Applications software houses have been responsive and the grumblings have quieted. Users will have to be convinced Unix will give them something they really need. If this is not done, the Unix crusade will be more like, "What if they gave a war and nobody came."

■

White is a senior writer at Computerworld Focus.

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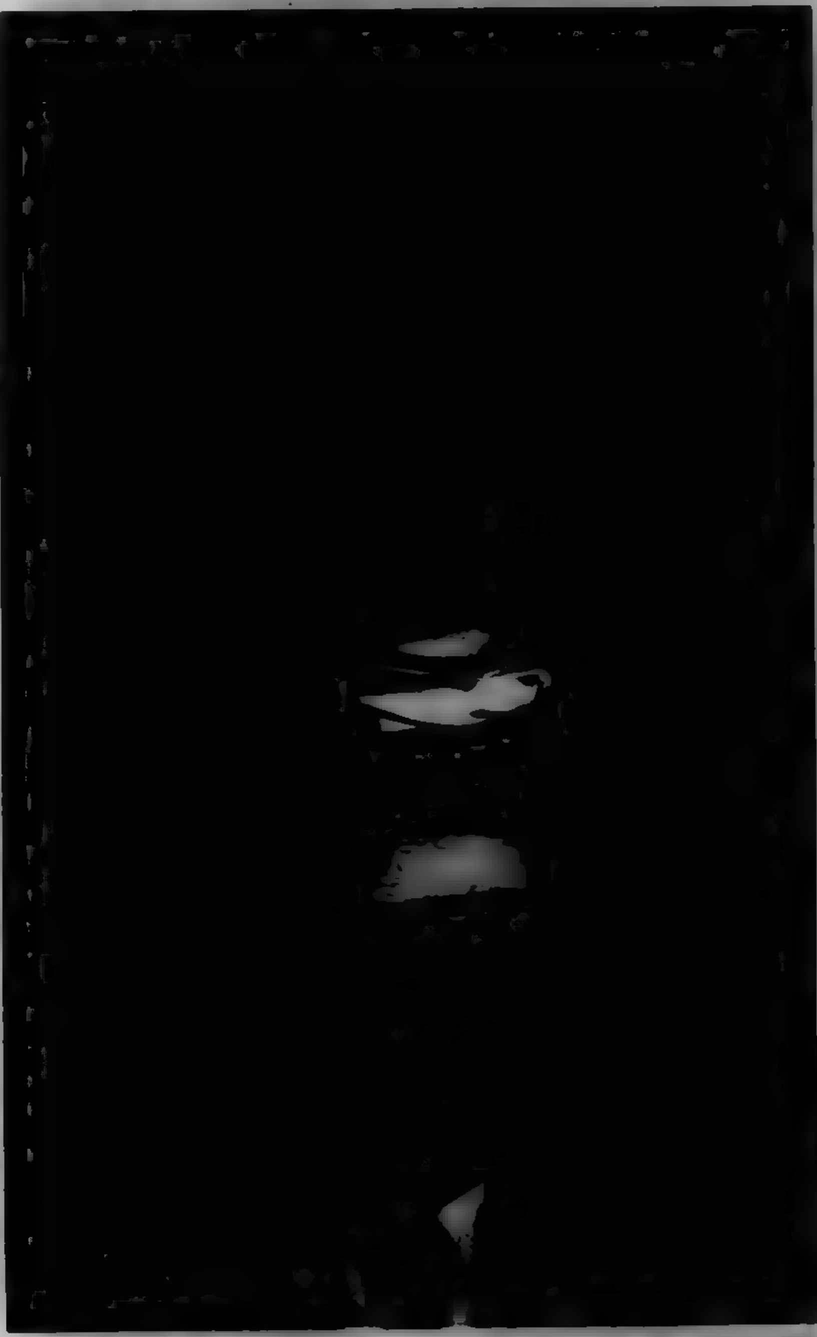

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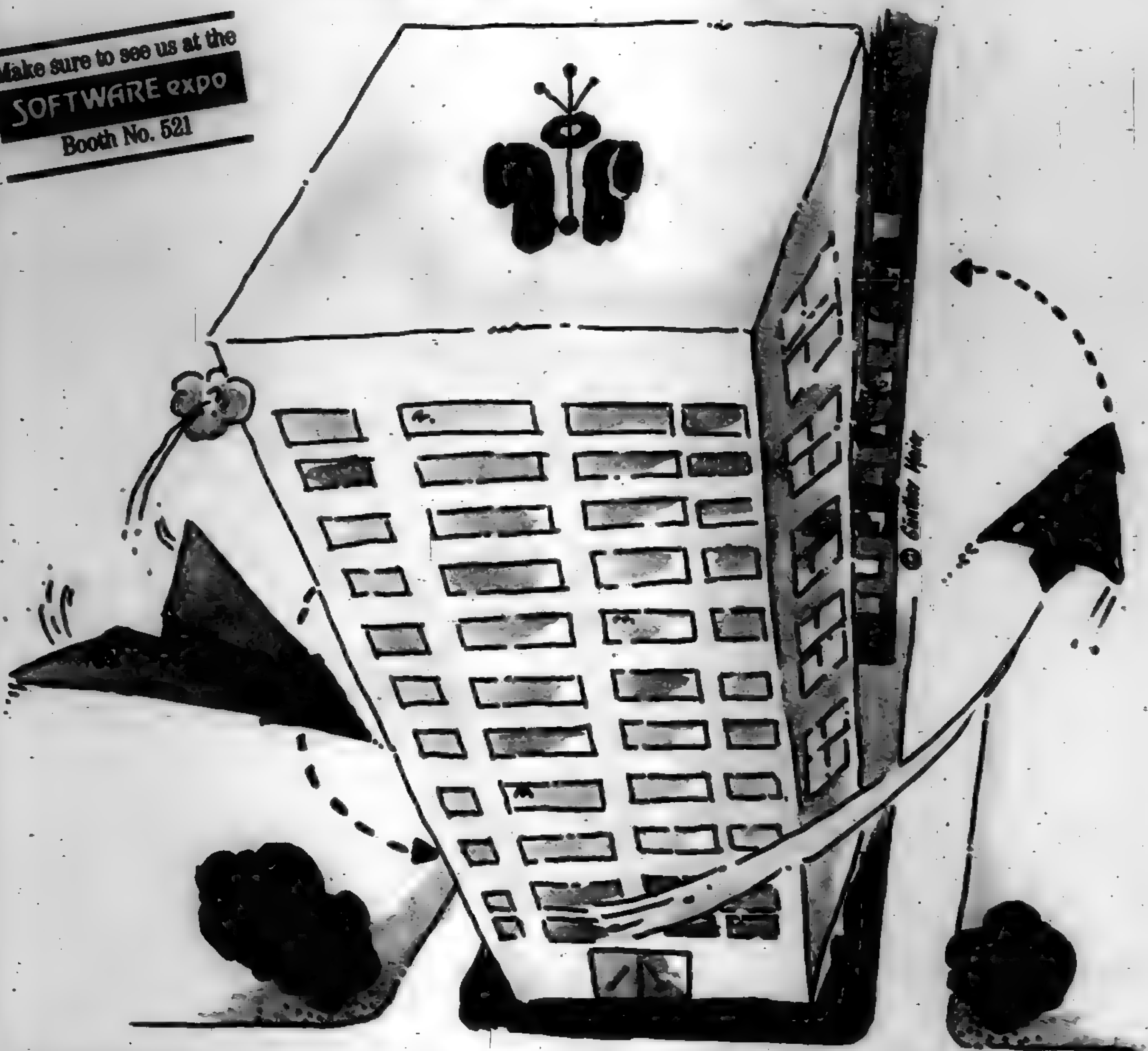

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Topview — Marvel or Mishap?

IBM's Topview has not turned out to be what users were led to expect. What's wrong with this much-touted software? Can Topview be made viable, or is it just a Big Blue mistake?

By Morton Rosenthal

Integrated software packages have not prevailed on the personal computer because they're not the true answer to integration. By trying to be all things to all people, most integrated packages offer a set of compromises that fail to meet the needs of most users who run more than a single application on the personal computer.

What these users really need is an integrating environment that will allow them to combine their favorite stand-alone programs into a single integrated system. The ideal integrating environment would let multiple-application personal computer users start a program, quit the program and start another without losing their place, transfer data among programs and even have programs run concurrently.

Sensing this need in the marketplace, IBM recently introduced Topview to do all the things an integrating environment should do. And nobody likes it.

Most people who have tried Topview have concluded the product is virtually unusable in its present form. What's wrong with Topview? Let us count the ways in which IBM went wrong.

Topview requires too much memory. It won't run most programs in background. Even when it can run a program in background, it can't drive a printer from background. It doesn't handle bit-mapped graphics. It allows file transfer among programs only if the receiving program has been written to be compatible with this feature. It requires the user to set up a

Program Information File for each program it runs, but the user may or may not have the information to do so. It doesn't run DOS batch files, and it's slow.

In spite of all its problems, however, Topview makes a lot of sense. Pretend for a minute that Topview does what it's supposed to do. After selecting the best of the stand-alone programs, you could use Topview to integrate them into a single system. Topview would let you run a program by opening a window on the display, and you could switch to a new program merely by opening a second window. You could return to an application at exactly the point where you left off, or you could let the application run in the background until you returned to it. The foreground program could occupy the full screen, or you could simultaneously look at multiple programs running in multiple windows.

These capabilities are powerful and IBM is certainly on the right track in thinking that any software that can effectively provide such capabilities is sure to be a hit in the marketplace.

What, then, can IBM do to make Topview viable? Or is Topview's future beyond IBM's control?

The next generation of hardware and software will solve Topview's memory problem. Huge amounts of random-access memory will be available at a reasonable cost and, of course, a new version of the PC operating system will allow the PC to address memory in far greater amounts than the present limit of 640K bytes. All in all, it should be a simple matter for IBM to modify Topview to work with a large memory system.

The slow operating speed can also be corrected by IBM in an enhanced version of the product. The change is necessary and IBM will make it if it wants Topview to get off the ground.

Topview's lack of graphics capability is a more serious problem. Although creating a graphics-oriented user interface is easy enough, integrating graphics programs is a horse of a different color. It's not difficult to store text when switching from one program to another, but storing an elaborate graphics display is far more challenging because so much more information is involved. Still, this is a problem IBM can solve in future versions of Topview.

A few of Topview's problems, however, cannot be so readily solved because they involve issues of compatibility between Topview and the applications programs running under it. By and large, the solutions to these problems aren't under IBM's control.

A few of Topview's problems cannot be so readily solved because they involve issues of compatibility between Topview and the applications programs running under it.

A major problem is background processing. For Topview to allow a program to run in the background, the program must use all standard PC-DOS conventions. Because handling input/output (I/O) operations through PC-DOS slows down a program considerably — especially when writing to the screen — most popular PC programs bypass PC-DOS and make direct hardware calls. The solution to this problem is complex, but a safe prediction is that, with few exceptions, the only programs that will ever run in Topview's background are those that have been designed by their developers to be compatible with Topview I/O conventions.

File transfer is another problem. Applications programs must be designed (or redesigned) to accommodate Topview's file-transfer buffer if they are to be able to receive files from other programs.

Designing an applications program to work with Topview is obviously the job of the software developer. Most developers are hesitant to adapt their software to Topview because they're not sure Topview will become popular. After all, if Topview fails to catch on, why waste development time to support it?

Moreover, a few developers are avoiding Topview compatibility for quite a different reason: They're scared to death IBM's entry into the software arena will put them out of business. Although they'd like to see an integrating environment standard emerge, they'd rather have that standard set by a company other than IBM.

And another company is, in fact, in a position to establish the standard. Microsoft Corp. recently released Windows, a multitasking integrating environment many think will pose a real challenge to Topview. Unlike Topview, Windows has bit-mapped graphics and its own screen interface; like Topview, however, Windows requires that applications programs be written to take advantage of its special capabilities.

Although Windows is not yet available at retail (only the OEM version has been released), it has a fighting chance of becoming the integrating environment standard. Microsoft's relations with OEM and developers are excellent; after all, Microsoft is the company that developed the MS-DOS standard. In fact, if Windows or its successor started to catch on, it wouldn't be surprising if IBM acquired the rights to it and offered it as its own. If that happened, we'd have a real standard.

A third contender for establishing the integrating environment standard is Digital Research, Inc., which sells GEM Desktop, a windowing program that provides an interface like that of the Apple Computer, Inc. Macintosh. The product does not provide multitasking, however, and most observers doubt it will ever be taken seriously as an integrator — at least in the business market.

Nevertheless, one group of users may latch on to GEM Desktop. The product has a definite appeal to executives and other light-duty users who want an easy-to-use, icon-oriented interface, but who don't want to buy a Macintosh. The size of this group is probably not sufficient to establish GEM Desktop as any kind of standard.

Some industry observers think IBM's recent Topview giveaway (a free copy with each hard-disk XT sold to dealers) was a ploy to get Topview into greater circulation and thus increase its chances for becoming the standard. If this was IBM's strategy, it won't work. It will take more than high circulation to establish a product that few people use more than once.

In the meantime, what are users to do while waiting for the standard to emerge? How will we ever juggle all those high-powered programs we'd like to run all at once?

Do nothing. Let Microsoft twist the developers' arms to write software for Windows while it twists its programmers' arms to complete the retail version of Windows. Watch IBM use its marketing muscle to get its enhanced Topview into the hands of every PC user it can. Then, when your favorite programs become available in special versions for a particular integrating environment, you can assume that environment has been established as a standard — and you should give it a try.

But don't hold your breath waiting. Using an integrating environment to integrate stand-alone programs on the PC is an excellent concept, but for the experienced PC user the concept has a long way to go. In the meantime, just relax and continue using your software the old-fashioned way. You aren't missing a thing.

* * *

Rosenthal is chairman of Corporate Software, Inc. in Canton, Mass., a firm that supplies personal computer software to large corporations and helps customers select and use PC software.

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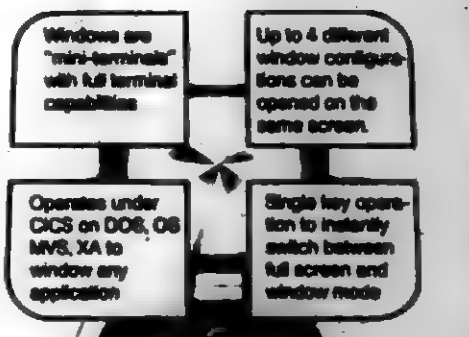
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So You've Chosen Your 4GL – Now Can You Cost Justify It?

By Gary G. Rossell

Selecting the right fourth-generation language is difficult enough; cost justifying the choice is another problem altogether. In 1984, as vice-president of data processing in charge of support services for Meridian Bancorp, Inc., I headed a team that began a search for an information center tool for corporatewide use. Meridian Bancorp is a $5.6 billion financial institution, the fifth largest bank holding company in Pennsylvania and a Fortune 500 company.

Only after we had made our decision, documented our reasons for the selection and obtained management approval did we begin the process of cost justification. We intentionally separated selection from justification to ensure that we had the right information center tool before we figured out how to justify the expense. Our tool was Nomad 2, a fourth-generation language data base management system (DBMS) developed and marketed by D&B Computing Services.

We always separate selection from justification to ensure that we do not come up with a system that, although it fits a budget, might be merely the best choice of a group of second-rate products or one that does not have all the necessary features for our organization's needs. Any other kind of planning would be a bit like deciding you could afford to spend only $6,000 on a new automobile before deciding that you really needed a passenger van that could hold eight people in relative comfort. We do not ignore the amount that we plan to spend on a new product, but we do separate selection from justification.

Naturally, if we could not cost justify our choice, we would have to turn to the three R's: regroup, reassess and, possibly, reselect. The inability to cost justify would definitely makes us reexamine our selection decision in depth.

Cost justification is taken seriously at Meridian Bancorp. We have learned to talk business English to management rather than computerese. We communicate in terms of return on investment (ROI), cost reduction and avoidance and efficient operations — not in acronyms.

We commit to short-term deliverables and make the believer/leader sponsor responsible for its implementation. We also commit the selection/justification team to deliver the product. This same sense of commitment conveyed in the proposal to management is built into the entire process of selecting and evaluating any significant new system.

That is, we make sure at every stage of these processes that we can prove to our own satisfaction that we have rigorously and thoroughly examined all the alternatives, that our choices are logical and that they can be explained in business terms. This examination and explanation is expressed in terms of what is best for the company, the business and the users rather than what will serve the primary interests of management information systems.

Even thus prepared, cost justification — after screening, evaluation and selection — is an important exercise, especially if you are in charge of it and getting ready to say to senior management: "I believe in it. I commit to it. I will deliver it for the company. You can hold me accountable."

Naturally, the justification is related to the selection criteria for a new system and to our initial goals. In the case of an information center tool, we were primarily interested in an information center tool for end-user computing.

Cost justification of a system requires a completely different mental set and different procedures from those required for merely identifying criteria and goals. But cost justifying is much easier after you have become familiar with the product's features and capabilities.

We decided not to limit the scope of our cost-justification efforts and expanded them to the following:

- Reduced applications development costs.
- Hard-dollar and soft-dollar savings.
- New business opportunities.

Programming Work Content

≡ Develop Screens ≡ Edit Data ≡ Add, Delete, Change Logic ≡ Match Files ≡ Table Look-Ups ≡ Code File Definitions ≡ Code File Relationship Logic ≡ Standard Functions • Date Arithmetic • Check Digits ≡ Reports • Page Numbers • Totals • Sum Into Matrix • Spacing/Headings • Sort	80%
Unique Logic	20%

Standard Function Results

≡ Quality of Code↑
≡ Testing Decrease
≡ Documentation
  • System↑
  • Program↑
≡ Productivity↑
≡ Post-Impl. Errors↓
≡ Maintenance Changes
≡ Prototype Possible

Figure 1

The identification of reduced application development costs required an analysis of the programming process. Figure 1 lists the major tasks that represent the program coding process.

Our analysis indicated that the basic tasks require 80% of the coding time, while the development of unique logic for a specific application takes the other 20%. As a result of this analysis, we identified the following cost savings for applications development using a fourth-generation/language DBMS:

- Less coding time than with Cobol.
- Less training time than with Cobol.
- Faster start-up by entry-level programmers.
- Lower average salaries for trainees.
- Decreased testing because of canned and debugged standard functions.
- Reduction of programming errors also because of the same canned functions.
- Reduced effort in maintaining changes.

In addition to identifying development savings, our analysis confirmed that a fourth-generation language could simplify basic coding tasks and make it possible for end users to accomplish them easily with a minimum of training.

We identified the following obtainable cost savings:

- Reduction or elimination of time-sharing services.
- Assumption of jobs being handled by service bureaus.
- Avoiding the hiring of contract programmers.
- Avoiding the purchase of minis and micros.
- Eliminating one report writer software package.
- Avoiding the purchase of an add-on option of a new software package.

With the concurrence of one of our users, we were also able to identify one new short-term business opportunity through the application of the fourth-generation language/DBMS to an existing manual system. The following other, less tangible opportunities were also identified:

- Reducing the invisible backlog of jobs that are never requested because users have given up trying.
- Tackling jobs with less obvious savings or benefits that have been put off due to low priorities in DP.
- Meeting the accelerating demand of personal computer end users who are outgrowing their personal computers and/or need data from the mainframe.

Later, we also plan to look at the possibility of doing a portion of the forms preparation work of large numbers of people in the corporation.

After exploring all these factors, we were able to provide two separate cost-justification estimates — either of which proved the ability of the system to pay for itself.

We are currently developing the new business opportunity option using the package's procedural and nonprocedural language-handling facilities for one of Meridian Bancorp's major departments. ■

Rossell is vice-president, data processing, in charge of DP support services for Meridian Bancorp, Inc. in Reading, Pa.

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Software Package Contracts - What Non-Lawyers Should Know

By Lawrence Szczech

Let's assume you are the financial or operations manager of a large organization that is about to bring in some new software. What will you advise? Have you given enough thought to this area to offer your company some protection? Without trying to impersonate a legal expert (and this article does not give legal advice), I've put together some pointers that may prove helpful in negotiating software package contracts. These guidelines are drawn from my firm's experiences as vendor and user.

The first point to remember when negotiating software contracts is that users don't buy software packages; they lease them. Because a lease carries with it no inherent rights of ownership, the only rights the organization has are those outlined in the leasing agreement or contract. The organization that wants to ensure that its software objectives will be satisfied will do so before signing on the dotted line.

When the purchase is a micro software package, the terms of the license agreement are cut-and-dried. They're usually printed on the carton containing the magnetic cartridge or diskette. In some states — Louisiana, for example — removing the shrink wrapper means agreeing to the terms.

Most IBM System 34/36/38 software package vendors will also have a prepared agreement, albeit one more open to negotiation. The professionalism of vendors goes a long way in determining their willingness to negotiate. Some vendors that are more open to an individual firm's needs will allow the addition of clauses that address legitimate business objectives. Almost all vendors, however, will require that the standard terms remain unchanged.

The first and last step an organization must take in leasing software is to have a lawyer look at the agreement. Lawyers are no protection from the burdens that may have to be carried later. Ultimately, your shoulders will bear the success or failure of any software contract. As the financial or operations manager, you should carefully review the contract's coverage of the following four areas: performance, pricing, timetable and add-ons.

In the following discussion of these areas, a one buyer/one vendor relationship is assumed. If the software package has been purchased from one vendor, that in turn uses another company to install and/or modify the package, make sure all parties and their roles are tied together in the same agreement.

Performance: The lack of standards in the software industry increases the need for defining what a package is supposed to do for its user (for example, how it should perform in your environment). Many users would no doubt like to attach their request for proposal to the contract and have it function as the performance criteria. No software package vendor would agree to such an arrangement. Placing personalised demands on a product designed (as all packages are) to offer standard functions would give the vendor no room to perform. Performance measures have to be geared to what the vendor says the unmodified package will do, not what a user would ideally like it to do.

What then is a fair measure of performance? One common example or statement of performance is that the software will function as outlined in the user documentation. A user could also ask to have the contract stipulate the software must pass certain postinstallation performance tests. It might also be wise to define acceptance of the package as occurring on the day performance tests are met.

Another option is to have a fixed trial period serve as the performance measure; when a large-scale system is being installed and tested, however, 30 or 60 days will hardly be ample time.

A key question could change both the vendor's and the user's perspectives in terms of performance warranties: Are you getting the source code? If you don't have the source code, you will be at the mercy of the software vendor if you ever want to make changes, integrate the package with another system, upgrade hardware or just if you come across a bug or lose some object code. Because you will not have the ability to change anything, performance criteria such as warranties will become ever more crucial.

When a user buys software with the source code, the software comes "as is." The vendor's contract is sure to revoke liabilities or warranties because the vendor would be a fool not to do so. By giving a user the source code, the vendor also gives the user the ability to modify the way the software performs. As a result, the vendor will therefore no longer want to sign a contract ensuring that the end result of that operation will meet certain levels. Buying software "as is" has no drawbacks — if you do your homework. That means seeing a demonstration in an actual client environment rather than in a controlled situation like the software vendor's office. Talking to a client actually using the software is the best way to measure software performance regardless of what the software is.

When a package is purchased without the source code, a user should make sure two points have been covered. First, does the contract stipulate how future versions of the software will be installed, how much they will cost and who will pay for them? Does a yearly maintenance or license fee include personnel costs of installation? Don't rely on future enhancements to increase the payback on your software investment. Most follow-up releases deal with solving what was wrong with the earlier version — for example, removing bugs or improving usage — not with expanding operational capabilities presently available. If enhancements are announced, the vendor will offer them under a separate module at a new price — you don't get software for free.

Never, never pay for everything up front — even for a discount. You'll lose your prime bargaining chip — withholding payment.

Second, make sure the vendor has placed the source code in escrow and has defined what happens if the vendor goes out of business. Do you get a copy of the source code? Does the holding firm become its owner and therefore your landlord? These are legal questions you must discuss with your lawyer.

Pricing: The contract states the price. Just make sure it also matches payments to vendor performance. If you're buying software, receiving the source code and having modifications done, a sample payment schedule might be the following: 50% of the package price when the agreement is signed; 50% of the package price upon installation; and modification charges to be billed to you only after you've signed off on work time sheets and/or reviewed progress in some type of regularly scheduled status meetings. A user buying a package without source code could tie part of the payment to installation and part of the payment to satisfactory completion of performance criteria (for example, postinstallation tests). Never, never pay for everything up front — even for a discount. You'll lose your prime bargaining chip — withholding payment.

The contract should also grant rights to future purchases at premium rates. A normal software package license entitles usage on only one CPU (but usually includes maintaining a backup copy for archival purposes). An organization that can foresee the need for duplicate copies or permission to download/migrate programs in a distributed/local network

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should realize that now's the time to establish the associated costs. Secretly producing such copies could invite a lawsuit from the vendor, and legal costs for copy-infringement defenses usually exceed package costs.

Establish the price for the remaining modules if you are buying one or two modules of an integrated system (for example, the company needs order entry and inventory now; maybe later manufacturing control and purchasing will be necessary).

This agreement might involve a set time frame or series of cutoff dates whereby the follow-up modules are available at a set price or increase at a set percentage that would allow for inflation and enhancements.

Timetable: A word is missing here — *realistic*. It is important that the timetable be realistic for both user and vendor. If you don't already have one, work out an installation action plan with the vendor to ensure a smooth transition from the present system.

Add-ons: The user who buys a software package is getting a lot more than the named entity usually stated in the beginning of the contract. What you're really getting, whether you realize it or not, is a new way of operating a portion of your business. Have you considered all that this entails? Do you want user training? Do you want user manuals in addition to system documentation? Is the cost included or extra?

Most software licenses start out by saying: "This agreement supercedes any previous verbal or written claims." If the organization wants the documentation included in the price of the software, get it in writing in the contract. Most vendors offer training on a billable basis. If you expect free training, get it in the contract. Such contractual dealings take time. Any software procurement timetable should reflect the need for this discussion period right from the outset.

Of course, even a well-written contract can't guarantee results. Some of today's software contracts go so far as to outline a means for settling disagreements that might arise. A prevalent example is arbitration, which allows the user to resolve disagreements while avoiding the excessive delays and costs of taking the vendor to court. Be careful, though. Recent precedents have given arbitrators not bound by stipulations within the agreement a free hand in deciding the outcome.

If disagreements do arise, another alternative is negotiating disputes. For example, assume the software has been installed. Response time is slow. A file won't accept any more records. Operators keep keying in the wrong data because the order form doesn't match the entry screen. Are these problems caused by hardware, or do you have a legitimate gripe about the software vendor's package? Identifying the culprit will require a computer expert. You have two choices: assign a senior programmer/analyst on staff or retain the services of a consulting firm.

If after clearly defining the issues and reviewing pertinent agreements you feel a legitimate claim exists, delineate this claim in a letter, detailing subsequent demands, and mail it to the vendor with copies to appropriate senior management. This action puts you on record (which will be valuable in the eyes of the court) and shows the vendor you're serious.

In the software industry, reputations go a long way in making sales, and most vendors willingly negotiate disputes, especially if the user hammered out a solid contract in the first place. Finally, negotiations should end with an agreement outlining the vendor's actions.

■

Sacasch is marketing manager for Mincron SBC Corp. in New York City.

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Prototyping – New Tools For Cutting Through The Applications Backlog

By Carol A. Kaniper

Many data processing departments are faced with application backlogs measured in years. And, although users are threatening to hold their collective breath until they turn blue, there seems to be little management information systems managers can do to crank out applications faster.

Application backlogs exist because the complexity of many DP systems has grown beyond human control. MIS managers have to spend too much time pigeonholing application systems into the organization's data base — verifying relationships here, creating new data bases there. As these procedures eat up time, the backlog grows, users get angry and applications — critical to a company's success — become obsolete before they are completed.

These problems are not new. Computer departments have had trouble meeting user demands for applications since the dawn of DP. A number of companies offer products that attempt to relieve the pressure of application system development. Known variously as fourth-generation languages, application generators and/or systems development tools, these products offer ways to streamline application development and better manage data base resources. Some of the systems and their makers include Dbase from Ashton-Tate; Ideal from Applied Data Research, Inc.; Linc II from Burroughs Corp.; Mantis from Cincom Systems, Inc.; SQL from IBM; and Ramis II from Martin Marietta Data Systems, Inc.

One of the most important capabilities these systems provide is application prototyping. Prototyping gets users involved in application development. They get to help engineer their applications, not simply test drive them. A prototype is the forerunner of a live system. It is a working model that gives users a better feel of how the system will work and allows users to determine if the initial design is correct. Among the benefits provided by the prototyping approach to application development are the following:

- **Happier users:** Fourth-generation prototyping involves the end user to higher degree than traditional application development. This increased involvement lets the user make changes to the application system at an earlier point in the process. Prototyping provides the user with a physical model to examine, test, evaluate and comment upon, rather than an intangible stack of specifications. There is a greater chance users will be pleased with the live system

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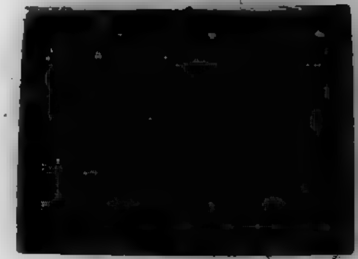

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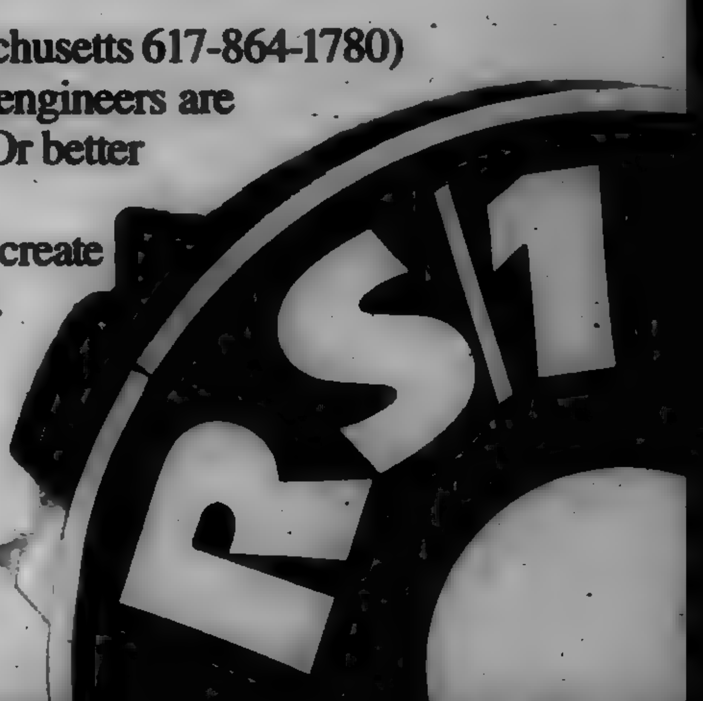

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when it is finally delivered because they have played an important role in developing it.

In his book *Application Prototyping: A Requirements Definition Strategy for the 80s*, Bernard H. Boar describes the benefit of increased user participation in application development. "Users must be actively involved to ensure the functionality and acceptability of the system. In conventional prespecification, users may or may not find reading the documents and attending the walk-throughs exciting. They may sign off after a careful analysis of the proposal or simply sign off to get rid of it.

"Users can't wait to see a prototype. Their eyes light up and the ideas swirl as they experience the imperfect model. The users actively participate because they have a meaningful and comfortable medium to participate through. The problem becomes one of sorting out all the ideas and suggestions for tryout rather than an absence of innovative suggestions," Boar notes.

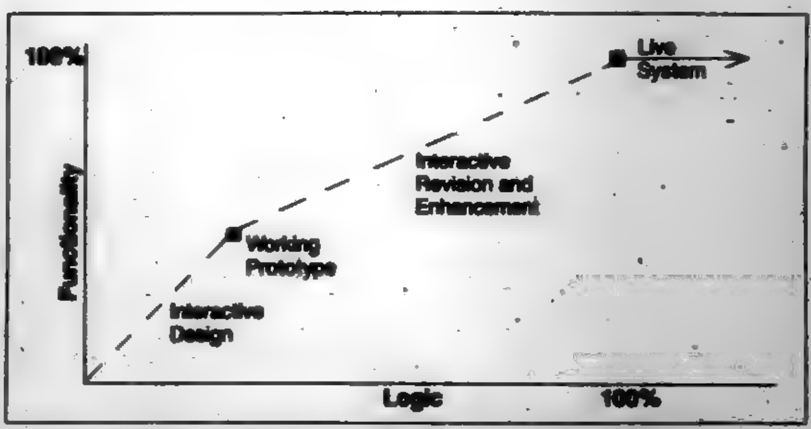


Figure 1. Evolving Applications Through Prototyping

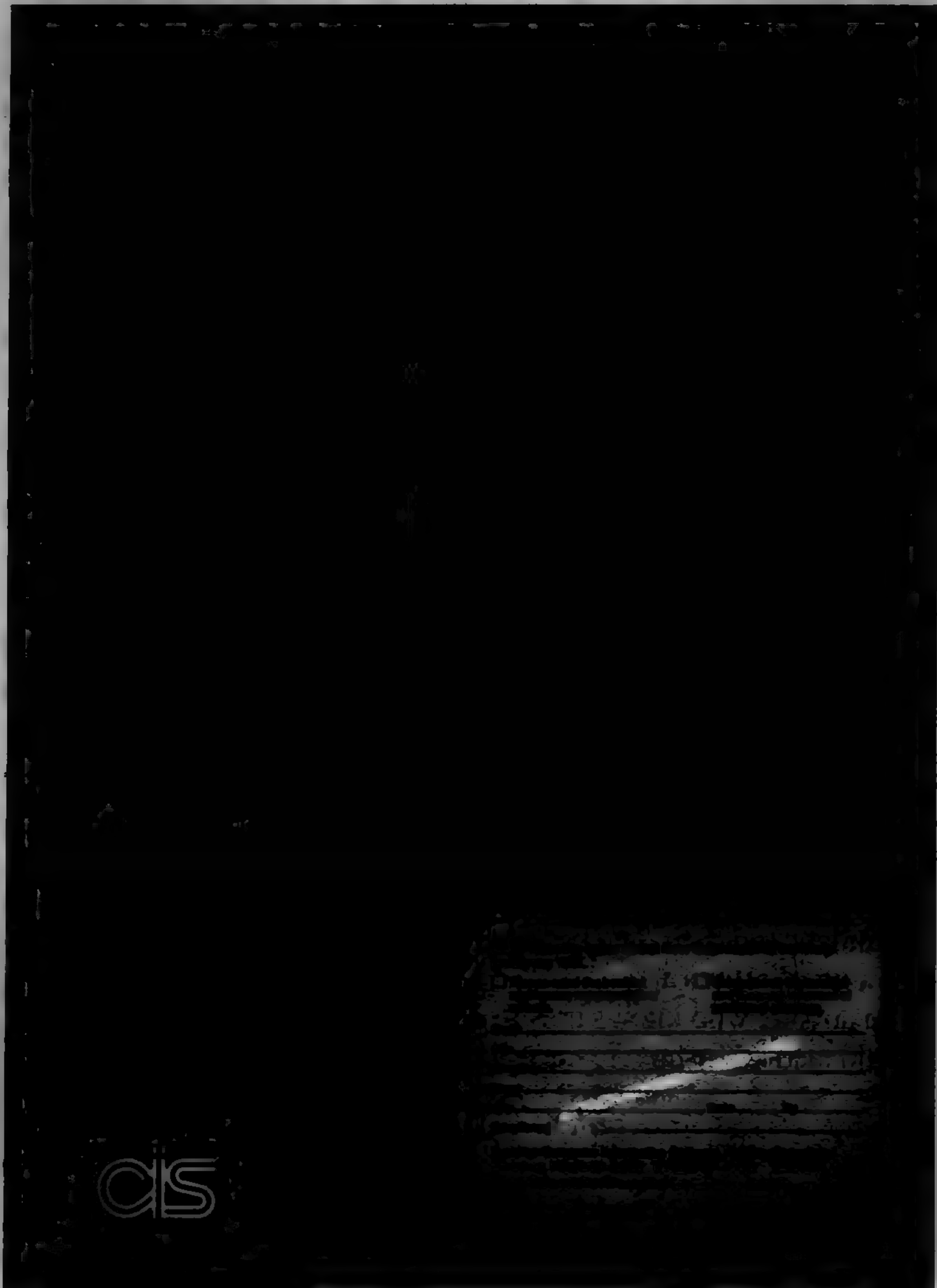
- **Improved DP productivity:** In a 1983 study of six companies using a fourth-generation system, Dr. Eberhard Rudolph of the University of Auckland, New Zealand, found fourth-generation systems can improve programmer/analyst productivity by 1,000% to 2,000%. One main reason for improved productivity is the prototyping capability provided by most fourth-generation systems.
- **Improved business responsiveness:** Prototyping with a fourth-generation system not only improves the productivity of the DP staff, it has a major impact on end-user productivity. Users get tailored solutions more quickly than previously possible, which may allow better use of clerical personnel, cost savings through more timely and accurate information and better decision-making ability.

The ability to produce application systems faster also allows an organization to accommodate new business more quickly, which enhances its market position. In addition, improved productivity may provide a competitive edge in a new business area (such as customer service) or automation of new business growth targets.

- **Reduced development risk:** According to Boar, many large software development projects never result in an operational system or do so only after significant modifications. "Medium- to large-scale application development is a high-risk undertaking. To minimize risk, models must be used to test the ideas. Only when the risk level has been negated by consensus acceptability of the model, are major resources expended to build the full system."
- **Reduced user training time:** It naturally follows that if users are involved in developing their own applications, training time will be significantly reduced. Users know the system because they helped develop it. In addition, once a definitive working prototype is developed, it can be used to train other users.
- **Simplified project management:** Boar points out that as a result of the iterative nature of developing an application through prototyping, it is unnecessary to create a formal control system such as Gantt or Pert diagrams. Because revised prototype systems can be created quickly, usually in a matter of a few weeks, a status report can be an actual demonstration of the revised working prototype.

Developing an application system based on prototyping closely parallels traditional application development in its early stages. In both approaches, a thorough systems analysis is conducted of the user's department and proposed application.

After systems analysis, however, the two approaches diverge. In a traditional development process, the systems analysis team then creates an extensive set of system specifications. The specifications are often an analyst's interpretation of the user's requirements as well as specifications such as how the new application will interact with the company data base — something in which the user has no interest. Yet the user is expected to review and approve the specifications. After the specifications have been approved, one or more programmer/analysts code the application system.



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After the coding, however, changes and revisions become difficult, and user input characteristically is no longer sought. At this point, careful attention must be paid to the entire program structure and its data base. A simple field change in a screen typically ripples throughout the entire program.

By means of the prototype approach, a more compact proposal is drawn up. Little mention is made of the interaction between the user's application and the corporate data base because many fourth-generation systems manage this activity automatically. When the general concepts for the application are agreed upon, the systems analyst or programmer creates a working model of the application (see Figure 1, Page 44).

The prototype or application model is a working framework. Usually in a matter of days or weeks, working screens rather than vast sets of specifications are produced and presented to the user, who is encouraged to make constant comments and updates. Almost any aspect of an application can be prototyped and tested by the user to make sure it meets application requirements. Logic can be tested for transaction processing, reports or batch processing. Though not fully featured with all the required functions and logic, this working prototype allows the user to review the basic application design before the system programs are generated.

As shown in Figure 1, the user and developer interactively revise and enhance the working model as it moves toward full production capability. More and more logic and functions are defined as the model moves closer and closer to the ideal system.

When the user and analyst agree that the model contains all the desired elements, a live system is generated. Some fourth-generation systems using the elements defined by the prototype will generate everything necessary for a live production system, including data communication links, the data base structure and the necessary Cobol programs.

What about the down side? If it's so easy to create application systems using prototyping, won't users request new systems more frequently? Won't users want every available bell and whistle included in their systems? Because programmer/analysts know bugs can always be fixed later, won't preliminary designs get sloppier and sloppier?

Certainly, prototyping is not a cure for bad design habits. A bad driver's driving techniques won't suddenly improve when he gets behind the wheel of a grand prix race car. If a DP department's application development practices are poor before a fourth-generation system is installed, the new system may not help much.

It is possible users will want to add more functions to their applications using the prototyping method than they might using a traditional approach. This is not necessarily bad, especially if the user feels the functions are necessary. If the user comes away with a system that has a few extra features, it won't, in most cases, add significantly to development time; it may help the user do the job and, therefore, probably will result in a happier user. If requests for progressively more functions get out of control, one approach is to point out the added cost and delay for creating each additional feature.

"We don't develop application systems anymore, we evolve them with the user's help," said Morris Ayres, DP manager for Universal Rundle, a plumbing fixture manufacturer in New Castle, Pa. "We work with the user to move the system from a concept to a full-blown system. Users become more comfortable through the evolution process — the process becomes a training ground," he added.

"In most cases, a systems analyst will work in a department and use the old system for a period of time. The analyst documents the old system for review purposes," Ayres explained. "Once we work out the conceptual design, we design new screens, get them to run and that system becomes the basis of development."

Ayres said that before converting to a fourth-generation system, Universal Rundle faced a three-year backlog of application requests. "We tried many different ways of simulating the proposed application. We used overhead projectors and showed users what the screen would look like before and after it changed," Ayres said. "No matter how hard we tried, we always seemed to come up short.

"Now we're getting systems in place faster. We've reduced our backlog to six months," he said. "Management knows it will get its application in place in a reasonable time frame; that's what it expects from us. We experienced a 60% increase in programmer productivity — just a sheer reduction in the number of lines of code we have to generate. We've reinvested the time we've saved on improving the quality of the applications we deliver."

Prototyping is but one aspect of currently available fourth-generation application system generators. Used properly, the prototyping approach to application development can help chop backlogs and give everyone — from DP personnel to top management — a little breathing room.

Kaniper is program development manager for Burroughs Corp. in Detroit, Mich.

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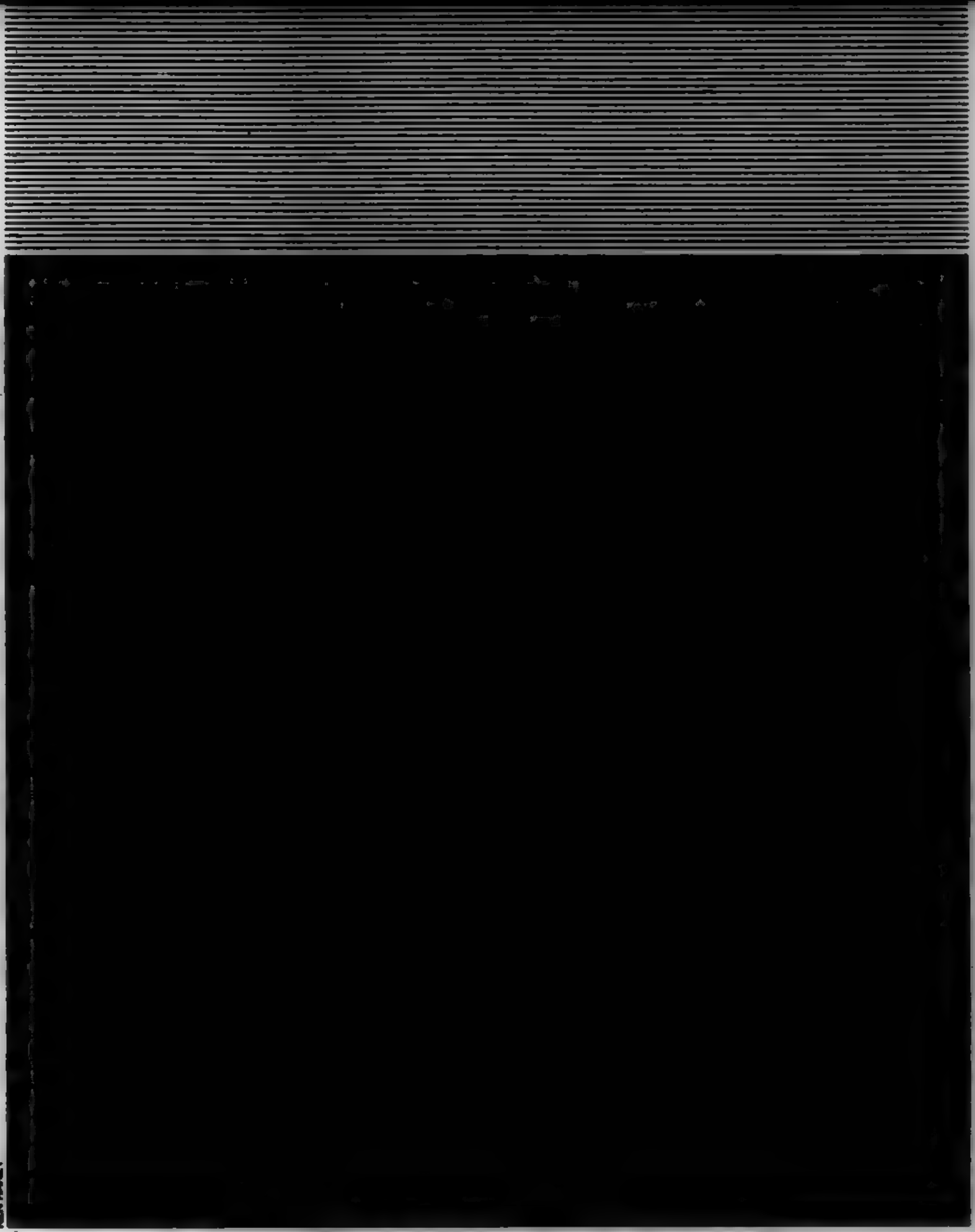

KEN RANEY

Bringing DSS Into Focus

Decision support systems are finally coming into their own. The technology is available today and their capabilities are just being discovered. Some organizations are already making DSS a reality.

By Stan Kolodziej

Every day, Steve Anderson sits at his terminal at the Atchison, Topeka & Santa Fe Railway Co. offices in Topeka, Kan. He types in his password and logs onto the railroad company's operations expeditor (OX) software system, developed in-house. As Anderson plugs in a set of commands he is soon enmeshed in OX's railroad car tracking subsystem. Very quickly Anderson sees which freight cars are scheduled to be used that day at various locations across the country. He also sees which cars are lying idle and what empty cars are being hauled to other areas.

Typing in a few more commands, Anderson leans back and watches as the computer flashes the effects of moving some freight cars from Clovis, N.M. to Barstow, Calif. The screen indicates the cars would be better used in Topeka. The OX system has just answered Anderson's what-if question and, perhaps, saved thousands of dollars in the bargain.

At Genrad, Inc.; a Waltham, Mass., electronics firm, Donald Sundue, corporate director of management information systems (MIS), looks at the massive monthly operations report sitting beside him. Instead of picking it up, he punches instructions into his terminal. Sundue's screen quickly displays a condensed electronic version of the report, presented by means of the Command Center, a decision support system (DSS) from Pilot Executive Software, Inc. of Boston, Mass. A few more keystrokes and Sundue has gleaned, consolidated and printed what he wanted from the report without flipping through any pages.

Both the above sketches represent real uses of DSS. At the Atchison, Topeka & Santa Fe Railway, the company's OX system has been touted in some circles as the most extensive user-developed computer system in the U.S., if not the world. OX also represents what DSS is supposed to be all about: putting computing power in the hands of users.

Steve Anderson, the railway's senior special assistant to the vice-president of the Information Systems Department, explained that the system was produced over the past decade almost exclusively by non-data processing personnel such as himself. OX was written with the help of the fourth-generation Mapper language and application tools provided by Sperry Corp. of Blue Bell, Pa. The system's grass roots user involvement began when the Atchison, Topeka & Santa Fe's industrial engineering teams were called in to try and improve the manual billing system and failed. A Sperry representative then entered and convinced Anderson that the railway really didn't need a DP department to handle automated billing. He was right. Within a mere four months, Anderson and three other railway employees without computer training had put both a billing system and a piggyback car-loading system in place.

"We've never had to go outside to get [the OX system] done," Anderson said. "We have our own expert systems people right here. The people using the system know the business, and they should be the ones who put it together."

OX is a decision-making tool in a very real sense, but it is not used by those making the most important corporate decisions at the Atchison, Topeka & Santa Fe. This has been a big dilemma for vendors of DSS since they first began appearing more than a decade ago. Aimed at corporate decision makers, today's DSS offerings are still used almost entirely by middle management and, ironically, these people are not corporate America's major decision makers. Executive hands have remained for the most part clean from the touch of computers and computer terminals. When executives do some decision making, they put pen to paper and use intuition, not keyboards and spreadsheets.

With executives looking the other way, DSS were quickly assimilated into corporate data centers, where programmers used them to pump financial data to financial analysts, accountants and other middle managers. These people, in turn, have since used DSS to produce the finished reports executives read and use as a base for some of their decision making.

"DSS has had trouble reaching executives because those who rise to the top of corporations also seem to rise above the data," explained Paul Cubbage, senior industry analyst at Dataquest, Inc., a San Jose, Calif. consulting firm. "Most of the time they don't even use data to solve problems."

The DSS concept got its start early with financial applications and has deviated little from this financial touchstone. Early mainframe-based DSS products such as Interactive Financial Planning System (IFPS) from Execucom Systems Corp., Austin, Texas; Focus from Information Builders, Inc., N.Y.; and System W from Comshare, Inc., Ann Arbor, Mich., were the inspiration for a number of large, financially driven DSS products that, until the arrival of the IBM Personal Computer, had a stranglehold on the DSS concept. Financial DSS programs are extremely data-driven and their supporters look askance at some of the more intuitive, abstract input to many decision-making programs now on the market for personal computers.

The IBM Personal Computer has had a twofold effect on DSS. First, it has done much to take DSS out of the old grasp of the DP department and into the lap of the user. Almost every DSS vendor now offers a micro version of its mainframe DSS product. Second, by downloading data from the mainframe onto a microcomputer and merging the data with programs such as Lotus Development Corp.'s 1-2-3, the user can create more open-ended, personalized DSS applications than is possible when tied to a mainframe.

An example can be found at the F.W. Woolworth Co. in New York, where the retailer's MIS department is working with users in its information center to migrate mainframe IFPS applications to IBM PCs. Using Execucom's Dataspan conversion software, programs written in Cobol and other non-Execucom languages can be converted to IFPS format without the use of programmers. Barry Putt, F.W. Woolworth's manager of corporate business applications, said divisional managers are using IBM PCs to create personal financial modeling projects using such cryptic tools as variance analysis, return on investment trees and profit center scenarios.

"IFPS command structure is easy enough to lead our people through any models they want to develop," Putt explained, adding that he welcomes the ease of transferring IFPS to a PC environment because he and his MIS colleagues are busy with other perhaps more important corporate work.

Putt's praise of the IFPS command structure is important, for the command structure is the way the DSS product and user communicate. "Overall, DSS has been uninteresting because of the interface problems," said office automation consultant Amy Wohl, president of Advanced Office Concepts Corp., Bala Cynwyd, Pa. "Most systems still require users to be experts. Artificial intelligence has been making ground, but not enough in improving the interface to DSS."

One of the bright spots Wohl mentioned, however, is Metaphor, from Metaphor Computer Systems, Inc. in Mountain View, Calif. Metaphor is an information retrieval and analysis system that is far from PC-oriented, costing between $8,000 and $10,000 per user. It employs the company's own workstations, shared file servers, data base servers and mainframe communications servers — all tied to a Xerox Corp. Ethernet local-area network. David Liddle, Metaphor's chief executive officer, said the ideal user of Metaphor would be a large company that requires "a lot of data and a lot of ad hoc decision making."

The Metaphor application capsules allow users to take the symbolic icons through windows on the workstation screen and to create their own DSS applications. Applications are not written in the traditional sense, and no code is used. Instead, applications are made by interconnecting the icons by arrows, linking each command in a long chain. Liddle said more than 90% of all Metaphor user applications (mainly financial querying

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Computer Associates, Inc. Jericho, N.Y.	CA-Financial Planner	Financial planning and modeling system that prepares monthly budget reports and forecasts budget results	NA	No	IBM 370, 4300 series, 370 series or plug-compatible mainframes	$35,000
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Decision Support Software, Inc. McLean, Va.	Expert Choice	Support system using inverted tree charts and step-by-step logic to reach decisions	128K	No	IBM PC, IBM XT and IBM compatibles	$495
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Execucom Systems Corp. Austin, Texas	IFPS/Personal	Financial modeling with full-screen editor and nonprocedural user interface	512K	IFPS (mainframe)	IBM PC, IBM XT, IBM AT and IBM compatibles	$895
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Computer Associates Sorcim/IUS, Inc. (formerly Sorcim/IUS, Inc.) San Jose, Calif.	Super Project 1.10	Project manager using Pert and Gantt charts to take user through stages of project planning	256K	No	IBM PC, IBM XT, IBM AT, IBM 3270 PC and IBM compatibles	$395
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Figure 1. Sampling of Decision Support Systems

and reporting) are produced this way by the actual users.

The often complicated command structure of most DSS products has been another stumbling block in getting executives to use the systems. Even the physical interface itself can cause resistance. "Executives have a psychological barrier about keyboards. Executives do not type," said David Friend, president of Pilot Executive Software, Inc., which is the producer of Command Center. Taking this observation into account, Friend has made sure the basic interface for Command Center is the electrical device called a mouse. Most other companies offering DSS systems are also starting to offer a mouse interface.

Many data bases used in DSS products are written in third-generation languages such as PL/I and C. The command interfaces between these data bases and the user are now being written in fourth-generation languages, however, which is a boon to users. These fourth-generation languages stress English-like commands and less emphasis on rigid procedures for users. With a more natural interface, DSS — especially those that run on micros — promise to gradually pry themselves from the traditional middle management base while offloading much of the DSS burden currently carried by MIS.

Texas Instruments, Inc. in Dallas, Texas, for instance, has been using Information Builder's Focus, a popular DSS fourth-generation language, to build personal DSS applications on a large part of the company's massive network of 14,000 personal computers. According to Bart Benne, Texas Instruments' manager of end-user computing, users can range from lab technicians and engineers to white-collar administrative staff. "Ninety percent of all applications on the data base query side are written by the users themselves, " Benne explained. "In the past, programmers would often have been too busy to do the job for them." Benne added that Focus training and programming seminars at information centers scattered throughout Texas Instruments operations has offloaded much of the overtime MIS processing work.

To be sure, the micro has spawned a whole new generation of smaller financial DSS products such as Easyplanner and Supercalc, both from Computer Associates Sorcim/IUS, San Jose, Calif.; DSS Workbench from Lloyd Bush Software Products, Inc., New York, N.Y.; and Esca-DSS from Esca, Inc., Chicago, Ill. However, the much lower costs and personalized touches associated with microcomputers have allowed new vendors of DSS products to explore niche areas and vertical markets with products based at least in part on abstractions founded on mathematics, psychology and intuition. Although many might lack the cachet of financial data, what they lack in business gravity, they compensate for in fun.

One of the oldest of these new open-ended DSS products is Expert Choice, which finds its inspiration in the analytical hierarchy process (AHP), a set of equations taken from the recesses of university research. Expert Choice uses an inverted tree-like "configuration analysis" procedure that measures pairs of options on the way to a predetermined goal.

According to Mary Ann Selley, president of Decision Support Software, Inc., the McLean, Va. producer of Expert Choice, "Expert Choice uses matrix arithmetic based on icons to lead the user to make gut decisions from a combination of qualitative and quantitative data. It's arriving at a strategy, and strategy is more than just juggling financial spreadsheets." Others seem to agree. Selley pointed out that current users of Expert Choice include bankers determining which countries to invest in, oil companies trying to find the best way of getting more dollars out of old oil wells, and U.S. Department of Defense officials who use the package to conduct nuclear attack, first-strike scenarios.

Other such DSS packages are increasingly becoming part of a melting pot classification known as "mindware." Maxthink from Maxthink, Inc., Piedmont, Calif.; Lightyear from Lightyear, Inc., Santa Clara, Calif.; and Trigger from Thoughtware, Inc., Miami, Fla., are examples of DSS mindware packages trying to ease themselves into business psyches — and pocketbooks.

Lightyear's chairman, Terry Garnett, described Lightyear as "a framework for organizing, analyzing and evaluating different alternatives." Thoughtware recently issued a letter of intent to purchase Lightyear, Inc. Jack Levine, president of Thoughtware, classified Trigger as a product "that automatically triggers actions based on exceptions to established guidelines" while hopefully increasing profit for corporate users. These products are targeted toward the business market, but their vendors would argue decision support is only as limited as the imagination of those using the packages. Trigger, for example, is being used by a police department to monitor the efficiency of squads supervised by a police lieutenant.

The future of DSS is tied to fourth-generation languages and the ability to make the communication between user and system as natural and easy as possible. David Tory, senior vice-president of planning at Computer Associates, Inc., the Jericho, N.Y. producers of CA-Financial Planner, a mainframe-based DSS, offered an explanation: "The whole orientation of DSS is toward languages users understand. DSS people are finally beginning to use the tools to make software a function of the computing environment, not the computer system itself."

Kolodziej is a senior writer at Computerworld Focus.

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MIT's Project Athena: A Meeting of the Minds

By Lee White

IBM and Digital Equipment Corp. have gone back to school at Massachusetts Institute of Technology in Cambridge, Mass. This time, though, IBM, DEC and MIT are all learning something new.

MIT needed a solution to a serious problem on its campus: There were computers dotting the terrain, and along with the various pieces of hardware were diverse operating systems, programs, protocols and networks, mostly centered around research activities. A student moving from one computational environment to another, even within the same department, met time and programming barriers that seemed hardly worth the effort to overcome.

As far back as 1979 The MIT Ad Hoc Committee on Future Computational Needs and Resources recommended networking the entire campus and distributing several thousand personal computers by 1989. But it was not until 1982 that the long-range planning efforts of the School of Engineering identified the need for computing resources in each department.

At about the same time, three other developments occurred: the advent of the 32-bit personal computer, which put the power of mainframe computing on the desktop; advances in networking technology; and vendor-awareness of the importance of the educational market.

Professors in the School of Engineering began discussions with major computer manufacturers in late 1982. As negotiations progressed, MIT decided that more than one vendor's participation would ideally simulate the true multivendor environment. In May of 1983, MIT signed a $70-million agreement with Digital Equipment

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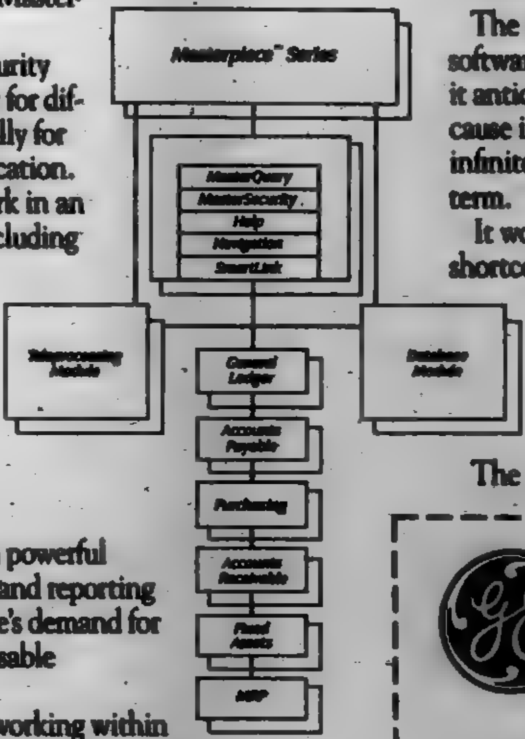

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Corp. and IBM, and Project Athena was born.

Project Athena, named for the Greek goddess of wisdom, differed in many ways from outwardly similar agreements inked by computer manufacturers and universities. For the most part, other pacts involved vendors' donating equipment to educational institutions with the hope that students would become accustomed to particular hardware during their campus days. Those students would influence the purchase of the same equipment after they graduated and entered the work force, vendors gambled.

Project Athena was the first time two big players signed on together for a long-term, side-by-side venture that involved much more than donating hardware. This venture meant the physical presence in adjoining work spaces of IBM and DEC engineers for three years and five years, respectively.

Steven R. Lerman, professor of civil engineering and director of Project Athena, was quick to point out that, although the five DEC and five IBM people talk to each other and have adjacent offices, the relationship between IBM and DEC exists only in the context of a shared relationship with MIT. "In many cases they are working on projects toward common ends — MIT's common ends — but there is no contractual relationship between IBM and DEC, none at all," Lerman explained, adding that their contractual relationship has fairly comparable conditions.

Lerman did, however, comment that each corporation just might have something to gain. "Athena matches some corporate end, but that end is very, very abstract."

For MIT, the end was not at all abstract. Making sense out of the impossible-to-quantify numbers of computers from myriad vendors, most operating in little more than a vacuum, was just one goal. Faculty members who served on the initial task force for Athena were also looking for new ways to teach. The educational environment of the '80s really differed very little from that of 100 years before: Students learned by listening to teachers' presentations of new concepts; by reading books and journals; by working problems and receiving feedback; and by observation, trial and error in the laboratory.

MIT's primary goal, then, was to devise imaginative ways to use computers to enhance and perhaps revolutionize the learning experience. Of the $70 million cost estimate for Project Athena, $25 million each would come from DEC and IBM and $20 million was to be raised by MIT. Most of that $20 million was earmarked for curriculum innovation and design. This money would allow faculty members time to work intensively on their projects. To date, $12.5 million has been raised. At a point less than halfway through the five-year program, more than 70 projects have been funded.

Project Athena was the first time two big players signed on together for a long-term, side-by-side venture that involved much more than donating hardware. IBM and DEC engineers share adjoining work spaces for three years and five years, respectively.

Although a preponderance of the courses deal with various engineering disciplines, a surprising number have originated within the schools of architecture and humanities, with a great deal of input from the Sloan School of Management.

According to Lerman, most of the interesting uses of computers in higher education do not involve using computers as substitute teachers or even as part of direct classroom teaching. Lerman explained that at MIT the average student spends only 12 to 15 hours each week in the classroom, but labors 40 additional hours outside the classroom reading, working in the library, writing papers and working in the laboratory.

As an example of how computers serve as an out-of-classroom aid, Lerman cited a professor who teaches a course in quantitative physiology. Part of the coursework involves teaching mathematical models of the heart-lung system; particular variables include heart rate, pressure in the aorta and oxygen transport across the artery. A standard mathematical model that is traditionally used produces six coupled differential equations. Most students understand the equations at some level but, because the equations are tightly interlinked, have no intuition of how the system really works.

"What the professor has done," Lerman explained, "is to build a software package with graphics. Students can exercise the model system and experiment to see what happens if a drug is administered that decreases the venal pressure or what happens if a drug accelerates the heart beat. They're actually performing 'what-if' experiments on this complicated mathematical formulation. We hope this method will help them develop intuition."

That professors in one of the most distinguished universities in the world could formulate novel methods for educational computing is not surprising. The more complex part of the project, creating a common environment so that these new educational methods are available to the entire MIT community, was something for which MIT sought outside help. In Athena's original planning phase, specifications were written for a long-term environment based upon networked high-performance advanced workstations with graphics capabilities. At the time, neither IBM nor DEC had built such a device, and it was decided that Phase 1 would revolve around existing hardware to build approximations of the future environment.

Unfortunately, asynchronization has been the order of the day for the hardware side of the project. DEC has announced and is shipping its Microvax II and, with a high-end display, the Microvax II matches MIT's specifications. IBM, on the other hand, has not announced an appropriate advanced workstation. Phase 1 has therefore consisted of lightly loaded VAX machines on the DEC side. The IBM side, after a number of design changes, uses Personal Computer ATs and XTs on a network with a uniform software environment and graphics displays. At present, the equipment includes about 53 VAX units, 160 PC ATs and a few Microvaxes for experimentation.

The single integrated network that ties the hardware together serves about seven or eight local-area networks. This network is two-tiered, with local Ethernets and a backbone network that links them together with a gateway between. The gateway, which is transparent to the user, operates with a single protocol.

With incompatibility looming large in the industry, MIT may well be blazing new trails for the coherence it hopes to attain. Lerman called this coherence "a fairly grandiose objective," admitting that MIT will not necessarily be able to drive the industry. "Neither IBM nor DEC nor any other manufacturer is obligated to follow the way we're headed, but we hope to demonstrate the value of that sort of environment," he said. If the project is as successful as the Athena committee expects, the results will demonstrate that hardware from different vendors can be integrated in a manner that exploits the relative advantages of

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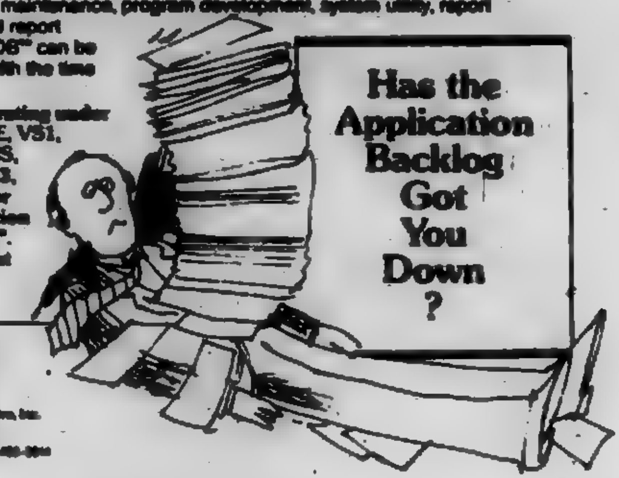
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each, while passing on the benefits of a uniform computing environment to programmers and users.

> **"We're talking about a university environment that is heavily oriented toward people and activities that are research-, teaching- or learning-oriented. To the extent these attributes can be generalized, then they can be transferred to other environments."**
>
> *Robert V. Mazza, IBM*

The heart of Project Athena, however, is not hardware but software. The two workstations presently run different software operating systems: the VAX machines run Berkeley Unix and the PC ATs (and XTs) run PC-DOS 3.0. The data communications protocols are written so that files can be moved freely between the two systems. Nevertheless, the team is headed toward a higher plane of compatibility. "We have prototype software that allows a VAX to provide disk space to a PC AT or PC XT. The PC issues an order to spin up the disk over the network. The VAX is hooked to the same network, and it recognizes the name of the person using the disk and accepts a password access. In effect, you have another PC disk, an E disk. You have the total illusion of having another hard disk, except that it really exists over the network and the VAX is providing it," Lerman explained.

DEC seems to be running ahead of IBM at this time, with its workstations and software actually driving the project, but Lerman hopes that gap will narrow soon.

At the beginning, DEC had its VAX units running Berkeley Unix, but lacked a high-performance workstation. IBM, with its PC AT, had a reasonable workstation, but could not run Berkeley Unix. In Phase 2, when common features of workstations will include a 32-bit processor, a high-resolution bit-mapped display and a local-area network, the theory is that both these problems will be resolved. Much of the uncertainty that exists now is due to IBM's slowness in coming up with a product.

Lerman would not comment officially on IBM's plans for an advanced workstation running Unix, stating instead that discussions are ongoing. He also said the Athena group and IBM were talking about the possibility of experimenting with an unannounced product. "The discussions are quite clear and moving in a certain direction. Part of the [antitrust agreement] issues were that [IBM] was restricted to only announcing things to which they were committed absolutely. So they're very conservative," Lerman said.

With $50 million riding on the project, IBM and DEC might be suspected of having underlying motives that go beyond sheer altruism and the quest for new ways to learn. Jack McCready, manager of External Research Programs for DEC, explained in the best corporate manner that DEC has a long-standing tradition of interaction with universities; he cited approximately 200 DEC-sponsored projects at more than 75 universities in recent years. McCready admitted, however, that Project Athena is certainly the largest project DEC has sponsored, and a first for its coinvolvement with IBM.

McCready's background lends itself well to his job. Prior to joining DEC in September 1984, he spent five years as president of Educom, a nonprofit consortium of 500 universities dedicated to looking at how colleges and universities use computing.

Before Educom, he was vice-provost for computing at Carnegie-Mellon University in Pittsburgh. While at Carnegie-Mellon in 1976, he negotiated a large three-year pact with DEC.

McCready stated that DEC has the best program of university involvement in the industry. "It's a long-standing commitment going back many years and a general success story in that we believe that working with research organizations in higher education is an excellent way to learn about computer information processing-related technology." Regarding Athena in particular, McCready stated that he thought the project could give birth to a new model of computing that might very well take over entire education and commercial accounts over the next few years.

This commercial applicability of Project Athena was not lost on McCready.

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Although predicting potential marketability of basic research is difficult, the educational community itself is a huge customer base for DEC, he explained, and accounts for several hundred million dollars each year. This dollar figure will increase as the price of the technology drops and the individual student and faculty workstation becomes a viable alternative to center-based computing.

> **"We will be able to learn a tremendous amount about the use of our products in a very large networking case, not hundreds of machines but thousands of machines. That has a direct commercial spinoff for us."**
>
> *Jack McCready, Digital Equipment Corp.*

In addition, DEC sees itself as a networking company, and networking is what Project Athena is all about. "[Athena] is probably going to be one of the biggest experimental utilizations. We will be able to learn a tremendous amount about the use of our products in a very large networking case, not hundreds of machines but thousands of machines. That has a direct commercial spinoff for us," McCready said.

Whether this spinoff is in the back of IBM's mind is a subject Robert V. Massa, director of development for Academic Information Systems at IBM was less inclined to discuss. "Clearly, we're talking about a university environment that is heavily oriented toward people and activities that are research-, teaching- or learning-oriented. To the extent these attributes can be generalized, then they can be transferred to other environments."

But Massa expressed doubt that much would be gleaned from Athena that would be relevant outside the groves of academe. He characterized the IBM/DEC activity at MIT as a system interconnect and programming architecture and a user and application interface defined by that environment. "It isn't as though we're bringing in our architectures, nor is DEC bringing in its architectures," explained Massa. He added that he didn't think the goals of Project Athena had anything to do with evolving communications, programs or applications interface standards. If such standards were a byproduct of Athena, Massa concluded, "it would be highly surprising to me and would certainly be an unexpected benefit."

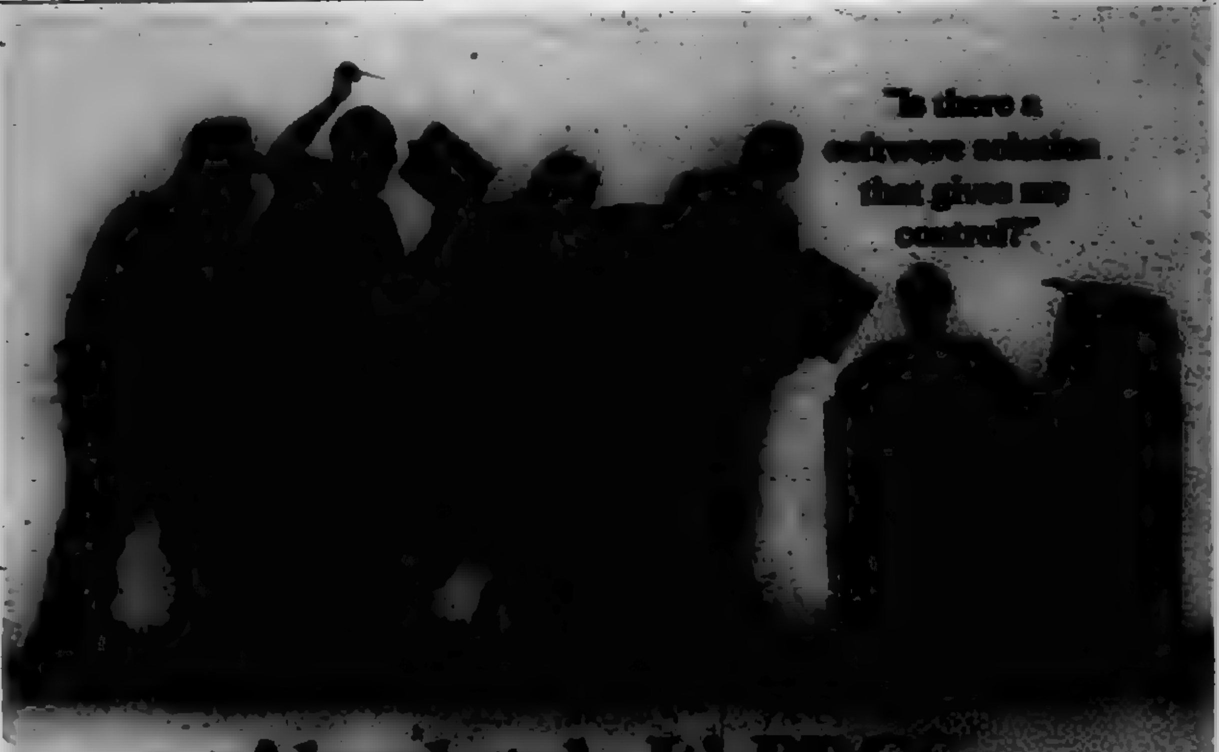
IBM's view notwithstanding, perhaps the most important result will be that of the DEC/IBM connectivity. When Number One and Number Two join forces, the potential market value of the results could be staggering. "We see environments out there where DEC and IBM systems have got to work together smoothly and that is the whole notion of coherence at MIT. IBM systems and DEC systems, networks of them, lots of them all working in a common environment," understated DEC's McCready.

Although present installations including both DEC and IBM systems stand to reap great benefits from a coherent technological breakthrough, the question of further narrowing the hardware vendor field would seem to be more probability than possibility. McCready insisted that the open environment of Athena would have broadening rather than narrowing results, but one would expect that IBM and DEC will have a substantial head start on commercial applications.

MIT's Lerman explained that any and all results of the Athena project will be owned solely by the university and they will be disseminated free of charge to other universities.

However, IBM and DEC don't have to worry about being left out in the cold. "The principle we're working on, although it's not embedded in contractual language, is what I would call the most-favored-nation principle. We will not make deals with third parties other than DEC or IBM that are better than we would make with DEC and IBM. We would like to create it at MIT and then convince [IBM and DEC] to build it as products. We're not in the support or the maintenance business; that really should be the realm of computer vendors and software houses. Our hope is that they come to us and say, 'Gee, that worked very well and we want to license all this stuff from you and build it.' "

White is a senior writer at Computerworld Focus.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Products

WESTBORO, Mass. — **Data General Corp.** has introduced two products designed to strengthen the company's networking offerings.

According to DG, the intelligent broadband controller (IBC) enables the company's Eclipse MV/ Family of computers to be connected with Net/One broadband local-area networks from Ungermann-Bass, Inc., Santa Clara, Calif. DG said the IBC is an IEEE 802.3 standard network interface designed to perform protocol handling and other communications tasks to reduce central processing overhead and improve system performance. The single 15-in. board includes 256K bytes of random-access memory, a Microeclipse processor, a data channel interface and a serial I/O section.

DG also introduced the CEO Document Exchange Architecture (DXA), the company's interface with the IBM Document Interchange Architecture (DIA) and Document Content Architecture (DCA). The company said it is implementing the interface to DIA/DCA in phases. The initial phase lets users send and receive mail through an IBM distributed office support system (Disoss) network while appearing to the network as a Displaywriter-like node. The second phase will allow the Eclipse MV/ Family system to emulate an IBM System/36 node.

The IBC is priced at $6,500. The CEO DXA software is priced from $1,500 to $6,500 depending on the type of Eclipse MV/Family system used.

For further information, contact Data General Corp., Information Systems Division, 4400 Computer Drive, Westboro, Mass. 01581.

CHICAGO — ARX, a software product that allows personal computer users to back up and restore disk files to the mainframe, was recently announced by **Chicago-Soft, Ltd.** ARX communicates through CICS (OS/DOS), VM/CMS or TSO. Operation can be in attended or unattended mode. A standard job may be set up on the personal computer to back up files regularly at off-peak hours reducing transmission times and leveling the system load. Directory management and reporting facilities are also provided, the vendor said.

Several techniques for data compression reduce the amount of transmitted and stored data, according to the vendor. In addition, data encryption techniques may be employed and private or public directories may be created to allow the sharing of program or data files.

The cost of ARX varies depending upon the mainframe operating system. For DOS/VSE, the price is $5,000 for five personal computers plus $1,000 for each additional 10; for VM/CMS, $10,000 for 10 personal computers plus $1,000 for each additional 10; and for MVS, $15,000 for 15 personal computers plus $1,000 for each additional 10. For more information, contact Chicago-Soft, 738 N. LaSalle St., Suite 2, Chicago, Ill. 60610.

LAFAYETTE, Calif. — **Theos Software Corp.** has introduced Theos, a multiuser operating system for Intel Corp.'s 80286 microprocessor.

Theos, an acronym for The Operating System, has four components: The system administrator, which handles user accounting and system security; the resource manager, which takes and prioritizes requests from the system administrator; the development workshop, which provides for software development; and the application grid, an application interface with operating system programs.

The company said the Theos system offers a help function and is complemented by the Basic, C, Macro Assembler and Executive Job Control programming languages.

The Theos operating system sells for $895, and for $1,295 bundled with Basic. The Theos development package sells for $1,695 and comes bundled with the operating system and the Basic, C and Macro Assembler languages.

Theos is at Suite 100, 201 Lafayette Circle, Lafayette, Calif. 94549.

Informix — ESQL/

PALO ALTO, Calif. — **Relational Database Systems, Inc.** has announced Informix—ESQL/, a product based on IBM's structured query language (SQL).

According to the company, Informix-ESQL/C is designed for use by applications developers who program in the C language. The company said the product enables users to embed dynamic and fixed SQL queries within their C programs, and reduce application time.

The price of Informix-ESQL/C running on PC-DOS or MS-DOS machines is $595. A Xenix version is also available for $749.

More information is available from Relational Database Systems, Suite 600,2471 E. Bayshore Road, Palo Alto, Calif. 94303.

PRINCETON, N.J. — **Martin Marietta Data Systems, Inc.** has introduced three products, Smartedit, PC/Reporter and Cobol/XE.

Smartedit is described by the company as an intelligent editor designed for the development and maintenance of programs written in Ramis II, Martin Marietta's fourth-generation language.

PC/Reporter is a PC-DOS version of the Ramis II language reporter. According to the company, PC/Reporter enables users with any sequential or comma-delimited Ascii files to generate customized reports using Ramis II's English-like syntax.

Cobol/XE is a Cobol-based customer information control system (CICS) application development system that supports Cobol programming in the CICS/VS, VM/CMS and VM/PC environments.

Prices for Smartedit range from $2,250 to $4,500. PC/Reporter lists for $795. Cobol/XE is priced at $15,000 for the VM/CMS version, $24,000 for the disk operating system (DOS) CICS version and $33,000 for the operating system (OS) CICS version.

For further information, contact Martin Marietta Telesales, P.O. Box 2392, Princeton, N.J. 08540.

SAN JOSE, Calif. — **Computer Associates Sorcim/IUS, Inc.** has announced Easyplus 1.1, a window manager, and the Easyplus Network Manager, a product that allows users to run windows on a network.

According to the company, Easyplus 1.1 integrates Computer Associates' Easybusiness Systems Plus series of accounting, word processing, data management and financial modeling packages, as well as other popular software packages such as Lotus Development Corp.'s 1-2-3 and Micropro International Corp.'s Wordstar.

The Easyplus Network Manager is designed, the company said, to give all the Plus Series programs operating under Easyplus full local-area network capabilities, providing data integrity.

Easyplus 1.1 sells for $149. The Easyplus Network Manager is priced at $395 each for units of four and $595 for units of eight.

More information is available from Computer Associates Sorcim/IUS, Inc., 2195 Fortune Drive, San Jose, Calif. 95131.

DEC AI Vaxstation

HUDSON, Mass. — **Digital Equipment Corp.** has introduced the AI Vaxstation, a workstation which the company said is the first to use artificial intelligence fully. According to the company, the AI Vaxstation combines the performance of the DEC Microvax II computer system with multitasking, multiwindowing and high-resolution graphics. The company added that the workstation's functions are integrated into DEC's VAX Lisp artificial intelligence programming environment.

Priced at $48,690, the AI Vaxstation has a 5M-byte Microvax II processor, a 71M-byte Winchester disk drive, a 95M-byte tape subsystem and a Decnet/Ethernet local-area network interface.

At the same time, DEC introduced

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three services for broadband networks; Physical design consulting, physical installation management and ongoing maintenance. The company said the services will support customers' broadband networks as well as Digital's broadband Ethernet products.

Costs for the services start at $1,000 per diem. More information is available from DEC, Maynard, Mass. 01754.

IRVINE, Calif. — **AST Research, Inc.** has announced Knight Data Security Manager, a software package the company said is designed to ensure data security, simplify the DOS command structure and add time management and messaging capabilities to microcomputers using hard disks.

Knight Data Security Manager

Running on the IBM XT, IBM AT and IBM compatibles, the Knight software employs user-defined passwords to protect data files and application programs. According to the company, the Knight program ensures data privacy by building "walls" around personal files and project areas, instead of using an encryption procedure.

The Knight Data Security Manager is priced at $295. For more information, contact AST Research, Inc., 2121 Alton Ave., Irvine, Calif. 92714.

BLUE BELL, Pa. — **Sperry Corp.** has introduced its Knowledge System workstation, the first of a planned Sperry product line of artificial intelligence/expert systems.

The Knowledge System is based on Explorer, a 32-bit workstation developed at MIT, Cambridge, Mass., under the auspices of Texas Instruments, Inc., Dallas, Texas. The Knowledge System will be marketed with Knowledge Engineering Environment (KEE) software, developed by Intellicorp, Menlo Park, Calif. Sperry said KEE enables rapid prototyping which gives an expert the ability to see quickly, with the aid of diagrams, the value of a knowledge-based system.

According to Sperry, The Knowledge System workstation can address up to 128M bytes of virtual memory, and contains a Texas Instruments high-speed processor designed to run Lisp, an artificial intelligence programming language.

The Knowledge System workstation is priced at $50,000. Copies of the KEE software systems are $60,000 each.

More information is available from Sperry, Information Systems Group, P.O. Box 500, Blue Bell, Pa. 19424.

FORT LEE, N.J. — **On-Line Software International, Inc.** has introduced Verify, a testing control system for IBM customer information control system (CICS) application programs. The company said that Verify's regression testing ensures that an application package will function properly in production.

Among Verify's other features listed were automatic testing which, according to the company, eliminates the need of repetitive operator input, and automatic logical verification, which eliminates the need to visually compare application screens and files.

Verify runs under the IBM DOS/VSE operating system or any operating system with CICS Release 1.5, or greater. It is priced at $25,000 for the DOS license and $35,000 for the OS license.

More information is available from On-Line Software International,Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

CAMBRIDGE, Mass. — **Index Technology Corp.** has introduced version 1.5 of its Excelerator software for systems analysts working with IBM Personal Computers. According to the company, version 1.5 offers graphics support for additional structured programming techniques, project data-sharing tools for controlling large projects with multiple Excelerator users, and expanded cross-referencing and analysis tools.

Excelerator Version 1.5

Excelerator version 1.5 is priced at $8,400 for single quantities, $7,900 each for quantities up to five and $7,400 each for quantities up to ten.

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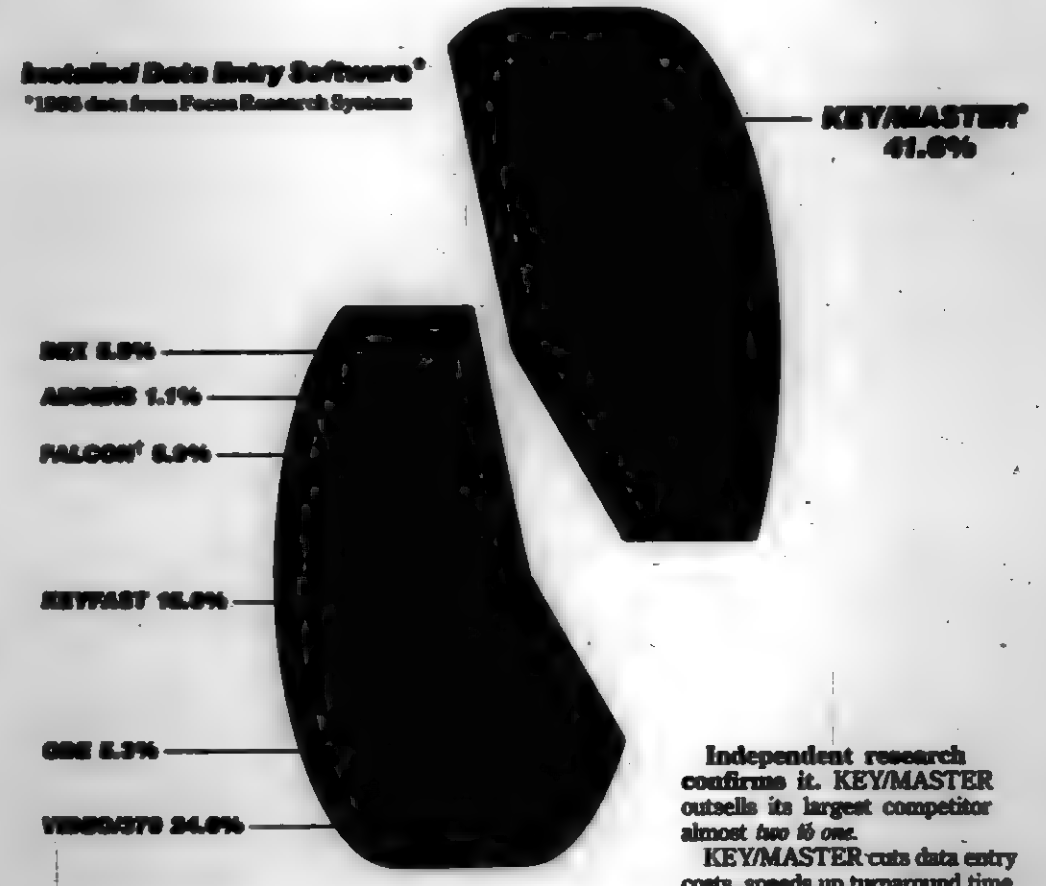

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Products

More information is available from Index Technology, Five Cambridge Center, Cambridge, Mass. 02142.

WOBURN, Mass. — **Systems Designers Software, Inc.** has announced Envisage, an expert system environmental shell which the company said enables a systems designer to create a variety of applications using such artificial intelligence techniques as traditional logic, Bayesian Inference and "fuzzy logic."

According to the company, Envisage frees the systems designer from "reinventing the wheel" each time a new expert system is developed, using subroutines and inherent techniques to allow the creation of a system specified by end-users.

Envisage runs on Digital Equipment Corp. VAX computers and is priced at $20,000. More information is available from Systems Designers Software, Suite 407, 444 Washington St., Woburn, Mass. 01801.

PROVIDENCE, R.I. — **Cadre Technologies, Inc.** has announced Teamwork/SA, a series of software development tools designed to enable a project team to capture systems requirements, organize them into models and maintain them in an integrated environment.

According to the company, Teamwork/SA is based on an Apollo Computer Corp. DN300 workstation, Apollo's Domain distributed network architecture, and Cadre's proprietary software. Among Teamwork/SA features that Cadre mentioned are a project library which serves as a central data base for everyone working on a specific project, an editing system with mouse interface and a model configuration management function which allows data flow diagrams to be collected into leveled sets.

Teamwork/SA

The single version Teamwork/SA system is priced at $34,900, and the software-only price for a single-user version is $9,800. The multiuser Teamwork/SA system is $41,900 per network node, and the multiuser software price is $17,500.

More information is available from Cadre Technologies, 222 Richmond St., Providence, R.I. 02903.

PRINCETON, N.J. — **TTSoftware**, a division of Martin Marietta Data Systems, Inc., has announced Runit, a disk operating system (DOS) shell program, and Mailit, a document conversion and transfer program.

According to the company, Runit provides a uniform interface to all IBM Personal Computer routines and simplifies program selection, use of DOS utilities, and mainframe log on. The program runs on the IBM PC, the IBM XT, the IBM AT and IBM compatible computers.

Mailit runs with IBM's Script and professional office system (Profs) word processing environments. The company said Mailit works with documents prepared with an IBM PC-based word processor, transferring the documents from Ascii format into the Profs and Script text formats.

Runit and Mailit are respectively priced at $100 and $300. For more information, contact Martin Marietta Data Systems, P.O. Box 2392, Princeton, N.J. 08540.

JERICHO, N.Y. — **Computer Associates International, Inc.** has announced CA-Unicenter, a software-based system for the management of corporate data centers using IBM and IBM-compatible mainframe computers. CA-Unicenter has three components: Data center management software for increasing programmer and operational efficiency; CA-Uniservice, a microcomputer and mainframe-based client service, support and training system; and CA-Activator, an on-line system for automating product installation and maintenance.

The CA-Unicenter is priced at $144,000 for a three-year lease. The company said a perpetual license is also available for $180,000.

For further information, contact Computer Associates International, 125 Jericho Turnpike, Jericho, N.Y. 11753.

FARMINGDALE, N.Y. — **Iskra Software International, Inc.**, a division of Iskra Electronics, Inc., has introduced Formatix, an applications generator for Digital Equipment Corp. VAX and PDP-11 computers.

The company said that Formatix can develop an application for immediate review, enabling the user to chain programs to produce applications. The company added that by using Formatix's menu function, programs generated by Formatix as well as those programs written in Cobol, Pascal or any other language, can be combined.

Formatix prices range from $1,700 for the DEC Microvax to $9,800 for the DEC VAX-11/782 computer.

More information is available from Iskra Software International, 222 Sherwood Ave., Farmingdale, N.Y. 11735.

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PC World Danmark is the monthly magazine that targets 12,000 IBM PC and compatible users and supplies them with first-hand information on the Danish PC market.

Run reaches 34,000 Commodore owners and potential owners in Denmark. Commodore is expected to grow at 40% per year through 1989. *Run* addresses the Commodore market with timely updates on hardware, software, and programs.

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September 16-20, San Diego — **1985 TCA Annual Conference.** Contact: TCA Conference, 1515 W. Cameron, B-140, West Covina, Calif. 91790.

September 17-19, Dallas — **1985 Software/Expo.** Contact: Pemco News Bureau, Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

September 18-20, Denver — **Data Base: A Manager's Guide.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

September 23-24, Cambridge, Mass. — **Decision Support and Expert Systems: A Developer's Perspective.** Contact: Decision Support Technology, 51 Church St., Boston, Mass. 02116.

September 23-24, Washington, D.C. — **PC LAN Versus Multiuser Systems.** Also, September 26-27, San Francisco. Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55425.

September 30-October 2, Dallas — **Optimizing Software Productivity and Quality.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

September 30-October 3, Washington, D.C. — **The 5th Annual Conference on Control, Audit and Security of IBM Systems.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

October 1-3, Austin, Texas — **Access '85.** Contact: Access '85, 11754 Jollyville Road, Austin, Texas 78759.

October 1-3, New York — **Understanding Modern PBX Systems.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

October 8-9, Tempe, Ariz. — **Controlling Computer Access in "User Friendly" Environments.** Contact: Center for Professional Development, College of Engineering and Applied Sciences, Arizona State University, Tempe, Ariz. 85287.

October 9-10, Palo Alto, Calif. — **Local Area Networks.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521

October 15-17, Washington, D.C. — **The Micro-Mainframe Connection.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

October 16-17, Los Angeles — **The Yates 2nd Annual Unix Market Forum.** Contact: Yates Ventures, Suite 201, 3350 W. Bayshore Road, Palo Alto, Calif. 94303.

October 15-16, Tempe, Ariz. — **Modern Techniques for Developing and Maintaining Computer Software.** Contact: Center for Professional Development, College of Engineering and Applied Sciences, Arizona State University, Tempe, Ariz. 85287.

October 17-18, Tempe, Ariz. — **Software Quality Assurance: An Investment in Product Integrity.** Contact: Center for Professional Development, College of Engineering and Applied Sciences, Arizona State University, Tempe, Ariz. 85287.

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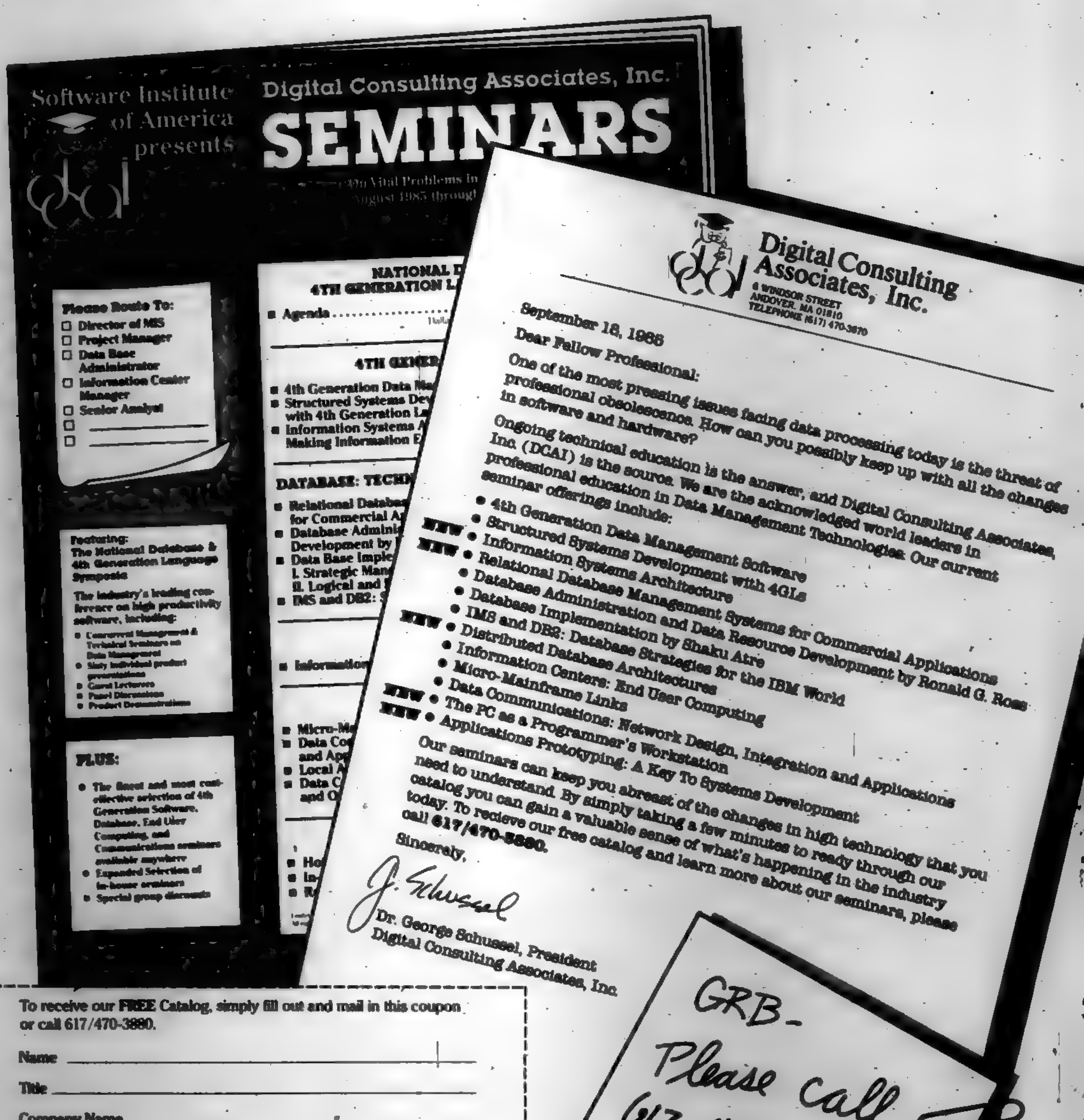

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Mac add-ons unveiled as Jobs departs

By Steve [illegible]

CUPERTINO, Calif. — Anticipated fanfare surrounding Apple Computer, Inc.'s introduction of its long-awaited 20M-byte hard disk and additional software and peripherals for the Macintosh computer was muffled last week when Chairman Steven Jobs angrily resigned from the firm he cofounded and helped to lead the microcomputer revolution.

Jobs resigned last week amid charges that he raided the company of five key employees with whom he planned to start an educational computer firm. When it was reported that Apple's board of directors was contemplating taking action against Chairman Jobs, Jobs insisted the board accept his resignation.

The resignation letter, which Jobs made immediately available to several newspapers, said the board of directors had taken a "hostile posture" toward him as a result of the new venture. In addition, he said, "The company's recent reorganization left me with no work to do and no access even to regular management reports."

News of the Jobs departure overshadowed last week's introduction of several key new Apple products. Among them was a 20M-byte, 3½-in. Winchester hard disk drive for which Macintosh business users have long been clamoring and which is seen as one of the peripherals the Macintosh needs to be considered a serious business tool.

"It's unfortunate the announcement has become so clouded with this soap opera," said Jan Lewis, an analyst with the Palo Alto Research Group in California. Apple's introduction of the hard disk drive was long overdue, Lewis said. "Apple had to come out with it. It couldn't go after the business market

Continued on page 6

Washington eases AT&T computer sales strictures

Permission conditional on revenues disclosure

By Bryan Wilkins

WASHINGTON, D.C. — In the most significant deregulatory move since the divestiture of AT&T, the Federal Communications Commission last week conditionally approved AT&T's request to market its telephone and computer equipment lines together with its regulated transmission services.

The FCC said it will drop the present requirement that AT&T sell telephone and computer equipment separately through its Information Systems subsidiary. Still in effect, however, is a requirement to maintain a separate sales operation for enhanced telecommunications services like electronic mail.

As a result, AT&T will no longer be forced to maintain duplicate marketing forces in its Informations Systems and Communications subsidiaries, allowing the company to integrate its bids for large-volume corporate customers. Since deregulation, these customers have often complained about AT&T's lack of coordination when dealing with its clients.

AT&T Executive Vice-President Charles Marshall alluded to these complaints in reacting to the FCC decision. "For our customers, it will mean better service," Marshall said in a prepared statement. "Various parts of our business will be in a position to work together to offer customers a fully integrated approach to their equipment and network service needs and, where desirable, one point of contact with the company."

Marshall said 10 corporate or government accounts will be selected for service by an integrated marketing team, which

Continued on page 2

TOP OF THE NEWS

Score another one for Lotus' campaign against unauthorized reproduction of micro software. The latest company to come clean was Computerknowledge, a Dallas-based software training organization, which late last week disclosed that it had uncovered and halted widespread illegal copying of Lotus 1-2-3 among its employees. Computerknowledge had an existing written policy prohibiting unauthorized software duplication by employees and is a member of the Association of Data Processing Service Organizations, the professional organization that has taken the lead in combatting illegal software reproduction.

■

Cray Research, manufacturers of some of the largest computers known to man, just released an upgrade of its X-MP line offering more memory than ever before. But users are still clamoring for storage space. "We have very large memory requirements and could use any memory Cray makes available," said Steven Walworth, planning analyst at the National Aeronautics and Space Administration's Ames Research Center

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Productivity key concern at Software/Expo

By John Desmond
and John Gallant

ANALYSIS

Despite all that is new in the computer industry, users at last week's Software/Expo in Dallas seemed most concerned with issues and technologies they have wrestled with for some time.

Underscoring them all, however, was a concern regarding productivity in U.S. business and the computer software industry's failure to cope effectively with this matter.

Regarding other concerns, users appeared to be still wrestling with some mundane, unglamorous issues such as controlling the massive influx of personal computers, paring the applications backlog and implementing core products like data base management systems and micro-mainframe links.

The first to address the productivity issue was keynote speaker Tom Nies, chief executive officer of Cincom Systems, Inc., the sole vendor to use the show as a springboard for a major product introduction (see story below). Nies declared that the current computer industry recession was the result of a declining rate of productivity improvement across all industries. The Cincom Systems executive placed blame for faltering productivity squarely on the shoulders of software vendors — IBM and the independents.

"The computer industry recession is primarily caused by the software vendors' old-fashioned approach to software," Nies said. "That approach makes it impossible for customers to consume new computers. It inhibits the forward movement of the computer industry."

Crediting hardware vendors with great advances, Nies said those gains have largely been negated by the software industry's evolutionary, almost snail-paced advances. "The idea of software generations is a hoax," he said. "There have been no revolutionary periods of change. There have been no great leaps and bounds."

With the failure of software to use the full potential of hardware, "we, as DP professionals, will not be able to satisfy the hoped-for revolution in DP. We won't be able to support, for example, distributed processing, real end-user computing

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Cincom DBMS out

By John Gallant

DALLAS — Serving notice to rivals that it intends to win back its "rightful place" in the data base management system market, Cincom Systems, Inc. last week introduced a relational DBMS

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NEWSPAPER

CDC losses kill bond offer

Divesting assets seen likely to stem losses, boost rating

By Clinton Wilder

MINNEAPOLIS — Control Data Corp. is facing steep losses and a potentially severe fiscal crisis in the wake of last week's 11th-hour cancellation of a $300 million public offering of bonds and preferred stock.

That is the opinion of analysts and company observers who have watched the U.S.'s fourth largest computer company flounder in a sea of unsuccessful diversification and devastated margins in the computer peripherals market. Most analysts said they believe CDC's No. 1 priority must be the continued sale of its corporate assets to raise cash for the preservation of credit arrangements with its banks.

The company had intended to use the proceeds of the offering to pay off debt issues. In recent weeks, the company announced it has fallen into technical default on covenants contained in those issues.

CDC's Commercial Credit Co. subsidiary, whose current profitability has offset some of the firm's losses in the computer business, appears to be the most likely candidate for divestiture, either as a whole or in parts. The proposed sale of the business to Security Pacific Co. was canceled in June, but Commercial Credit has restructured since then and is projected to more than triple its $25.2 million first-half profit for the full year.

By contrast, CDC's information services and products business unit, which comprises mainframes, supercomputers, peripherals and data processing and other automated services, lost $32.7 million in the first six months of 1985. Some estimates project the full-year loss for the computer unit at as high as $100 million.

"By selling off assets, it buys [the company] time to get operations under control. There are some very attractive assets within Commercial Credit," said Michael Geran of E. F. Hutton & Co.

CDC's current volatile situation was sparked Sept. 17, when underwriter Goldman, Sachs & Co. announced it would not authorize CDC's sale of $100 million in shares of depositary preferred stock and $200 million in subordinated debentures or bonds.

In addition to forcing the company to seek alternative short-term financing to replace the offering, the news rocked Wall Street's confidence in CDC's financial future. Within hours, Standard & Poor's Corp. lowered its credit ratings on the senior debt, preferred stock and commercial paper of CDC and Commercial Credit.

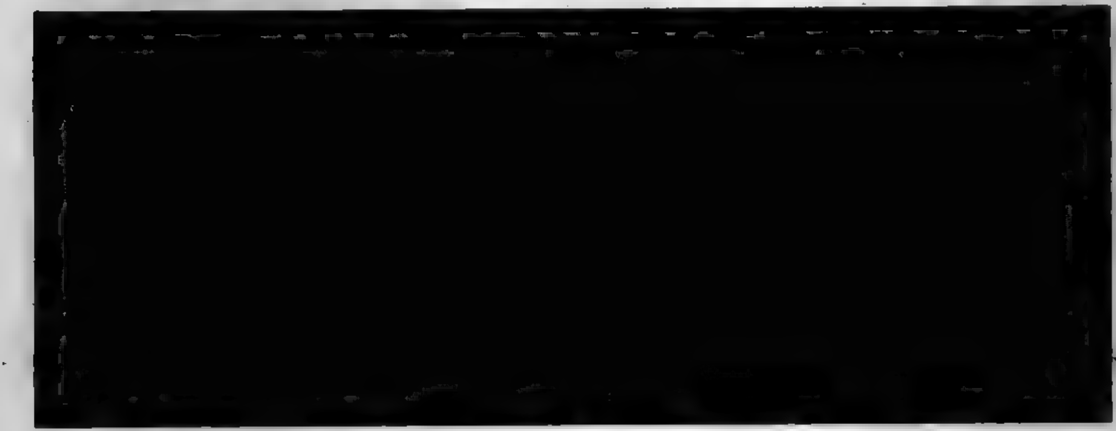
"If Goldman Sachs, with its reputation for integrity and thoroughness, rejected the offering, there's a lot more to CDC's situation than has been reported before," said William Shaffer, president of the Minneapolis consulting firm of Shaffer & Associates, Inc. and a veteran CDC observer. "When you add up all the indicators, it's a very serious situation."

Shaffer said customer confidence may be shaken in the company. "The scientific user community is very dependent on support. It's hard to sell in that environment without confidence in that support."

E. F. Hutton's Geran predicted CDC will pay particular attention to support to prevent further erosion of its customer base. He said the company's biggest financial drains are its peripherals and DP services businesses.

Analyst Jonathan Fram of Paine Webber, Inc. compared CDC's experience in peripherals to battered semiconductor vendors in the dynamic random-access memory chip market. Excess capacity and a wave of Japanese imports have turned the stagnated peripheral market into a cutthroat battle for market share, often regardless of price. "CDC seems to be holding its own in pricing, but the peripheral business is nothing to write home about," he said.

The investment community consensus is that CDC must accelerate its recent pattern of consolidation and divestiture to retain a fighting chance at keeping its financial ship afloat. "I think they are trying to do that," Fram said. "The sense of urgency is there."



From page 1

Washington eases AT&T computer sales structures

will be used to determine general marketing policy. He said AT&T hopes the FCC will continue removing its structural separation conditions from other parts of AT&T's business, citing in particular its enhanced service offerings, which will continue to be marketed through AT&T Information Systems.

There will be no immediate "radical reorganization, nor do we anticipate any significant new downsizing of our force because of this action," Marshall said.

Daniel J. Harrold, a Washington, D.C., attorney and spokesman for the International Communications Association (ICA), which represents large telecommunications users, reacted to the FCC's move by saying the association wants to see details of AT&T's accounting plan before making a judgment. "This is the key to lifting the separation requirements. There is obviously going to be some subsidy [of equipment sales and transmission], but the question is how much and to what degree."

In a separate move, the FCC denied AT&T Communications' request for permission to proceed with an optional discount pricing plan, Pro-America, which would have awarded users a 15% discount on all direct-dial long-distance calls for a flat $25 monthly fee. The requested tarriff was not supported by demand figures supplied by AT&T, the FCC ruled.

The FCC conditioned its permission allowing AT&T to drop the separate subsidiary requirement for the marketing of terminal and computer equipment — the heart of its Second Computer Inquiry decision policy — on AT&T moves to establish accounting procedures and network disclosure policies. The FCC will have to approve these plans before the new policy can go into effect.

First, AT&T will have an obligation to disclose to its competitors changes in technical interconnection standards to its core network at the time it is ready to make a make/buy decision. Competing equipment organizations will have to sign a nondisclosure clause if they are seeking to bid for one of AT&T's contracts. If they do not sign, AT&T must publicly disclose its planned network changes at least six months before they are to go into effect.

Second, the FCC is requiring that AT&T establish an order placement structure to prevent discrimination in the servicing of new orders coming into AT&T for connections to its dominant long-distance network and to ensure that all customers receive the same treatment. The FCC will require monthly reports on installations in this regard.

Third, the FCC will require AT&T Communications to disclose proprietary information on its customers' telecommunications installations if directed by the customer to do so. This gives the customer some power over the selection of a carrier and equipment, the ICA's Harrold said.

The fourth and final condition will require AT&T to set up a cost accounting system to track joint and common costs shared between the equipment arm and the transmission portion for AT&T's combined marketing, research and development and sales efforts.

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James Martin, noted author on information management, urged more automation in MIS to build a knowledge base for the corporation the future/28

IBM Chairman John Opel asserted that foreign governments should stop monopolizing their telecommunications networks and open them to free-market forces/29

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Cray doubles memory on X-MP line

By James Connolly

MINNEAPOLIS — Responding to what users described as an insatiable demand for more memory, Cray Research, Inc. last week upgraded available CPU memory on its X-MP line of supercomputers.

Cray introduced four expanded-memory X-MP models, cut the price on an existing model, discontinued another model and announced I/O products. The product line now consists of nine models, featuring various memory capacities in uniprocessor, dual-processor and four-processor versions.

The X-MP line now stretches from the previous 1M-word (using 64K-bit words) uniprocessor X-MP/11 to the new high-end X-MP model, the four-processor, 16M-word X-MP/416 that costs $16 million. While the X-MP/416 is priced just $1.6 million below the top-end Cray system — the 264M-word Cray-2 announced earlier this year — the machines are not competitors, Cray Executive Vice-President Marcelo Gumucio noted.

> **”**
>
> *'We can use all of the memory we can get.'*
>
> — **John E. Ranelletti**
> **Lawrence Livermore**
> **National Laboratory**

"The Cray-2 and the X-MP are really two different machines. The Cray-2 has a [264M-word] memory but is a new machine about which we are still learning the total capability. It was designed to solve larger computational problems that can be comprehended in main memory. The X-MP is a multitasking, multiprogramming machine for which there are a lot of application packages available," Gumucio said.

Supercomputer consultant Sid Fernbach of San Jose, Calif., noted that the four-processor X-MP "is just as good a machine as the Cray-2" and that the software for the Cray-2, the second of which is scheduled for delivery to a [National Aeronautics and Space Administration] location next month, "isn't too good."

Managers interviewed last week at X-MP installations, while unfamiliar with the details of the Cray announcements, welcomed news of the memory enhancements.

"For our applications at [the Nasa Ames Research Center] we have very large memory requirements and could use any memory Cray makes available," commented Steven Walworth, planning analyst for Nasa Ames at Moffett Field, Calif.

John E. Ranelletti, head of the computation department for Lawrence Livermore National Laboratory in Livermore, Calif., added, "I'm not personally familiar with the announcement, but we can use all of the memory we can get."

The X-MP/416 moves ahead of the existing four-processor, 8M-word X-MP/48 at the top of the X-MP line. Both systems use emitter-coupled, bipolar memory technology.

The dual-processor systems announced are the X-MP/216 with a 16M-word memory and the 8M-word X-MP/28.

Cray also said it is cutting the price on the 4M-word X-MP/24 from $10.5 million to $8.5 million and discontinued a 2M-word version. The fourth new processor is the X-MP/18, featuring 8M words of memory.

Cray said all dual processors and uniprocessors now will use static MOS memory technology.

The company announced that several features previously available only on the largest Cray X-MPs have been extended to all models. The features include gather/scatter and compressed index vector instructions, which allow for vectorized processing of randomly organized data, and a 1G-byte channel for connecting a Cray Solid-State Storage Device.

Cray also introduced its DD-39 1.2G-byte disk storage device, featuring a 5.9M byte/sec. transfer rate, and announced an IBM Data Streaming Interface with a 3M-byte bandwidth for data access from IBM storage devices.

Delivery for the new uniprocessor models reportedly is scheduled for the second quarter of 1986, for the new dual processors in the third quarter of 1986 and for the new four-processor models in the fourth quarter of 1986.

The X-MP/416 costs $16 million; the X-MP/216 costs $11.5 million; the X-MP/28 costs $9.5 million; and the X-MP/18 costs $8 million.

Field upgrades from uniprocessors to dual processors and from dual systems to four-processor systems are unavailable. However, memory upgrades within those systems are available for the price of the difference between models.

IBM rolls out PC Network products

IBM last week announced products for its PC Network and enhancements to its microcomputer software introduced last summer.

The PC Network Analysis Program monitors activities and identifies problem conditions on a network. The program can sample, analyze and present network operation information at user-selected levels. It monitors conditions at individual adapters and tracks traffic for specific periods of time.

The software maintains a program-created directory of powered-on adapters.

The package costs $1,295 and will be available in December.

The company also added the IBM Business Management Series Local-Area Network Access Edition. The program works with the Business Management Series, a six-package series of general ledger and accounting packages, and enables the programs to operate on the PC Network.

With the package, five concurrent users, consisting of a network server and up to four remote users, can access one of the six business packages. Users can share logs, programs and data files. The Business Management Series Local-Area Network Access Edition's applications job monitor tracks which IBM Personal Computer on a network is running the program, monitors reserved files and manages locked application files.

The software costs $245.

The IBM Local-Area Network Printmanager enables users of an IBM PC Network or a Corvus Systems, Inc. Omninet to share an IBM 3820 page printer equipped with a Synchronous Data Link Control card. A user can choose from up to 55 fonts.

The Data and Words modules of the IBM Personal Decision Series also have been enhanced. Words now includes a facility that converts documents so they can be used by IBM's Displaywrite 1, 2 or 3. A second change improves the package's interface to Word Proof spelling checker. The Data module now supports the installation of Displaywrite 1, 2 or 3.

The firm also introduced a C compiler that runs under IBM's PC-DOS 3.1. The compiler features include selectable-memory-model support.

The compiler sells for $495.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

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From page 1

Macintosh add-on products unveiled as Jobs departs

without having a hard disk drive," according to Lewis.

Hard Disk 20 fits underneath and connects to the back of the Macintosh and can be used with any Mac with 512K bytes of memory. It is the second hard disk drive to be introduced for the Macintosh in recent months. General Computers, Inc. of Cambridge, Mass., introduced a 20M-byte hard disk for the Macintosh last month in Boston.

Scheduled for limited availability in November, the Hard Disk 20 can operate twice as fast as a floppy disk drive, a spokesman said. Hard Disk 20 comes with a hierarchical filing system, and the software uses the Macintosh's file folder icons for grouping together related files, a spokesman said.

The product costs $1,499.

Apple also introduced a version of its dot matrix printer: Imagewriter II, priced at $595, can operate at up to 250 char./sec. and gives users access to three printing modes.

The printer is said to include an expansion slot for a range of interface boards.

For the Apple II line of computers, the company introduced a 3½-in. floppy disk drive that can store up to 800K bytes of information. Available immediately, Unidisk 3.5 includes systems software utilities for formatting and duplicating diskettes and for copying and deleting files on a diskette.

It is designed to bridge the gap between Apple's low-end, 143K-byte floppy disk drives and its 10M-byte Profile hard disk. The Unidisk 3.5 costs $499.

Other products introduced by Apple include the following:

- The Apple Personal Modem, a Hayes Microcomputer Products, Inc.-compatible 300/1,200 bit/sec. modem. Currently available, the modem operates at 1,200 bit/sec., 110 bit/sec. or 300 bit/sec. for compatibility with other networks that require lower speeds.

The modem also uses the Hayes Smartmodem Command Set and can be connected to any personal computer with a standard RS-232C serial port. The Apple Personal Modem costs $399.

- Switcher, a utility that allows Macintosh 512K and Macintosh XL users to store up to eight applications in memory at the same time. Switcher also allows users to transfer data between Macintosh applications.

For example, users can copy a graphic from a Macdraw onto a Macwrite word processing document.

Early versions of Switcher were made available in April to Compuserve, Inc.'s Micro-Networked Apple User Group and to several software developers, including Microsoft Corp., which included the utility in its Excel spreadsheet product.

Individual copies of Switcher are priced at $19.95, the vendor said.

Two commercial Unix users stand by their systems

By Charles Babcock

NEW YORK — Two large users of AT&T Unix operating systems in commercial settings told attendees at the Unix Expo conference that they think they have made the right choice.

Both said, however, that they have had difficulty building a professional staff experienced in Unix.

Steven Stamps, director of development at J. J. Kenney Co., said his firm was trying to download 70% of the transaction processing currently handled by six Perkin-Elmer Corp. superminis onto 150 individual workstations.

J. J. Kenney is a broker of municipal securities for other brokerage houses. Many of the transactions that its computers must process are read-only or informational messages for its traders, and downloading them to AT&T Unix PCs would eliminate the need to expand its central data processing center, according to Stamps. The firm built a prototype system, and it is being used by six traders, but J. J. Kenney ran into difficulties.

"We found we did have a performance problem. The system became spongy at 10 terminal users. We had thought we could run 24," he said.

The development staff has had to reconfigure the system to get better response times, Stamps said.

George Grant, director of marketing for Quotron Systems, Inc., Los Angeles, said his firm spent five years preparing to market a Unix stock quotation and office automation system to brokerage houses.

One year to convert

According to Grant, Quotron's 80-member development staff spent from 1980 to 1983 building software development tools, including screen managers, window managers, a data base management system and forms manager.

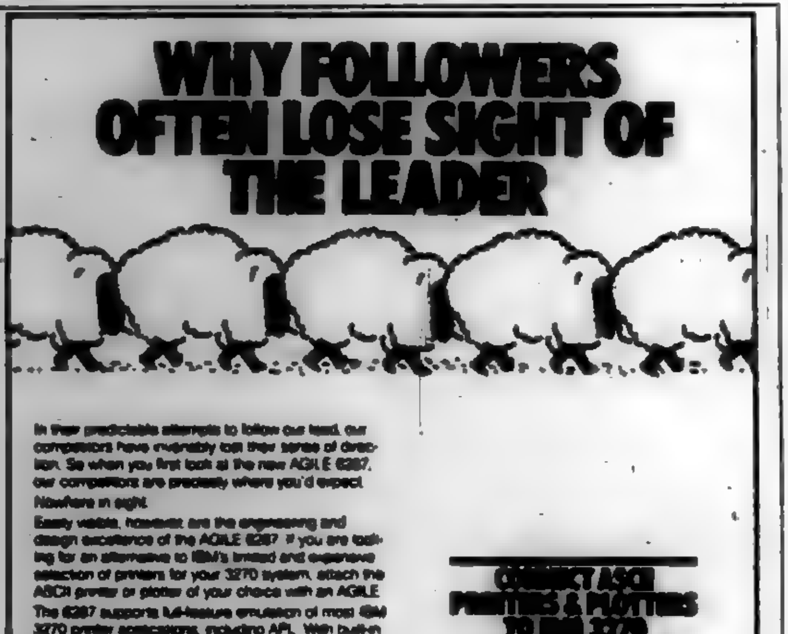
Once the tools were assembled, the staff was able to convert Quotron's stock quote service into the C language in a year.

"It is the Unix system with the tool set that makes productive application development possible," Grant told conferencegoers, many of whom said they were interested in using Unix in their business offices.

Unlike Quotron, J. J. Kenney was able to buy many of the system utilities and the data base management system it needed rather than develop them itself. Availability of those products indicates how the market for Unix has changed in the last five years, Stamps said.

He and Grant both complained that it is difficult to find experienced Unix programmers and that such programmers were commanding top salaries. A programmer with five years' experience in Unix and 10 years' experience in data processing can earn $50,000, he said.

Stamps also said commercial users worry about the "polarization" between System V, which AT&T is promoting as a standard, and University of California at Berkeley's Version 4.2, which some users view as offering a wider selection of enhancements.



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Walker Interactive for sale?

Major software firms most probable bidders

By Maura McEnaney

SAN FRANCISCO — Walker Interactive Products, Inc. is for sale and could be sold within the next several weeks, according to industry sources and analysts.

But mum is the official word from the vendor of financial applications packages, once touted for its applications development tools and line of business financial software. Vendors rumored to be interested in the firm declined to comment.

Industry analysts said they heard of the Walker rumor as early as last April, and the software industry's leading vendors are quick to confirm the possibility of a sale. One vendor source said a sale to Management Science America, Inc. (MSA) was imminent, but another said any sale will take some time to finalize.

Potential buyers for the $20 million company include the industry's largest software vendors, among them MSA, McCormack & Dodge Corp., Cullinet Software, Inc. and IBM. Analysts have their own theories on the potential sale of the company, which has been troubled with poor sales and steep liabilities during the past several months.

William Shattuck, analyst with Montgomery Securities, put his bet on Cullinet as the most likely buyer of Walker. "It would make a lot of sense for Cullinet," Shattuck said, particularly in light of Cullinet's legal dispute with McCormack & Dodge over the international marketing rights for Cullinet's General Ledger package, originally purchased from McCormack & Dodge. One source, formerly associated with Walker, said MSA is the likely buyer, a view held by one of MSA's chief competitors.

Shattuck downplayed the MSA interest. "It seems to me [buying Walker] would make more sense for a company that is trying to get into the applications market rather than a company that has pretty much covered all the bases, like an MSA."

Brian Muttert, a software analyst with Robertson, Colman & Stephens, an investment banking firm here, would not comment on the pending sale of Walker, because of what he said was his firm's financial involvement with Walker Interactive.

Several years ago, Muttert said, Walker was viewed as a fast-track company that developed a solid reputation for its interactive software applications.

Launched as a consulting company by Jeffrey Walker in the mid-1970s, Walker garnered investments from venture capitalists and was reborn in 1980 as Walker Interactive Products. Shortly thereafter, the company recorded 200% annual sales growth on the strength of sales of its Integrated Interactive Financial Systems.

Computerworld *staff writer John Desmond also contributed to this report.*

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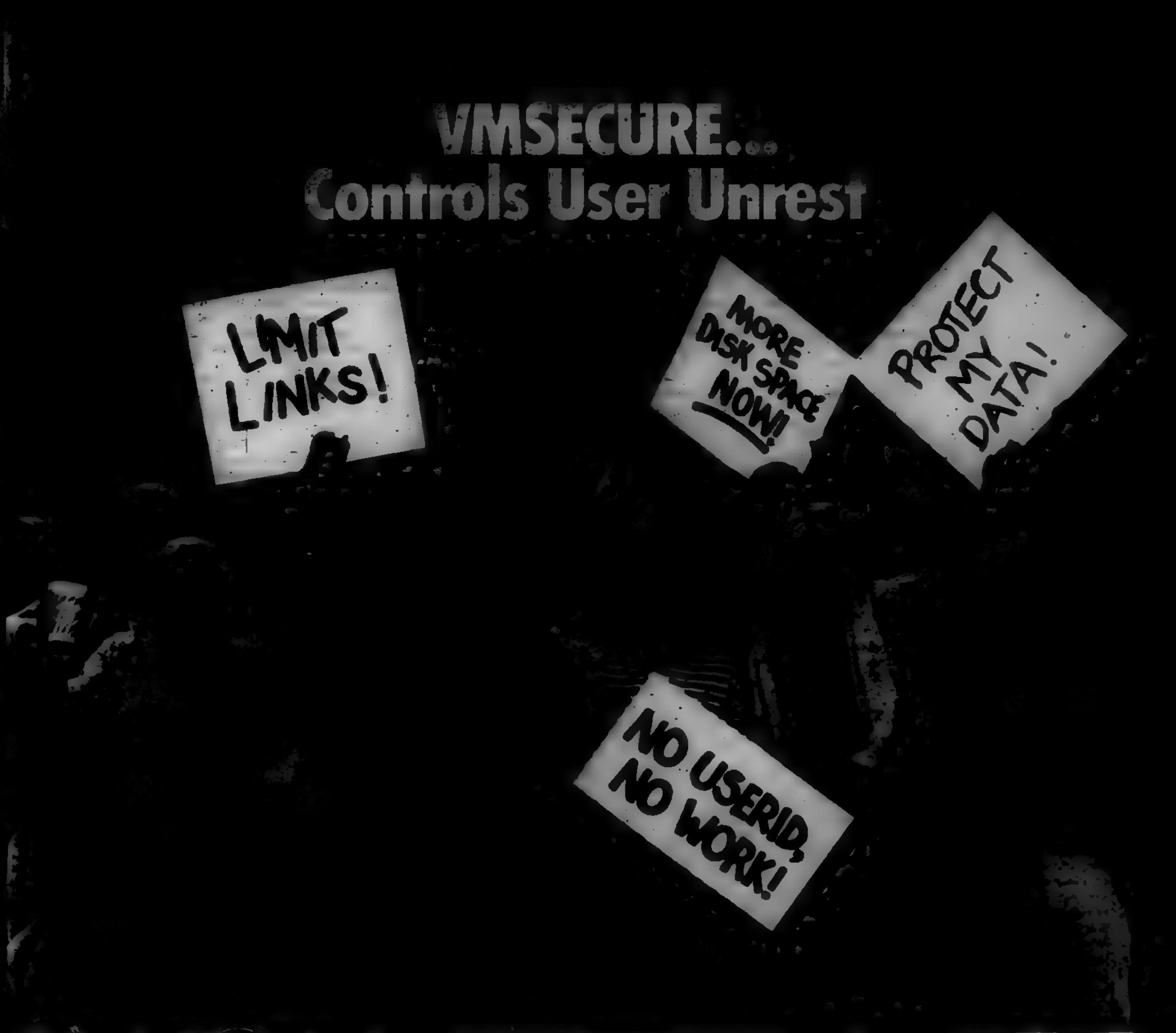
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Run With The Leader

NEWS

From page 1

Productivity key concern at Software/Expo conference

and applications development without programmers. We are simply selling old technology repackaged."

DP and MIS managers interviewed at the Software/Expo last week expressed concerns about improving productivity, and many said they plan to do it with personal computer software ranging from decision support to graphics packages.

Jim Grayson, MIS manager with Standard Meat Co. of Fort Worth, Texas, said he was looking for a package offering good graphics on a personal computer to free up demand on the mainframe. "Graphics is a big CPU hog," he said.

Decision support software was being sought by Steve Chaney, information center manager for Standard Meat. The company's information center has worked well for middle management, "and now I want something easier to use for upper level executives," Chaney said. "At the executive level, they need more of a presentation system than something to develop applications with."

Controlling the proliferation of personal computers is a chief concern of Michael Friedkin, technical services manager in the Louisiana State Department of Labor, Baton Rouge. "Management has said to go out and buy personal computers. My unit has to coordinate all that and try to provide micro-mainframe links and support," he said. "One thing I want to look at is the information center concept to see if we can slow the need for links" and prolong the useful life of his mainframes, he said.

George Connor, systems analyst at the Sandia National Laboratories, Kirtland Air Force Base, Albuquerque, N.M., said he wants to quicken the pace of application development by having users do more on their own. "Our financial systems are all implemented, but the users want more," he said, pointing out his backlog. Recent research at the laboratory, which has a development and support staff of 169, showed that half of the staff's time is spent maintaining business applications.

Gene Gotland, finance systems manager for Boeing Aerospace Co. of Seattle, said he hoped to find products that will help him distribute applications to end users and allow users to write ad hoc applications. "We are trying to do this with personal computers and fourth-generation languages," he said.

Not surprisingly, users made their way to Dallas' Infomart to learn more about fourth-generation languages, relational data base management systems and other products lumped under the banner of productivity tools. DBMS was born more than a decade ago, but it remains a basic concern of users who must integrate applications developed over a span of three decades. Software/Expo sessions seemed to offer just what these users were looking for: They focused primarily on day-to-day issues such as development, maintenance, DP management and the optimum use of productivity tools like DBMS and fourth-generation languages.

From page 1

Cincom announces relational DBMS for IBM mainframes

for IBM mainframes.

In the previous decade, Cincom took the early lead in the DBMS race with its Total product. But in recent years, the Cincinnati-based vendor has fallen behind such rivals as Cullinet Software, Inc. and Applied Data Research, Inc. (ADR) in the independent DBMS market. (IBM still maintains control over the DBMS market, but Cullinet and ADR have lately boasted impressive gains over Big Blue.) Cincom is hoping to turn that around with the debut of its Superior Relational Architecture (Supra) "advanced" relational DBMS.

According to Cincom President Dennis Yablonsky, the advanced aspect of the product is that it implements the American National Standards Institute's ideal DBMS model. Although the model drafted by the institute's Standards Planning and Requirements Committee — which was made up of representatives of major hardware and software vendors and some of the largest U.S. companies — is more than a decade old, Yablonsky said Cincom has become the first vendor to implement it fully in a commercially available relational system. Yablonsky hosted the company's multimedia press unveiling of Supra during the Software/Expo conference held in the Infomart facility.

Yablonsky said Supra meets the committee's requirement that a relational DBMS incorporates a three-schema architecture. That means the system maintains three independent definitions (schemas) of data: an external or user view; a conceptual view that organizes data in a relational table format; and an internal or physical view of how data is managed and stored. He said most relational DBMS, including Cullinet's IDMS/R, ADR's Datacom/DB and Cincom's existing TIS product, currently only support a two-schema architecture.

In addition to leading Cincom's renewed attack on the DBMS market, Supra has also become the flagship of the company's newly focused product line. Under the banner of TIS/XA, Supra joins Ultra, the company's Digital Equipment Corp. VAX-based DBMS; its Mantis applications development system; its Control series of manufacturing and financial applications; and its Net/Master and PC/Contact network management systems.

"TIS/XA is intended to automate the automation process," Yablonsky said. "Supra shows that we are in the DBMS market to stay. We intend to take back our rightful place through aggressive development and marketing."

The three-schema design, Yablonsky said, automates a variety of functions, relieving programmers and data base administrators from writing teleprocessing monitor and data base navigation and derivation logic and data integrity code. By separating the conceptual data view from the physical view, he said, Supra eliminates data redundancy, allows for the enforcement of data integrity constraints and enables users to restructure the physical data base without modifying existing applications.

Supra consists of five components. The Spectra information retrieval and application development system, which customers got a sneak peek at during Cincom's recent Directions '85 conference, enables end users to access data through nonprocedural commands. The Normal data base administration tool automates logical and physical data base design through a set of tools that assist the data base administator.

According to Yablonsky, the Relational Data Manager component supports the three components of the relational data model: relational structure, manipulation and integrity. Manipulations include the SELECT, PROJECT and JOIN commands that must be supported in a true relational DBMS. Supra's Physical Data Manager supports all data structuring techniques such as indexing, chaining, sequential and flat file. Yablonsky said the component was designed to reduce physical I/Os and ensure high performance. He said the data manager also supports on-line dynamic file allocations or deallocations for nonstop processing. Supra integrates data in the data manager and native IBM Vsam files, providing users access to data in existing Vsam-based applications.

The final component, the In-Line Directory, controls data access, security and applications development. It maintains information about users, programs, views and data definitions and integrates all Supra components.

Supra, available now, costs $145,000 for IBM DOS/VSE and $215,000 for MVS or MVS/XA.

Infomart, site of this year's Software/Expo

Limited product debuts seen at Software/Expo

DALLAS — With the introduction of its Superior Relational Architecture relational data base management system, Cincom Systems, Inc. of Cincinnati led the rather slim pack of software vendors unveiling products at last week's Software/Expo conference.

While not introducing a software offering, Vienna, Va.-based Boeing Computer Services Co. announced site licensing options for all of its microcomputer software products and for some of its mainframe tools. At an Infomart press briefing, the company said it will offer unlimited right-to-copy licenses for one company site or for a group of sites to provide more purchasing flexibility for its customers.

Citing the recent controversy over software copying, Boeing said it wanted to take a firm stand and address larger organizations' need to overcome copy protection limitations. As an example of how the pricing schemes would reduce costs, a spokesman said a buyer could save more than 90% on the single-copy price of the Boeing Calc package, depending on the pricing plan chosen. Boeing will provide reproducible diskettes and camera-ready copies of documentation.

Forecasting Planning Associates and Systemware, Inc., both of Dallas, jointly announced Data Center Manager/1. The product, designed to run on an IBM Personal Computer, aids DP professionals in the management of computer equipment, software and supplies. Data Center Manager/1 offers an inventory data base that supports disaster recovery planning, budgeting and forecasting, configuration management and component failure impact analysis.

The package consists of separately priced basic inventory, budgeting, configuration and maintenance modules. Basic inventory is available now for a one-year license fee of $4,995. Other modules are scheduled to be available later in the year at prices to be announced.

Austin, Texas-based Data Interface Systems Corp. unwrapped its DI-3270/L product for IBM 3270 Personal Computer-terminal emulation. A spokesman said the products use local-area network technology to support micro-to-micro communications and that one or more micros in the network serve as gateways to a host system, acting as an IBM 3274 controller. All micros in the network act as 3278 terminals and 3287 printer controllers, with up to four logical units supported at each node.

A stand-alone implementation of the system is also available. Currently available for bisynchronous systems, DI-3270/L will reportedly support IBM's Systems Network Architecture in 1986. Pricing ranges from $650 to $950 per node. Stand-alone version pricing starts at $300.

Arlington, Texas-based Southwest Software Services, Inc. introduced Version 3 of its Zeke — The Controller automated scheduling and dispatching system for batch jobs under IBM's DOS/VSE and MVS operating systems. Enhancements enable automatic replies to job messages to be defined to the system along with the reply Zeke is to use. Dates and critical run parameters can be cataloged, checked, verified and automatically entered by Zeke when a specified program requests the information.

In addition, an on-line security system has been added, and multisystems support enables the Zeke data base to be shared between DOS/VSE, MVS and CMS. The DOS/VSE version of Zeke costs $11,500, and the MVS version costs $19,500.

Al Lee & Associates, Inc. of Dallas announced enhancements to its Magec on-line applications development system for IBM OS and DOS users. A utility function has been added to generate data item definitions automatically from existing Cobol copy book definitions. The system's access method transparency feature has been expanded to support IBM's Vsam, Isam and Bdam and Applied Data Research, Inc.'s Datacom/DB.

Magec costs between $28,000 and $72,000, depending on configuration and operating system.

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All seminars through December 31 are listed below. Call for information on later seminars.

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CULLINET SEMINARS/U.S. FALL/WINTER 1985

State, City	Date	Database Management System IDMS/R	Information Center Management System	Applications: Manufacturing	Applications: Financial	Applications: Human Resources
ALABAMA						
Birmingham	11-13-85	●	●	●	●	●
Montgomery	12-4-85	●	●			
ARIZONA						
Phoenix	9-25-85	●				
CALIFORNIA						
Los Angeles	9-24-85	●	●	●	●	●
Los Angeles	11-6-85	●				
Orange County	10-3-85	●	●	●	●	●
Sacramento	9-23-85	●				
San Diego	10-23-85	●	●	●	●	●
San Francisco	9-26-85	●	●	●	●	●
San Jose	11-5-85	●	●	●	●	●
COLORADO						
Denver	11-12-85	●	●	●	●	●
CONNECTICUT						
Hartford	11-19-85	●	●	●	●	●
DELAWARE						
Wilmington	9-25-85	●				
DISTRICT OF COLUMBIA						
Washington D.C.	11-26-85	●	●	●	●	●
FLORIDA						
Jacksonville	11-20-85	●				
Orlando	10-3-85	●	●	●	●	●
Tallahassee	12-5-85	●				
Tampa	11-6-85	●	●	●	●	●
GEORGIA						
Atlanta	12-11-85	●	●	●	●	●
HAWAII						
Honolulu	11-26-85	●				
ILLINOIS						
Chicago	9-25-85	●	●	●	●	●
Chicago	12-4-85	●	●	●	●	●
INDIANA						
Fort Wayne	9-27-85	●	●	●	●	●
Indianapolis	12-11-85	●	●	●	●	●
South Bend	12-3-85	●	●	●	●	●
IOWA						
Des Moines	10-2-85	●	●	●	●	●
MAINE						
Portland	10-16-85	●				
MARYLAND						
Baltimore	10-15-85	●	●	●	●	●
MASSACHUSETTS						
Boston	12-12-85	●	●	●	●	
Burlington	9-24-85	●				
MICHIGAN						
Detroit	11-14-85	●	●	●	●	●
Grand Rapids	10-18-85	●	●			
MINNESOTA						
Minneapolis	9-25-85	●	●	●	●	●
Minneapolis	12-12-85	●	●	●		
MISSISSIPPI						
Jackson	11-5-85	●	●	●		
MISSOURI						
Kansas City	9-24-85	●	●	●	●	●
Kansas City	12-13-85	●	●			
NEBRASKA						
Omaha	12-9-85	●	●	●	●	●
NEW JERSEY						
Fairfield	9-24-85	●	●	●	●	●
Princeton	11-15-85	●	●	●	●	●
NEW MEXICO						
Albuquerque	10-15-85	●				
NEW YORK						
Albany	11-7-85	●				
Long Island	9-24-85	●				
New York	11-7-85	●	●	●	●	●
New York	9-11-85	●				
Rochester	10-24-85	●	●	●	●	●
Syracuse	12-12-85	●				
NORTH CAROLINA						
Charlotte	12-10-85	●	●	●	●	●
Greensboro	10-3-85	●	●	●	●	●
OHIO						
Cleveland	9-12-85	●	●	●	●	●
Columbus	9-25-85	●	●	●	●	●
Columbus	12-12-85	●	●	●	●	●
OKLAHOMA						
Oklahoma City	12-3-85	●	●	●	●	●
OREGON						
Portland	10-1-85	●	●	●	●	●
PENNSYLVANIA						
Philadelphia	11-21-85	●	●	●	●	●
Pittsburgh	10-15-85	●	●	●	●	●
RHODE ISLAND						
Providence	11-6-85	●				
SOUTH CAROLINA						
Charleston	11-26-85	●	●	●		
Columbia	11-7-85	●	●	●	●	●
Greenville	10-1-85	●	●	●	●	●
TENNESSEE						
Chattanooga	12-13-85	●	●			
Knoxville	11-20-85	●	●	●		
Memphis	9-25-85	●	●	●	●	●
Memphis	12-3-85	●				
Nashville	10-30-85	●	●	●	●	●
TEXAS						
Abilene	10-1-85	●				
Amarillo	12-4-85	●				
Austin	12-12-85	●	●	●	●	●
Corpus Christi	11-5-85	●				
El Paso	11-6-85	●	●	●	●	●
Houston	9-24-85	●	●	●	●	●
Lubbock	10-17-85	●				
San Antonio	10-29-85	●	●	●	●	●
Tyler	10-16-85	●				
UTAH						
Salt Lake City	9-23-85	●	●			
VIRGINIA						
Lynchburg	12-17-85	●				
Norfolk	11-12-85	●				
Richmond	10-29-85	●				
WASHINGTON						
Seattle	12-12-85	●	●	●	●	●
Spokane	11-14-85	●				
WISCONSIN						
Milwaukee	10-16-85	●	●	●	●	●

CULLINET SEMINARS/CANADA FALL/WINTER 1985

Province, City						
ALBERTA						
Calgary	10-17-85	●			●	
Edmonton	10-15-85	●			●	
MANITOBA						
Winnipeg	11-28-85	●	●	●	●	
NOVA SCOTIA						
Halifax	10-22-85	●			●	
ONTARIO						
Ottawa*	9-26-85	●				
Ottawa*	12-12-85	●				
Toronto	9-24-85	●	●	●	●	
Toronto	11-19-85	●	●	●	●	
QUEBEC						
Montreal	12-10-85	●				
Montreal	12-16-85	●	●	●	●	
Quebec City	11-6-85	●				
SASKATCHEWAN						
Regina	12-5-85	●			●	

*Includes Encumbrance Accounting

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Cobol 85 standard wins Ansi approval

By John Gallant

Cobol 85 is a U.S. standard at last. The American National Standards Institute (Ansi) gave its final approval to the proposed language upgrade less than one month after receiving the Cobol 85 standard document from its drafters.

In a sooner-than-expected move that surprised even insiders [CW, Sept. 16], Ansi's Board of Standards Review approved the Cobol 85 standard through letter balloting that ended Sept. 10. According to Dorothy Hogan, vice-president of communications for Ansi, 11 members of the 12-member review board voted to approve the standard; one ballot was not returned.

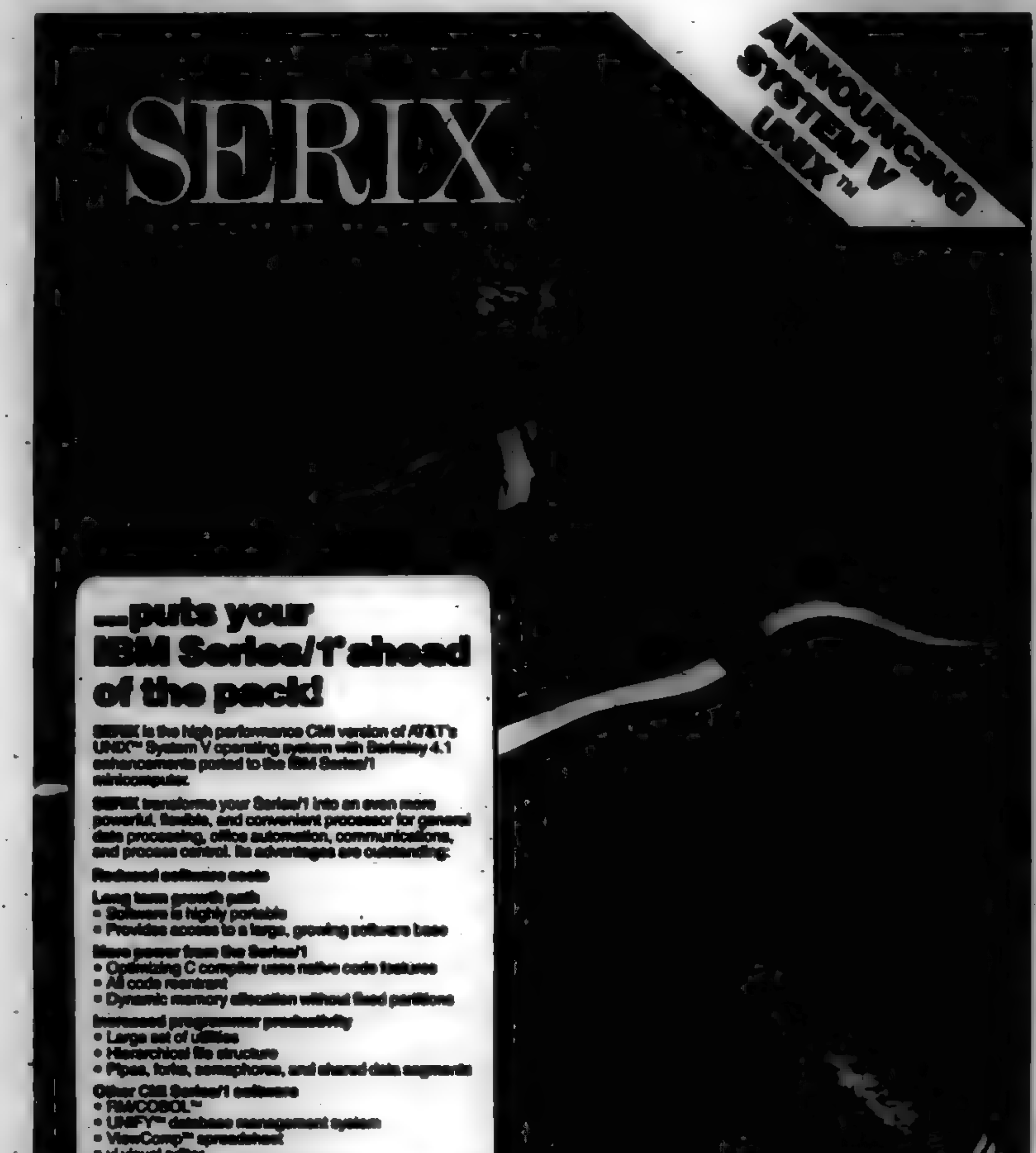
The Board of Standards Review received the Cobol 85 draft standard from Ansi's X3 committee — primary drafters of the upgraded language — in late August. X3 committee members told *Computerworld* at that time they were not expecting a final vote on the document until later in the year.

Committee members received no special notification of final approval and only learned of the vote through a periodically distributed Ansi publication.

"It's great news that we now have an American standard," said Jerome Garfunkel, a member of the Ansi X3J4 Cobol subcommittee and founder of Jerome Garfunkel Associates, Inc. "But the news comes as something of a surprise. It points out one of my greatest disappointments with the whole standards procedure. Even as a member of the Cobol committee, it has been very difficult to find out what stage the document was at and when it was to be approved."

According to Ansi's Hogan, the Board of Standards Review's vote set in motion a 30-day period during which people can appeal the approval. But, she said, no objections have yet been received.

The Cobol 85 standard now awaits only final International Standards Organization approval, a step expected before year's end.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TOP OF THE NEWS

Continued from page 1

at Moffett Field, Calif. **For more on the Cray X-MP, see page 4.**

■

Ranks of IBM Personal Computer AT clones can soon swell with an entry from Hewlett-Packard, a machine currently code-named Viceroy. The system, which could debut in the next few days, is said to be priced lower than the AT and to offer a floppy-disk controller and up to 640K bytes of memory. HP will also toss in its line of specialized graphics cards and monitors, making Viceroy suitable for computer-aided design and manufacturing tasks.

■

The saga of the IBM PCjr continues. Last week the company told its employees that they could purchase the erstwhile Peanut, complete with color monitor, disk drive and three software programs for a bargain-basement price of $450. The original price tag for the PCjr was in the $1,200 neighborhood. To reduce inventories further, currently estimated to be well in excess of 100,000 units, IBM is expected to flood retail outlets with PCjrs just in time for Christmas shopping and with a base price of about $600. Last Christmas they cost approximately $750.

■

A couple of weeks after Apple Computer Marketing Vice-President William Campbell pronounced the demise of the Macintosh Office concept ("We don't have the products to sell the Mac Office") at the Macworld Expo in Boston, Apple pops up on the CBS network presentation of *Death of a Salesman* advertising . . . Mac Office. Actually, there is a nice counterpoint between the two seemingly clashing episodes: Picture beleaguered salesman Campbell as a high-tech Willy Loman and Mac Office as a system that is liked but not *well liked*. **For more on Mac and Apple, see page 1.**

■

Ulric Weil, principal at Morgan Stanley & Co. and experienced IBM watcher, said that IBM booked $6 billion in orders for its 3090 mainframe line in the second quarter of 1985. These orders were so significant in and of themselves, Weil said, that the computer industry as a whole was able to post a 13% increase over 1984's second quarter.

■

It was a busy week for bicoastal data base ballyhoo. On the East Coast, the principals in a new company called Ansa Software — President Steve Dow and venture capital angel Ben Rosen — visited prospective corporate clients, dealers and trade press reporters to beat the drums for their Lotus Development Corp. 1-2-3-compatible micro data base management system Paradox. And out west, Symantec Corp. — headed by former Lotus and Microsoft Corp. executive Vern Raburn — finally released its integrated Q&A package, which includes a data base function and a natural-language front end. **More on both products, page 12.**

IBM software targets 4700 system, mainframe Unix

By John Gallant

IBM last week unleashed software that brought its 4700 financial system into the Office Systems architecture and provided an array of applications and development tools for its mainframe Unix operating system.

IBM's introductions brought yet another processor — the 4700 Personal Computer — into its strategic DIA and Distributed Office Support System (Disoss) linked family of products. In addition, the products for the IX/370, IBM's VM-hosted implementation of AT&T's Unix System V, seemed to signal an intention on IBM's part to make IX/370 a more viable operating system alternative.

An IBM spokesman said the announcement of 4700 Personal Computer Office Systems support provides "an initial offering of access to DIA distribution services for users in a 4700 system environment." He said that through compatibility of IBM Personal Computer products, including Personal Services/PC, on the 4700 Personal Computer, "a broad base is established for continuing IBM 4700 Office Systems support" — a statement that paves the way for other 4700 financial system products to be brought into the Office Systems fold in the future.

With Personal Services/PC running on a 4700 Personal Computer or a Personal Computer attached to a 4700 Controller, users gain access to DIA distribution services to and from Disoss on a host processor. Distribution services refers to the sending and receiving of messages, documents and Personal Computer files.

Text documents created on the 4700 Personal Computer running Displaywrite 2 or 3 and Personal Services/PC can also use Disoss for distribution. Office Systems support will be available when the previously introduced RM4700CTLR package for the 4709 controller and 4700 Personal Computer Application Services package become available later this month. Pricing is based on individual product prices.

IBM's nine IX/370-related announcements included the following:

■ IX Cobol ($6,000), a version of Austec, Inc.'s ACE Cobol modified to operate under IX/370. It supports record and file locking and is based on American National Standards Institute's (Ansi) Cobol 74 standard.

■ IX Basic ($3,500), an Ansi Minimal Basic standard compiler and interpreter.

> *With Personal Services/PC running on a 4700 Personal Computer or a Personal Computer attached to a 4700 Controller, users gain access to DIA distribution services to and from Disoss on a host processor.*

■ IX Pascal compiler ($4,800), a Unix implementation of Pascal that allows users to compile and execute Pascal programs under IX/370.

■ IX Prochart ($16,000), a version of Visual Engineering, Inc.'s Visual:Prochart. It allows users to create business graphics and is based on the Ansi Graphics Kernel Standard.

■ IX Integrated Word/Math ($12,000), integrated office automation software that was previously announced for the IBM Personal Computer.

■ IX Ultracalc ($10,000), developed by Olympus Software, Inc. It is a financial planning and modeling package with business graphics.

■ IX Informix ($14,000), an implementation of Relational Database Systems, Inc.'s Informix relational data base management system.

In conjunction with IX Informix, IBM also introduced the IX Informix Embedded Query Facility for Cobol ($9,000), which allows users to build custom data base applications under IX Cobol; and IX Informix Embedded Query Facility for C ($9,000), which supports the use of query language statements to access data bases from C programs and allows users to call C functions and use C library routines while using the IX Informix product.

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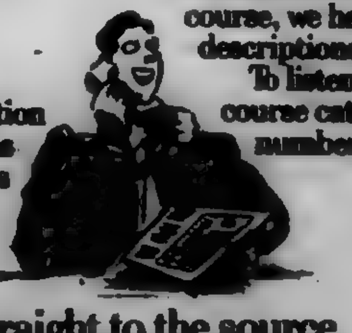

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Ansa offers Paradox IBM-compatible relational DBMS

By Donna Raimondi

A microcomputer data base management package from Ansa Software with the ability to import Lotus Development Corp.'s 1-2-3 data directly into its data table was scheduled for release and shipment today.

The Paradox relational data base management package for IBM and compatible microcomputers is the first product from Ansa, a company backed by venture capital firms Kleiner, Perkins, Caulfield & Byers and Sevin Rosen Management. The latter is a principal backer of Lotus and Compaq Computer Corp.

Paradox uses machine reasoning features to evaluate user requests and to write programs that seek the fastest route to an answer, according to Stephen M. Dow, president of the company and a partner on leave of absence from Sevin Rosen. In an interview last week, Dow said the package will be shipped through dealer channels immediately and will sell for $695. The company does not plan any direct sales, he said.

Lotus 1-2-3 similarity called a benefit

Paradox's similarity to 1-2-3 is a major benefit to users, according to beta test site user Lesley Pollitt, director of software management at Micromentor, Inc. in Cambridge, Mass. It allows 1-2-3 users to learn Paradox easily, she said.

Paradox is said to handle information management problems through query by example, program synthesis and heuristic query optimization techniques.

Data from a variety of sources can be integrated into Paradox, the vendor said.

The software's built-in programming language, PAL, is said to enable users and programmers to develop turnkey applications that meet their specific needs.

Paradox uses tables to display information in rows and columns. The columns hold categories of information while the rows show individual records. Each table or file can contain up to 260 million characters — formatted in 65,000 rows and 255 columns, with 4,000 char./row and 255 char./col.

A form is used to display data when working with information about one record. Any change made in the form is reflected immediately in the table. Forms can have borders, boxes and annotations on the screen.

Query forms on the screen enable users to retrieve, select or perform calculations on information in the tables. Users question their data by checking off columns and selecting rows.

Reports can be user designed or employ the Paradox program's standard reports.

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Symantec package out

By Jeffry Beeler

PALO ALTO, Calif. — A closely watched four-year-old software company last week released its first product, an integrated data base, word processing and report generator package that will use a natural-language interface, according to its developer, Symantec Corp.

The Cupertino, Calif.-based vendor's Q&A product will reportedly unite its data base, word processing and report generator functions to allow users of IBM or IBM-compatible micros to produce documents that derive their contents from two or more sources.

To perform tasks such as writing memos or updating data bases, a user summons a high-level menu that lists Q&A's constituent modules — the File data base, Report format generator and Write word processor. The user then simply selects the menu heading for the desired module.

Q&A uses its natural language interface to create and update data bases without moving to other programs or swapping disks, the company said.

Q&A's natural language capability resides in the product's "intelligent assistant," which enables users to create, populate, edit and update data bases with English language commands rather than with a formal query language.

According to beta user Jay Yamada, who serves on the board of directors for KQED, San Francisco's public television station, the station has used Q&A for about two months.

"I would typically spend two to three days creating [Ashton-Tate, Inc.] Dbase III screens and prompts for KQED's data base," Yamada said during a private interview. With Q&A he was able to perform the same tasks in about 10 minutes.

Q&A's systems prerequisites include 512K bytes of random-access memory and a choice of either two floppy disk units or one floppy and a hard disk module.

For users who already have 512K-byte IBM-compatible micros, the Symantec package sells for $299. When Q&A is bundled with a 256K-byte expansion board, the purchase price rises to $349.

Lotus to deliver remedy for Symphony 1.1 defect

CAMBRIDGE, Mass. — The latest version of Symphony needs some fine-tuning to correct a bug that may cause data to be lost, Lotus Development Corp. revealed last week.

The company said it will send existing users two replacement disks next month to correct the problem.

The bug in Release 1.1 can cause data losses when the user is inserting or deleting rows and columns and moving ranges. The bug was discovered by "quality assurance people and a couple of customers," a spokesman said. Release 1.1 began shipping July 22.

Lotus President Jim Manzi said the company was receiving about 10 complaints a day from Symphony users. Appearing at a press conference to kick off formally the company's Signal product [CW, Sept. 16], Manzi declined to say how many copies of the program had been shipped with the bug in it, although all those copies sold since the version was released contained it, he said.

According to Manzi, not every user of Symphony would have experienced the defect, although it may occur during use of common spreadsheet functions, including inserting and deleting data or transferring numbers between sections.

Stephen J. Crummey, vice-president of sales and service, downplayed the problem, calling it "not a big deal." The fix for the Symphony version that came out on July 22 is not totally resolved, he said. The company will probably swap two of the six diskettes in the Symphony package. The solution will be out in early October at no cost to registered users, Crummey added. An updated version of Release 1.1 will be shipped to dealers within the next week.

In the meantime, users can minimize the risk of losing data if they save their worksheets before using the INSERT, DELETE or MOVE commands, a spokesman said.

One user told *Computerworld* that Symphony has an additional problem with its color features. Release 1.1 is supposed to show both text and graphs in color, according to Russell Baris, project analyst at Pfizer, Inc. of New York who has had the version for about three weeks. When used with an IBM Personal Computer AT or a Compaq Computer Corp. Deskpro 286, the color does not come through on text, he said, adding that Release 1 did color the text. Baris said he told Lotus about the problem and was informed a fix would be sent when available.

A spokesman admitted that Release 1.1, when used with IBM's color card and a color monitor, can produce black and white text for some users. That glitch, along with other bugs that have been reported by users since the package was released, will be corrected in the forthcoming fix.

TCA crowd in buying mood

By Paul Korzeniowski

SAN DIEGO — There was little evidence of a slump at the Telecommunications Association 1985 conference last week where crowded aisles made it difficult to walk around, and users said they were in a buying mood.

The show attracted 250 vendors, up from 230 in 1984, and the association predicted attendance would total 14,000 people, up from 12,700 last year.

The audience seemed to be equally divided into users and vendors, with large contingents from MCI Communications Corp., AT&T and Pacific Bell.

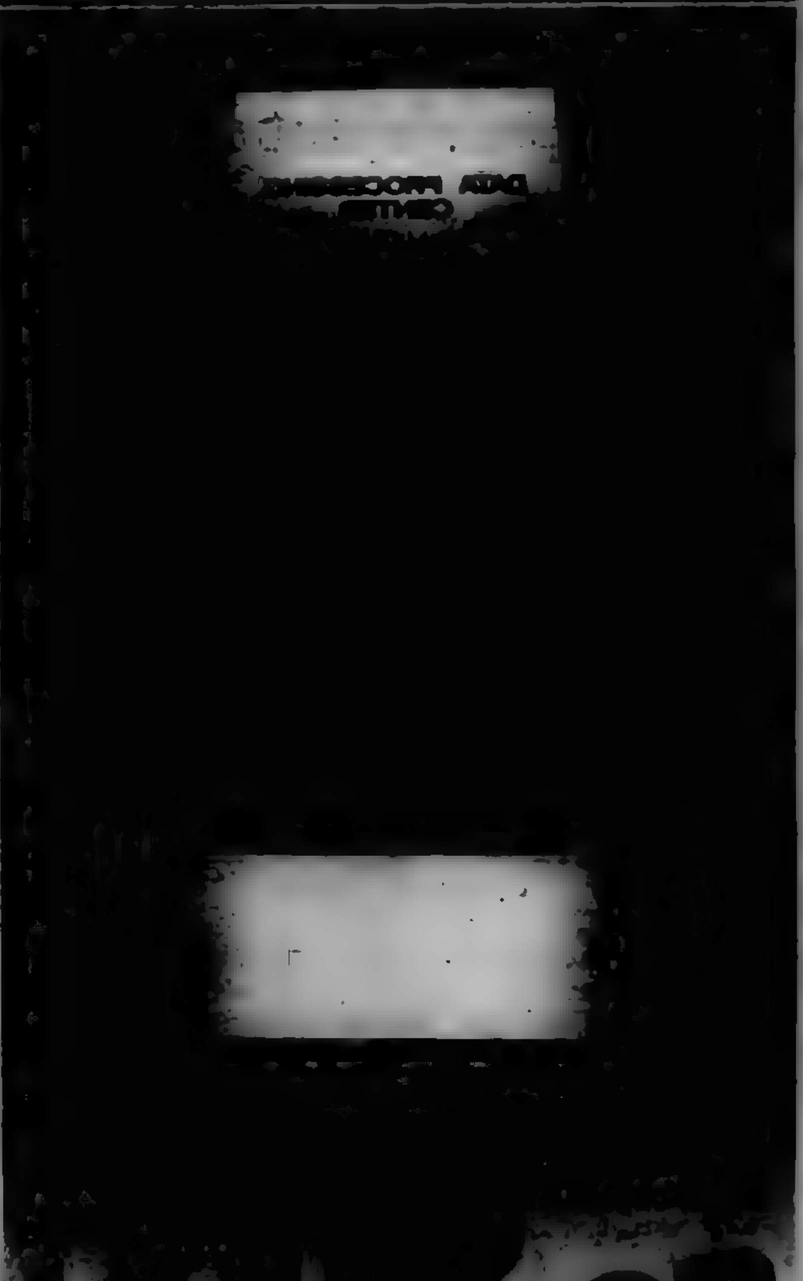
Users interviewed by *Computerworld* were in a buying rather than a browsing mood. Most were evaluating products that had been previously introduced. Only one product announced at the show was mentioned by a user as a probable purchase. J. P. D'Amico of the Los Angeles Police Department expressed an interest in T-Bar, Inc.'s 2001 matrix switch. He was not interested in a similar offering IBM unveiled a week before the show. "We are staunch supporters of [Digital Equipment Corp.] equipment," D'Amico stated.

Richard P. Schoettger Jr., a programmer analyst at Guild Mortgage Co. in San Diego, was evaluating all the items necessary to link his company's IBM System/38 to remote offices. His shopping list included modems, multiplexers and common-carrier services. "I was surprised that satellite equipment had progressed so much," he noted. "The satellite companies seem to have solved the problems of voice delay."

Nick Cook, vice-president of telecommunications at First Nationwide Corp. in San Francisco, was checking to make sure that he didn't overlook any item necessary when his company installs its first T1 line next month. "My best advice has come from other users whom I met during lunch," he said.

Other managers were interested in products that would enable them to squeeze more performance out of existing equipment. John G. Gacek Jr., director of telecommunications operations at the Chicago Board Options Exchange bought a private branch exchange in 1983. At the show, he was searching for a call management software package that would enable him to determine how that private branch exchange is used. Call management packages store data from local and long-distance calls and produce a number of reports that help managers determine if telephone lines are needed or telephone services could be eliminated.

Network management packages supply the same type of capabilities to companies with data networks, and Keith Felton, communications systems manager at California Casualty Management Co. in San Mateo, Calif., was inspecting these offerings. "The network diagnostic products included more features than I would have expected," he said.



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Raychem

The alternative is alarming.

IBM expands net strategy with protocol converters

By John Dix

RYE BROOK, N.Y. — Driven by the need to mesh support of Personal Computers and minicomputer equipment into its mainstream networking strategy, IBM last week announced two protocol conversion devices.

The announcement involved the 3708 network conversion unit and an eight-port communications adapter for a previously announced network controller. Both devices convert asynchronous Ascii data streams into IBM's Synchronous Data Link Control (SDLC), the protocol of its Systems Network Architecture (SNA), and provide full screen 3270 data format emulation.

These announcements come one year after the unveiling of IBM's first two major products in this area, the 7171 Ascii Device Attachment Control Unit and the 3710 Network Controller.

Analysts said IBM has little choice but to broaden its support of asynchronous Ascii communications because that is the natural protocol of its widely used Personal Computer. It also opens the door to the synchronous Ebcdic realm of IBM for users of typical minicomputer peripherals such as asynchronous Ascii terminals, printers and plotters.

Ten-port device

The new 3708 network conversion unit is a 10-port device that can be configured with one or two host links, leaving, respectively, nine or eight ports to support asynchronous Ascii devices. Besides performing the Ascii-to-SDLC conversion, the $4,500 unit provides full screen 3270 emulation.

Ascii devices, which can be located up to 4,000 ft from the 3708, are supported at speeds up to 19.2K bit/sec. through RS-232C interfaces. Remote devices can be supported with modems. When the 3708 is configured with two host links, one running to an IBM processor and the other to an Ascii host, terminal users can select the desired host through a menu. The 3708 is scheduled to be available next month.

The concurrently announced eight-port communications adapter provides the same protocol conversion functions as the 3708 but as an internal card option for the previously announced 3710 Network Controller. The 3710 concentrates three types of protocols — SDLC, IBM's Binary Synchronous Communications protocol and selected asynchronous protocols — over one SDLC or X.25 communications link.

While the 3710 previously supported asynchronous data streams, it did not provide protocol conversion. The 3710 can be outfitted with seven of the new $3,900 communications adapters — slated for delivery in the first quarter of 1986 — to provide up to 56 Ascii ports. From the host side, the Ascii devices look like 3270 devices attached to a Physical Unit Type 2 3274 cluster controller.

"IBM has to support Ascii because of the [Personal Computer] and the need to coexist in multivendor shops," according to Dave Moschella, director of computer market planning services at International Data Corp., a market research firm in Framingham, Mass.

Besides Personal Computers, the mainframe maker has turned to asynchronous Ascii communications with its System/36, said Peter Lowber, director of information systems with the Yankee Group, a Boston-based consultancy. "It might make sense to use Ascii locally in these environments," Lowber noted, "and 3270 to access the corporate data base."

IBM's intentions are not so benevolent in the view of Dale Kutnick, an independent consultant in Wayland, Mass.

"IBM wants to push SNA as a standard further down into corporations. That means it is going to have to support asynchronous Ascii, non-IBM devices to a much greater extent," he said.

HOW TO
MAKE A
GREAT
IMPRESSION
AT THE
OFFICE

Justice pushes stronger computer crime law package

By Mitch Betts

WASHINGTON, D.C. — The U.S. Department of Justice last week offered anew its computer crime legislation, as part of a package of eight bills attacking white-collar crime and contract fraud.

The computer crime legislation is virtually the same as the administration bill offered last year (S. 2940). U.S. Attorney General Edwin Meese III said the Federal Computer Systems Protection Act of 1985 would repeal and replace the "incomplete and flawed" computer crime legislation enacted by Congress last year.

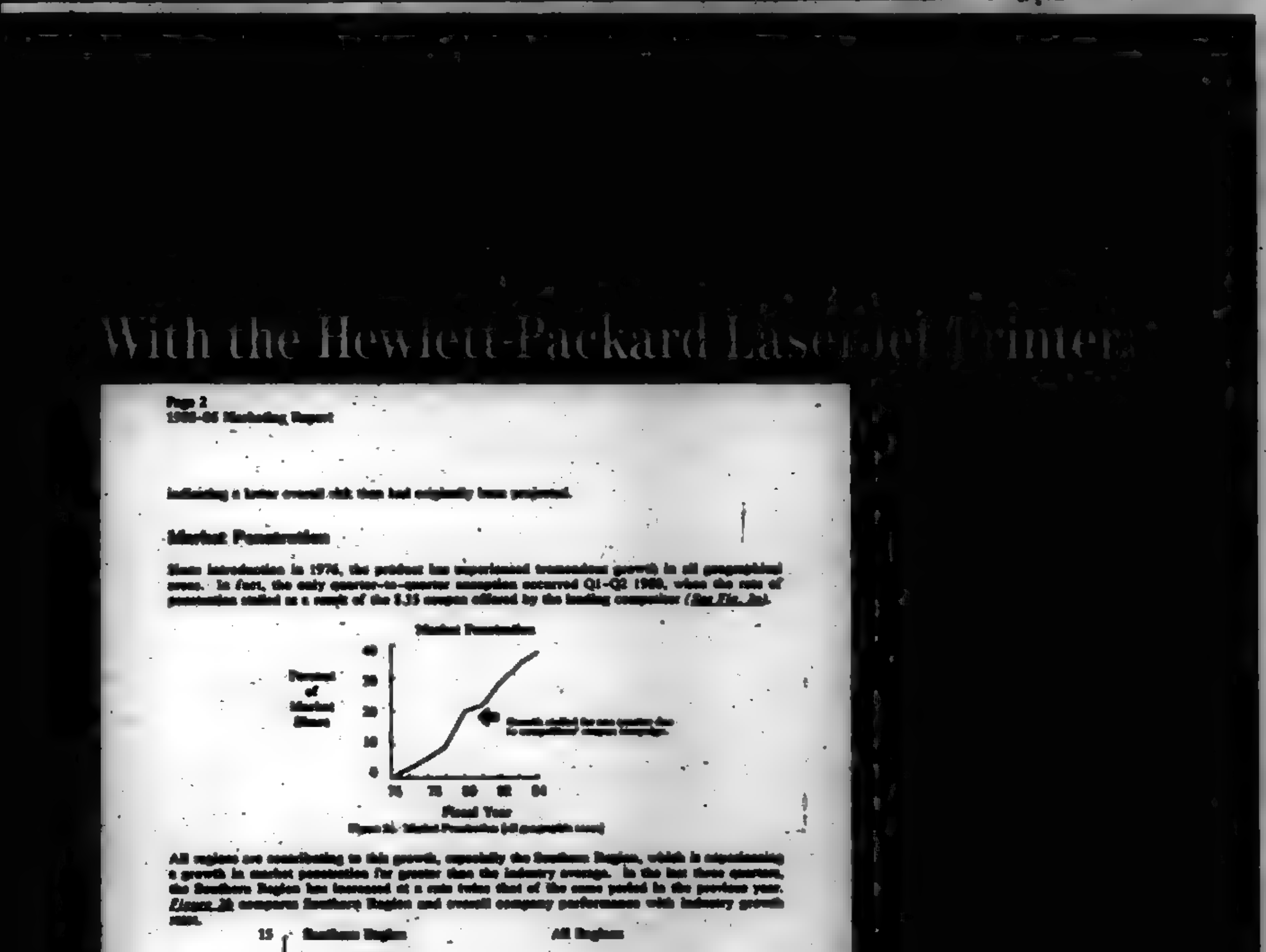
The Justice Department's bill would make it a federal felony to engage in computer fraud or theft or to damage computer hardware or data when the offense involves computers used by the U.S. government, federally insured financial institutions or private businesses engaged in interstate or foreign commerce.

The Justice Department repeatedly has attacked the Computer Fraud and Abuse Act of 1984 enacted by Congress — and drafted mostly by the House Subcommittee on Crime — for technical and drafting flaws. The statute outlaws unauthorized access to data stored in federal government computers [CW, Oct. 11, 1984].

Sen. Strom Thurmond (R-S.C.) and Rep. Hamilton Fish Jr. (R-N.Y.) are expected to introduce the package for consideration by Congress' judiciary committees.

Meanwhile, Sen. Patrick J. Leahy (D-Vt.) is on the verge of introducing the Electronic Communications Privacy Act [CW, Aug. 12], according to an aide.

In a recent speech to the Electronic Mail Association, Leahy said the bill provides civil and criminal penalties for unauthorized access to the computers of a communications system — if data is obtained or altered — and provides civil remedies for the unauthorized disclosure of the contents of an electronic message.



With the Hewlett-Packard LaserJet Printer

IBM blasts apartheid

By Donna Raimondi

ARMONK, N.Y. — Escalating civil unrest and the economic uncertainties of doing business in South Africa prompted IBM last week to issue a strong statement demanding that the South African government address the problems of apartheid.

The statement harshly criticized the unbending policies of apartheid that, the company said, are undermining the business climate there. "We have stated that we believe economic activity can facilitate positive social change," IBM said. "We are following this principle when we say we intend to remain in South Africa as long as we can maintain an economically sound business and as long as there is a chance that we — together with others — can contribute to peaceful change."

But IBM said it is "very discouraged by the current political situation and the resulting business environment in South Africa, which are reducing the chances of meeting those objectives."

IBM also said the government there has not shown progress in dealing with its problems. "The rapidly deteriorating situation is having a significant impact on IBM's South African business as well as business in general in South Africa," IBM said. "It is imperative that the South African government address the problems of apartheid with the compelling and urgent attention they deserve."

The statement goes beyond previous IBM pronouncements on apartheid and, according to IBM spokesman Michael Dutton, was prompted by business instability caused by customers taking their business to foreign competitors in fear of U.S. policy restrictions.

VIEWPOINT

EDITORIAL

The computer did it

A month ago we reported that a faulty computer modeling program was possibly to blame for Union Carbide Corp.'s failure to warn adequately neighbors of its Institute, W. Va., plant that a cloud of toxic gas had escaped. [CW, Aug.19].

According to these initial reports, a computer modeling program from Safety Emergency Systems, Inc. incorrectly predicted the gas cloud would remain over the plant. The vendor denied its program was at fault and contended that incorrect data was fed into the model. Union Carbide acknowledged that substitute data was used for the chemical that was thought to have escaped.

Plant supervisors first thought toxic aldicarb oxime gas was released. Data was prepared for the model on only three chemicals, and aldicarb oxime was not one of them. So an operator made the closest approximation and entered data on that chemical.

In the confused, emotion-charged (remember Bhopal, India?) aftermath, it seemed logical to leap to the conclusion that the modeling program made the wrong prediction on the speed and direction the gas cloud would travel because the wrong data was entered. "Garbage in, garbage out," said Gary Gelinas, president of Safety Emergency Systems.

Or in the catchphrase solution to so many modern technological mysteries: "The computer did it."

We are quick to blame the bloodless, lifeless, carefully constructed interpreters of ones and zeros when lives are endangered or lost. A similar incident occurred recently when a glitch developed in a space shuttle launch. According to reports, faulty computers would have shut off the shuttle's engines and prevented the craft from ascending into high orbit had not human operators intervened and kept the shuttle climbing. The image was of computers run amok sending the astronauts plummeting helplessly back to Earth. But this time, the humans prevailed.

Computers haven't taken over yet. They're not smart enough. And, we need to examine our tendencies to give them more credit and more blame than they deserve.

For instance, we learned in a follow-up call to Union Carbide that a broken steam pipe may actually have caused the leak disaster. Runaway vented steam heated up a tank containing two chemicals, changing the state of the chemicals and increasing pressure in the tank. The operator could not identify the leaking chemical because he apparently had no idea that the chemicals had changed into different states in the tank. For want of a thermostat, perhaps, 135 people were hospitalized.

It may be good news that these recent press reports were initially off the mark. It is not encouraging, however, to recall how quickly and easily assumptions of guilt were made in the first place.

In reality, the Union Carbide incident demonstrated the seeming impossibility of programming for the unpredictable. It's like building the perpetual motion machine. Those in the computer community must take the lead in educating society that computers are limited to the assumptions built into their programs, just as Union Carbide's model was limited by the predictable.

LETTERS TO THE EDITOR

Bulletin board abusers don't rate protection of First Amendment

I must take exception to the editorial,"Hands off," [CW, Aug. 26]. In it, you expressed the opinion that computer bulletin boards should have First Amendment protection.

The computer system that I have responsibility for is currently under attack by a group of people accessing it via a public packet-switched network. The access attempts have come from all over the country, and the hackers have tried to sign on using standard vendor maintenance accounts. It is clear that the information about these accounts is on an underground bulletin board being used for criminal purposes.

Although we intend to prosecute the perpetrators when the Federal Bureau of Investigation catches them, I would have been happier if the problem had never existed. I am not at all amused by these "cute little bit bangers," and I will support any and all efforts to force them to behave lawfully, even if their instincts direct otherwise. The removal of temptations presented on bulletin boards seems to be a good start toward this goal.

Stephen M. Rush
San Francisco

■

The editorial, "Hands Off" [CW, Aug. 26], missed the point: Abuse of privacy and property by placing private information on computer bulletin boards is not a fantasy but a very real problem and one that did not exist before computer technology made private codes so critical and so easily and destructively disseminated.

Your position, which stated that because freedoms are often abused by some that the best policy is to ignore them, is surely not meant to be taken seriously. Legislators are hardly characterized fairly as "busybodies ... poking around" when they hold as extensive hearings as are being held in California on issues on the public's agenda.

These abuses do happen. The Data Processing Management Association (DPMA) is concerned about them, and your newsweekly regularly reports them.

The bill that Sen. John Doolittle (R-Calif.) introduced in California does not limit any of the rights protected by the First Amendment. On the contrary, those rights are enhanced by being protected in a computer environment as they are in traditional media. There is no First Amendment right to invade another's privacy nor to encourage another to do so by publishing the access codes that would accomplish it.

Doolittle's bill addresses this concern and so does the DPMA proposal. The means differ, but the intent is the same.

Donald G. Ingraham
Alameda, Calif.

Manager defends function of memos to organize long-term group projects

Walter Cuirle's viewpoints expressed in "Minimizing the flow of managerial memos" [CW, Aug. 12] are interesting but need a different perspective.

There are several valid reasons for written memos. New ideas are easy to say and to listen to, but later on when action may be required, it is much better to refer to written notes than it is to trust one's memory. Status reports often contain a number of specific points of information such as solutions to past problems, changes in completion dates and so on.

I would certainly argue with some of the numbers that Cuirle uses to justify his recommendations. Two hours to prepare a one-page memo seems very excessive.

The thought of managing 10 people for one month on a project without written memos scares me. I can't always remember all the details of what I did last week let alone all the ideas encountered in a project of one month's duration.

As a manager, I can read, study and act on written memos and reports much more easily and quickly. Meetings are for questions, discussions and planning. At the end, a written summary of points raised and answered can be referred to for review, study and implementation at a later time.

I certainly can appreciate Cuirle's concern for the reduction in paperwork and managerial time. However, the particular examples and recommendations he gave could only encourage less than adequate control that in turn would result in less than satisfactorily completed projects.

Ted Farrell
Albany, N.Y.

For more letters, turn to page 22

VIEWPOINT

Ruminations on communications

LECHT ON SCIENCE
Charles P. Lecht

Let me begin by stating that I've always thought of AT&T as being extremely fair in its practices, and I was against its dismemberment and still feel it to be one of the finest companies in the U.S. or anywhere else.

Nevertheless, one cannot overlook the rising cost of communications at a time when competition is supposed to be bringing it down. Consider the cheery human voice that ends long-distance noncredit card calls with "Thank you for using AT&T." Although I confess to not knowing the real number of these messages, I'll go out on a limb and state that they number at least a million a day — the U.S. has more than 150 million telephones so I feel safe in my guess. At no less than three seconds and sometimes as much as five seconds for each "Thank you for using AT&T," the suggestion that these consume at least four million seconds of valuable telephone time daily is unquestionably conservative.

Supposedly you can use one of the alternative services that make you dial another number before you dial the one you want or others that make you dial so many numbers for one call that you deserve a medal for doing it right the first time. But these are too demanding as far as I'm concerned: 10 numbers is as many as anyone I know can handle without having to redialing after getting someone in Zambia by mistake.

No, friends, I'm not going to file a petition to remove the "thank yous" from our telephones — courtesies are hard enough to come by these days, sincere or not.

A maze of menus designed by a robot

What I am concerned about is what's next. And not only from AT&T. Already MCI Mail insists on giving the day's headlines and a lot of advertising when I sign on, and then takes me through a maze of menus that must have been designed by a robot for a robot with part of the former's circuitry missing — all this in my office in Japan while I'm trying to send a simple message to New York.

> ”
>
> *It's hard to swallow the promises of those that resell AT&T's service; AT&T still makes and sells it best. Why else would virtually all of the U.S. be on it?*

The headlines and advertising take 12 seconds. Whether or not this is directly billed to me is never clear, but I'm old enough to know that, as the saying goes,"You don't get anything for nothing in this world." Someone's paying for the creation and transmission of the headlines, the urgings to send a telex or two and the sales pitch for Dow Jones — all of which preceeds the question of why I signed on to the system in the first place.

On weekends, I get announcements of specials. You know, the kind that we expect to find on the windows of our local deli, but in this case, I'm paying the rent of the window space.

I could go on to mention other systems that insist that I spend my bucks on similar stuff, but it might just bring watchdog lawyers out of their kennels to bark up a storm of indignation based on their arguments on humanity's moral right to switch services if one or another doesn't suit them. Of course, the fact that there's still nowhere to switch to, especially if you want to cross a state's boundary that isn't in our national telecommunications network — a euphemism for AT&T's core business long-lines facilities — is hardly noticed.

It's hard to swallow the promises of those that resell AT&T's service; AT&T still makes and sells it best. Why else would virtually all of the U.S. be on it, including IBM? From my perspective, the pushing of advertising and news on the non-AT&T networks signals that there are still no non-AT&T networks — that is, competition — in our communications industry. How else could our alternative network services purveyors get away with it?

The lessons we learned in the mainframe computer industry wherein others tried to compete directly with IBM by piggybacking on the things IBM did best, namely making IBM computers, cannot be forgotten. Sure, we saved a buck or two by buying the alternatives, but when the whole picture was put together, unless we really knew what we were doing — for example, buying an Amdahl Corp. mainframe to add processing power to an otherwise IBM system — we were bound to lose out on the deal. The ex-customers of RCA Corp. and Univac can attest to this.

Buy away, my friends. But if the system thanks you too much for doing so or gives you news you've already read at breakfast, watch out. You are paying for it.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specialising in computer and communications technologies.

Squeezing CPU power: Is the effort worth the return?

THE DATA CENTER
John P. Murray

No matter how well the technical support group does its work in monitoring and fine-tuning information processing hardware resources, and no matter how extensive the factual basis for providing justification to move to a larger mainframe, it can still be difficult to convince senior management of the need to do so.

The facts supporting the need can be marshaled and presented in the most businesslike manner possible, and yet senior management will deny the request. It is likely that the denial will be accompanied by directions to squeeze more out of the installed hardware.

In some instances it is possible, even after a considerable amount of fine-tuning has already been done, to obtain a bit more processing capacity from a heavily loaded mainframe.

An important question should be raised in such a circumstance — notwithstanding management's directive to do more with the current hardware: What is the real cost of attempting to gain that probably minor benefit?

Provided that the system is indeed well tuned and that it is operating at a high level of efficiency, significant gains in throughput in a particular area are probably going to be obtained at the expense of some other area. On a net basis, the difficulty or inconvenience experienced in one area may be more than offset by the gains produced in another area.

> ”
>
> *Although there may be some political benefit to being able to inform senior management that the instructions to squeeze more out of the system are being followed, the use of a cost-return ratio might demonstrate that the actual value of the effort is questionable.*

If the issue of fine-tuning the hardware resource is appropriately addressed, a considerable portion of the total gain to be realized can be obtained early with a rather limited effort. Given the proper advanced planning and analysis, 20% of the total effort can produce 80% of the total return.

This is the case because much of the total benefit will often be found in major areas; if these areas are addressed first, the gains can be substantial.

Getting results from other areas

Once the more prominent problem areas have been addressed, getting results from other areas will take a great deal of time and effort. And the potential results are going to be questionable in terms of the return on that effort.

Although there may be some political benefit to being able to inform senior management that the instructions to squeeze more out of the system are being followed, the use of a cost-return ratio might demonstrate that the actual value of the effort is questionable.

If such fine-tuning impedes or reduces a particular department's productivity, the value of any gains realized after the initial 80% or so would have to be questioned.

For example, an adjustment may be made to provide more resources for batch processing. In a heavily loaded system, this probably means that on-line processing receives fewer resources.

Although the net effect may seem, and may indeed be, rather small, spread over a large active network, the result in terms of lost productivity and lowered morale may be significant. It may well be that the adjustment, while speeding up some of the batch processing, will reduce overall throughput.

Minor increase put to better use?

One must ask if the time spent in obtaining this rather minor increase in hardware efficiency could be put to better use somewhere else. The net return on the investment of this time might be much greater if it was devoted to other areas.

The decline in the cost of raw processing power continues. Given that continuing decline, the issue may not be whether there is unused processing power, but whether the potential return is worth the effort expended to harness it.

If, indeed, a 20% effort will produce an 80% return, can an additional 30% or so effort be justified to produce another 5% return? Every installation must make its own decision, but the answer is clear.

Murray is director of management and information services for American Breeders Service, a DeForest, Wis., division of W. R. Grace & Co. and is the author of Management Information Systems as a Corporate Resource.

Apprenticeship in DP shops guarantees high quality

READER'S PLATFORM
Bo Sanden

A certain basic structure is taken for granted in most DP organizations: On the one hand, there are managers who are not really supposed to be involved in technical matters other than to receive reports and so on from the technical staff.

There may be reports of technical solutions as well as progress reports, but the manager is not expected to solve technical problems, only to understand the issues when they are presented. The manager works with administrative tools such as assignment of people, adjustments of plans, budgets and so on.

The technical staff, on the other hand, is supposed to concentrate on the purely technical issues and not to manage. Sometimes, a dual career is implemented whereby technicians can be promoted to technical positions on a par with management positions but notably as system experts. This normally implies a high degree of specialization in particular systems or techniques.

The type of organization where this occurs is probably based on traditional manufacturing where the main objective is to control large-scale production that is not very complicated. The main issue is to manage large groups of people, to motivate them and to provide career paths.

By contrast, I like to see the approach in the time-honored tradition of creative crafts, which is very appropriate because there is always an important creative element in software design.

The traditional organization in these trades is based on masters and apprentices, often with certain steps in between. The master is the manager but also the technical authority and the instructor.

Unlike that of a technical expert, the important characteristic of the master is not in-depth knowledge of a given system. That sort of necessary expertise can be delegated. Rather, it is general design experience and acquired skill, which are more generally applicable.

There are several advantages with this approach: First, it is highly motivating. To the young apprentice with a technical interest rather than administrative ambitions, the master is a professional guide as well as a role model. To the senior technician, it is a way to continue working wih the technique while eschewing the boring details.

Over the years, the distance to the actual development terminal increases as does the distance to the program code. This prevents burnout. The master is not a chief programmer but is in charge of delegating the details.

Second, it guarantees quality. The master can assume the responsibility for the conceptual integrity of the large system. The approach economizes the scarce resource of senior technical talent. Just as important, it makes quality a central issue.

Today, quality is often the concern of a separate quality department rather than of the line or project organization. As the technician sees it, quality is rewarded with prizes and pats on the back, and promotion is based on completely different criteria. The career of the master, however, is built solely on professional skill.

Communicate and clarify questions

An integral part of this skill is the ability to communicate and clarify technical questions. The existence of a master promotes the discussion of technical issues within the development group.

Contrary to the common belief that programmers are loners who prefer not to share a solution with anyone until it is finally coded, in actuality even the most reticent programmers love to discuss technical problems.

The real reason why technical problems are not discussed is that nobody wants to listen. Colleagues are busy with their own problems, and the administrative manager is neither competent nor interested. The true master, however, will welcome the opportunity to provide guidance, mildly enforce relevant standards or concepts or simpy tackle an interesting problem.

Another advantage is that technicians will receive competent feedback. However well intentioned, the administrative manager will base judgment on the word of others or on the compliance with plans and may easily overestimate a mediocre job in a critical project. At the same time, the manager may let an outstanding effort in a smoothly running project go unnoticed, simply because the work is so well done that the project never becomes critical and, therefore, never draws attention to itself.

The master, on the other hand, would hopefully be knowledgeable enough to judge each task on its own merits and be able to distinguish the difficult ones from the easy ones.

Continued on page 22

Sanden is in charge of a distributed systems project at Philips Data Systems in Monterrey, Mexico.

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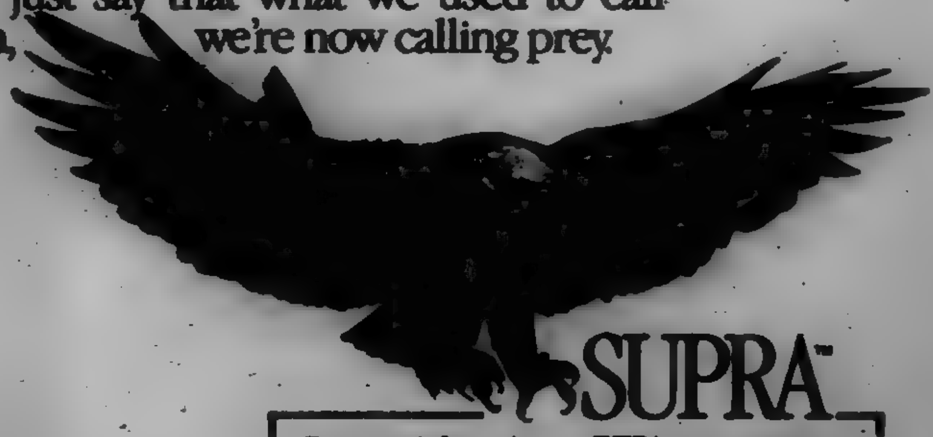

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LETTERS

Microprocessor comparison misleading with Mips figures

The article, "Chip vendor representatives wield claims at NCC session" [CW, July 29], in which technically well-qualified panelists at a technical session representing four major microprocessor manufacturers described and compared their products, is incomplete in a way that makes it seriously misleading.

The reader finishes it believing that the panelists presented their microprocessors mainly in terms of million instructions per second (Mips), a simplistic, would-be measure of processing power, and made emphatic — if not belligerent — claims of superiority based on it.

In fact, the panelists, all of whom were apparently involved in the design of their products, spent by far the greater portion of their time on the technical features of their CPUs and the associated coprocessors and instruction sets.

Computerworld's audience needs timely information about advances in the art of microprocessor design and about how those designs are evaluated. Information regarding the inadequacy of widely touted Mips figures, particularly when designers themselves publicly deemphasize Mips evaluations, deserves to be noted.

William J. Clover
Chicago

Two-vendor shop provides no guaranteed solution

The article, "Choosing and using consultants," [CW, Sept. 2] was amusing and sad. It stated that an IBM representative decided that a particular shop needed to become a two-vendor shop. I cannot think of a single problem that is solved just by becoming a two-vendor shop.

The sad part is that a company would hire someone from IBM to come into a non-IBM shop to make recommendations. Do they really believe the representative is not going to recommend changing to IBM hardware? That is like going to a Ford dealer to help you choose between a Ford and a Chevrolet.

Bruce Powell
Port Arthur, Texas

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From page 18

DP apprenticeships guarantee high quality

All these requirements of the master may seem like a large order, and obviously, the master's tasks are not easy ones. Masters are not just any people who have been around for a while. They must certainly have a genuine technical interest and an urge to continue developing technically.

Given that, the other qualities can be acquired. There is a very natural path leading from the hands-on design of small programs to bigger programs to the design of large systems by means of specifications or other abstract tools, with the details delegated to others.

The ability to communicate technical issues develops in parallel, beginning with the reviews or presentations of one's first programs, if supported by the organizational culture. Finally, a growing interest in working with other people in delegating tasks is part of human maturation.

The master-apprentice organization does have a certain patronizing character, and one might think that this would be resented by apprentices. My experience, however, is that it will not, because of the technical authority of the master as well as the difference in work experience that will normally exist. People with a technical interest will respect a person who can provide concrete advice and suggest viable solutions to technical problems.

A different situation often exists today. Because of the rapid technological changes, many technicians who are fresh from school suddenly find themselves supreme authorities of some part of the technology, especially in small organizations where nobody has had the time to master the latest novelties. This may be challenging to a highly talented individual, flattering perhaps to others, but in general, it is not very healthy.

Inventing devices to cope

The young individuals will have to invent their own devices to cope with the technique. There will be no role model, and the only nonadministrative career presenting itself is extreme specialization in the particular technique, which may not always be a very attractive prospect.

Masters exist in many places. Perhaps we do not hear very much about them simply because good results are produced without much ado. Also, perhaps managers count themselves fortunate having a talented and experienced individual in the organization and do not realize that mastership can be cultivated. There is no lack of potential masters and young talent in need only of the right kind of support and guidance.

Maybe masters are particularly common in the academic world, which probably attracts more technically oriented and less career-oriented individuals than industry. Probably the existing management philosophy of industry hinders the development of masters. It may, however, be necessary to change the paradigms and recognize software development as a creative craft, not only to improve dramatically the general quality of software but also to create a more motivating environment and thus solve the problems of excessive manpower turnover.

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Employment figures reflect trend toward efficiency

By Clinton Wilder

Employment levels of most major mainframe and minicomputer vendors declined or grew only modestly in the first half of 1985, reflecting both this year's industry slump and a trend toward more efficient manufacturing.

The worldwide work force at Control Data Corp. is at its lowest level in nearly eight years, having shrunk by 3,720 positions since Jan. 1 and by more than 10,000 jobs since 1981. Burroughs Corp. has been the year's other big job loser among the Bunch companies, with more than 2,000 employees laid off, chiefly in administration and production, in accordance with Chairman W. Michael Blumenthal's long-term consolidation plan.

At financially troubled CDC, the sale of subsidiary Magnetic Peripherals, Inc. production facilities in Minnesota, Texas and Kentucky slashed 900 positions, the largest single component of a domestic work force reduction of 3,400 since Jan. 1. CDC's worldwide employee population of 60,400 as of June 30 was its lowest since the end of 1977. Most of the cuts have taken place in production jobs, and CDC is not adding employees in other areas, according to spokeswoman Susan Bush.

IBM work force

At the other end of the spectrum, the work force continues to grow normally at IBM, the world's second largest industrial employer behind General Motors Corp. With 402,000 employees worldwide as of June 30, Big Blue grew by 7,000 employees in the first two quarters, consistent with its annual employee growth rate of 10,000 to 15,000 during the last several years.

The U.S. work force increased by 3,000 employees in the period, also a normal IBM growth rate, for a total of 242,000. "Hiring is proceeding across the board," spokeswoman Maxine Yee said. "Even though our profits have been lower than in past years, that hasn't connected to our employment figures."

The profit margins of Digital Equipment Corp. have also held up reasonably well during the current slump, but DEC has slowed its domestic hiring to a trickle and has reduced its manufacturing force. The U.S. work force expanded by 6,600 in the final nine months of 1984 but remained level between Jan. 1 and July 1 of this year.

Like Burroughs, DEC is in the midst of a long-term job reduction plan, but DEC's plan focuses specifically on the production area. Planning for smaller machines and more efficient, automated production lines, DEC has trimmed 3,000 manufacturing positions since the beginning of 1984. Another 2,000 cuts are planned in the next one to two years to reduce production employment to 25,000 worldwide from a high of 30,000 two years ago.

"As our computers get smaller and more powerful, they need fewer people to build them," said DEC spokesman Jeff Gibson. "Fewer materials means fewer people to move the materials and fewer people to schedule them. When someone leaves the company in production, we're often revamping the process instead of filling the position."

The same type of elimination by attrition has hit large vendors' middle management jobs in the current downturn, according to one leading executive headhunter. "The middle management ranks have been severely hurt in this retrenchment, and I think those jobs are gone forever," said William Tholke, managing partner of the Korn/Ferry International executive search firm in Palo Alto, Calif. "Companies have identified a lot of duplication and are finding they can do without many of those positions."

Employment levels in so-called revenue-generating positions — direct sales, service and support, for example — have generally been spared the layoff axe. "But

Continued on page 26

Employment levels

		Jan. 1	June 30	[illegible]
Burroughs Corp.	U.S.	Not available		
	World	65,300	63,000*	-3.5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
Data General Corp.	U.S.	13,030	11,875	-8.8
	World	17,800	16,690	-6.2
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
Hewlett-Packard Co.	U.S.	56,000	57,000*	+1.2
	World	82,000	85,000*	+3.6
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
IBM	U.S.	239,000	242,000	+1.2
	World	395,000	402,000	+1.8
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	7,470	[illegible]	[illegible]
Sperry Corp.	U.S.	27,900	27,800	-0.3
	World	36,900	36,800	-0.2

[illegible] figures for Aug. 1

Most employment levels declined or grew only modestly.

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Ada gets Nasa nod for space station use

By Mitch Betts

Ada, the programming language of choice with the U.S. military, recently gained another convert. The National Aeronautics and Space Administration will use Ada in the on-board flight systems of the manned space station project scheduled for launch in 1992.

Nasa is the first nonmilitary U.S. agency to use Ada, the high-order language developed for the U.S. Department of Defense, according to U.S. Air Force Maj. Allan H. Kopp, a deputy director of the Pentagon's Ada Joint Program Office, which monitors Ada developments.

The advanced language may also be used in the operating systems and applications of an advanced air traffic control project that is being designed for the Federal Aviation Administration (FAA), *Computerworld* has learned.

Nasa's Space Station Project Office at the Johnson Space Center in Houston selected Ada as the language for flight subsystem applications programs on the space station. Furthermore, officials said Ada is a candidate for the space station's ground control computers as well.

Liana Burke, a software manager at the Johnson Space Center, said Ada was selected because it is the most robust and modern language, because Ada compilers have been developed in the private sector, and because the Pentagon's support for Ada "gives us a degree of confidence in its long-term viability."

Commenting on the selection, Kopp said, "I think it clearly indicates that Ada is moving outside the realm of the Department of Defense into other government applications."

Kopp added that the Nasa action will have "ripple effects" on the computer industry. "It will mean that contractors doing business with Nasa will have to know Ada. It will mean the vendors who support those contractors with computer hardware and software will have to have Ada capability," he said.

Meanwhile, the Ada programming language is a leading candidate for use in advanced air traffic control software at the FAA, according to government and industry sources.

The firms competing for the FAA's Advanced Automation System contract, IBM and Hughes Aircraft Co., are both using Ada design tools in the early stages of the design process, a well-placed government source confirmed. Moreover, Ada is a strong candidate for use in the actual operating systems and applications software, if a mature compiler and trained personnel can be found to implement it, the source added.

In addition to Ada's reputation for modularity and low-cost maintenance, Ada makes a good choice for the FAA because of its error-free code and high reliability — important features for collision-avoidance systems, government and industry sources said.

Last year, the government awarded contracts totaling $246.7 million to IBM and Hughes for a three-year competition to design the advanced air traffic control system [CW, Sept. 3, 1984]. The contractor with the best design will get the production contract, with delivery beginning in 1989.

Ada already is the standard language for critical military computers at the DOD. The North Atlantic Treaty Organization recently announced it will implement the Ada language in all military systems, beginning in January 1986, according to Maj. Kenneth Schoonover, Ada project officer for the Air Force Systems Command, who spoke at the recent Federal Computer Conference in Washington, D.C.

However, the U.S. Postal Service (USPS), which last year planned to use Ada software for mail-sorting equipment at two bulk mail centers [CW, Aug. 20, 1984], ultimately did not use Ada.

According to Frank A. Amoroso, a USPS program engineer, those plans went awry when contractors, claiming that adequate Ada hardware and software were not available in time, substituted software products operating under AT&T's Unix system, which uses the C language.

From page 24

Employment figures show efficiency trend

that has been curtailed — we're hiring, but it's not wide open," DEC's Gibson said.

Overall, DEC added 400 employees between Jan. 1 and July 1, all of them overseas, for a worldwide employment total of 89,000. The U.S. work force remained relatively stable, falling by 300 for a total of 59,300.

More than two-thirds of Prime Computer, Inc.'s 8% work force increase since Jan. 1 has been in sales and research and development positions. The Natick, Mass., minicomputer maker expanded by 680 jobs for worldwide employment of 8,100 as of Aug. 25.

Hewlett-Packard Co. has seen increases of 1,000 domestic and 2,000 overseas employees in 1985, with no particular concentration in specific job functions.

Two Bunch mainframe companies, Sperry Corp. and Honeywell, Inc., have experienced a modest decrease in employment since the beginning of the year. Honeywell's worldwide job total fell by 650 positions to 93,621 as of June 30.

At Sperry Corp.'s Information Systems Group, a slight increase in domestic employees in the first seven months of 1985 offset most of the loss of 600 laid-off production employees at the Sperry terminal and communications equipment facility in Salt Lake City, for a total of 36,800 employees worldwide and 27,800 in the U.S. as of July 31.

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Martin urges MIS managers to automate operations

By Charles Babcock

NEW YORK — Management information systems managers need to put more automation into their operations with engineering-style techniques, according to James Martin, the noted author and commentator on information management.

In a recent address to Cadre, Applied Data Research, Inc.'s users group, Martin described how information engineering will bring about a leaner, more end-user-driven corporation in the 1990s.

Martin said the modern corporation will be structured on a knowledge base composed of all data and rules pertaining to the business. The chief resource of the knowledge base will be an encyclopedia in which integrated models of data, the enterprise and the processes that run it are stored and cross-referenced.

> ”
>
> *The modern firm will be structured on a knowledge base composed of all data and rules pertaining to the business.*

The emerging techniques of artificial intelligence, when applied to the knowledge base, will be able to correlate the information and use the rules in many stages of decision making, he said.

To get to this point, however, MIS managers will need to use more disciplined techniques that lend themselves to manipulation by computer logic. Many MIS professionals worry that automation in their field could jeopardize their careers, but they should not, Martin noted.

"It's much more fun to work with power tools than hand tools," he said.

To move toward automation, MIS managers must minimize some current careless practices, such as incorporating the imprecise communications of English language specifications into program designs.

Much of Martin's talk addressed diagramming program specifications, a topic that has occupied his recent attention and is the subject of a forthcoming book.

"Diagrams have got to have the precision of a computer language. They are a computer language," he maintained. Precision diagrams will allow automated conversion of data flow diagrams into data navigation diagrams, decomposition diagrams and more, he said.

Bit-mapped personal computers like the IBM Personal Computer AT allow much more precise diagramming and give software developers a tool that yields a much quicker response time than a terminal, he noted.

Building a prototype early in the application development process would yield greater productivity, according to Martin. "I have never seen an example of a prototype being given to end users without end users changing it. So if you build a system without a prototype, you are probably going to build it wrong," he said.

Martin urged his listeners not to underestimate the role that artificial intelligence will play. AI is no "genie coming out of the bottle," he said, but its ability to apply a set of rules to a large body of data will make it a valuable component of the firm of the future.

That cannot happen while AI is the subject of a kind of cult following that needs specialized computers to run its programs, according to Martin. "You want to lift it out of its subculture and anchor it in the world of IBM and MIS," he said.

Information engineering, he concluded, will push MIS away from manual techniques and toward automated techniques. "This makes so much sense that every efficient corporation will do this" by the 1990s, despite massive migration problems, he said.

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IBM's Opel calls for competition in foreign telecom nets

By Jeffry Beeler

SAN FRANCISCO — IBM Chairman John Opel last week called for foreign governments to open telecommunications networks to the free-market dynamics that have fostered advances in the U.S. information processing industry.

"Competition must increasingly govern . . . an industry segment with which information processing is converging — telecommunications," Opel said during the eighth quadrennial International Industrial Conference.

"Historically the telecommunications networks of the world have existed under noncompetitive arrangements — as franchised monopolies owned or tightly regulated by government," Opel said during the conference luncheon address.

Within the last few years, however, governments have begun to retreat somewhat from their traditional monopolies and to push their telecommunications industries steadily toward deregulation. The process is already nearly complete in the U.S. and appears to be gathering momentum in several other countries as well.

"Britain has liberalized its policy," Opel told some 500 conference audience members representing more than 60 nationalities. "So have Canada and, to some extent, Ireland. Japan has passed legislation ending its traditional monopoly system with the intention of opening the telecommunications market to competition. Other countries are actively debating similar changes."

The worldwide movement toward deregulated telecommunications promises to yield significant benefits, Opel maintained. "Competition not only will continue to propel the growth of information processing," he said, "it also will power new growth in telecommunications. And it will bring both industry segments together in a flourishing $2 trillion marketplace before this century ends."

IBM Chairman John Opel called for worldwide deregulation of telecommunications.

In information processing, free enterprise has already fostered dramatic price/performance improvements and has otherwise fueled breathtaking technological advances, Opel said.

To underscore his point, he contrasted the recent histories of the information processing and telecommunications sectors. Since 1955, the execution rates for general-purpose processors have grown by a factor of 938, while the associated costs have dropped by a factor of 234.

In the telecommunications field, by contrast, a Tokyo-to-San Francisco telephone call that cost $17 in 1968 carries a $7 price tag today. "That difference in performance [between the information processing and telecommunications industries] reflects the price exacted by regulation, which, among other things, inhibits the abandonment of obsolete equipment for new [equipment]," Opel said.

Competition in the information processing industry has also "made an anachronism of artificial national regulatory barriers," promoted the development of international standards and blurred the distinction between what should and should not be regulated, he said. Similar changes are expected to accompany the ongoing deregulation of telecommunications networks.

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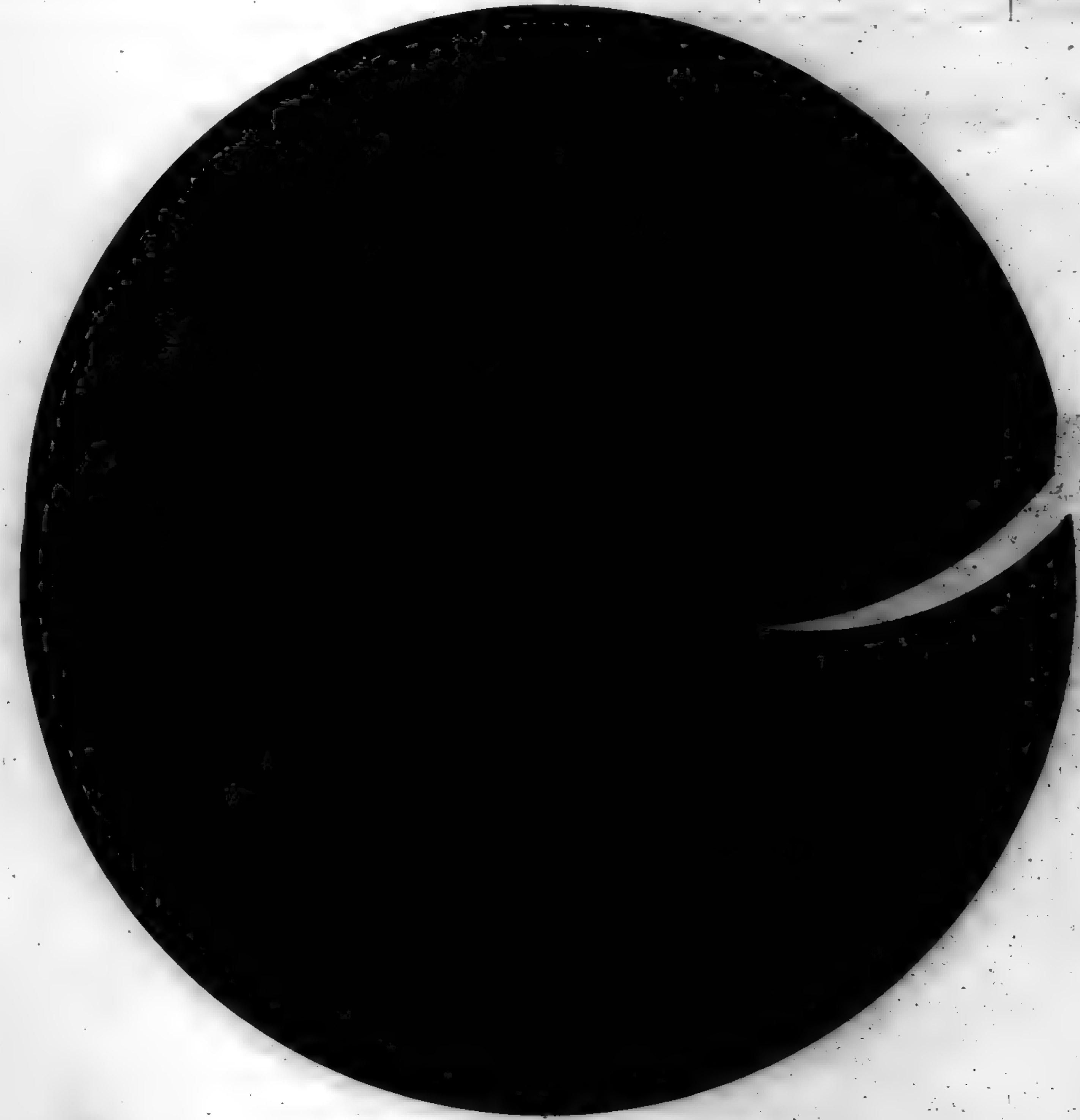

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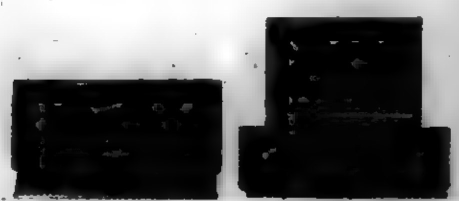

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WASHINGTON UPDATE
CW Washington Bureau

U.S. representative assails nine-digit Zip code program

WASHINGTON, D.C. — U.S. Rep. Glenn English (D-Okla.), a critic of the U.S. Postal Service's (USPS) nine-digit Zip code program, recently said the USPS should place more reliance on new optical character recognition (OCR) and bar-code equipment for mail sorting.

English, chairing a Sept. 13 hearing by the U.S. House of Representatives Subcommittee on Government Information, Justice and Agriculture, told USPS officials, "The focus should be on automation" rather than on the Zip + 4 program to reduce mail-sorting costs at the quasi-governmental agency.

The USPS recently announced it will begin testing multiline OCR equipment that can read the entire address on an envelope and print a bar code on the lower part of the envelope. At the same time, the USPS announced it will increase the discount that business mailers get for using the nine-digit Zip code [CW, Aug. 19].

English said the new equipment will make Zip + 4 obsolete, but USPS representatives disagreed. "This move toward multiline readers does not in any way lessen our commitment to Zip + 4," testified Jerry K. Lee Sr., senior assistant postmaster general.

"Deployment of the multiline readers over the next several years will enable the Postal Service to increase near-term automation-related savings while Zip + 4 volume continues to build," Lee said. "In the long run, the Zip + 4 code, coupled with multiline equipment, promises to provide the highest productivity gains for the Postal Service."

English said he has long urged the USPS to implement an automation program first, then consider a longer Zip code if that is cost effective. English charged that the Zip + 4 program has been mismanaged and that further discounts to mailers are an unnecessary subsidy.

NBS announces development of data dictionary standard

GAITHERSBURG, Md. — The National Bureau of Standards (NBS) recently announced that it will publish a standard for data dictionaries used in information systems of the U.S. government.

The announcement said the NBS will make the proposed Ansi standard on information resource dictionary systems a new Federal Information Processing Standard to promote portability of data among government users.

A preliminary cost-benefit analysis estimated that the U.S. government would be able to save more than $120 million, in constant 1983 dollars, by the early 1990s by using a standard data dictionary, according to the NBS.

In addition, the NBS announcement reported that a set of automated validation tests is currently under development.

DOD encourages ATM banking at military bases

WASHINGTON, D.C. — The U.S. Department of Defense recently proposed new regulations that encourage banks and other private financial services to open facilities — including automated teller machines — at DOD bases for military personnel.

The proposal stated that, although branch offices of banks, savings and loan associations and credit unions are preferred, ATM kiosks are permitted when full-scale financial services cannot be provided.

"In acquiring [ATM] services," DOD added, "preference shall be given to proposals that offer shared-access ATMs."

Public comments on the proposed rules are due Oct. 23.

Joint venture to offer packet network service

SAN DIEGO — A gaggle of unlikely partners has joined forces with the intention offering a packet-switching service later this year, it was announced at the Telecommunications Association 1985 show last week.

At the conference, MCI Communications Corp., Amdahl Corp., Pacific Bell, Security Pacific Data Transmission Corp. and Dow Jones News/Retrieval service demonstrated a service capability that may be ready as early as this winter.

While traditional packet-switching carriers such as GTE Telenet Communications Corp. and McDonnell Douglas Automation Co. supply users with end-to-end services, this joint effort will have different companies providing network link segments and components.

In the demonstration, Pacific Bell and Security Pacific provided local-exchange packet connections to Dow Jones over an MCI long-distance link. Amdahl provided the network management processors, network concentrators and other components needed to access the packet net.

The joint venture plans to build networks for private customers using local-exchange packet nets interconnected with packet links from MCI.

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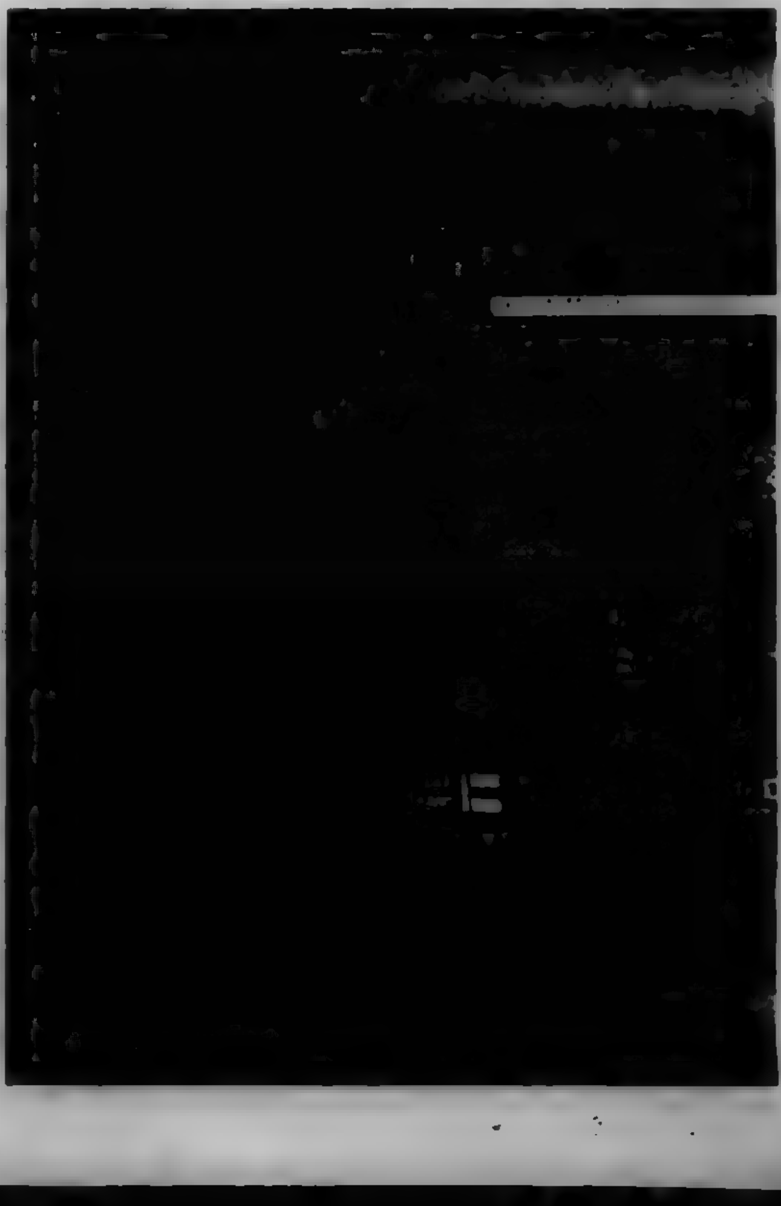

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HOW TO AVOID IT, FROM THE LEADER
IN ON-LINE TRANSACTION PROCESSING.

WHAT COMPUTER FAT IS.

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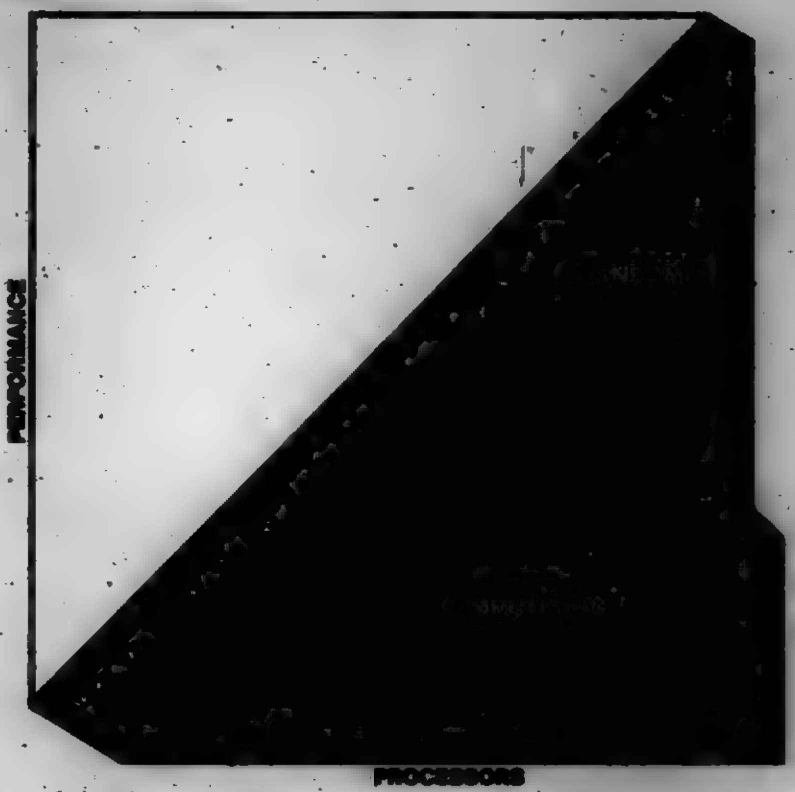
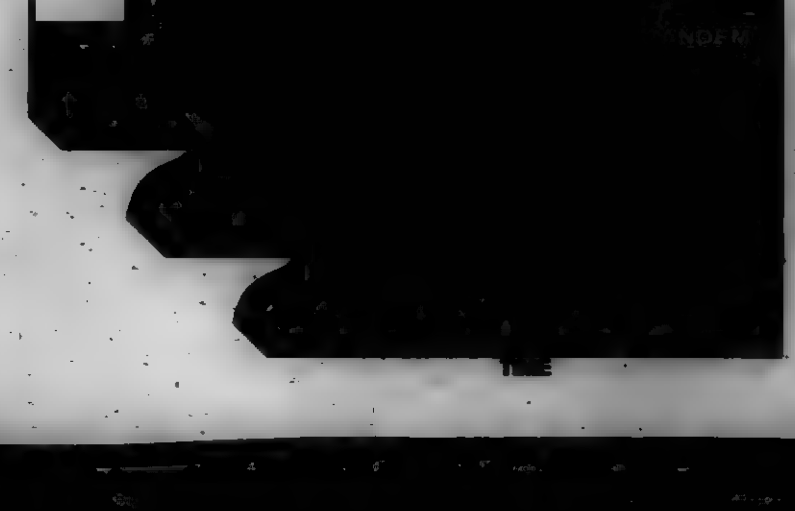
WHAT IT COSTS.

The performance cost. With conventional computer architecture, doubling your processors does not double your performance. With Tandem, each incremental increase in processing power provides matching performance.



The dollar cost. With conventional computer architecture, growth is convulsive. You must continually over-invest to assure sufficient processing power. With Tandem, growth matches need. You never invest more than you have to.



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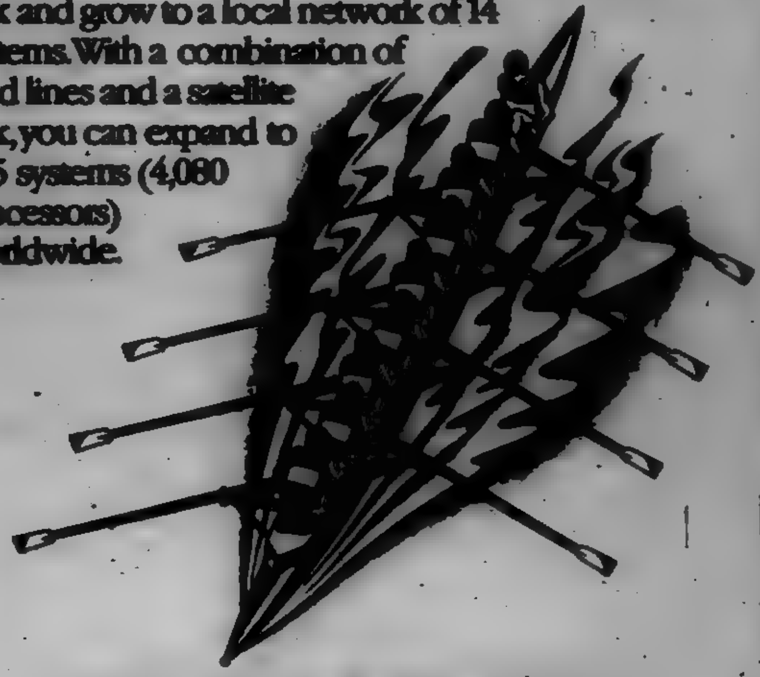

In a Tandem system, there are no idle backup components. They all share the workload.

With Tandem, your software expands, too. All systems work like one system, and you'll never have to rewrite a line of applications code.

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TANDEMCOMPUTERS

Federal historians alarmed at loss of computerized data

By Mitch Betts

WASHINGTON, D.C. — Government historians and records managers, upset by the loss of computerized government data, vowed at a recent meeting to take a more aggressive role in shaping information management policy.

The meeting, hosted by the Society for History in the Federal Government, featured complaints from records managers and archivists at federal agencies:

■ Information systems are rarely designed with any input from records managers and archivists, who must retrieve historically important information 30 or more years after it is stored.

■ Records managers in the government are placed far below DP managers in the information management hierarchy and get little respect or resources.

■ The U.S. Congress has given an alphabet soup list of agencies that have the authority to manage federal records, but strong policy direction is lacking.

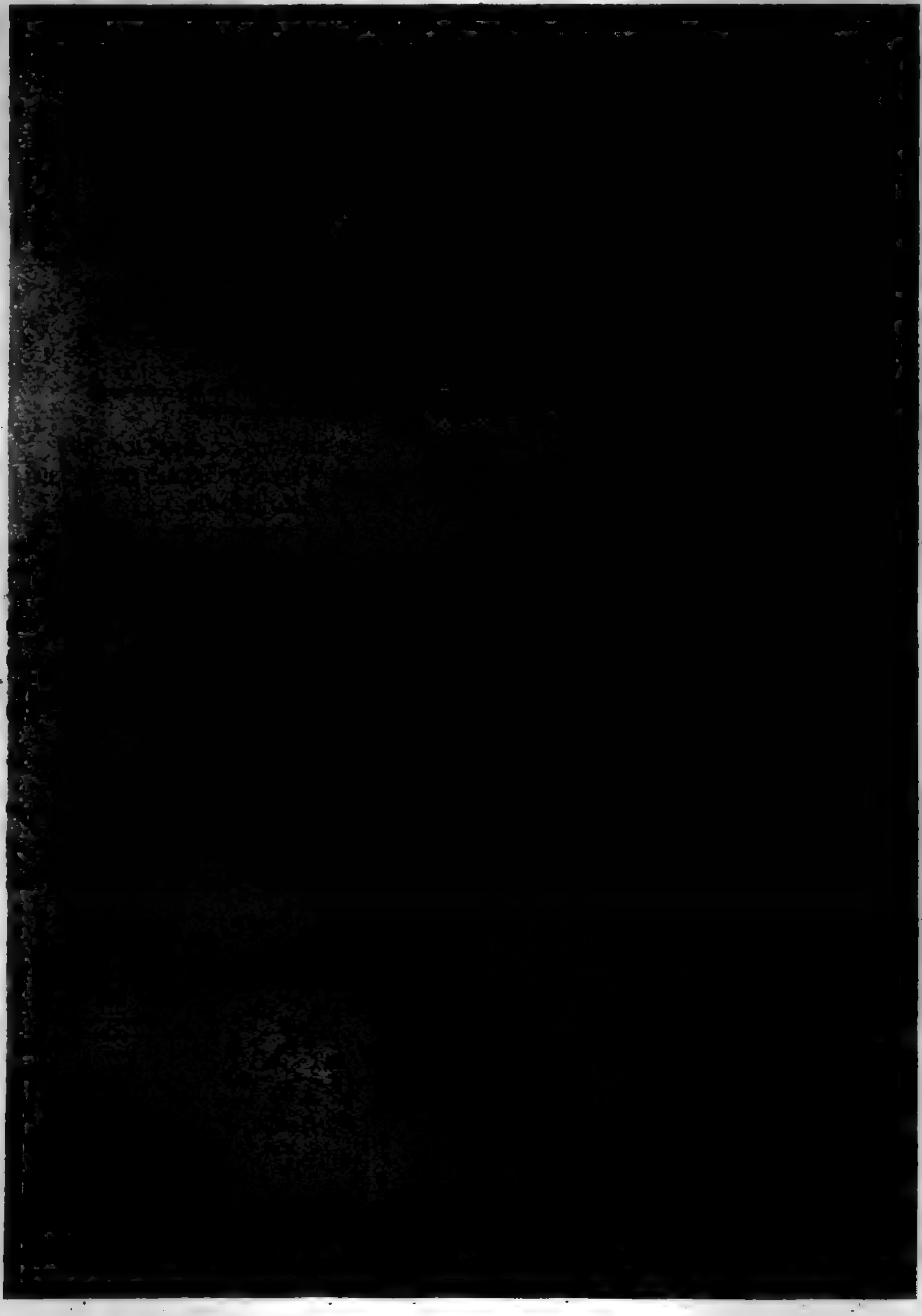
Generally, records managers and archivists need to retrieve and store certain types of government information, such as analytical reports, precedent-setting agency policies and directives, minutes of board meetings, legal opinions and comments on legislation.

According to a blue-ribbon panel called the Committee on the Records of Government, the computerization of government records has caused several problems, including the deletion, caused by word processing software, of historically significant first drafts of policy documents.

Consequently, "the U.S. is in danger of losing its memory," the committee's recent report said. Because of erasures of electronic records, future historians may know less about the 1985 arms control talks than about the 1972 Strategic Arms Limitation Talks, it said.

Furthermore, the growing use of electronic mail makes it less likely that important government memos will be preserved, the report said.

Frustrated with these problems, participants at the meeting said a government agency or committee is needed to set information policy. Anna Nelson, who was project director of the committee report, said a high-level records council is needed to coordinate policy along with the National Archives and Records Administration.



WORLD DIGEST

CW International News Network

MANILA — As part of a sweeping effort to computerize government offices, the Philippine's President Ferdinand Marcos has eliminated the country's $50,000 ceiling on the importation of computer equipment, reduced tariffs on those products and established a cabinet subcommittee to review the status of computerization.

The subcommittee, headed by Prime Minister Cesar Virata, is responsible for formulating a plan to boost technological development in the Philippines. Acting as consultants to the committee are technical experts from the government and private sector. Key government ministries and agencies reportedly have been assigned to lead the automation project and will be the first to acquire equipment.

VIENNA — Philips Data GesmbH announced a microcomputer named Yes. Yes is equipped with an Intel Corp. 80186 processor, DOS-Plus operating system and 64K bytes of read-only memory from Digital Research, Inc. Production of the system will take place in Austria, Philips said. For marketing and sales within Austria, Philips said it hopes to line up 100 distribution partners before the end of 1985.

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Finally, Honeywell gives the people in the trenches, the end-users, the friendly kinds of software that make the DPS 6 system easily accessible to everyone.

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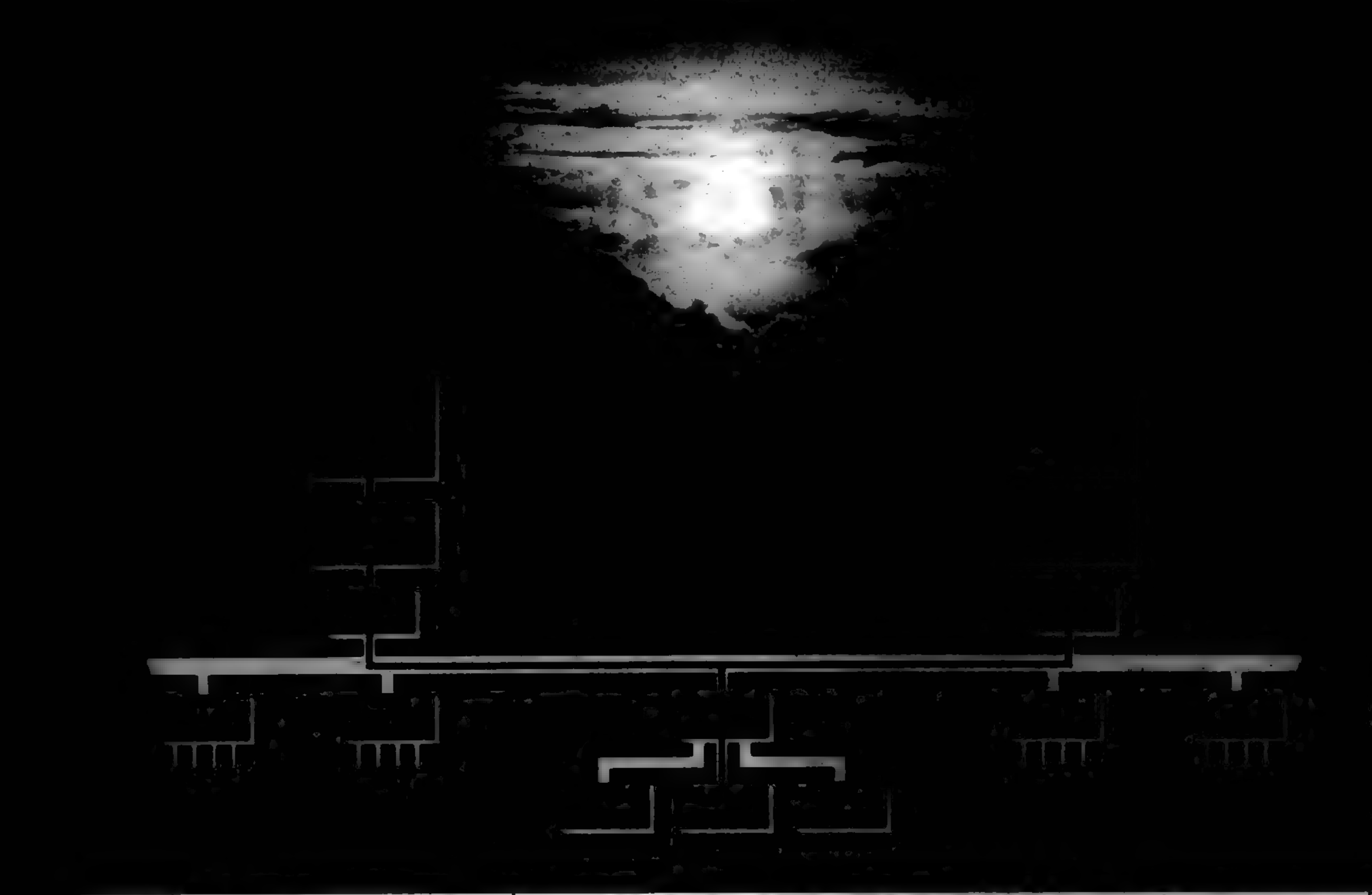

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Micro statistics tool helps General Foods track tastes

Cuts division's $6,000 monthly CPU costs

WHITE PLAINS, N.Y. — You can't tell a book by its cover, and you can't judge a cereal by the design of its box. Nevertheless, said a spokesman for General Foods Corp., maker of the Post brand breakfast cereals, research shows that such factors as package shape or color can translate into millions of dollars of sales — lost or gained — for the company.

So it was with appropriate thoroughness and care that the General Foods' food division headquarters in this New York suburb went about selecting a microcomputer statistical analysis package to help determine the likely affects of product packaging and other variables on consumers' buying decisions. The headquarters supports six food divisions, which make and market products such as Minute Rice, Maxwell House Coffee, Oscar Mayer bologna and Post Raisin Bran.

According to Stephen Rood, a group marketing information associate at General Foods, members of the company's data research department will survey hundreds — sometimes thousands — of consumers to gather information about their purchasing habits. General Foods researchers collect demographic data as well as information about test subjects' reactions to a product or a package design.

The data sets that contain information from the surveys are large, Rood said. "It would be typical to find someone looking at, say, 30 variables and 1,000 cases from the interview data."

Until recently, the market research group relied on mainframe software packages, mostly SAS Institute, Inc.'s SAS, to perform regression analyses and other statistical operations on the information that had been collected. To access the software, which runs on a 16M-byte IBM 3033 at General Foods' corporate headquarters in Rye Brook, N.Y., the group had to pay up to $6,000 per month for CPU time.

"What was happening," Rood continued, "was that a number of people were coming in and saying, 'Well, gee, if I could download the data to a micro, it could substantially cut those costs.' "

Last summer, Rood, who is responsible for finding tools for market analysts to use in their work, obtained a copy of SPSS, Inc.'s SPSS/PC and installed it on an IBM Personal Computer XT. Since then, he and seven other micro users have been performing statistical analyses on micros using the SPSS package.

To access survey data, users dial into either the 3033 or one of 10 Prime Computer, Inc. 2250s General Foods maintains for data storage. They download the information to SPSS/PC using error-checking communications protocols in Temple, Barker & Sloane, Inc.'s Addata data base software. Portions of Addata run both on the 3033 and on the personal computers that run SPSS/PC.

For operations that the micro package does not support, such as discriminate analyses, and for analysis of data sets with more variables than the micro package can handle, users still rely on mainframe software. Rood said applications involving both micro and mainframe analyses at different stages are common.

Since the micro software has been installed, however, analysts have used it for as many projects as possible, Rood said, because of the cost savings it represents.

Besides performing regression, variance and factor analysis procedures on market research data, the analysts use the software to examine consumer trends and warehouse figures on product turnover. They also use it to prepare data for procedures like graphics display that are available in other software packages.

Application: Microcomputer statistical analysis package

Business: Packaged food

User: General Foods Corp.

Rood said most analysts learned to use SPSS/PC within a week because they had been exposed to SPSS mainframe software at college and had no problem understanding the micro version's documentation. The short learning cycle translated into lower costs and higher efficiency.

"We need a situation where we're not going to have analysts spending a great deal of time learning a new program," he said. "This package lets them get into their analysis and use a variety of statistical procedures on their data right away and with relatively little help."

Rood said he expects about 100 employees at General Foods to use the micro statistical analysis software eventually. The firm does not impose any top-down restrictions on microcomputer hardware and software. Users who can justify a purchase to their superiors are free to buy whatever they think will meet their needs. The company maintains an information center to guide users in their choices.

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6.1

CALENDAR

WEEK OF OCTOBER 20

OCTOBER 21-22, LOS ANGELES — **Direct Response Marketing for Financial Institutions: Telemarketing, Direct Mail & Sales Training.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

OCTOBER 21-23, BOSTON — **Hammer Forum '85: Shaping the Second Revolution in End-User Computing.** Contact: Hammer and Co., Hammer Forum, 5 Cambridge Center, Cambridge, Mass. 02142.

OCTOBER 21-23, SAN FRANCISCO — **Lamond on IBM.** Contact: Reggi Veatch, National Marketing, Suite E-1A, Standard Court E., 9160 Red Branch Road, Columbia, Md. 21045. Also being held Oct. 29-31 in Dallas and Nov. 4-6 in Boston.

OCTOBER 21-23, WASHINGTON, D.C. — **Controlling Software Projects: Management, Measurement and Estimation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Dec. 9-11 in Dallas.

OCTOBER 21-24, CHICAGO — **Systems & Applied Technology Conference & Exhibition (Satech '85).** Contact: Satech '85, 2472 Eastman Ave., No. 34, Ventura, Calif. 93003.

OCTOBER 21-24, PITTSBURGH — **Work Measurement Techniques Workshop Series.** Contact: Institute of Industrial Engineers, Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

OCTOBER 21-25, BOSTON — **Analysis Workshop.** Contact: Judy Trelogan, Arthur Young & Co., 1950 Roland Clarke Place, Reston, Va. 22091.

OCTOBER 21-25, CHICAGO — **CICS Macro-Level Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 21-25, NEW YORK — **Comprehensive Course in Data Communications.** Contact: *Data Communications*, Special Projects Conference Management Center, c/o Information-Breakthroughs, Inc., 445 W. Main St., Wyckoff, N.J. 07481. Also being held Nov. 18-22 in Lake Buena Vista, Fla.

OCTOBER 21-25, NEW YORK — **Structured Systems Design Workshop.** Contact: Elise Rabelais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 21-25, WASHINGTON, D.C. — **Ada Software Engineering Workshop.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Oct. 28 to Nov. 1 in Los Angeles.

OCTOBER 22-23, BOSTON — **Developing End-of-Arm Tooling for Industrial Robots.** Contact: Robotics International of the Society of Manufacturing Engineers (SME), P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

OCTOBER 22-25, DENVER — **Data Base: A Builder's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also set for Nov. 12-15 in Dallas and Dec. 3-6 in Washington, D.C.

OCTOBER 22-25, SAN FRANCISCO — **Worldcom '85 — World Communications and Computers: 1985-2000 Conference and Exhibit.** Contact: International Council for Planning and Innovation, P.O. Box 17392, Washington, D.C. 20041.

OCTOBER 22-26, SAN FRANCISCO — **Fifth Multinational Conference on World Communications and Computers.** Contact: International Council for Planning, P.O. Box 17392, Washington, D.C. 20041.

OCTOBER 23-26, NEW YORK — **Strategies for Office Automation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held March 11-13 in Boston.

OCTOBER 24, NEW YORK — **DOS/VSE for Systems Programmers.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 24-26, LOS ANGELES — **Local-Area Networks: Selection and Implementation.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

OCTOBER 24-25, SAN FRANCISCO — **Lamond — The IBM PC.** Contact: Reggi Veatch, National Marketing, Suite E-1A, Standard Court E., 9160 Red Branch Road, Columbia, Md. 21045. Also being held Nov. 7-8 in Boston.

OCTOBER 24-25, SAN FRANCISCO — **PC as a Programmer/Analyst Workstation.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Nov. 21-22 in Washington, D.C. and Dec. 12-13 in Boston.

OCTOBER 25-27, FRANKFURT — **The Forth Modification Laboratory Conference.** Contact: Forth Interest Group, P.O. Box 8231, San Jose, Calif. 95155.

WEEK OF OCTOBER 27

OCTOBER 26-27, HOUSTON — **Isecon '85: The Information Systems Education Conference.** Contact: Isecon '85, Data Processing Management Association, 505 Busse Highway, Park Ridge, Ill. 60068.

OCTOBER 27-30, CHICAGO — **International Facility Management Association 1985.** Contact: Melvin R. Schlitt, Executive Director, International Facility Management Association, Suite 1410, 11 Greenway Plaza, Houston, Texas 77046.

OCTOBER 28, ZURICH — **Europe's New Challenge: Emerging Business Opportunities Related to**

Continued on page 44

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—*ComputerWorld*

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—*Popular Computing*

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—*Computers and Electronics*

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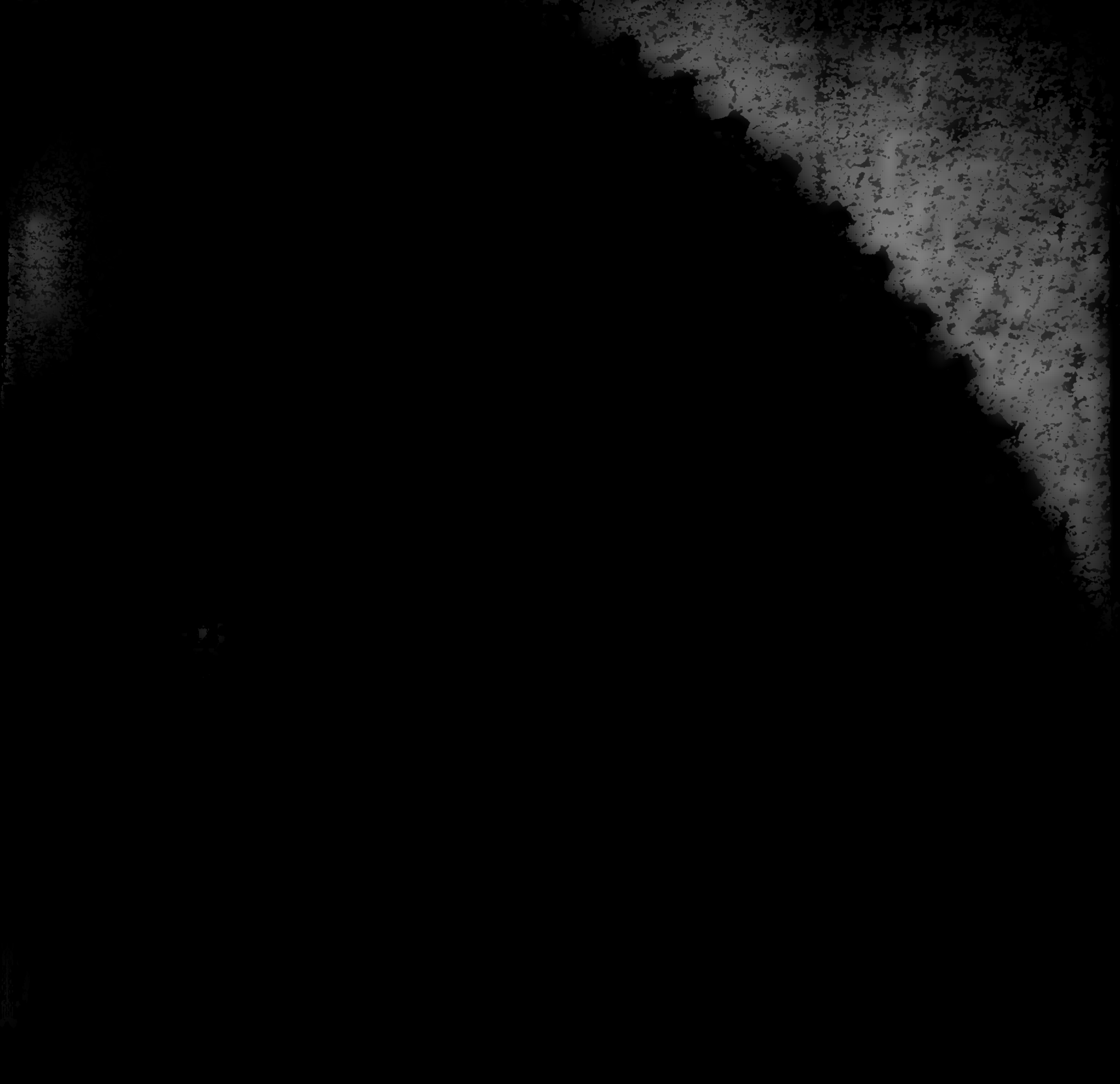

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Calendar

Gaas and the III-V Technologies. Contact: Robert F. Dick, Horizon Associates, 2255-G Martin Ave., Santa Clara, Calif. 95050.

OCTOBER 28-29, DALLAS — **The Computer Acquisition Forum.** Contact: Ashley Pearce, Gartner Group, Inc., P.O. Box 10212, Stamford, Conn. 06904.

OCTOBER 28-29, SAN FRANCISCO — **Payment Systems Partnerships II.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

OCTOBER 28-30, BOSTON — **X.25 and Other Protocols.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 28-30, COLUMBUS, OHIO — **C Programming Language.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

OCTOBER 28-30, HOUSTON — **The 34th Annual Data Processing Management Exposition (DPMA) International Computer Conference and Business Exposition — DPMA Houston '85.** Contact: Doris Dodge, Conference Meetings Manager, DPMA International Headquarters, 505 Busse Highway, Park Ridge, Ill. 60068.

OCTOBER 28-30, NEW YORK — **Cellular Communications '85.** Contact: Online Conferences, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

OCTOBER 28-30, NEW YORK — **Localnet '85.** Contact: Online Conferences, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

OCTOBER 28-30, WASHINGTON, D.C. — **Local-Area Networks.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 28-NOVEMBER 1, BOSTON — **CICS/VS Command-Level Programming Course.** Contact: Computer Assistance Product Development Corp., Suite 108, 11498 Luna Road, Dallas, Texas 75234.

OCTOBER 28-NOVEMBER 1, BOSTON — **Information Modeling Workshop.** Contact: Judy Trelogan, Arthur Young & Co., 1950 Roland Clarke Place, Reston, Va. 22091.

OCTOBER 28-NOVEMBER 1, NEW YORK — **Database Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 28-NOVEMBER 1, TORONTO — **The James Martin Seminar.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402. Also being held Nov. 18-22 in Atlanta.

OCTOBER 29-31, WASHINGTON, D.C. — **The Sixth Annual Federal Office Automation Conference.** Contact: Dallas Kinney, Conference Communications, Box N, Wayland, Mass. 01778.

OCTOBER 31-NOVEMBER 1, SAN ANTONIO — **Federal ADP and Telecommunications Procurement.** Contact: International Data Corp., Washington Division, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102. Also being held Nov. 14-15 in McLean.

WEEK OF NOVEMBER 3

NOVEMBER 4-5, BOULDER, COLO. — **International Tele/Conferencing Symposium.** Contact: Tom Cross, Cross Information Co., Suite C, 934 Pearl St., Boulder, Colo. 80302.

NOVEMBER 4-6, WASHINGTON, D.C. — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

NOVEMBER 6-8, BELLEVUE, WASH. — **Hands-On Unix for Programmers.** Contact: Specialized Systems Consultants, P.O. Box 55549, Seattle, Wash. 98155.

NOVEMBER 7-8, NEW YORK — **Videotex Delivery of Financial Services: On-Line Banking, Electronic Brokerage and Transactional Services.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925. Also being held November 14-15 in San Francisco.

NOVEMBER 7-8, WASHINGTON, D.C. — **Data Administration: Development and Practice.** Contact: Barnett Data Systems, 19 Orchard Way N. Rockville, Md. 20854.

NOVEMBER 9, NEW YORK — **Computer Education in Transition, B.A.S.I.C.(s) and Beyond.** Contact: Association of Computer Educators, 751 Bard Ave., Staten Island, N.Y. 10310.

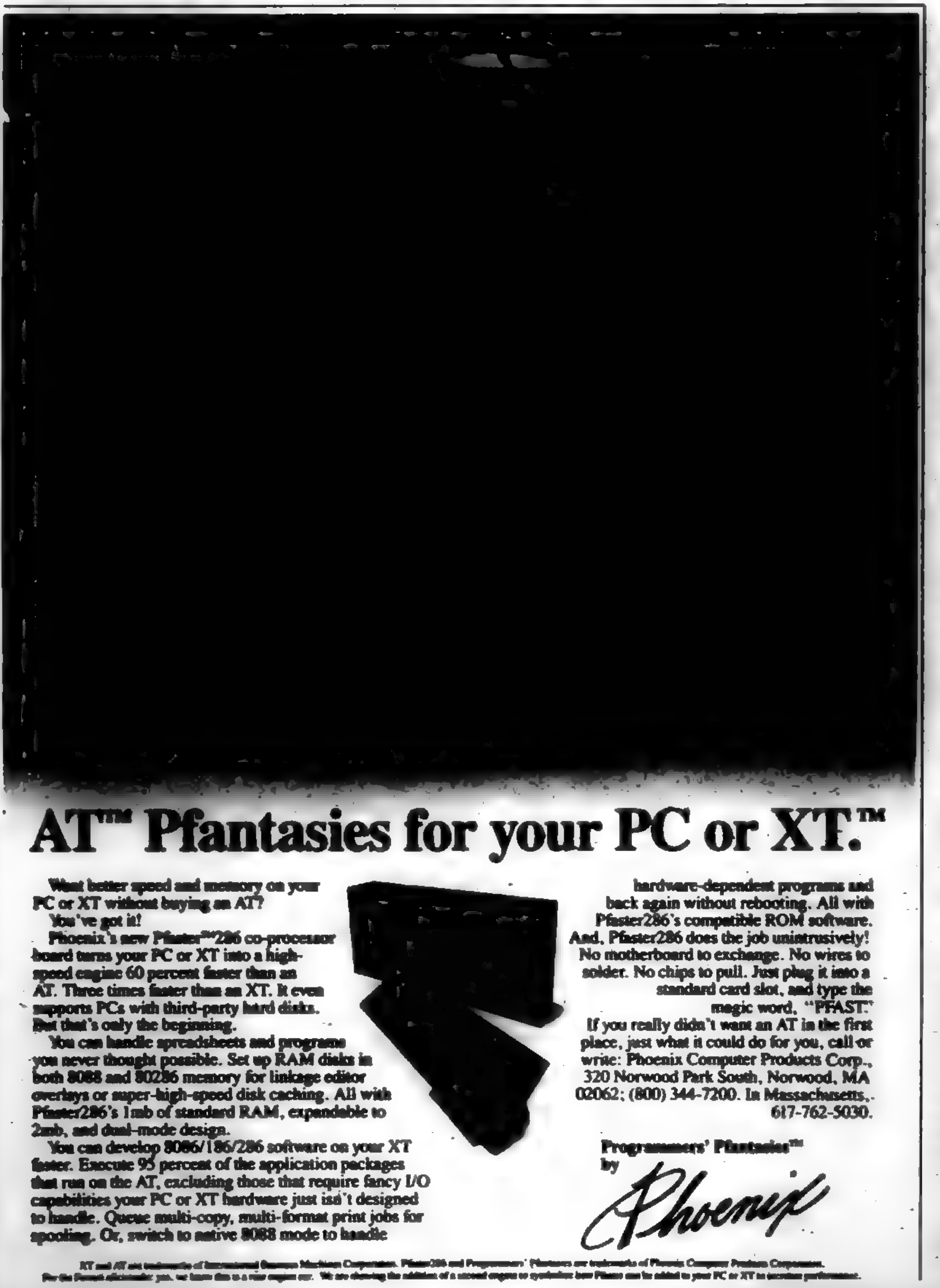
WEEK OF NOVEMBER 10

NOVEMBER 10-13, BALTIMORE — **The Ninth Annual Symposium on Computer Applications in Medical Care (SCAMC).** Contact: Gail Mutnik, Symposium Coordinator, SCAMC, Secretariat: Office of Continuing Medical Education, George Washington University Medical Center, 2300 K St. N.W., Washington, D.C. 20037.

NOVEMBER 11-13, WASHINGTON, D.C. — **The Conference on Software Maintenance-1985 (CSM-85).** Contact: Donald A. Parker, CSM-85 Publicity Chairman, National Aeronautics and Space Administration, Goddard Space Flight Center, Code 820.1, Greenbelt, Md. 20771.

NOVEMBER 11-15, SAN JOSE, CALIF. — **First International Conference on Computer Workstations.** Contact: Institute of Electrical and Electronics Engineers, Inc. Computer Society, 10662 Los Vaqueros Circle, Los Alamitos, Calif. 90720.

NOVEMBER 12, NEW YORK — **T-1 Carrier Strategies.** Contact: DMW Group, Inc., Seminar Division, 2020 Hogback Road, Ann Arbor, Mich. 48104.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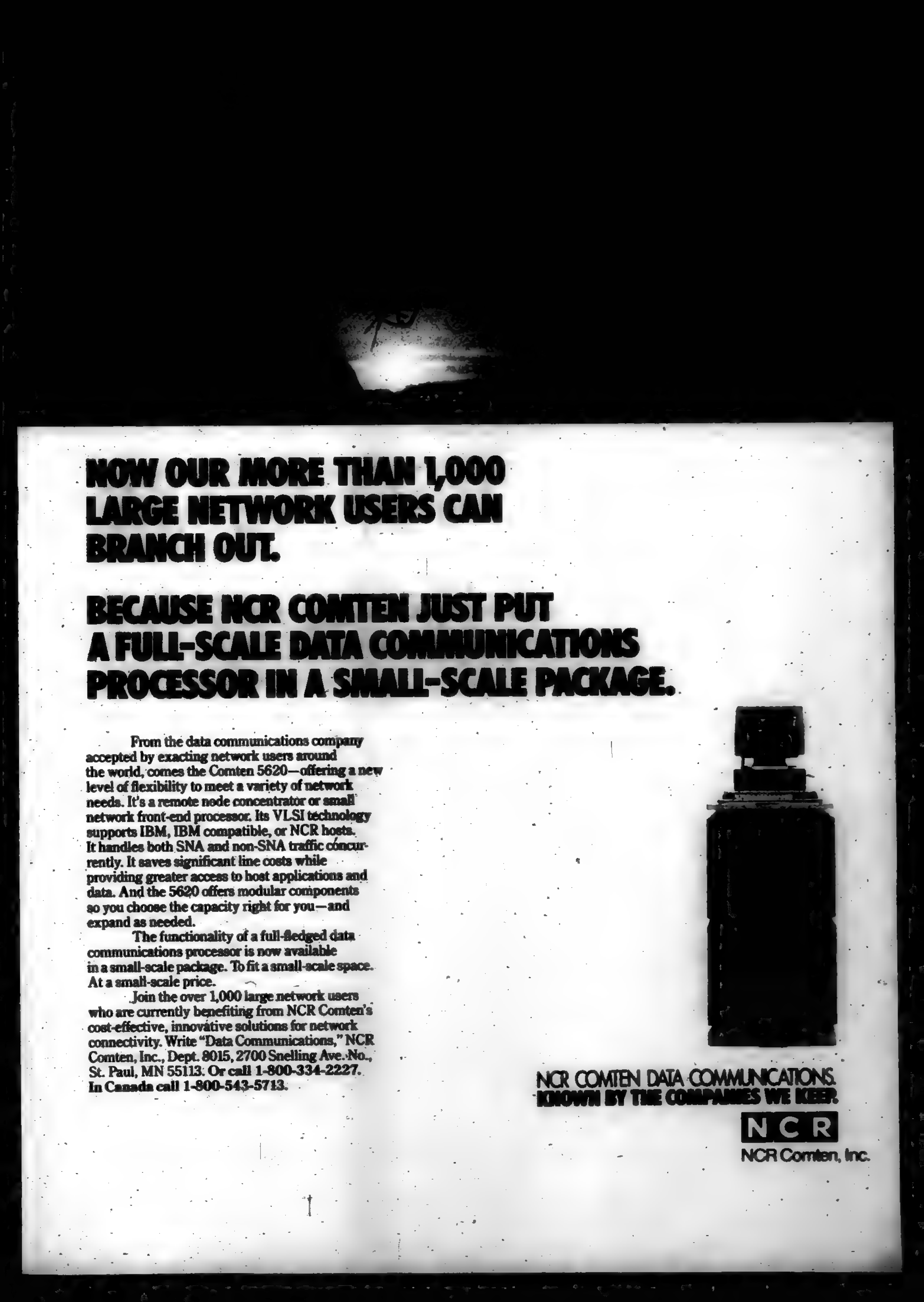

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SOFTWARE & SERVICES

UK users moving to MVS

Security called catalyst for migration from DOS

By John Desmond

BUCKINGHAM, England — DP auditors in the UK who are demanding improved data access security are helping to drive conversions from IBM's widely installed DOS/VSE to its strategic MVS operating system.

That is according to Michael Kerford-Byrnes, principal of MKB Technical Services, a consulting firm that specializes in DOS-to-MVS conversions.

"Here, internal and external auditors who come to computer installations actually have some teeth, and because they have a bit of computer knowledge, they know where to bite," Kerford-Byrnes said in a telephone interview from England.

"A lot of users are running out of steam with DOS' and they need [Extended Architecture (XA)]. They need it for capacity, for function, and they desperately need it for security," he continued. "The general attitude over here is rapidly becoming if you're going to have any sort of access control, it's got to be RACF or something like it," he said, referring to IBM's Resource Access Control Facility MVS security control program.

Thus, he said, more and more users in Europe are being attracted to MVS for a reason other than the need for increased functionality and capacity. Rather, the demand for better data security is becoming a chief motivation to convert.

Continued on page 55

Notes from the software industry front

Sunnyvale, Calif.-based Data Design Associates, Inc. and Applied Data Research, Inc. (ADR) of Princeton, N.J., announced a development and marketing agreement through which Data Design's four mainframe financial applications will work with ADR's Datacom/DB relational data base management system. Data Design's accounts payable, general ledger, fixed assets and capital project management tools will be compatible with Datacom/DB.

■

Mitrol, Inc. of Woburn, Mass., has purchased worldwide exclusive distribution, marketing and maintenance rights to Rockville, Md.-based General Electric Information Services Co.'s (Geisco) Mims manufacturing applications development system. Mitrol said it will market Mims in North and South America. Through Geisco's partnership with Teamco of Norway, Teamco will

Continued on page 51

DOS micros get IBM link

Multi Soft, Inc. of Edison, N.J., has announced Super-Link, a micro-mainframe link package for data transfer between IBM's PC-DOS or Microsoft Corp.'s MS-DOS operating systems and IBM mainframes.

Super-Link includes a microcomputer control program, a library of mainframe subroutines and a microcomputer screen management program.

Super-Link will support IBM mainframes running VM/CMS, TSO or CICS and micros running PC-DOS, MS-DOS and S1, a microcomputer operating system developed by Multi Solutions, Inc., parent company of Multi Soft. S1 is available for several Motorola, Inc. 68010 microprocessor-based micros.

The micro-mainframe product provides links to applications running on the mainframe, rather than direct links into data base management systems. The VM/CMS version is available now, and the CICS and TSO versions are scheduled to be available by the end of October. Super-Link is priced from $10,000 to $60,000 depending on the hardware and number of micros.

SOFTALK
John Gallant
CW Senior Editor

Cobol 85 plods to acceptance

There's a good chance the beleaguered Cobol 85 standard will finally cross both the international and American finish lines before the end of this year.

But don't be overly surprised if the standardization process stretches into the new year and what could have been Cobol 85 becomes instead Cobol 86. The controversial — to say the least — Cobol 85 standard has exhibited a real knack for discovering stumbling blocks as it plods along toward International Standards Organization (ISO) and American National Standards Institute (Ansi) approval. Whether the proposed standard will find yet another such obstacle before January is anybody's guess.

The proposed Cobol standard was known for years as Cobol 80 and was initially envisioned as a routine overhaul of the existing Cobol 74 standard. But Cobol 80 was just not to be. Cobol 85's official label, 8X, replaced the 80 as a sign of just how uncertain the final date of approval would be. If the standard does indeed become known as Cobol 85, it will represent the first internationally embraced upgrade of the most widely used programming language in 11 years. That's simply too long.

Though a programming language like Cobol may seem dry and uninteresting to the uninitiated, it is a language that, like any other, must evolve over time if it is to survive. As with English, programming languages have to change to accommodate new ideas and new approaches.

Changes to spoken languages are subtle and reflect shifts in attitudes

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- ■ Control Data introduced a service designed to help its Cyber 180 users manage their DP resources/48
- ■ Whitesmiths made its Idris operating system available for Hewlett-Packard's Series 200 technical workstations/48
- ■ Interactive Software Systems unveiled Panelpro, an IBM CICS applications development tool/48

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Harris offers engineering tools

Modules include design, drafting

Harris Corp. has introduced Harris Civilcad software with design, drafting and data management capabilities for civil engineering and construction applications.

The software runs on all H series superminicomputers from the Fort Lauderdale, Fla.-based company. Civilcad includes seven modules: Digital Terrain Modeling, Cogo, Hydro, Bill of Materials, Earthwork, Roadway Profile Design System and Civilcad Drafting.

Each module can be purchased separately or in combination. On the entry-level Harris 60, up to 48 users can work with the Civilcad software modules for concurrent handling of various tasks. Harris processors can host Harris microcomputers or any IBM-compatible microcomputers as workstations or terminals.

A turnkey Civilcad system with hardware, software and peripheral equipment for a four-user civil engineering environment costs $194,000.

The system includes a Harris 60 superminicomputer, a 474M-byte disk drive, a streaming tape drive, a floating-point processor, a matrix printer, four graphics terminals, four digitizing tablets, a plotter and Harris Drafting, Cogo and Digital Terrain Modeling software modules.

The price for all seven modules in the Civilcad package is $56,000. The packages are available now.

Pick users to set guides

LAS VEGAS (CWN) — Major licensees of the Pick operating system have formed an association that will seek to establish basic standards designed to allow portability of users' applications under the numerous implementations of the operating system.

Representatives of 11 of the operating system licensees formed the association under the temporary chairmanship of Leonard Mackenzie, chief executive officer of General Automation, Inc., Anaheim, Calif. General Automation uses Pick as the operating environment for its GA Zebra series of supermicrocomputers.

Two interim committees were also formed, a technical standards committee and a committee that will meet in October to formalize the association, elect officers and define its charter.

Dick Pick, the developer of the operating system, has also been invited to join the association through his company, Pick Systems, Inc. of Irvine, Calif.

CDC provides consulting service

Control Data Corp., based in Minneapolis, has announced a consulting service to help Cyber 180 series computer users running the NOS or NOS/VE operating systems manage present and future computer resources.

The Capacity Management and Performance Analysis Service consists of two component services, Vital Signs and Work Load Analysis.

The Vital Signs service provides software said to monitor and analyze system use, establish a base line, recommend system tuning alternatives and monitor system performance.

In addition, a report prepared every quarter provides a summary of resource usage, system dynamics, system overhead and resource overlap and recommends ways to improve system performance and throughput, a spokesman said.

The Work Load Analysis service predicts future work load levels and generates configuration alternatives to process the predicted work load, which is based on customer forecasts of applications growth, according to the vendor.

Prices range between $14,000 and $22,000 per year for Vital Signs; Work Load Analysis costs between $14,000 and $30,000 per year, CDC said.

Operating system out for HP Series 200

Whitesmiths, Ltd. of Concord, Mass., has announced that its Idris operating system is now available for Hewlett-Packard Co.'s Series 200 technical workstations running on the HP 9000 minicomputer.

Idris is a real-time, multiuser, multitasking operating system created by Whitesmiths for software development. Idris was designed to run on small machines, such as the HP Series 200. The operating system is said to provide a real-time environment compatible with AT&T's Unix.

The product is managed by a hybrid schedule, which allows for both deterministic execution of real-time processes and reasonable response time for interactive time-sharing processes in a time-sharing system. Idris provides low-level file and device I/O services and interprocess communications using shared data, locks, events and messages as well as Unix-style "pipelines."

Device drivers are included in C source for floppy disk drives, hard disks, printers, serial I/O, terminals and integral CRTs and keyboards. Approximately 100 utilities are provided with Idris, including Whitesmiths' C and Pascal compilers as well as an assembler, linker, librarian and related object tools.

A variety of software tools for such functions as communicating with other systems, controlling multiuser login and security and sending and receiving mail are also included.

The single-unit price for Idris running on the HP Series 200 is $2,500.

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Panelpro boosts on-line applications development

Interactive Software Systems, Inc. of Chicago has announced Panelpro, a programming aid that allows Cobol programmers to develop on-line applications without knowledge of IBM's CICS.

Panelpro requires a programmer to know only Cobol to develop command-level programs, a spokesman said. Panelpro uses statements familiar to Cobol programmers such as Read/Write and Rewrite, which are said to reduce the need for CICS specialists.

Panelpro introduces the Procedure, Screen and Report verbs. Screens are painted by preparing subsequent screen lines, which range from one to 99,999 in number. Pseudo-conversational programming starts with the procedure code, circumventing conventional commentary normally required in Cobol.

In other features, Panelpro offers forward and backward paging, creation of temporary data names during coding and automatic editing.

Panelpro works with IBM Vsam file structures, eliminating the need to convert existing files when the system is installed. Panelpro is priced at $15,000.

Software said to translate PDP-11 programs to VAX

Virtual Systems, Inc. of Walnut Creek, Calif., has announced a program, Macrovax, that translates assembly language software written for Digital Equipment Corp. PDP-11 systems into VAX assembly language.

Originally written to translate the company's own library of PDP-11 source programs into VAX native-mode assembly language, Macrovax is now commercially available, according to the vendor.

Running on either the PDP-11 or VAX system, Macrovax can translate 98% of the PDP-11 assembly language programs with minimum programmer effort, a spokesman said. Assembly language directions and control statements are translated in such a way as to ensure optimum performance on a VAX.

Macrovax automatically segregates PDP-11 programs into code and data areas, and models the PDP-11 stack in the data area. Programs may be of any size, but data is limited to a 64K-byte area.

The Macrovax program is priced at $10,000 per CPU. The system includes manuals and a one-week training session.

SCA introduces source-to-load tracking option

Software Corporation of America (SCA) has announced the Connection option for its Change Tracker mainframe software, which automatically tracks changes made to executable libraries. The product runs in IBM OS, MVS and MVS/XA environments.

A spokesman for the Herndon, Va.-based SCA said the Connection option provides source-to-load change tracking capabilities. The option captures and records information about source modules as it is extracted and input to the compiler.

The information is carried forward through the compilation into the linked-edited load module. Used together, the Change Tracker and Connection options are said to eliminate manual efforts required to identify the source modules that comprise a load module.

The Change Tracker is integrated with the linkage editor and records each time a program is added or changed.

The Change Tracker is priced at $6,500 for a single-CPU permanent license and $9,900 for a site license. The Connection option, to be available in November, is priced at $3,500 for a single-CPU permanent license and $5,000 for a site license.

MProlog out for Lisp system

Logicware, Inc. of Toronto, Ontario, has announced that its MProlog language is available for the Symbolics, Inc. 3600 Lisp-based computer.

Previously available on a variety of machines, MProlog reportedly now allows artificial intelligence applications written in Prolog to run under Lisp.

According to the vendor, MProlog allows users to develop programs on a Lisp Symbolics 3600 machine and move those programs to a Motorola, Inc. MC 68000-based system. MProlog on the Symbolics 3600 costs $12,000.

"One thing I'm sure of: all my engineers hate computer downtime as much as you do."

SYSTEMS SOFTWARE

■ Key Solutions, Inc. has announced Version 1.2 of the Missing Commands data inquiry and maintenance package, offering display or update of any IBM System/38 file in hexagonal, character or formatted mode.

According to a spokesman, the Missing Commands package can be used to display and update any System/38 file one record at a time or one full page at a time.

In other added features, Missing Commands has an additional screen to display a full page of records, showing only the data from fields specified by the user, and a feature to scan optionally by field name. The product also has a new facility for deleting records and a display to provide current file information.

The Missing Commands is priced at $560. Current users can update to Version 1.2 for $75 per copy.

Key Solutions, 111-G Shelley Ave., Campbell, Calif. 95008.

■ Adaroc, Inc. has announced the Project Implementation and Control System (Pics) for the IBM System/38.

Pics is designed to monitor programs that are frequently updated and altered. The system supports multiple libraries and a variety of object management functions and ensures that production source and objects are synchronized and have been properly secured. It also ensures that new or changed objects have been successfully transferred to production, the vendor said.

Written in IBM's RPG-III, Pics is menu-driven and includes a management checkpoint feature that validates documentation and test requirements prior to job implementation.

Pics is priced at $1,850.

Adaroc, 30 Mohawk Drive, Northboro, Mass. 01532.

APPLICATION PACKAGES

■ Prescience, Inc. has announced Hieroglyph, a report writing package for Sun Microsystems, Inc. workstations running AT&T's Unix.

Hieroglyph integrates text processing, graphics, document aids, document filing, data handling and production tools, a spokesman said.

The software offers concurrent application processing, multiple window editing, computer-aided design graphics capabilities, the ability to embed graphics in text, the ability to scale graphics, support of laser printers, a spelling checker and three user-experience levels.

Hieroglyph sells for $2,400.

Prescience, Suite 300, 830 Bay Ave., Capitola, Calif. 95010.

LANGUAGES

■ Pyramid Technology Corp. has announced optimizing Fortran 77, C and Pascal compilers for its Pyramid 90X, 90MX, 98X and 98XE processors.

The compilers work with Pyramid's Common Language Environment, a standardized high-level program development and execution environment integrated with Pyramid's OSX operating system. The operating system is said to incorporate both the University of California at Berkeley's Unix 4.2 and AT&T's System V Unix features.

The C optimizing compiler will be bundled and shipped with OSX. Pyramid's optimizing Pascal and Fortran 77 compilers are priced at $6,000.

Pyramid Technology, 1295 Charleston Road, Mountain View, Calif. 94043.

■ Touch Technologies, Inc. has announced that its data base language Intouch can now call routines written in other Digital Equipment Corp. VMS languages.

Cobol, Fortran, C or Basic procedures can be executed from Intouch, a spokesman said. No compiling or linking is necessary.

Intouch is priced at $7,500 for the DEC VAX-11/730 and Microvax II, at $15,000 for the VAX-11/750, $25,000 for the VAX-11/780 and 785 and $40,000 for the VAX 8600.

Touch Technologies, Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.

■ Franz, Inc. has released Opus 42, a version of its Franz Lisp interpreter and compiler that is said to provide compatibility with Common Lisp and object-oriented programming capabilities.

A feature known as Flavors has been added to the Lisp kernel to give object-oriented programming capability, the vendor said. Other enhancements include the ability of functions to return multiple values, a package feature that allows multiple name spaces to reside in the Lisp environment, hash table objects, closures to control the scope of a variable definition and a history mechanism.

Opus 42 costs $5,000 for the first copy and $1,000 for subsequent copies. The new version is available on processors from Apollo Computer, Inc.; Sun Microsystems, Inc.; Cadmus Computer Systems, Inc.; Masscomp; Tektronix, Inc.; Harris Corp.; and Digital Equipment Corp.

Franz, 1141 Harbor Bay Pkwy., Alameda, Calif. 94501.

■ A C compiler optimized for the Motorola, Inc. 68020 microprocessor is available from Alcyon Corp.

The C6820 compiler will run under

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SOFTWARE & SERVICES

the following systems: Versados on most Motorola development systems; AT&T's Unix; Digital Equipment Corp. VAX VMS or Microvax computers; and Regulus on Alcyon processors, a spokesman said. An upgrade of Alcyon's C68 compiler, the C6820 contains the instructions and addressing modes of the MC68020 32-bit microprocessor and the MC68881 floating-point processor.

The C6820 is said to be a full implementation of the Kernighan and Ritchie C language specification and consists of a macro processor, compiler, relocatable assembler, linking loader, support library and utilities.

Support utilities download executable programs and symbol tables to the MC680X0 target via a serial channel.

Prices are $2,295 for Motorola hosts, $2,995 for VAX Unix systems and $3,495 for VAX VMS computers.

Alcyon, 8716 Production Ave., San Diego, Calif. 92121.

ON-LINE DATA BASES

■ Zandar Data Corp. is offering the Surplus Electronics Component Acquisition Program data base of excess electronic and computer components that manufacturers want to sell.

The seller pays $10 per item listed on the system, plus a 5% commission when the material is sold. The purchaser pays the seller directly, a spokesman said. Users order items through the system; the owner of the material makes the delivery, according to the spokesman.

Accessing the data base requires a terminal or computer operating at 300 bit/sec. Menus direct users to the desired categories where a catalog of available items is displayed.

Zandar Data, 2923 Osmundsen Road, Madison, Wis. 53711.

TRAINING

■ Pansophic Systems, Inc. has announced that videos and workbooks are now available to aid users of Easytrieve Plus, the company's information retrieval and data management system.

The basic video course offers instruction on computers and storage and on how to create an Easytrieve Plus program. The intermediate course covers 10 topics, such as writing Easytrieve Plus procedures and job activity tables.

The videos are free to Easytrieve customers with maintenance agreements. For new customers, the Easytrieve Plus videos cost $2,000 each or $3,000 for the two-video set.

Pansophic, 709 Enterprise Drive, Oak Brook, Ill. 60521.

From page 47

Notes from the software industry front

distribute Mims in Europe, the Far East and Africa.

■

Relational Technology, Inc., Alameda, Calif., said its Ingres relational data base management system was selected by MIT as the foundation data management system for the Cambridge, Mass.-based university's Project Athena. Project Athena is an institutewide project to integrate computer and communications capabilities into all phases of the educational process.

■

Sequent Computer Systems of Beaverton, Ore., and Unify Corp. of Lake Oswego, Ore., have signed a marketing and distribution agreement that allows Sequent to market and support the Unify relational data base management system as part of its Balance 8000 parallel computing system. Unify was designed for AT&T Unix programming environments.

■

Cambridge, Mass.-based **BBN Software Products Corp.** and **Digital Equipment Corp.** of Maynard, Mass., inked a multiyear contract that allows DEC to manufacture, sell and support on a nonexclusive worldwide basis BBN Software Products' RS/1 engineering and scientific data analysis software. DEC previously sold RS/1 only in the U.S., Canada and Japan and did not provide technical support.

■

Tandem Computers, Inc., Cupertino, Calif., and American Manage-

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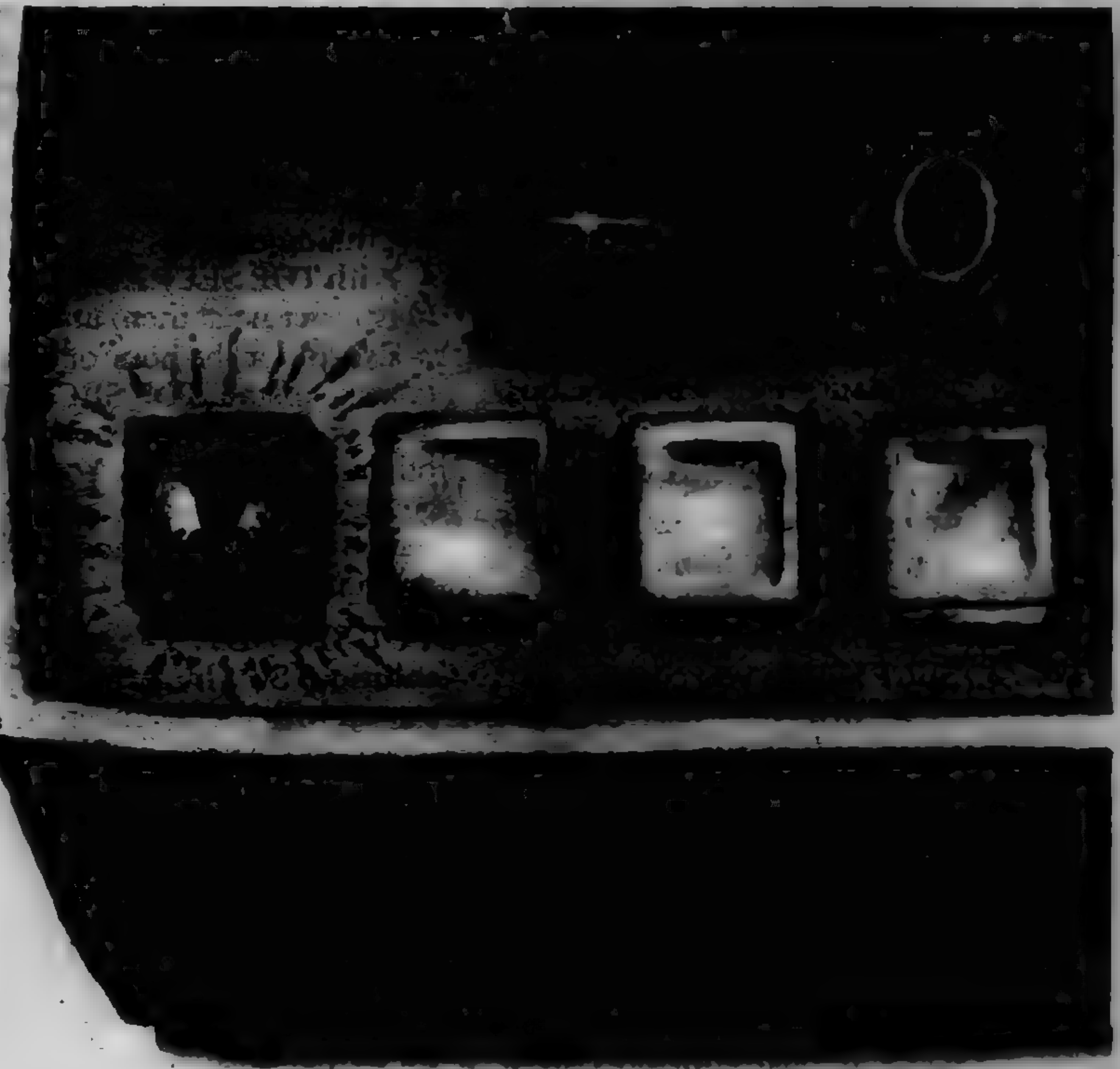

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ACF2 gives you a closed system from the word go. Whether you're ready for that level of security or not.

TOP SECRET gives you default protection, too. But TOP SECRET lets you choose the best time to introduce it.

With TOP SECRET you efficiently secure resources and users in logical sequence. Not by rigid product demands.

And that's our secret: we make it easy to fit the world's best data security into the busiest dp schedules.

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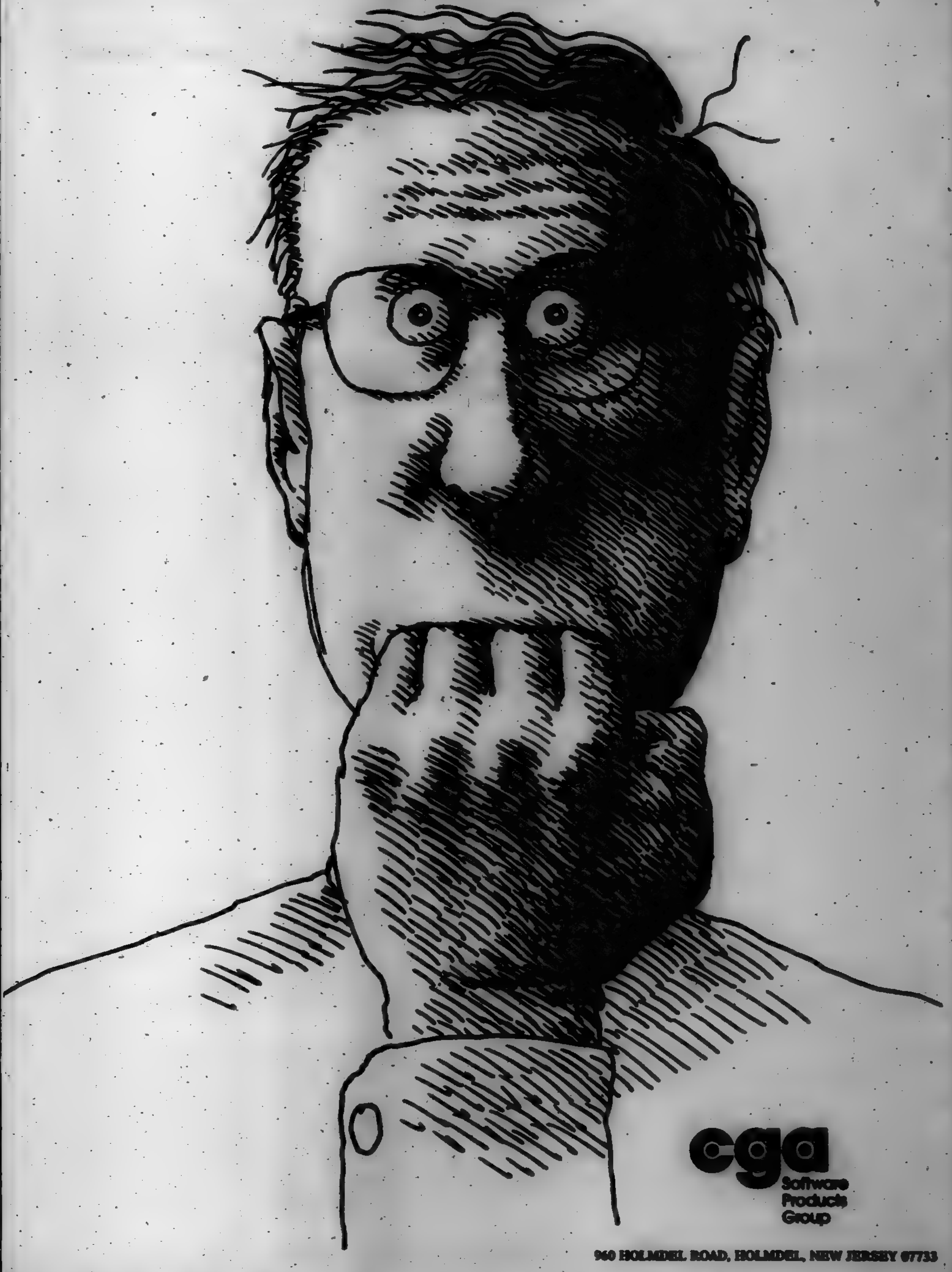

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Micro-mainframe concept striving for MIS acceptance

SOFTLINE
Thomas O'Flaherty

To paraphrase Mark Twain: Everyone talks about micro-mainframe links, but no one does anything about them. Or so it must seem to the dozens of link vendors that have seen their wares picked over but infrequently bought.

The frustrating thing is that so many people, both MIS professionals and end users, can see that micro-mainframe linkage would be the answer to many of their problems. A link cannot only get data to a user but also put the processing of that data into the end user's hands. More thoughtful MIS managers understand that pushing data and processing deeper into the organization will inevitably lead to cleaner data and more reliable processing.

Many observers have predicted a rapid increase in the use of micro-mainframe links. Instead, the growth in micro-mainframe applications has been relatively slow. But the term micro-mainframe link is already in danger of joining management information systems, distributed data processing, decision support systems and others that once promised to revolutionize data processing but instead were ignored or became objects of derision.

Actually, the micro-mainframe concept suffers the opposite problem from the fads listed above. Where they were heavy on concepts and light on practical choices, the micro-mainframe area presents a plethora of choices and, if anything, not enough conceptual glue to bind them together.

If, for example, micro-mainframe choices were limited only to data downloading, then, ironically, there would almost certainly be much more of it. The demand for data downloading is certainly high on most users' initial wish lists.

Downloading, if not too ambitious, can be accomplished relatively easily and can offer real benefits, reducing rekeying, combining data from different sources, ensuring better quality data and so on. There are many products available that can perform downloading reasonably well.

But even within downloading there are two issues that have slowed acceptance. The first is that the very number of products that can serve people's needs hinders and may even immobilize the decision process. In addition, selectors assume, usually incorrectly, that they are making a long-term decision with many implications, similar to choosing a data base management system.

Intertwined with the selection problem is that of overspecifying. As users begin to understand what they might want in a link, they begin to want more. Awkward, current-generation downloading is not enough for them. What they really want is the type of interactive downloading that would result from cruising through the mainframe data base and selecting/joining whatever data they need.

Obviously, such tools do not exist yet. Even if they did, the complexity of real-world mainframe DBMS, both from a technical and conceptual standpoint, would make the exercise far beyond the capabilities of most users, even those who fancy themselves computer literate.

MIS staff members sometimes contribute to the overspecifying by listening too closely to what users think they want — and users have become much more assertive as a result of real and imagined successes in using micros.

Typical MIS mistake

Ironically, the typical MIS error is to try to plan too far into the future. Authoritative checklists recommend such micro-mainframe capabilities as mainframe-type error checking and access security, multivendor environment compatibility and operational efficiency.

These capabilities are excellent. However, in most cases they are examples of the best being the enemy of the good. Far too little is known about the ultimate uses of micro-mainframe links to be able to say what the characteristics of any link should be within a particular organizational setting.

At the same time, one should not downplay the real problems that exist. Those organizations that have ventured beyond simple data downloading have begun to see that the real opportunities in the micro-mainframe environment are balanced by equally real problems.

What are the major problems? In strictly technical terms, users will not see seamless, distributed data base products for a very long time. Multiple data base management will be a painful experience where micro data bases are allowed to be both independent and meaningful.

As mentioned above, both data integrity and data security are in-

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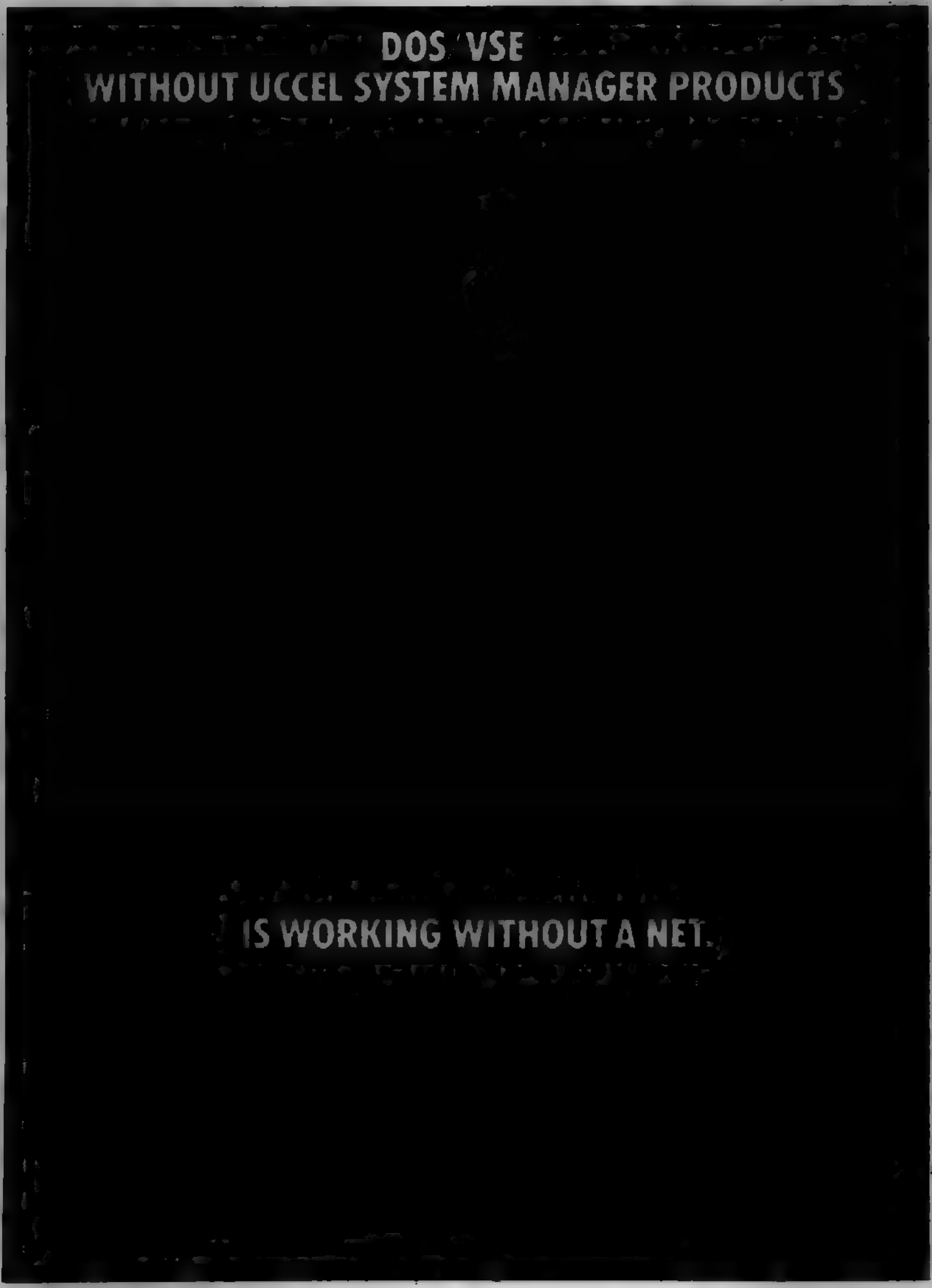
O'Flaherty is a principal of information service strategies in Wood-Ridge, N.J. He consults on MIS planning and the development of computer-based products.


DOS/VSE
WITHOUT UCCEL SYSTEM MANAGER PRODUCTS
IS WORKING WITHOUT A NET.

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UK users converting from DOS/VSE to MVS

Nothing with the equivalent credibility of RACF exists in the DOS market, Kerford-Byrnes said. Also, few, if any, security products in the DOS market offer compatibility with MVS. "People aren't going to get hooked into a security system in the knowledge that they'll very likely have to abandon it when they go to MVS. So they decide to go straight to MVS."

Different auditors have different concerns. "Some don't like application programmers being able to change the little message on your credit card statement. Other companies don't like anybody being able to dial in, type in a password and get on-line to somebody's system. Others don't like the idea of source code even being read by anybody but the person who wrote it or the DP manager," according to Kerford-Byrnes.

Conversion outfits like MKB Technical Services are in demand because they have experience in DOS-to-MVS conversions, something few users can boast. "We've made nearly all the mistakes you can make. We know the things we must not do. In a DOS-to-MVS conversion, there is a list of things you must not do when setting up the MVS side of things. It's only once you've done those things you realise they're wrong. By that time, it's too late to go back," Kerford-Byrnes said.

For those shops that try conversion on their own, "It can stop application development work dead for anywhere up to a year," Kerford-Byrnes said. Even for those that hire a service, there are risks. "There is always going to be some sort of interruption of development work, because somebody's got to check it all out. Secondly, you have to provide education in the new technology."

Advance planning consumes one-third of an MKB conversion project's time. Planning encompasses subroutines, source code, sequence of job execution, an inventory of every program to be converted, setting of standards and procedures and a target completion date schedule.

Training users in an unfamiliar operating system is a major task of a good conversion service, Kerford-Byrnes maintained. "We provide education services to train the users in the standards and techniques we've derived for that shop," he said. "We teach them to be self-sufficient." In conjunction with the conversion team, the users write the JCL and procedures needed to operate the MVS system. The system is brought up live by the users under the guidance of the conversion team, the consultant said.

While applications and operations personnel in a DOS shop may know how to run the company payroll program blindfolded, they are not so confident with a new system. "If you take a turnkey conversion service and they get MVS up and running for you, and three weeks later you find you've got to rerun all three weeks work because there was a user data error, how do you do it? All you have is the working payroll system and the JCL to execute it. You've still got to learn how to run the converted system. And that is no small task."

The hardest part of the conversion process is taking applications that work in the DOS environment and making them work in the very different MVS environment. "You need to spend an awful lot of money converting something that works into something that works. Probably with a great deal of disruption, aggravation, hassles and bad feelings. With no immediate tangible benefit. That's a pitfall," Kerford-Byrnes said.

Despite the risks, the sooner users make the conversion the better, in Kerford-Byrnes' view. "The longer users leave it, the harder it will be, because they'll have more work to convert." Whether a user goes to MVS or directly to MVS/XA from DOS depends on the shop. "There's no point in spending all that money [for XA] if you don't need it," he said.

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Micro-mainframe links look for MIS acceptance

creasingly important issues when trying to combine the micro and mainframe worlds. Micros hooked to mainframes often do not observe even the most elementary rules of terminal security. The problem is, though, that micro-mainframe security must go beyond mere terminal security, if the micro-mainframe benefits are to be obtained. There are answers, but they are complex and not always complete.

The most critical technical problem is the one that is often not even perceived as an issue: How do you build micro-mainframe systems? Our slowly bought experience in designing and implementing traditional host systems has to be at least partially relearned in a micro-mainframe environment.

Basic questions have to be asked, including "How do you segment data? How do you segment processing? Who, or rather what, maintains control?"

Some mainframe-oriented design and implementation methodologies will not be able to be retrofitted at all. Others will need extensive changes in both concept and detail.

The micro-mainframe concept is real, but it will not overtake the world quickly, unlike the way that micros themselves did. Rather, the precedent is probably closer to that of DBMS, which took five to 10 years to become established even after there were viable products and concepts available.

Micro-mainframe experience can only be obtained the way that most experience is obtained, slowly and sometimes painfully.

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Cobol 85 plods along on its way to acceptance

and culture. But changes to a programming language must be adopted in a more formal fashion to ensure that they are consistently applied. That is especially true in Cobol's case because it is the premier business programming language and must mean one thing to all people if it is to have any value at all.

Thus it is ironic that the very process by which Cobol is upgraded and standardized is in danger of killing the language.

Perilously close to death

In the time since 26-year-old Cobol was born, the world of information processing has been completely reshaped. It is to the language's credit that it has survived this long. But during the period since 1978, when the Cobol 85 drafting process actually began, Cobol's image took a beating, and the language came perilously close to dying. Some said Cobol contracted an illness — obsolescence — from which it may never recover. Even an approved standard may not be medicine strong enough to save Cobol, they said.

Cobol has two things going for it of which the so-called fourth-generation languages, which have picked up so much ground in the last few years, cannot boast. One is the gargantuan inventory of existing Cobol programs, which provides an incentive for shops to stick with Cobol. The other is the fact that Cobol is an industry standard, and no fourth-generation language has emerged yet to take on that mantle.

But even the most zealous Cobol advocate would readily admit those qualities alone will do little to prolong Cobol's useful life. The only way it will survive is if new features and functions — that address the problems of productivity and maintenance — are added in a timely fashion. The drafters of Cobol 85 were well aware of that, and they took pains to implement a rich variety of features that make Cobol stronger.

However, many of the features embodied in Cobol 85 were envisioned years ago, and, had they been fully implemented in standard compilers, users could have enjoyed the benefits they offered much sooner. The overlong gap also prompted vendors to implement selected features of Cobol 85 in their compilers before the entire standard was approved. That posed a problem for users, eager to take advantage of the new features, who had to choose among different compilers, each offering selected pieces of Cobol 85.

The standards-making bodies have taken steps to refine the draft approval process, and credit should be given to those Ansi and ISO members who pushed for reform. Essentially, Cobol will now be given new features — addenda — every two or three years, and the language will be fully overhauled every decade.

It is imperative that the organizations make those reforms work. And it is important that the groups continue to implement new procedures for improving Cobol — and other widely used languages — in a swifter fashion. Age alone is no reason for Cobol to grow feeble and die. Those who rely on it must better address the task of ensuring its continuing health.

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Notes from the software industry front

ment Systems, Inc. (AMS) of Arlington, Va., will jointly market the AMS Computer Assisted Collection System to banks, financial houses and telecommunications companies as a result of an agreement penned recently by the two firms. AMS will license the software, which supports the collection of delinquent credit accounts, directly to Tandem Nonstop processor users as part of the Tandem Alliance.

■

In artificial intelligence happenings, **Inference Corp.**, Los Angeles, and **SRI International, Inc.** of Menlo Park, Calif., entered into an agreement through which Inference will train SRI knowledge engineers in the use of its Automated Reasoning Tool for expert systems development. SRI personnel will then provide consulting services for both Inference and SRI customers to aid in the building of expert systems.

■

Also in the AI world, **Teknowledge Federal Systems, Inc.** of Thousand Oaks, Calif., and **Computer Thought Corp.** of Plano, Texas, have indicated that negotiations are under way on a deal that would have Computer Thought convert Teknowledge's S.1 Version 2 knowledge system development tool to Ada. A Teknowledge representative said the conversion would allow the company's aerospace and defense customers to comply with the U.S. Department of Defense's Ada requirements.

■

Palo Alto, Calif.-based **Quintus Computer Systems, Inc.**, developer of a Prolog compiler and other programming tools, unveiled agreements with **Digital Equipment Corp.**, **Xerox Corp.**, **C. Itoh Data Systems** and **Apollo Computer, Inc.** DEC will market, sell and distribute Quintus Prolog for its VAX systems; Quintus will deliver a version of the compiler for the Xerox 1100 series of artificial intelligence workstations; Apollo will jointly market the Prolog tool for its Domain workstations; and C. Itoh will distribute Quintus Prolog for the **Sun Microsystems, Inc.** Sun-2 workstation in Japan.

■

Primavera Systems, Inc., Bala Cynwyd, Pa., and **Control Data Corp.'s Cybernet Services Group** have entered into an agreement that makes Primavera's Project Planner and Primavision graphics software a key component in Control Data's new Cybernet Express Project Manager engineering project management software.

■

Quadratron Systems, Inc. of Sherman Oaks, Calif., will supply six of its software products for **Burroughs Corp.**, Detroit, B20/B25 and XE processors. The packages include Q-Office+, Q-File, Q-Plan, Q-Phact data base, Q-Chart and Q-Zed source code script editor. Burroughs will support the software with its version of AT&T Unix System V, which is scheduled to be released later this year.

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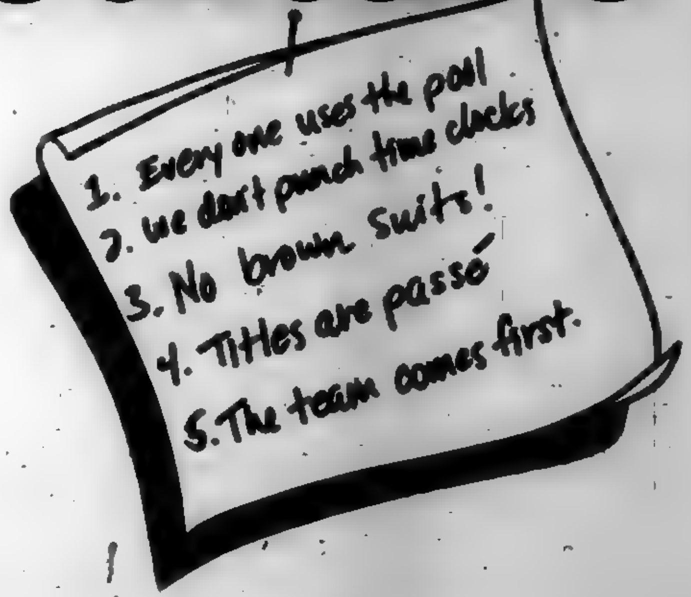
Harnessing Corporate Culture

By Jane Linder

The unwritten rules of corporate culture can confound the neophyte and the veteran alike. But once alerted, information systems professionals can put culture to work for them.



A large, successful manufacturing firm was known for its decentralized decision making. Autonomous operating units were structured as profit centers with full line and staff functions.

In this environment, the vice-president of manufacturing asked his information systems manager to begin installing common systems throughout the plants. The idea made sense to the manager. He began to staff projects and move toward installation. After 12 months of conflict, arguments and all-out confrontations, the manager conceded defeat and left the company.

One could blame his political skills for the debacle; the truth is that he ran afoul of the company culture. In this firm, the operating managers held clear, indelible authority for results and the means of achieving them. There was no value on cooperation; competition raged between groups.

The vice-president who suggested the changes had neglected to inform the powerful plant managers that they were to accept common systems. Instead, he asked the information systems manager to brave those waters on his own. Without visible support from the top, the manager had embarked on a countercultural effort to implement cooperation and some centralized decision making. From the outset, his chances for success were almost nil.

Corporate culture profoundly affects our ability to succeed. We can have a major influence on it.

Those who define culture speak of long-standing unwritten rules, matter-of-fact prejudices, customs for relating to colleagues or simply "the way we do things around here." Cultural anthropologists describe culture as a mechanism for adapting to the environment. In other words, culture is a set of behavioral prescriptions that help employees cope with the problems and decisions that face them daily.

These behavioral prescriptions represent, in codified form, the values of the company. Within a company, then, culture is an important mechanism for encouraging the "right" behavior — actions that uphold what the company stands for and help the company succeed on its own terms.

Culture influences both the systems we build and how we approach them. In addition, by building the "right" kinds of systems and using the "right" approaches, information systems can influence corporate culture.

Cultures vary tremendously, but five general dimensions describe common attributes of business culture (Figure 1, ID/2). These represent preferred behaviors: what is appropriate and "smart" behavior within the organization and what is not. Although these attributes are clearly simplifications of complex behavior patterns, they are useful for analysis.

Helping the company succeed

Let's assume that we are trying to support a stable, strategically valuable, existing culture. For each cultural dimension, we can identify the kinds of systems and information systems approaches that are culturally consistent.

There are three reasons why a culturally consistent approach is important:

- Well-defined cultures can help companies succeed. A strongly felt company culture encourages strategically correct behavior far more effectively than a network of control-oriented procedures. The culture's content — shared values, beliefs, implicit motivators — is a powerful, positive force in implementing company programs and guides behavior toward what is best for the firm. All things considered, it behooves information systems professionals to contribute to building a strong culture in whatever ways they can.
- On a more pragmatic level, information systems professionals succeed more often when they understand the company culture. Using culturally consistent systems and approaches is simply less risky. When the system fits the way business is conducted, end users feel comfortable and are

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Jane Linder is president of Linder & Associates, Inc. The Lexington, Mass., consulting firm works with senior MIS managers doing organizational planning.

satisfied customers. By carefully considering the firm's culture, MIS can make some predictions about what projects are most likely to succeed.

■ Very few of the tools for influencing culture are so easily engineered and implemented as information systems. Any information systems effort to influence culture should be part of the comprehensive, officially stated program.

Non-MIS tools such as compensation policy, hiring programs, supervisor training and management education are extremely influential to corporate culture. But their implementation is often longer term, so information systems can have a much more specific, much more immediate impact on behavior.

Spotting conservatives

So-called entrepreneurial firms encourage risk taking and are informal, aggressive, even impulsive. Above all, they value results. Conservative companies tend to be exactly the opposite. They are typically risk-averse, formal organizations with deliberate decision-making policies. The people in them adhere to procedures — they focus more on how something is done than on what is actually achieved.

Xerox Corp. used to be considered entrepreneurial but now might be seen as conservative. Most would agree that AT&T is trying to change from conservative to entrepreneurial. The stereotypical big company is conservative; the small one, entrepreneurial.

The entrepreneurial culture can be an exciting environment for information systems. Entrepreneurs are comfortable with state-of-the-art, unproven technologies. Their willingness to experiment can extend to challenging, high-payoff information systems projects.

Armed with a prototype approach, loose project definition and flexible tools, a staff of business analysts and technical wizards can match the action orientation that this culture values. Personnel should be dedicated to particular user areas to maximize service. In addition, a strong data administration function is vital to provide some glue between user-directed projects. (It need not, however, report through the information systems organization.)

The prototype methodology does not mean the entrepreneurial approach condones abandoning information systems planning. What is required is a top-down systems and telecommunications architecture — a rough blueprint for major data and processing blocks and the flows among them. Specific systems can be planned bottom-up with their respective users.

One problem that the MIS department faces in such a company is prudent resource management. One large entrepreneurial firm counted 1,100 MIS professionals in its ranks, compared with 250 in a conservative company with the same sales volume. Also, because of the interest in new technology, maintenance programmers and operations personnel tend to be accorded even less stature than usual.

A final difficulty for information systems in an entrepreneurial firm is enabling sufficient data access. The type of ad hoc systems that this culture tends to foster are normally data intensive. Add the fact that they are in constant flux and that information systems have great difficulty providing certified, available data.

In a conservative culture, on the other hand, proceduralized systems and proven technologies are preferable. Systems should be developed through a traditional life-cycle methodology using Cobol for efficiency.

The premier planning dimension in conservative companies is financial. Projects are selected based on tangible savings and return on investment, consistent with an overall spending guideline. All project and recurring expenses are charged back to the user to complete

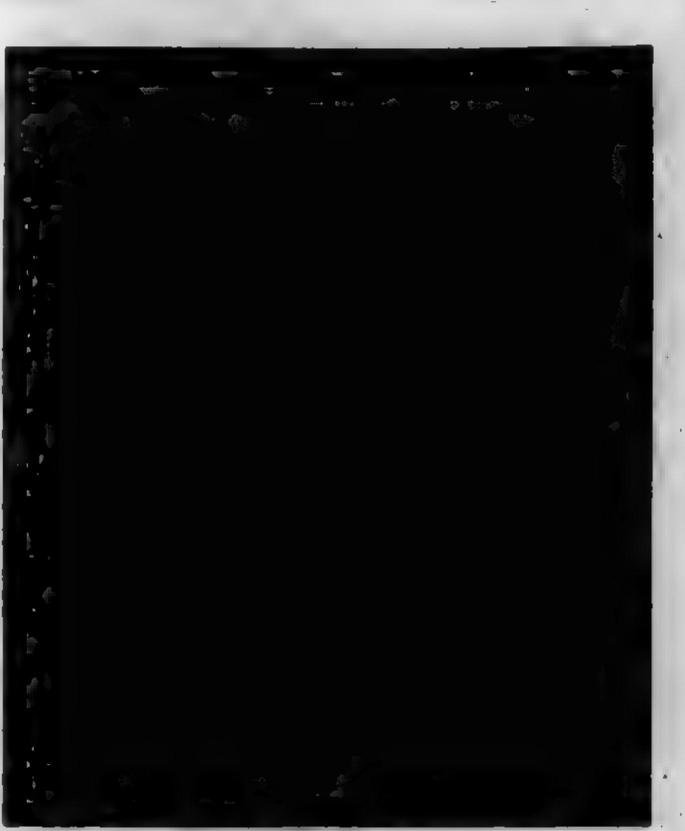

Figure 1

the picture of financial accountability. A monthly user steering committee sets priorities and monitors resource allocation.

Information systems development personnel in a conservative firm should be organizationally pooled for maximum productivity. Some may argue about whether pooling achieves greater productivity, but the important point from a cultural perspective is that business conservatives perceive that it does.

Maintenance personnel, on the other hand, should be dedicated to particular systems for operating stability. Strong, solid technicians should dominate the staff. The business savvy needed by individuals in the entrepreneurial setting is unnecessary here — the requirements are understood, and the pace of change is slow. Data center and telecommunications operations must be superb. These should be managed as factories using all the efficiencies made possible by a known environment.

Lines of authority

MIS issues in this culture include enforcing technology followership. The upshot may be a chronic exodus of the most capable people to more exciting shops. Occasionally, a "soft" benefit project will be important for the company. MIS personnel must find ways to identify these and sell them to top management.

In one conservative bank, analysts simply "jury-rigged" the cost/benefit projections to favor a telecommunications project. Senior management, comfortable with the financial analysis, approved a project that turned out to be unexpectedly important for the bank's competitive position.

Companies with clear lines of authority place decision making in the hands of a specific person. They align authority with responsibility and reward people for "stopping the buck."

Opposite these companies stand firms with ambiguous authority, firms that need to build support for ideas and action plans before they proceed. They lean toward matrix management structures where authority and responsibility are often shared or out of balance.

In many cases, an ambiguous authority structure is a veneer over highly centralized decision making. The military is an example of an organization with clear lines of authority. Texas Instruments, Inc.'s pre-1983 matrix management structure — since changed — institutionalized ambiguity.

When lines of authority are clearly drawn, information technology can be developed accordingly. Departmental functions can be automated under departmental aegis; the divisional data center can handle divisional decisions. Almost the only technology that cannot be distributed easily is corporate telecommunications.

The distributed architecture of hardware and software leads also to a hierarchy of data access in these firms. Each level of management receives the data needed to make the decisions for which it is responsible. Planning must be bottom-up, and MIS can play an important consulting role to ensure a coherent finished plan. Business unit managers should be allocated specific personnel and have ultimate responsibility for project progress and spending.

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The main stumbling block in project methodology is access to the real decision maker. As the anecdote in the beginning of this article indicates, the MIS manager failed partly because he took his orders from the vice-president. In that case, the plant manager turned out to be the real decision maker.

In this highly delegated environment, however, some important central functions may languish. The firm must maintain a central technology scanning or research and development function to stay abreast of changes in the field. Once such a function is established, a corollary problem is disseminating its results. One large, decentralized chemical company staffs its central high technology group with people who have both technical and strong consulting skills. It is their job to sell innovations to their business constituencies.

In an environment with ambiguous lines of authority and responsibility, "unowned," shared systems and large, tightly coupled systems fit well. Policies that substitute for individual operating decisions can be embedded throughout such systems. When these are managed by cross-unit steering committees, no single user has the authority to mandate substantial changes.

Because no one is really certain who will be making what decisions, users at all levels must have access to the most detailed data. MIS project methodology must deal with the resulting confusion. Consensus time and detailed walk-throughs should be built into all but the smallest projects.

The same rules apply to whatever MIS planning is required. Planning is a consensual process, with MIS taking the lead to make things happen. In fact, MIS will find itself the agent of change on almost any front. This cultural bias should be reflected in MIS staff selection — strong "sales" personalities — and represents a structural risk in the ambiguous environment. A commitment to internal communications among a lean MIS senior staff substitutes for clear, articulated demand from the users.

Cooperative vs. competitive

Cooperative companies emphasize teamwork. People build strong relationships across organizational units and strata. Mentors abound, as senior people nurture and cultivate their subordinates to succeed them. Competitive firms place great importance on individual achievement. They are populated with "stars" who close big sales or produce hit shows. Japanese firms epitomize the cooperative culture. The stereotypical large law office or consulting firm is competitive.

Figure 2

"Owned," shared systems are consistent with a cooperative culture. These are systems that are shared among several operating units. Each has the freedom to go elsewhere, but they choose to share. To the extent that business conditions enable these users to cooperate, the versions of the system remain identical.

A cooperative culture is also fertile ground for systems that build corporate data — where one group enters data so that another can add to it or use it. Also appropriate here are systems that enable easy access not only to cross-unit data but to ways of analyzing it, such as template libraries. For ownership, systems must be decoupled. But for the

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best access to data, systems must be integrated. The architecture in a cooperative environment, then, is one of buffered integration and loose linkages.

Project methodology must be vitally concerned with shareability. Strict technology standards will ensure that users throughout the company can share software and data. In a similar vein, the MIS planning process must include a coordination step after the usual bottom-up effort. Personnel can be pooled, shared or moved across functions easily.

Implementing an architecture of shareable data and systems is not trivial. Strong central data administration, telecommunications and standards functions are critical. These groups can devote considerable energy to enabling broad access to certified data and to pacing the introduction of new technologies.

The competitive culture's separatism skews the MIS architecture toward single-owner sites with private data bases and strong internal security measures. Departmental computing prevails here. One large, competitive-culture firm had a separate data center for each business function — manufacturing, marketing and so on — and countless stand-alone minicomputer sites with Rube Goldberg-type telecommunications links between them.

The project methodology in a competitive culture must address security concerns in far more depth than other cultures require. In addition, existing systems should be periodically audited to ensure that they are operationally sound.

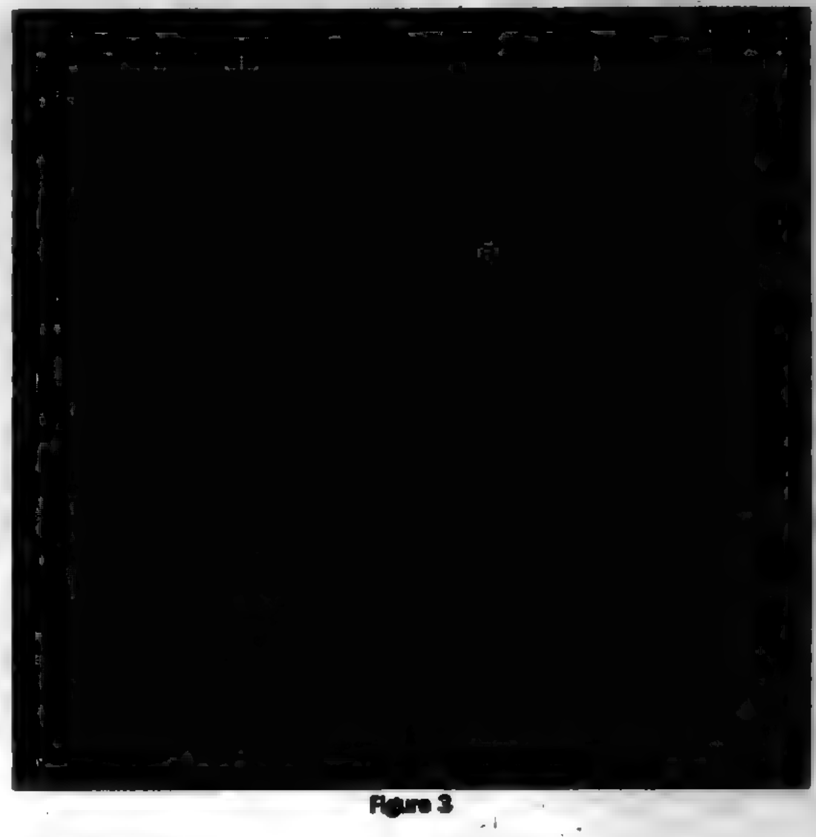


Figure 3

To fit in this culture, information systems resources are thoroughly decentralized, with solid-line reporting and strongest loyalty to specific users. As MIS adopts the competitive "we-they" attitude, movement among information systems groups is difficult, and joint projects are virtually impossible.

Whatever overall MIS planning and resource allocation is done is the province of a single senior executive. In keeping with the culture, unit plans are approved or denied at this level, almost unilaterally. MIS shoulders the burden of maintaining its service image when business unit projects are cut.

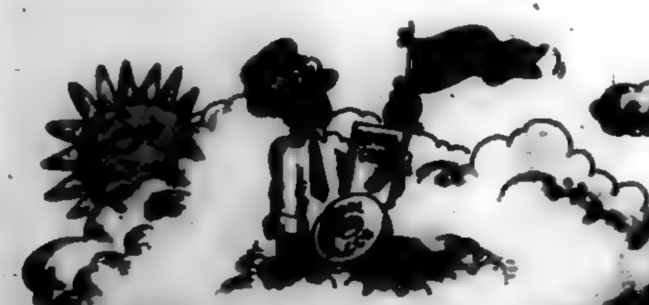
The issues this culture raises for MIS are serious. Central functions such as standards, data administration, planning, R&D and telecommunications risk becoming empty and ineffective.

Led vs. managed

When a company is led, it has clear, long-term goals to pursue. It had a vision of the future; it is creative; and it cares about the "big picture." A firm that is managed focuses on financial objectives that are often shorter in term. Its statement of values depends on the problem at hand, yet it is a hotbed of the latest analytical techniques. Lee Iacocca's Chrysler Corp., despite its attention to financial matters, is led. IBM and Hewlett-Packard Co. are led. Colgate-Palmolive Co.'s ill-conceived "shopping spree" of the '70s reflects the fact that it was managed.

The interesting thing about companies that are led is that they know where they are headed and what is important to them in getting there. Armed with this knowledge, MIS can build systems that provide specific information support. This is what corporate data modeling is all about. Computer systems can deliver strategically selected information to decision makers at all levels. This stands in stark contrast to a leaderless firm, which sits with a pool of detailed data, unable to decide which elements are important and which are not.

Organizationally, the strategically defined data bases demand a robust



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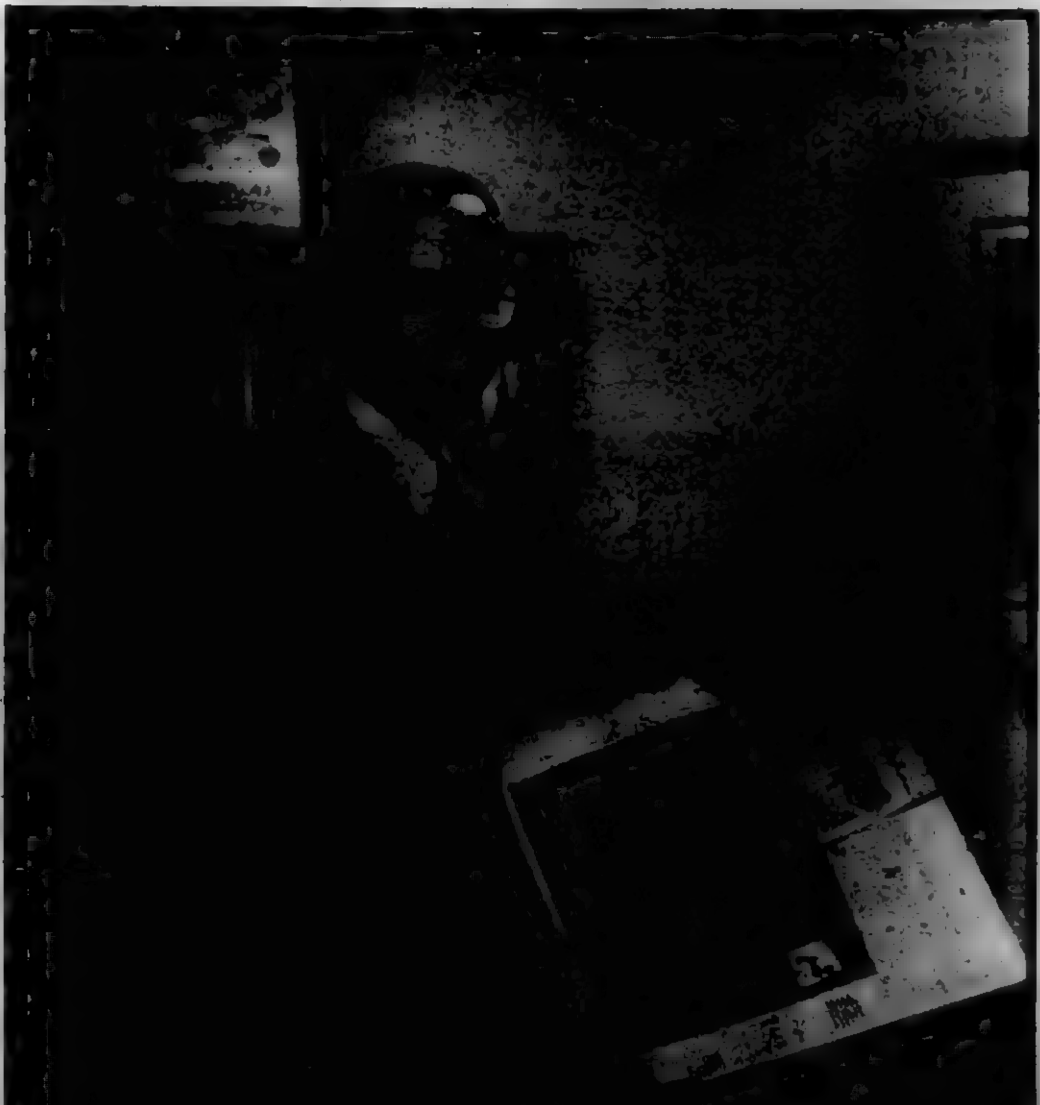

EnerConnect is the second major micro product from Enertronics, developers of the successful EnerGraphics package. As the ad for EnerConnect says, it is “. . . the first software package that puts mainframe graphics capability into the hands of anyone with an IBM PC . . . or 3270 PC.”

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data administration function. Because the driving force is company direction, MIS staff should include business analysts to make the connection between corporate strategy and their daily activities. Among the MIS executive's most important roles is gaining access to strategic circles in the company, so it is imperative that the MIS executive be a leader in his or her own right.

Information requirements in managed companies change often because there is no substantive long-term direction. As a result, flat, detailed data bases must be maintained so virtually any question can be answered.

Managed firms are often concerned with their MIS spending as a percent of sales. The irony is that their short-term, financial objectives dictate expensive, detailed, central information sources. A short-term view — usually no more than one budget cycle — drives stopgap projects with shortcut methodologies.

No energy is "wasted" on standards and documentation; the focus rests with on-time, in-budget delivery of today's top-priority projects. This is an exceptionally difficult goal to meet because the priorities change with the caprice of daily business problems.

To succeed in this environment, MIS must maintain a fluid organization and follow the shifting priorities. In addition, MIS staff members should plan to complete all projects within a single budget cycle. Longer term efforts are simply outside the attention span of the "managed" business.

The main problem MIS experiences in a managed culture is keeping personnel. Turnover often exceeds 40% per year. Of course, this undermines MIS credibility because undocumented, nonstandard systems are passed from one set of inexperienced hands to another.

Emphasizing ethics

Ethical companies distinguish outwardly between right and wrong. Their policies emphasize honesty and fair play. An ethical firm would never condone an employee bribing foreign officials, even if it were the foreigners' accepted way of doing business. So-called amoral cultures are closer to Machiavellian ones. Success is deemed good, regardless of how it is brought about.

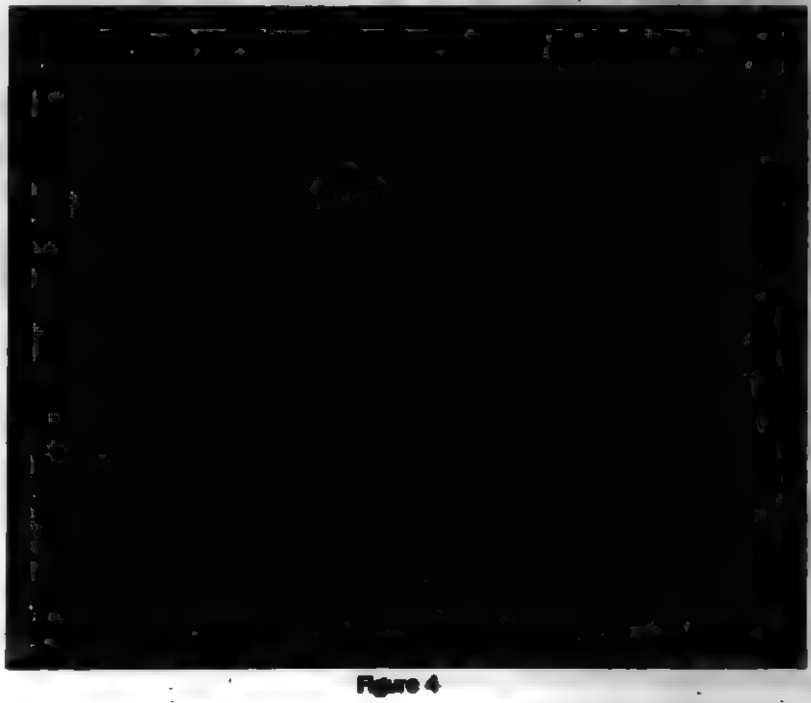

Figure 4

Ethics start with people, but computer systems can be supportive, influencing high standards of behavior with internal checks and balances. This form of "policing" is actually much more palatable than audits and supervisory reviews. The more traditional approaches establish an atmosphere of defensiveness; people are seen as basically untrustworthy. Computer controls are automatic, quiet, depoliticized inspections.

Just as systems can support ethical behavior, an absence of computer controls is consistent with amorality. In one large high-tech firm, there was no automated (or even manual) system to ensure that what was shipped was also billed. There was no way to identify what capital equipment each department owned.

In that firm, company property commonly found its way into employees' homes. Sales representatives "loaned" units to favored customers. It is interesting to note that senior management turned to tighter computer controls for a solution.

In any analysis of culture, we must understand that a company is not homogeneous. Each division, sometimes each department, has a subculture of its own, even though the corporate culture is strong. MIS managers must take these into account as they plan culturally consistent activities throughout their realms. Many failures can be attributed to MIS' having projected the cultural bias of its parent organization onto the other units it supports.

Permanently on hold

ABC Co., a fictional subsidiary of a Fortune 100 manufacturing firm, was active in a variety of business sectors. It held a large market share in hospital supplies and had a strong franchise in several industrial lines. Its widely distributed consumer products unfortunately appealed to a steadily declining segment of the population.

Its sales had been flat for several years, and its profits were stable but softening. Some recent acquisitions, particularly in the hospital supplies area, brought in new products that ABC hoped would fuel future sales growth.

The company had a long-standing ethical and cooperative culture. Its lines of authority, however, were so ambiguous that it could rarely put together an organization chart. ABC was extremely conservative — risk averse and process- rather than action-oriented. Its managers' days were filled with meetings in which very little was accomplished.

In addition, ABC was effectively managed by the one-year financial goals placed upon it by its parent company. ABC had no spelled-out strategy or long-range plan; it had no leadership.

One of ABC's largest rivals was using information systems to strategic advantage by offering terminals to purchasing agents who placed orders directly into the firm's order processing system. ABC's MIS people worked with its marketing sponsor to outline a system that would allow ABC to catch up.

Together, they envisioned a fully functional system that would be owned by marketing. Both MIS and the marketing sponsor were justifiably excited by the challenge and opportunity this project presented.

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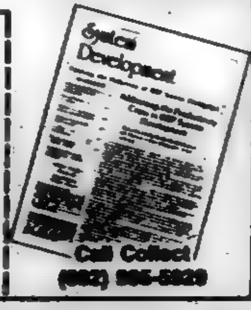

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Over the course of the project, there was some personnel movement. The manager in charge of development transferred. A new supervisor was installed between the project leader and the new manager. The marketing sponsor left the company.

Despite these developments, the project leader pushed on, selecting a distributed architecture. A local vendor was to provide a turnkey system with communications links and a language that were new to ABC.

Breaking the rules

This project broke several cultural rules. First, the strategic system that they envisioned could not easily exist in a managed company. Secondly, the MIS department planned a distributed system. The firm's ambiguous lines of authority made the aberrant marketing champion a critical figure. Unfortunately, he had left.

In the aftermath, MIS failed even to convene a steering committee to shepherd the project. In short, they had no vehicle for building consensus. Finally, the lack of a chargeback system made it impossible for the department to tell the customer what the system cost. This uncertainty, in a conservative firm, proved untenable.

The outcome? A working system was delivered. But there were so many technical and political problems with it that it was placed in endless pilot and eventually deprived of funding. MIS was credited with a failure.

ABC's long-range MIS plan also called for installation of a complete set of integrated manufacturing resource planning (MRP) systems with a common data base technology. Again, the MIS department led the effort, convincing the manufacturing vice-president that the project would pay off handsomely in the long run. A one-plant pilot was approved.

The department tackled the project with enthusiasm and professionalism. The package was implemented; the skeptical plant manager was converted to an ally; and the benefits were counted. All this took about a year.

The MIS management prepared a presentation for senior management to try and gain approval for the next step. The price tag was $30 million, and the payback period was eight years. The project was turned down cold.

The MIS professionals had committed two fatal cultural errors. First, they had embarked on a multiyear plan in a managed, short-term-oriented company. To fit comfortably into this kind of environment, any project must be funded within a single budget cycle. Otherwise, it risks having funds cut off midstream.

In a related error, MIS undertook an effort with visible costs and less tangible benefits. Managed conservatives become very nervous when asked to fund projects with long paybacks of soft benefits.

The MRP II project was left in endless pilot as the MIS group was sent off to find a microcomputer solution that could be implemented on a shoestring.

A common mistake

XYZ Corp. was a high-tech firm growing at a 35% compound annual rate. Although only in its second decade, its market success had brought it into the Fortune 200.

> ”
>
> *Very few of the tools for influencing culture are so easily engineered as information systems. Non-MIS tools are extremely influential but their implementation is often longer term.*

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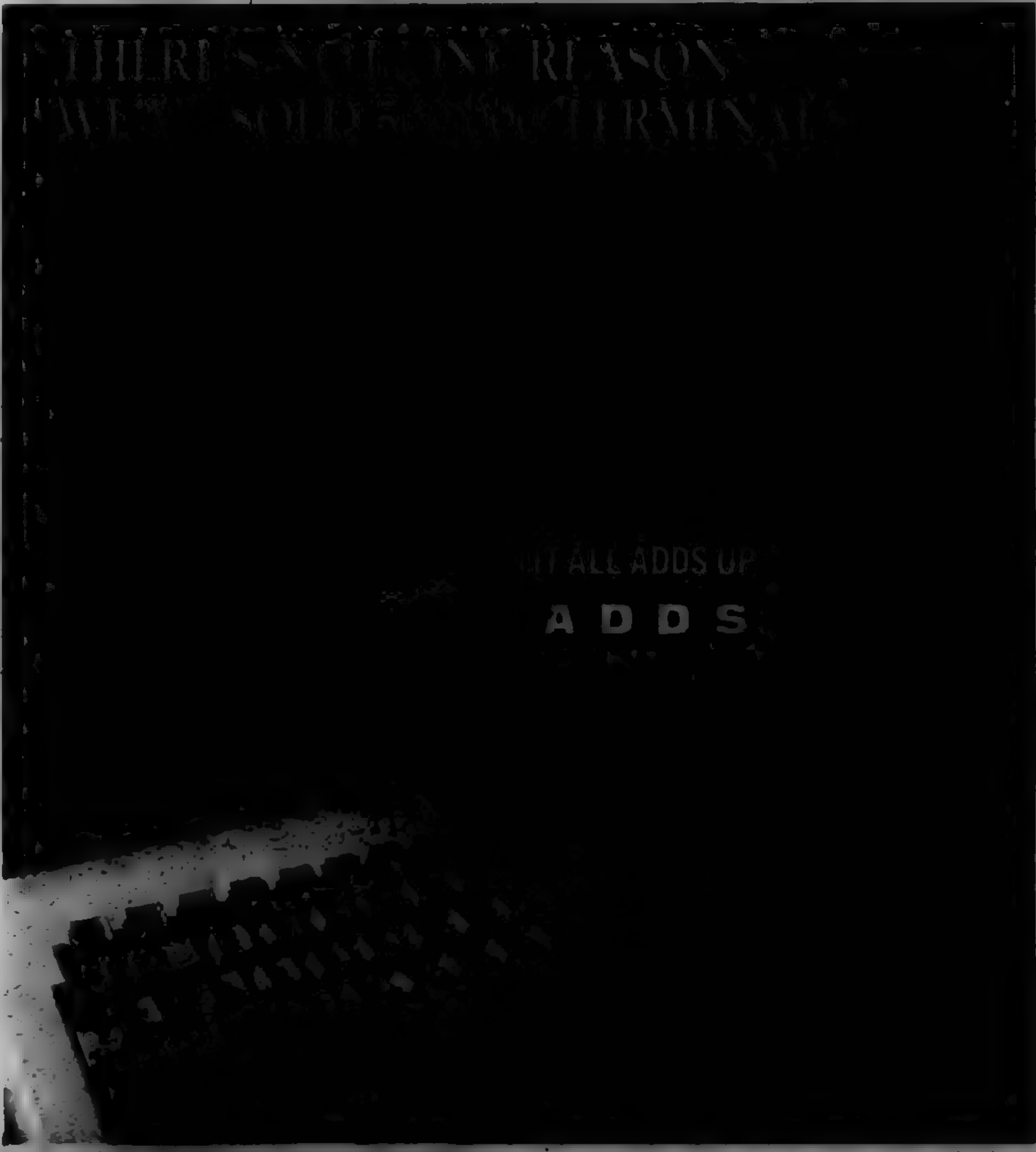

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The culture was, above all, entrepreneurial. It was ethical and competitive, with ambiguous lines of authority held over from its days as a smaller company. The original founder continued to lead the company with a clear, well-articulated vision for the future.

Because of its rapid growth, XYZ had outstripped the capacity of its core transaction processing systems. The director of MIS began a project to address order processing, billing, accounts payable and accounts receivable. As one might expect, MIS managed the project with a well-controlled, traditional life-cycle method.

A user manager was named to participate fully in the project team, and a respected consulting firm was hired to define and document the requirements. Their superior expertise was retained for general and detailed system design and for programming. After three years, three major design revisions and about $30 million in out-of-pocket expenses, there was still no system. After the third year, the name of the project was changed to conceal the continuing disappointment.

Where did MIS plans go awry? In an entrepreneurial firm, the traditional MIS approach is dead wrong. Even though the systems they were building were traditional transaction processing systems, the MIS team should have been using a prototype approach.

Possibly the only way to satisfy these users would have been to define a broad architecture, then begin roughing in the pieces with high-level languages and packages. With rapid deliveries and an evolutionary attitude, MIS would have been able to keep pace with the needs of a changing business.

> ”
>
> *Xerox used to be considered entrepreneurial but now might be seen as conservative. AT&T is trying to change from conservative to entrepreneurial.*

The first assignment given to the new MIS manager of XYZ was to investigate a stalled project and recommend an action plan. As he looked into the matter, he found two camps arguing over which software package to implement.

On one side, the user had selected a clearly superior package that was consistent with the way she did business. On the other side of the argument was the MIS director. He wanted to implement the system that was already being used worldwide for similar functional groups. Although the package was an older batch-type system, the MIS director believed consistency would serve the whole company better than a little extra capability in one group.

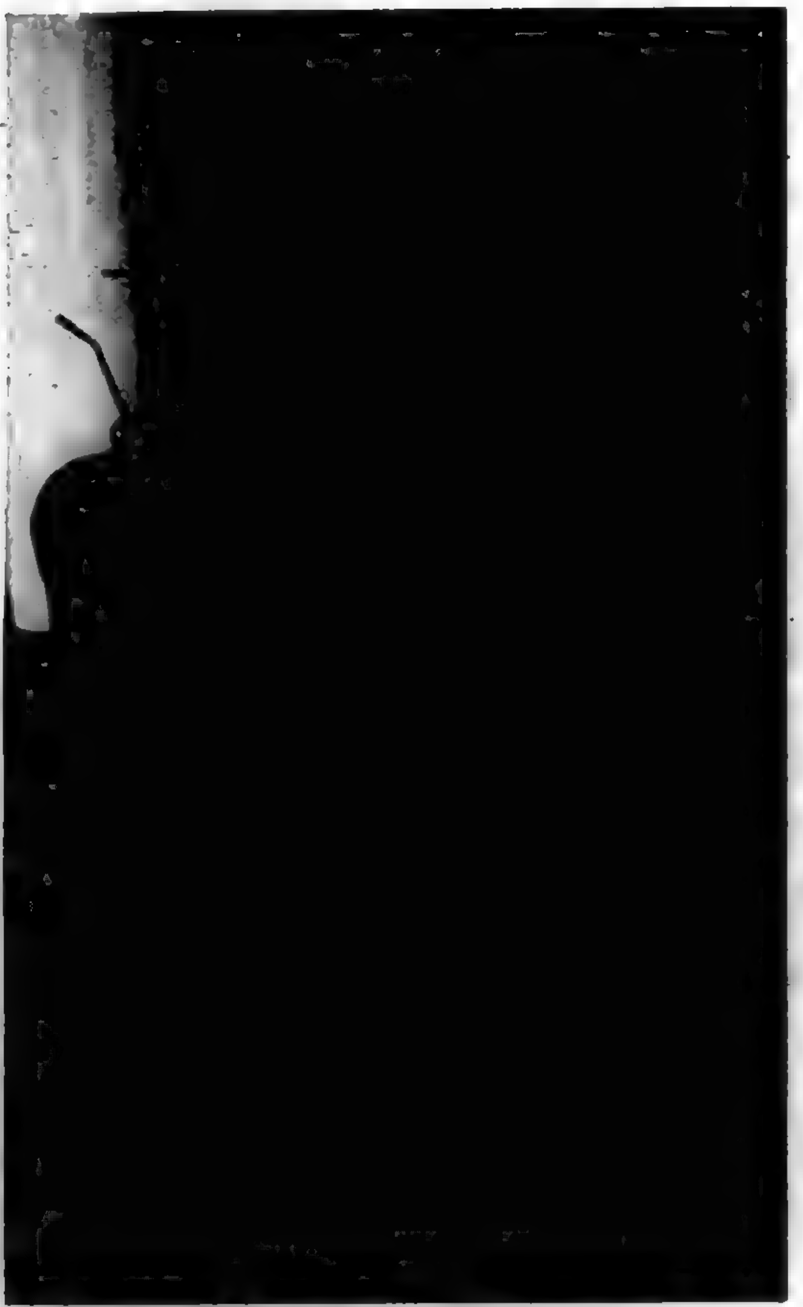
The MIS manager backed the user's choice rather than his superior's. Although he had compiled a thorough analysis of both systems, the real reason for his decision was cultural. He perceived the culture to be individualistic and competitive, not cooperative. In that environment, the key to success is meeting the needs of the user. Period.

Culture building

In general, MIS professionals can be more successful by identifying important aspects of their corporate culture and adjusting their policies and approaches to fit within the environment. Sometimes project success is a matter of changing only a few key, countercultural practices that have stymied solid efforts at progress.

Culturally consistent MIS activities will benefit the corporation by strengthening and solidifying the firm's culture. Obviously, MIS activities alone will not drive culture. They can, however, make a significant contribution toward influencing behavior and then values, as part of a coherent, culture-building program.

At the same time, MIS can participate in influencing culture. As we saw in the vignettes above, some of the cultural attributes of ABC Co. and XYZ Corp. were undesirable. With careful planning and the support of executive management, MIS professionals can play an important role in helping a firm modify its values.



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Software maintenance:
penny wise, program foolish

By Girish Parikh

U.S. programmers shave days off software development time while squandering weeks on ad-libbed software maintenance. Soviet and Japanese companies have a jump on developing rigorous methods.

Computer professionals still ignore software maintenance. For software development, there are at least some methodologies, even if U.S. companies are drifting from them. But for software maintenance, there are no systematic methods in place yet.

The ideal way to systematize software maintenance would be to build techniques into the software development methodologies. Today most development facilities avoid dealing with the maintenance phase, and in this respect, they are incomplete. Judging from the alarming software maintenance statistics — 50% of DP budgets allocated to maintenance, more than 50% of programmer time consumed by ongoing maintenance, and more than $30 billion spent on maintenance annually worldwide — the omission is critical.

The pervasive lack of attention to the subject persists on a national level. The much-touted race between Japan and the U.S. on developing fifth-generation computers receives wide publicity. But the one-sided competition in software maintenance, which may affect the eventual outcome of the fifth-generation race, simply is not addressed by most computer professionals in the U.S.

Software maintenance consumes substantial resources. By streamlining and automating this work, the saved resources can be diverted elsewhere — toward developing applications for fifth-generation computers. Japan seems to understand the software maintenance problems and is making moves to solve them, as evidenced by the Software Maintenance Engineering Facility project under development by the Joint System Development of Japan.

The U.S. is perhaps more aware of the Soviet Union's threat to American technological supremacy regarding software. The fear seems to be: "The Russians are coming! The Russians are coming!" It seems to me that almost any country, even a developing one, can surpass the U.S. in the software field simply by making software reliable and modifiable and by developing modification techniques that can be taught.

On a company level, what is the effect of lack of attention to software maintenance for a data processing manager? The impact may or may not be immediately visible; however, the long-range effect can be devastating. When management considers maintenance a low-priority activity, the staff doing maintenance gets the message immediately.

In most companies, development programmers also handle maintenance. Instead of using systematic maintenance processes and updating documentation, they rush through the work by patching the programs so they can get back to development work quickly. Over time, the programs become almost impossible to modify, and documentation deteriorates.

Cleaning up the maintenance mess will be much more difficult and expensive than preventing it in the first place. By instilling "positive maintenance attitude," by encouraging the use of software maintenance techniques and tools and by providing maintenance training, many problems can be avoided.

Weak foundations

I have been through the software maintenance trenches for several years and observed the weak foundations of many applications systems. At the moment, U.S. software consists of precarious skyscrapers of unstructured and disorganized code on the verge of collapsing under severe maintenance problems. A better balance cannot be attained unless these basic problems — not just the symptoms — are promptly solved, and new software is developed with a methodology that includes teachable modification techniques.

You cannot avoid software maintenance: It is intrinsic to software. Why not do maintenance right and avoid the problems?

To be complete, software methodologies must offer exact guidelines for maintaining the software

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Girish Parikh is a Chicago-based consultant, lecturer and writer. His newest report, "There Is A Fortune To Be Made in Software Maintenance: Opportunities in the $30 Billion Software Aftermarket," is published by Shetal Enterprises, Chicago.

developed with those methods. That way, the original structures are preserved, and maintenance operations can continue effectively, efficiently and economically. A methodology that can help solve the maintenance problems of unstructured software, as well as provide guidelines for maintaining structured software, would be even more useful.

Further, a country can develop national standards for software development and modification. There is already at least one technology eminently suitable for such standardization: Jean Dominique Warnier's logical methodology. The French systems scientist's technique of designing programs, called logical construction of programs (LCP), is such that any LCP programmer can maintain almost any LCP program anywhere.

To my knowledge, Warnier's methodology is the only one that provides precise guidelines for modifying programs; even more important, the modification techniques can be taught. Imagine how much maintenance saving can be achieved by such national standardization and education.

> ”
>
> *U.S. software consists of precarious skyscrapers of unstructured and disorganized code on the verge of collapsing under severe maintenance problems.*

In searching for the root of the problems, some have named Fortran and Cobol as the culprits responsible for the development and maintenance problems. I do not think this is the case.

Although the trite phrase "It's the fault of the computer!" is a popular one, we have all learned that the program can also be at fault. In fact, in almost all cases the program is at fault; all things considered, it is relatively rare that a computer malfunctions. So we changed our strategy and started blaming the "bug" in the program. But from where did the bug come?

Whodunit

Of course, a high-level language or any language that helps develop clear structures can help prevent or eliminate bugs. However, to a large extent it is the program design that makes the difference. So if the program is poor, it's generally the fault of the program design or rather the fault of the programmer who did a poor job of designing. Or, in an all-too-familiar scenario, it is the fault of the programmer who did not even care to outline the program before starting to write code.

In a worst-case sense, this is like rushing to start building a house before preparing a blueprint. It will be a miracle if the house is built at all, and if it is built, it may not be functionally sound or even safe. And such a house, if it gets finished at all, would cost a fortune to build, not to mention its subsequent maintenance. How many times would it be torn apart and construction started all over?

Applying this same principle to coding without preparing a design outline, we see that maintenance for these programs is even more awkward than usual. The difficulty is intensified because typically there is no adequate documentation to support the maintenance effort.

Again I must point out that Warnier's LCP technique can help design optimal (efficient in memory usage and execution speed), clearly structured, well-documented, reliable and easily modifiable programs. Programmers can code in Fortran, Cobol or almost any other programming language using LCP, because the design technique is independent of programming language and hardware.

LCP programs can save a bundle in the long maintenance cycle, starting in the initial development stage. The technique saves in testing time during development and maintenance, as programs work on first or second effective test. Since, in

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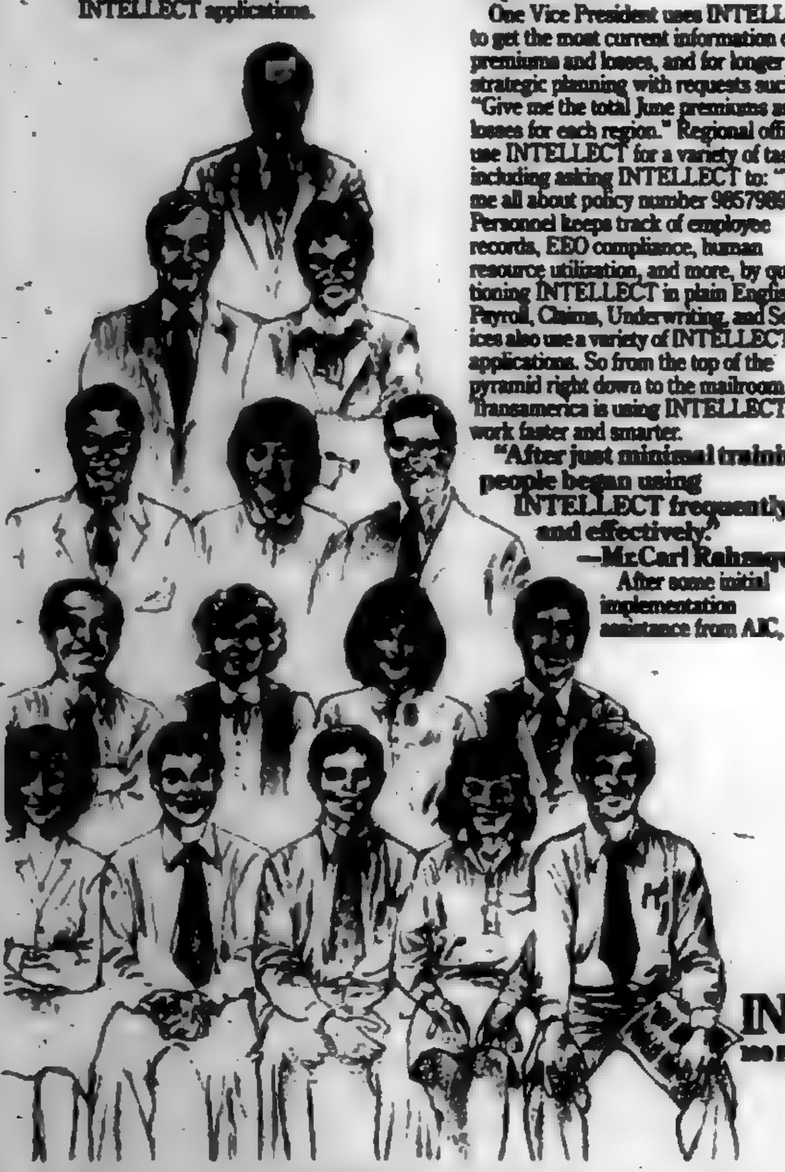

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the traditional development cycles, testing takes about 50% of resources and time, LCP techniques can save a bundle in initial testing alone, not to mention the continuing saving in the maintenance cycle. In addition, program modification techniques can be taught.

Learning on the fly

One observation illustrates how deep the maintenance problems reach. It may sound ridiculous to non-DP executives, but it is a fact that in many large companies it takes about six months for a programmer to be productive in maintenance work. In the end, such work usually amounts to more than half of a programmer's responsibilities.

Without formed methodologies, many of these programming professionals lack formal training in software maintenance, and they are forced to learn on their own. This pickup, on-the-job training does allow them to complete the assigned work.

But maintenance skills learned the hard — and expensive — way, if they are learned at all, are generally not of much use when programmers hop jobs. Statistics quickly reveal the implications: Programmers change jobs every 1½ years on the average. In all likelihood, they then spend another six months learning how to use the nonstandard maintenance techniques of their new posts.

Ironically, the frustrating maintenance work itself contributes to the high programmer turnover. What a colossal waste of programming resources! It is easy to see why backlogs for new systems now amount to years in length.

Most companies contribute to this wasteful cycle by failing to take software methodologies seriously. Just look at the DP job section in the Sunday newspaper of your city. How many companies look for designers and programmers with experience in a certain methodology? Most advertisements specify skills in programming languages (usually Cobol and even Bal) and some software packages such as CICS and IMS, but not in software maintenance techniques.

We may be seeing a symptom of a deeper phenomenon. The concern of many DP managers seems to be to get the development job up and running, to get a pat on the back and maybe a promotion and a raise. If the system doesn't work out or if a time comes for them to modify or maintain their brainchildren, there is almost always another job to go to instead.

The concern of the U.S. still seems to be focused on the front-end work of development, even though software maintenance is estimated at 67% of the software life cycle. There are an estimated one million programmers in the U.S. alone, most of whom are spending more than half of their time on ongoing maintenance. But most training programs address only development issues. How much programmer time and resources are wasted doing trial-and-error maintenance, not to mention losses incurred because of incorrect changes?

Creating new methods

Though maintenance work is influenced by the development method used, (typically ad hoc method — that is, no method at all) we need to address maintenance problems on their own terms also. For a given development method, we should create maintenance techniques drawn from that method.

The task of creating maintenance techniques for unstructured software, developed without using any method, will be a challenge. But if we want to close the software maintenance gap, we must deal with these problems by treating the causes, not just removing the symptoms.

There are several options available for dealing with unstructured code, such as redeveloping, replacing with an off-the-shelf package and restructuring. In addition to techniques for maintaining software treated with the former options, techniques are also needed to handle maintenance work on the unstructured software as it is.

Understanding software becomes one of the keys to making correct changes. With unstructured software, maintenance programmers spend about half their time just understanding the programs. If the tools and training are developed to expedite standing of unstructured software, companies will realize a significant saving.

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> *Programmers change jobs every one-and-a-half years on average. In all likelihood, they then spend another six months learning the maintenance techniques of their new posts.*

Recently a debate has started about the validity of current terminology. An excerpt from Dr. Edager W. Dijkstra's privately published newsletter "EWD" in May 1983 pointed out that "maintenance" itself is a misnomer: "To begin with, a program is not subject to wear and tear and requires no maintenance." Dijkstra coined the term "structured programming" but has not coined a new term for maintenance; he simply laments over the established one. Yet the term "program maintenance" has been in practice since electronic computing began over 30 years ago.

My question to those who have started debating over the term now is, where were you all this time? Of course, most of us were preoccupied with other computer topics — especially development. Though maintenance work was and is being done by programmers around the world since the dawn of electronic computing, no one seems to have paid much attention to it or even to its name.

Was it laziness? Or did we have a misconception that by developing methodologies for the front-end development, software maintenance would naturally fall in place? Did we simply not have the foresight to worry about the future, to see what was going on below the surface in the real world?

Perhaps the reason lies in programmers' general dislike for software maintenance. Some even hate the work. They want to remain high on the excitement of new development. It is a challenge to solve a problem by developing a new program. But once the program is installed, the excitement abates; programmers start seeking new pastures to satisfy their appetite.

Unfortunately, they have to work on existing programs. After all, these programs were their (or their fellow professionals') brainchildren, and they cannot abandon them. There are heavy investments in existing software, and management wants to make the most of it. So programmers grudgingly carry on, correcting errors, modifying code, adding new requirements, adapting to new software environments and so on.

Instead of changing the label, why not develop a generally accepted definition of the term and go on — identifying the variety of topics and subtopics on and related to the subject. In other words, develop a taxonomy, define the terminology for the subject and then get on to the more important work of developing software maintenance methodologies, both technical as well as managerial. With a generally accepted terminology, we will be able to communicate with the world at large.

Time to act

In 1981 the National Science Foundation commissioned a group of industrialists, scientists and teachers, known as the Computer Science and Engineering Research Study. Their study yielded a report that aptly predicted the threat to U.S. dominance in the software field:

"If software practices continue to drift, in 20 years the U.S. will have a national inventory of unstructured, hard-to-maintain, impossible-to-replace programs written in Fortran and Cobol as the basis of its industrial and government activities. Conversely, the Soviets may very well have a set of well-structured, easily maintained and modifiable programs in more modern languages because, in fact, they plan to leapfrog Fortran and Cobol.

"In this case, the competitive process of selecting efficient industrial processes among feasible alternatives will be impaired in the U.S. but facilitated in the USSR. We could then face a software gap more serious than the missile gap of some years ago."

Since then, it seems that fear has acted as catalyst for the U.S. Department of Defense to start the Software Engineering Institute centered at Carnegie-Mellon University in Pittsburgh. The institute plans to hire some 250 engineers to conduct a study of software methods and their applicability to defense systems. But it remains to be seen how the Software Engineering Institute tames the giant of software maintenance.

It seems that even in 1985, not much attention is being paid to software maintenance. It is naive to believe that by working on front-end development methodologies, the software maintenance problems will go away. In fact, if development is the front side of the coin, software maintenance is the other side, which stays much longer in view.

We are more than 30 years behind when it comes to software maintenance. We have awakened late. The giant subject of software maintenance may prove to be even larger than development and harder to tame. We have created enough mess with the existing software. Now instead of skirmishing around with the term, let's get started on the real work — honing the subject into an engineering discipline, developing software maintenance tools and producing educational and training courses and materials.

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MICROCOMPUTERS

Rockwell signs unlimited license pact

Agreement authorizes duplication of Smart

By Eric Bender

OVERLAND PARK, Kan. — An unlimited software site license agreement, signed this summer, was recently revealed by Innovative Software, Inc. and Rockwell International Corp.

The deal gives Rockwell, which employs more than 100,000, perpetual worldwide rights to copy Innovative's Smart Software System, a series of integrated modules for the IBM Personal Computer and compatible systems.

Creating a standard for Rockwell, the arrangement will provide several important advantages, said Gordon Armour, staff specialist for emerging technology at Rockwell Defense Electronics Operation's information systems group in Anaheim, Calif.

According to Armour, these will include greater interchangeability of personnel, easier interchangeability of files, the development of expertise with specific programs, general availability of high-quality software tools, a chance for broadened user training, the ability to create ancillary products and "the obvious economic benefits."

Rockwell, which expects to sign a similar deal for another type of micro software next year, did not disclose financial terms or release estimates of the number of personal computers involved.

In fact, the Fortune 50 firm did not disclose details on the magnitude of its micro installations to Innovative, which complicated initial negotiations. "That was the first hurdle we had to get over," Innovative Marketing Vice-President Ron Ferguson told *Computerworld*. "If you find out, I'll be glad to read about it."

However, Ferguson said, it made sense to sell a license as a service to an organization, as mainframe software may be sold, rather than by number of machines. "We, as an industry may be setting some artificial limitations in terms of selling our services to this segment of the market."

Under the agreement, "Rockwell has the right to duplicate and use the programs as they exist today; all else is unbundled," he said. Other contracts give Rockwell options to buy documentation updates or support from Innovative.

After duplicating the programs from master disks provided by Innovative, Rockwell will distribute and control the software internally through technical libraries. "We will have rigorous control procedures at the technical libraries," Armour emphasized. One benefit of these procedures is that as Smart Software enhancements come along, "we can simply pump the updates downstream," he said.

All software will have a special screen tailored for the company and an individual serial number, Ferguson noted. Although "we do not prohibit user copying, Rockwell does not want them to do it from the perspective of control of updates," Ferguson said. Users will be reminded that the software is a corporate asset and that they are not authorized to copy it.

"With the employer behind that, there will be much less misuse within the organization," Ferguson said.

- Gateway Communications rolled out a series of micro-to-micro and micro-to-mainframe communications packages/58
- An expansion system that gives four-user capability to the IBM Personal Computer AT running PC-DOS was introduced by Anex Technology/58
- Samna enhanced its Samna+ integrated software/59

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SMALL TALK
Eric Bender
CW Senior Editor

Micro vendors willing to deal

The year 1985 has been far from a gangbuster one for microcomputers so far, but the landscape is changing lately — most noticeably in software licensing.

After a year and a half of sound and fury about site licensing, we're starting to see some significant activity. Behind the flurry of announcements, which turned out to be simple volume purchases (stop the presses!), are coming deals with genuinely different contractual arrangements.

One example is Innovative Software, Inc.'s recent agreement with Rockwell International — a perpetual, worldwide unlimited license for the Smart System software (see above story).

Controlling micro software

Negotiations may be a lengthy, complicated process — for example, Rockwell would not tell Innovative exactly how many micros were installed — but they hold the promise of coming up with a more sensible way for corporations to buy, distribute and control micro software.

We're also seeing a host of vendors dropping copy protection. Many of these are tiny firms, struggling to stay alive in a slow market that has created some significant disappointments even for stars like Lotus Development Corp. But regardless of vendor motives, dropping copy protection makes life a little easier for corporate users.

Microsoft Corp. bit that particu-

Continued on page 66

Software Publishing enhances PFS:Write word processing

Software Publishing Corp., based in Mountain View, Calif., has enhanced its best-selling PFS:Write word processing package for the IBM Personal Computer and compatible systems, providing an integrated spelling checker, wider documents, additional character enhancements, microjustification, context-sensitive Help screens and a quick-save feature.

Available now at the same retail price of the previous version, $140, the upgrade uses features requested in 1,500 responses to a customer survey that Software Publishing carried out earlier this year, according to product manager Dave Burns.

PFS:Write's spelling checker uses a 75,000-word dictionary to correct documents for misspellings, typographical errors, repeated words and irregular capitalization, according to the vendor.

The package now supports documents up to 250 characters wide and offers added character styles such as italics, superscripts and subscripts.

The quick-save feature permits users to save documents with a single keystroke during editing, rather than requiring them to go out to the main menu, Burns noted.

Current PFS:Write customers can upgrade to the new version for $35, according to a company spokeswoman. Software Publishing also is offering the software bundled with PFS:File, PFS:Plan, four utilities and two diskettes for $350.

PFS:Write requires IBM's PC-DOS or Microsoft Corp.'s MS-DOS 2 or higher and 256K bytes of random-access memory.

Software Publishing declined to give sales figures for PFS:Write, although it noted that independent research by Software Access International, Inc., a Mountain View firm, found that the software is the most popular word processing package available for less than $300. More than 1.7 million PFS series packages have been shipped, the spokeswoman said.

Ven-Tel takes wraps off modem

Internal, stand-alone versions offered for IBM micro families

Ven-Tel, Inc. of Santa Clara, Calif., has announced a 2,400 bit/sec. modem for the IBM Personal Computer series in both internal and stand-alone versions, both priced at $695.

The Half Card 24 expansion card reportedly provides communications for the micro at 2,400, 1,200 or 300 bit/sec. The card fits in a short slot in the Personal Computer XT and uses the standard Personal Computer AT command set.

Half Card 24 is said to be fully compatible with Ven-Tel's Half Card 1,200 bit/sec. modem and the Hayes Microcomputer Products, Inc. 1200B. It also supports software available for 1,200 bit/sec. modems and comes packaged with Microstuf, Inc. Crosstalk XVI communications software.

Other features include local and remote test modes, call progress reporting, automatic speed selection and automatic fallback to 1,200 bit/sec. when calling another modem operating at the lower speed.

A spokesman for Ven-Tel said the 2400 Plus stand-alone modem is fully compatible with the Hayes Smartmodem 1200 and the Ven-Tel 1200 Plus. The autodial, autoanswer modem can operate in both asynchronous and synchronous modes.

The stand-alone modem also includes automatic fallback, compatibility with 1,200 bit/sec. software, local and remote test modes and call progress reporting. Both the stand-alone and internal products are AT&T Bell Laboratories 212-A compatible at 1,200 and 300 bit/sec. and V.22bis-compatible at 1,200 and 2,400 bit/sec.

Micro communications package debuts

VM Personal Computing, Inc. of Danbury, Conn., has introduced and shipped Relay Gold, a microcomputer communications software package said to provide multitasking, a new-generation script language, full menu- or command-driven operation, flexible screen scroll-back and a learning mode.

The $225 program is available for all versions of the IBM Personal Computer, IBM-compatible systems, the Data General Corp. Data General/One and the Wang Laboratories, Inc. Professional Computer.

Unlike most other communications software, Relay Gold permits users to continue working on an application while files are being transferred, the company said. The software also allows personal computer users to send a file, receive a file and exchange messages with each other simultaneously.

Script language

The script language allows users to write a script of commands for Relay Gold, using features such as conditional waiting and branching, variable handling and error trapping, according to VM Personal Computing. This reportedly permits the software to handle virtually any communications task.

In micro-to-mainframe communications, Relay Gold is said to allow either the micro or the mainframe to control the operation, permitting cooperative, distributed and multisite processing. Binary, text and data files can be uploaded or downloaded to and from IBM mainframes using the vendor's Relay/3270, with error detection and correction maintained in both directions, the vendor said.

Relay Gold emulates TTY, DEC VT100 or VT52 and IBM 3270 terminals. The software supports the public-domain Kermit and Xmodem protocols in addition to its own bidirectional protocol. Modems are supported from vendors including Hayes Microcomputer Products, Inc., AT&T, Penril Corp., Prentice Corp., Racal-Vadic, Inc., Rixon, Inc. and Telenetics Corp.

Tools link IBM micros

Gateway Communications, Inc. of Irvine, Calif., has unveiled a series of micro-to-micro and micro-to-mainframe communications link software packages for the IBM Personal Computer line. The products were developed by Network Software Associates, Inc.

The five products in the G/SNA series reportedly allow the IBM Personal Computer, Personal Computer XT and AT to communicate with each other and with a mainframe in the IBM Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) environment at speeds up to 19.2K bit/sec.

G/SNApc 3270 allows the micro to access an SNA host by emulating an IBM 3274 controller equipped with a 3278 or 3279 terminal and 3286 or 3287 printer. It sells for $585.

G/BSCpc 3270 permits 3274 emulation in a bisynchronous rather than SNA/SDLC environment and costs $475.

G/SNApc 3770 emulates an IBM 3770 remote job entry workstation for mainframe access, allowing the micro user to submit a mainframe job request and to download, locally process and upload mainframe data. It costs $585.

G/SNA PCcom is a direct micro-to-micro link using the SDLC protocol and including interactive message exchange, file transfer and remote/local IBM PC-DOS command capabilities. It is priced at $475.

G/SNApc Combo provides 3270 and 3770 micro-mainframe communications for a price of $795.

Anex unveils expansion unit

Anex Technology, Inc. of Congers, N.Y., has announced an expansion system that reportedly gives four-user capability to the IBM Personal Computer AT and other Intel Corp. 80286-based micros running IBM's PC-DOS or Microsoft Corp.'s MS-DOS.

The basic configuration of Multi-AT/4, priced at $1,695, includes an eight-slot expansion chassis to support IBM-compatible keyboards and monitors as workstations, a hookup for a second workstation and Anex Multi-DOS, the multiuser software enhancement for PC-DOS.

The chassis is said to provide for memory expansion of up to 640K bytes for each workstation with Anex Multi-RAM memory expansion cards.

The Multi-DOS software replaces selected system calls with new code for faster response time at the same processor speed, according to the vendor. Each workstation is said to maintain the same performance of a stand-alone micro, regardless of the number of workstations running on Multi-AT/4.

Each workstation is able to run the same or different programs concurrently and transparently. PC-DOS-compatible programs can run on any or all of the workstations, Anex said.

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Samna upgrades tool to aid data transfer

Samna Corp. of Atlanta has announced an enhanced version of its Samna+ integrated software that reportedly supports the Document Interchange Format (DIF) for easier data transfer with other spreadsheet packages.

Release 3.1 of Samna+, the so-called Turbo version, is said to perform common operations faster than Release 2.11. DIF support facilitates the exchange of Samna+'s word processing, word-base management and spreadsheet data with Lotus Development Corp.'s 1-2-3 and Symphony.

Samna+ Turbo is targeted for IBM Personal Computer users producing extensive documents with numerical data. The software requires a minimum of 415K bytes of memory, excluding the requirements of the PC-DOS operating system.

The product is priced at $695. Users of Release 2.11 may upgrade for $50 or at no cost if they purchased the previous release after July 23.

Interactive enhances PC Screen

Interactive Data Corp. of Waltham, Mass., has announced an enhanced version of PC Screen — the IBM Personal Computer, Personal Computer XT and AT software interface for the vendor's Standard & Poor Corp. Compustat financial data base.

Version 2 features code rewritten in Lattice, Inc. C language that is said to halve the software's response time. Increased calculating power reportedly allows processing of nested match calculations.

PC Screen examines data on publicly traded companies according to criteria set by the user, including available variables, ratios or user-defined calculations.

PC Screen requires a micro with a minimum of 256K bytes of memory and the user's subscribed access to Compustat.

PC Screen Version 2 is available to current users free of charge. The annual license fee for Interactive Data's financial service is $15,000 for the first user in an organization and $7,500 for each additional user.

Corona Data gives micro MS-DOS, net

Corona Data Systems, Inc. of Thousand Oaks, Calif., has announced that its shipments of the Mega PC micro after Oct. 1 will include the Microsoft Corp. MS-DOS operating system with the MS-Net local-area network software.

The bundled software reportedly allows the Mega PC to expand to up to eight user workstations.

The new operating system and local-area network are included in the price of all Mega PC systems. Current users of MS-DOS 2.11 on the Mega PC may upgrade to DOS 3.1/MS-Net free of charge.

Prices for the Mega PC are $5,345 for the 10M-byte hard-disk version and $1,675 for each additional workstation.

SOFTWARE

■ **Information Technologies, Inc. has cut the price of its terminal emulation software for the IBM Personal Computer line.**

The firm's Linkup System Coax reportedly enables an IBM Personal Computer to connect to an IBM 3274 or 3276 controller and to emulate an IBM 3278 or 3279 terminal.

Linkup System Coax now sells for $495. The product previously sold for $995.

Information Technologies, 7850 E. Evans Road, Scottsdale, Ariz. 85260.

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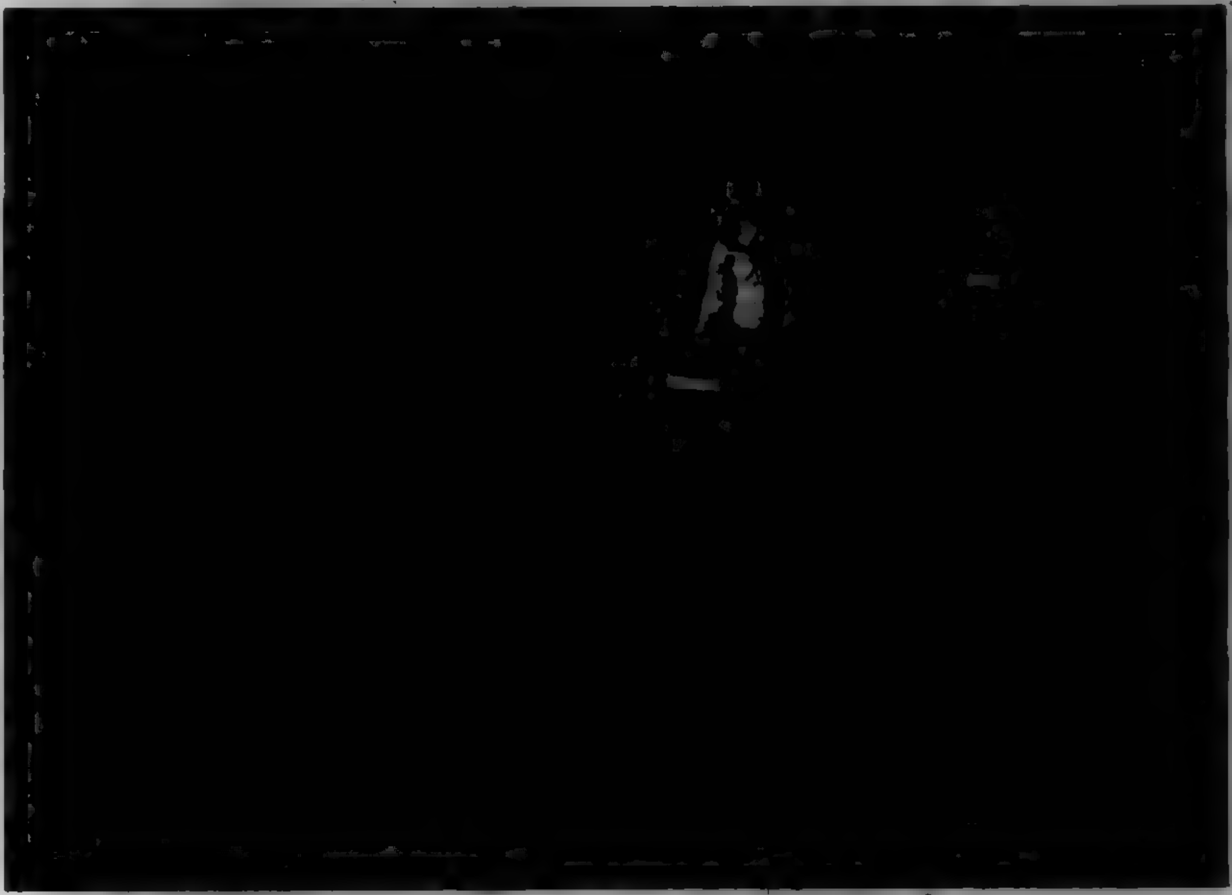

TI announces the portable sales tool for General Electric Plastics' field communications.

Instant access with their technical data base and 24-hour communications with headquarters. That's what the SILENT 700™ Model 707 with its easy access module means to GE Company's Plastics Sales Division. Regardless of time zones and sheer distance from the home office, GE Senior Sales Representative Ray Forester can get the latest product data and cost analysis information he needs to prepare for and close a sale. All he needs is his TI 707 portable data terminal and a telephone.

"With the terminal, I can tap into GE Plastics' data base. When ERIS (Engineering Resins Information System) is accessed by my TI 707, I can provide a customer with technical information and product specifications on the spot and leave him with a printout to review.

"The terminal also acts as my message center when I'm in the field. I transfer messages through the GE Crossfile (electronic mail), and the individuals receive them in written format when they pick up their messages. They seem to respond more promptly with accurate, hard copy in front of them. And since I can receive messages anytime, anywhere, the TI 707 all but eliminates 'telephone tag.'"

Ray Forester believes that the TI 707 is ideal for the salesman on the go. It's lightweight and rugged, takes up approximately one half of a briefcase, and is quiet even at peak operation. "It's exactly the productivity tool we needed for our division's field communications," he concluded.

Find out about the Model 707 SILENT 700 Portable Data Terminal from TI and how it can solve your communications problems. Call 1-800-527-3500, ext. 709; in Canada, 416-884-9181. For more information write TI, P.O. Box 809063, Dept. DTB 1930W, Dallas, Texas 75380-9063.

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From page 59

Software

■ **Boston Business Computing, Ltd. (BBC) has introduced software permitting Digital Equipment Corp. VAX mainframe editing functions to be performed on micros.**

The program, BBC PC/EDT, is said to provide the functionality of VAX EDT Versions 3 through 17 for DEC PDP-11 and of VAX/VMS Version 4 on the DEC Rainbow, the IBM Personal Computer, Personal Computer XT, AT and compatible computers.

Editing features include multiple buffers; undelete line, word and characters; and redefine keyboard.

Users can execute PC-DOS or MS-DOS commands from BBC PC/EDT, the vendor claimed. The software supports directory and subdirectory commands for PC-DOS or MS-DOS Versions 2 and higher and requires one disk drive plus 128K bytes of memory.

BBC PC/EDT costs $200, the vendor said.

BBC, P.O. Box 121, 1211 N. Main St., Randolph, Mass. 02368.

■ **Software for plant and facility maintenance that runs on the IBM Personal Computer XT and AT is available from Project Software & Development, Inc.**

Called Maximo, the package is said to perform work order tracking, inventory control and equipment history applications for a range of sites, including manufacturing sites, hospitals and universities.

Maximo uses a mouse and menu-driven screens that users can design by adjusting parameters such as length and field descriptions. A report writer produces predesigned or user-formatted reports containing data for work orders, inventory or equipment history, the vendor noted.

Written in the C programming language, Maximo runs on the IBM PC-DOS 3 operating system and requires a hard disk and 640K bytes of internal memory. Maximo is available as software only or as a turnkey system. The software-only package includes the program, reference manual, tutorial and mouse for $17,900.

Priced at $22,900, the turnkey system includes the software, a 640K-byte IBM Personal Computer AT, 20M-byte hard disk and color monitor with Personal Computer interface.

Project Software & Development, 20 University Road, Cambridge, Mass. 02138.

■ **Decisionex, Inc. has unwrapped a program that runs on the IBM Personal Computer and compatible systems for calculating the cost of renting commercial space.**

Called Tencost, the program projects all costs of occupancy associated with a single lease from the corporate tenant point of view by accounting for actual or proposed lease provisions and by comparing alternate lease proposals on a present value or level rent annuity basis, the vendor explained.

Tencost costs $495.

Decisionex, 1200 Post Road E., Westport, Conn. 06880.

■ **Assimilation, Inc. announced an interactive program that combines word processing with data base storage, manipulation and merge features for the Apple Computer, Inc. Macintosh.**

The program, known as Business Essentials, contains two modules: Autowriter and Data Merge.

Autowriter, the word processing component, is said to store words, names, sentences and paragraphs in the Macintosh for later insertion into standard correspondence forms.

The data base module, Data Merge, can list 600 items in 16 different fields for cross-referencing and manipulating data, the vendor said.

Business Essentials costs $79.

Assimilation, 485 Alberto Way, Los Gatos, Calif. 95030.

■ **Reference Software, Inc. offered software that lets IBM Personal Computer users access the Random House Dictionary and Random House Thesaurus.**

The package, called Reference Set, allows users to check the spelling of words, find synonyms and insert changes directly into text without having to exit programs or save files.

Macros are provided for storing words and phrases that a writer uses repeatedly and for entering these text strings with one keystroke.

Reference Set runs on the IBM Personal Computer, Personal Computer XT, AT and compatible computers. It requires IBM PC-DOS or Microsoft Corp. MS-DOS Version 2 or higher, 128K bytes of memory and either two floppy disk drives or a hard disk drive.

The software package costs $89. The dictionary and thesaurus are available separately for $69 each.

Reference Software, 2363 Boulevard Circle, Walnut Creek, Calif. 94595.

■ **Primavera Systems, Inc. has released Version 2.5 of its project management and control system, Primavera Project Planner, and Version 1.6 of Primavision, a compatible graphics plotter package. Both run on the IBM Personal Computer line.**

Version 2.5 of Primavera Project Planner provides screen graphics to view activity data in bar charts, resource and cost histograms and resource and cost profiles.

Users can produce graphics displays for all project activities or use the automatic sorting feature, Autosort, to look at only selected activities. Scrolling allows users to view a specific time period or group of activities, the vendor noted.

Continued on page 61

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Continued from page 60

Other project management system enhancements include free-float computation, reporting and sort/select, which allows an activity to be delayed without affecting the start of its successor.

In addition, a Generate command creates text files in the same format used to input records in Primavera's batch system. The command reportedly lets users break large networks into subnetworks by transferring files to a relational data base or report writer for further processing or by reentering files in the project manager for updating progress and performing "what-if" analyses.

Primavision Version 1.6 offers full match lining of multipage plots to produce images that span up to 10 sheets. Relationship lines on time-scaled logic diagrams can be suppressed to compress charts, according to the vendor.

Other upgrades include the ability to increase lettering sizes, thermometer bars for charting progress on a bar chart and network logic diagrams, the ability to save plots to user files and the ability to generate plots using start and end days and months.

Version 1.6 also adds support for Calcomp's 1040 and 1070 series plotters and other 907 Calcomp controller plotters.

Primavera Project Planner, at $2,500, and Primavision, at $1,500, run on the IBM Personal Computer, Personal Computer XT, AT and other compatible microcomputers. A minimum configuration is 512K bytes of memory, a hard disk and DOS 2 or higher, according to the vendor.

Primavera Systems, Suite 925, Two Bala Plaza, Bala Cynwyd, Pa. 19004.

■ **A sales/contact management system for the IBM Personal Computer, Personal Computer XT and compatible machines is available from Business Systems International, Inc.**

Called Salesbase/PC, the package is said to schedule follow-up actions, maintain a data base of contacts, create selected or mass mailings, forecast sales, record customer purchase histories, automatically dial contact phone numbers directly from the data base and create tutorial screens for on-line sales training.

The software also includes an on-line Help facility that can be accessed with one keystroke, the vendor noted.

System requirements are 256K bytes of memory, IBM's PC-DOS or Microsoft Corp.'s MS-DOS Version 2 or higher and a monochrome or color monitor. Salesbase/PC costs $895.

Business Systems International, 20942 Osborne St., Canoga Park, Calif. 91304.

■ **A word processing package that includes a 100,000-word dictionary, thesaurus, document indexer and word library for the Apple Computer, Inc. Macintosh computer is available from Rio Grande Software, Inc.**

Called RGS Wright+, the word processor is also said to provide a math module, graphics package, on-line Help facility, an undo function and the ability to merge data and charts into new and existing documents, the vendor claimed.

RGS Wright+ is compatible with Corvus Systems, Inc., Davong, Inc. and Tecmar, Inc. hard disk drives and interfaces with Apple's Macwrite and Macpaint. The software sells for $195.

Rio Grande Software, P.O. Box 5906, 221 Nolana, McAllen, Texas 78504.

■ **Fast Forward, Inc. has unveiled an electronic bulletin board with security, electronic mail and intercomputer file transfer capabilities for business users of the IBM Personal Computer.**

The electronic mail facility, known as Corporate Bulletin Board (CBB), includes an on-line text editor and is said to let users create public or private memos, certified mail, carbon copies and mailing lists. It reportedly allows the user to upload memos as files, edit and forward memos and keep confidential messages in private mailboxes.

CBB can transfer software programs, spreadsheets, word processing documents and data base files from one unit to another, including exchanging files between the Apple Computer, Inc. Macintosh and IBM Personal Computer. An Xmodem error-checking file transfer meth-

Continued on page 63

Introducing the TI 880 AT Printer.
Because you need a multi-user printer that works overtime.

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Continued from page 61

od gives 99.6% error-free transmission over noisy long-distance lines, the vendor claimed.

Data protection is provided by passwords and security levels. A call log records system activities, including security violations and incorrect passwords.

CBB runs on the IBM Personal Computer, Personal Computer XT, AT and compatible computers. The software supports IBM's Topview and Digital Research, Inc.'s Concurrent PC-DOS in both foreground and background modes, the vendor said.

A minimum configuration is 192K bytes of random-access memory, two floppy disk drives, a Hayes Microcomputer Products, Inc. Smartmodem, asynchronous communications card and communications software.

CBB sells for $495.

Fast Forward, P.O. Box 14706, Portland, Ore. 97214.

■ Semantic Microsystems has announced Macscheme, an implementation of Lisp for the 512K-byte Apple Computer, Inc. Macintosh.

Macscheme is said to conform to the standards for Scheme, a Lisp dialect, and to support such Common Lisp features as lexically scoped variables, first-class procedures, macros, generic arithmetic including floating-point and infinite precision integer arithmetic and the concept of continuations.

The software reportedly provides an interpreter with runtime error detection and debugging plus a Smalltalk-like interface that offers multiple scrolling windows.

Macscheme costs $125.

Semantic Microsystems, Suite 543, 1001 Bridgeway, Sausalito, Calif. 94965.

■ Rockkind Software Corp. unwrapped Ride/DM, a version of the high-level business language Ride, that is said to let programmers develop multiuser data base applications for networked personal computers.

Ride/DM works with The Database Machine, Cogent Data Technologies, Inc.'s board for the IBM Personal Computer, Personal Computer XT and AT, which acts as both file server and hard-disk controller for the network. The Database Machine gives networked micros simultaneous access to shared data files.

The software includes Ride programming features such as a screen forms manager and string processing. Ride/DM sells for $495.

Rockkind Software, 3060 Valmont Road, Boulder, Colo. 80301.

■ Cubicomp Corp. has upgraded its Picturemaker three-dimensional design and animation software — which runs on the IBM Personal Computer — with additional imaging and motion scripting features.

Imaging enhancements include texture mapping to superimpose two-dimensional images onto 3-D objects, shading to create reflective surfaces and the ability to generate transparent objects.

New motion scripting features include velocity profiling, which allows an animator to vary how fast an object accelerates in 3-D space, and metamorphosis, which smoothly transforms a 3-D shape into another.

Picturemaker costs $39,500.

Cubicomp, 3165 Adeline St., Berkeley, Calif. 94703.

■ West End Film, Inc. has added antialiasing to its Artwork three-dimensional display list drawing software for the IBM Personal Computer and compatible computers.

Antialiasing is a technique that is said to eliminate the jagged edges that appear in computer-generated images by ramping the edges on lines and planes of color to fade into the background and appear as a higher resolution image.

Antialiasing in Artwork requires the Number Nine Computer Co.'s Number Nine Revolution graphics card, the vendor said.

Artwork software costs $2,450.

West End Film, 2121 Newport Place N.W., Washington, D.C. 20037.

COMMUNICATIONS

■ Gamma Productions, Inc. has announced the Gamma-Net 3.1 local-area network for the IBM Personal Computer line, based on the MIL-STD-1553 standard developed for digital data communications on board military aircraft.

Gamma-Net 3.1 runs at 2M bit/sec. with a data throughput of up to 400K bit/sec., a spokesman said. The product supports IBM's PC-DOS 3.1 software and can service up to 255 nodes.

The network is installed using coaxial cable and an add-on controller card for each node. The card can be installed in an IBM Personal Computer, Personal Computer XT, AT and compatibles.

Features include collision avoidance and collision detection, error-checking on three levels and packet size varying from 4 bytes to 64K bytes. Cable segments can be as long as 1,500 ft of RG-58-type coaxial or up to 4,000 ft of RG-8-type coaxial without repeaters.

The Gamma-Net 3.1 local-area network is priced at $299.95 per node.

Gamma Productions, Suite 102, 817 10th St., Santa Monica, Calif. 90403.

■ Softronics, Inc. has announced three versions of its Softerm PC terminal emulation software. The program now runs on the Texas Instruments, Inc. Professional computer, NEC Corp. Advanced Personal Com-

Continued on page 66

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MICROCOMPUTERS

Continued from page 63

puter III and the Wang Laboratories, Inc. Professional Computer.

Softerm PC reportedly includes emulation capabilities for more than 30 terminals, including the Digital Equipment Corp. VT100 and VT220, IBM 3101, Data General Corp. D200 and D410 and the Televideo Systems, Inc. 925 and 950. The software also includes file transfer and utility functions.

The software requires a micro with a minimum of 256K bytes of memory, a monochrome or color monitor and Microsoft Corp. MS-DOS 2. The TI Professional computer version also requires an asynchronous communications controller card.

Each of the three versions is available for $195.

Softronics, Suite 203, 7730 N. Union Blvd., Colorado Springs, Colo. 80918.

■ Systech Corp. has released a data communications processor for Intel Corp. Multibus-based microcomputers that was designed to provide serial interfaces with a wide range of standard and custom communications protocols.

The four-channel DCP-8804 board is said to raise system throughput by off-loading communications-related functions from the main computer. It enables Multibus-based machines to operate in asynchronous, bisynchronous, Synchronous Data Link Control, High-level Data Link Control, X.25 and Systems Network Architecture communications protocols.

For OEMs, the company also provides AT&T Unix-compatible software drivers that enable the OEMs to adapt the DCP-8804 to their computers.

The DCP-8804 with 256K bytes of random-access memory costs $3,575. The X.25 optional software costs $7,000. Installation of an IBM 3780 emulation package costs $4,500, and the license fee for remote job entry software is $200.

Systech, 6465 Nancy Ridge Drive, San Diego, Calif. 92121.

■ Avatar Technologies, Inc. has announced a hardware and software system that reportedly transfers files between the Apple Computer, Inc. Macintosh and a host IBM mainframe running CICS, TSO or CMS.

Macmainframe was designed for use with Avatar's standard host file transfer software running on the mainframe. Macmainframe is said to give Macintosh users full IBM 3278 terminal emulation and either local or remote connection to the host, with dial-in capability for multiple users.

The hardware unit connects an IBM 3274 or 3276 control unit to the Macintosh modem port with coaxial cable. It reportedly provides an auxiliary RS-232 port with terminal pass-through capabilities for asynchronous communications.

The Macmainframe software reportedly operates in conjunction with Apple's Macterminal program, allowing file transfers to be set up in standard Macintosh format with the mouse or keyboard. Macmainframe is compatible with Avatar's Turbo series of IBM Personal Computer-to-mainframe links.

Macmainframe is priced at $1,395.

Avatar Technologies, 99 South St., Hopkinton, Mass. 01748.

■ Gateway Communications, Inc. has announced Advanced Netware/G, a network operating system compatible with IBM's PC Network and PC-DOS 3.1 that reportedly supports up to eight file servers on a local-area network.

Advanced Netware/G runs on Gateway's G/NET, a network that interconnects the IBM Personal Computer, Personal Computer XT, AT and compatible computers and is said to make G/NET compatible with the standard defined by Microsoft Corp.'s MS-NET and IBM's PC Network with PC-DOS 3.1.

Multiuser applications software running under PC-DOS 3.1 will reportedly operate unmodified in the Advanced Netware/G environment.

Features of the network operating system include electronic mail, remote workstation access, full-function printer spooling, system security and applications development support.

Advanced Netware/G is priced at $1,595. Each file server on a network requires a separate copy of the software. Netware/G users can upgrade to Advanced Netware/G for $295.

Gateway Communications, 16782 Red Hill Ave., Irvine, Calif. 92714.

■ Grafpoint unveiled a Tektronix, Inc. 4107 graphics terminal emulation package that lets MS-DOS-based personal computers locally run mainframe graphics software and off-load graphics operations from a host.

Called Tgraf-07, the software supports from 640- by 480-pixel to 1,024- by 1,024-pixel resolution boards, including the IBM Enhanced Graphics Adapter, the IBM Professional Graphics Adapter, the Verticom, Inc. M-16 and the TAT Galaxy series.

Additional boards supported include the 720- by 300-pixel resolution Texas Instruments, Inc. Professional and the 640- by 400-pixel resolution AT&T Personal Computer 6300, NEC Corp. APC III and Sperry Corp. Personal Computer.

Tgraf-07 is said to be compatible with such mainframe packages as Manufacturing & Consulting Services, Inc. Anvil-4000 three-dimensional computer-aided design system and United Computing Services, Inc.'s Ansys.

Tgraf-07 sells for $995.

Grafpoint, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

STORAGE

■ Cipher Data Products, Inc. has introduced its Series 9000 system, a transportable ¼-in. tape subsystem for use with the IBM Personal Computer line.

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Two years ago...

SAS Institute launched an effort to develop a subset of the SAS® Software System for the IBM Personal Computer. After careful study, we agreed that C was the programming language of choice. And that the Lattice® C compiler offered the quality, speed, and efficiency we needed.

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Development had progressed so well that we expanded our efforts to include the entire SAS System on a PC, written in C. And to insure that the language, syntax, and commands would be identical across all operating systems, we decided that all future versions of the SAS System—regardless of hardware—would be derived from the same source code written in C. That meant that we needed a C compiler for IBM 370 mainframes. And it had to be good, since all our software products would depend on it.

So we approached Lattice, Inc. and asked if we could implement a version of the Lattice C compiler for IBM mainframes. With Lattice, Inc.'s agreement, development began and progressed rapidly.

Today...

Our efforts are complete—we have a first-rate IBM 370 C compiler. And we are pleased to offer this development tool to you. Now you can write in a single language that is source code compatible with your IBM mainframe and your IBM PC. We have faithfully implemented not only the language, but also the supporting library and environment.

Features of the Lattice C compiler for the 370 include:

- **Generation of reentrant object code.** Reentrancy allows many users to share the same code. Reentrancy is not an easy feature to achieve on the 370, especially if you use non-constant external variables, but we did it.
- **Optimization of the generated code.** We know the 370 instruction set and the various 370 operating environments. We have over 100 staff years of assembler language systems experience on our development team.
- **Generated code executable in both 24-bit and 31-bit addressing modes.** You can run compiled programs above the 16 megabyte line in MVS/XA.
- **Generated code identical for OS and CMS operating systems.** You can move modules between MVS and CMS without even recompiling.
- **Complete libraries.** We have implemented all the library routines described by Kernighan and Ritchie (the informal C standard), and all the library routines supported by Lattice (except operating system dependent routines), plus extensions for dealing with 370 operating environments directly. Especially significant is our byte-addressable Unix®-style I/O access method.
- **Built-in functions.** Many of the traditional string handling functions are available as built-in functions, generating in-line machine code rather than function calls. Your call to move a string can result in just one MVC instruction rather than a function call and a loop.

In addition to mainframe software development, you can also use our new cross-compiler to develop PC software on your IBM mainframe. With our cross-compiler, you can compile Lattice C programs on your mainframe and generate object code ready to download to your PC.

With the cross-compiler, we also offer PLINK86™ and PLIB86™ by Phoenix Software Associates Ltd. The Phoenix link-editor and library management facility can bind several compiled programs on the mainframe and download immediately executable modules to your PC.

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Continued from page 94

The Series 9000 reportedly permits Personal Computers to read and write to either 10½- or 7-in. magnetic tape reels, as used on such larger systems as the Hewlett-Packard Co. 64000 mainframe.

The unit includes a controller card and a cabling and program diskette for use under the IBM PC-DOS 2 or later. The 9-track drive can read and write data in the IBM/Ansi-compatible, phase-encoded format at 1,600 bit/in., or 1,600/3,200 bit/in. in its dual mode.

The price of the Series 9000 ranges from $5,995 to $10,995.

Cipher Data Products, 10101 Old Grove Road, San Diego, Calif. 92138.

■ **Advanced Digital Information Corp. has introduced a ¼-in. cartridge tape storage system that reportedly offers general-purpose interface bus compatibility to data logging and automatic test equipment.**

The Model 570 Data Library, which connects to IBM's Personal Computer, Personal Computer AT and XT and compatibles, is said to provide 67M bytes of formatted user capacity. The data cartridges have permanent forward/reverse reading block keys that establish block locations.

The unit costs $3,900.

Advanced Digital Information, P.O. Box 2996, Redmond, Wash. 98073.

■ **Acknowledge, Inc. has introduced its AN-9600-PC 9-track magnetic tape subsystem for use with the IBM Personal Computer and Wang Laboratories, Inc. Professional Computer.**

The product reportedly permits file transfer between mainframes and personal computers by way of standard ½-in. tape.

Included with the AN-9600-PC reportedly are software utilities to allow conversion of Ebcdic mainframe files into the Ascii format used by personal computers.

It costs $4,995 for the IBM Personal Computer and $5,995 for a Wang-compatible unit.

Acknowledge, 10 Pennsylvania Ave., Framingham, Mass. 01701.

■ **National Memory Systems Corp. has introduced its NMS 01-OL 400M-byte laser optical memory system for use with the IBM Personal Computer line.**

The NMS 01-OL reportedly has a 15-msec access time and write-once capability. It stores 400M bytes of data on removable 5¼-in. media.

Also included in the unit are said to be a hard-disk storage unit, available in capacities ranging from 84M bytes to 335M bytes. The unit's host controller serves as interface and controller for both the hard disk and the laser disk.

The unit costs $15,900 with a 335M-byte hard disk.

National Memory Systems, 355 Earhart Way, Livermore, Calif. 94550.

■ **Genoa Systems Corp. has unwrapped internal and external 60M-byte cartridge streaming tape backup subsystems for IBM Personal Computer XT, AT and compatible computers.**

Model 3160 (internal) and 3260 (external) subsystems of the Galaxy line back up a 20M-byte hard disk in less than 4.3 minutes, according to a spokesman. Data transfer reportedly occurs at 86.37K byte/sec. at 90 in./sec. streaming mode speeds.

Features include multiple-window software, menu-driven commands, a context-sensitive on-line Help facility, an intelligent command line editor for editing entries without retyping and compatibility with local-area networks from 3Com Corp., Novell, Inc. and other vendors. An IBM PC-DOS toggle lets users run other applications or PC-DOS commands without exiting a Galaxy program in progress.

Reports are said to include partial or full directories plus tape utilization reports after backups.

The subsystems run under PC-DOS 2, 2.1, 3 and 3.1 and require 256K bytes of memory, a floppy disk drive to install the software, an 80-char. by 25-line color or monochrome display and two expansion card slots.

The system includes tape drive, interface card, cable, ¼-in. streaming tape cartridge, software in a 5¼-in. diskette and documentation.

Prices are $1,395 for the Model 3160 and $1,645 for the Model 3260.

Genoa Systems., 73 E. Trimble Road, San Jose, Calif. 95131.

From page 57

Micro vendors willing to deal

lar bullet for its net version of Word.

That introduction also represented another quiet sign of change, in that Microsoft Word for Networks is the supplier's first application specifically tailored for a local-area network. The debate about pricing of network software may be over before anyone notices.

There's some chance that the debate will be over before Lotus figures out its network policy. Lotus has been announcing plans to announce network plans for about a year now, so the current hints don't really send that delicious shiver of anticipation up and down the spine.

The 1-2-3 upgrade policy finally detailed earlier this month does show that Lotus is listening to its larger customers, who will get different pricing and other arrangements.

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COMMUNICATIONS

Communications tool for file transfer bows

By John Gallant

NATICK, Mass. — Software Research Corp. recently announced multivendor communications software that will allow processors from IBM, Digital Equipment Corp. and Wang Laboratories, Inc. to share files and messaging capabilities.

Software Research's Strategic Network Environment (SNE) Release 1.1 File Transfer Version 1. The first of a planned series of SNE products, the File Transfer software runs as an application under IBM's MVS or MVS/XA, DEC's VMS, Wang's VS, IBM's PC-DOS and Microsoft Corp.'s MS-DOS operating systems and supports messaging and a variety of file transfers between the diverse systems.

Using an IBM mainframe under MVS as a central or controlling node, a spokesman for Software Research said, SNE File Transfer allows users to link DEC's VAXs, Wang's VS minis and IBM's Personal Computers, Personal Computer XTs and compatibles as nodes off the mainframe. The software provides the file transfer and messaging capabilities between any two of the nodes.

SNE File Transfer supports text or binary data file structures including IBM's Vsam, Qsam, partitioned data set and generation data groups; DEC's RMS; Wang's DMS; and PC-DOS and MS-DOS sequential files. In addition, the product performs any Ascii or Ebcdic data format conversions required to transfer supported files among different environments.

The spokesman said the product, dubbed a "universal file transfer network utility," allows users to assign symbolic

Continued on page 72

Peer-to-peer protocol debuts

By John Desmond

BERKELEY, Calif. — Orion Group, Inc. has announced the Orion SNA6.2 Peer Communications Facility, said to implement fully IBM's System Network Architecture (SNA) peer-to-peer communications protocols Logical Unit 6.2 (LU6.2) and Physical Unit 2.1.

The protocols enable microcomputers, minicomputers, mainframes, terminals, file servers and other devices to exchange information directly rather than going through a central host, the company said.

The networking facility was written in C under AT&T's Unix System V and was developed in conjunction with Apple Computer, Inc. The package requires no custom hardware and is being directed at OEMs and value-added resellers. Apple, the first licensed customer, is using the product to connect indirectly its Macintosh microcomputers with an IBM System/38, according to a spokesman.

Orion President Paul Rampel maintains his product is the first third-party product to offer full implementation of the IBM SNA 6.2 and 2.1 protocols, which many believe will become the industry standard for passing data between unlike computer systems. "These network protocols have been identified by IBM as a point of convergence for all its equipment, and no hardware vendor will be able to ignore it," he said. "Companies that implement the LU6.2 standard first will be way ahead of the game."

Rampel maintained that his product helps provide a missing capability of Unix System V — advanced networking capability. "We have a distinct advantage in the Unix marketplace," he said.

Continued on page 72

AT&T adds microwave bypass

Having once said it would not encourage users to bypass local telephone companies, AT&T has introduced two microwave bypass systems, an endorsement that will sap revenues from the former Bell operating companies.

The AT&T Network Distribution System product line includes a low- and high-end system. The low-end Network Distribution System Digital Radio 23 (DR23) is provided under a multimillion-dollar private-label contract by Digital Microwave Corp. in Santa Clara, Calif. It is a 23-GHz digital microwave system that supports transmission rates from 1.544M to 6.312M bit/sec. for up to 10 miles.

At 6.312M bit/sec. — commonly referred to as T2 speeds — DR23 is said to be able to accommodate up to 96 digital voice channels, each operating at 64K bit/sec. The system's antenna can be installed on a roof or within an office, facing out a window.

Both the DR23 and its bigger brother, the DR6, provide point-to-point links for data or voice communications. The links can be used in common bypass applications, such as linking corporate facilities or linking a company directly to its long-distance communications carrier, thus eliminating the need for using the telephone company's local loops.

The high-end DR6, developed by AT&T Bell Laboratories and manufactured by AT&T's Network Systems Group, is a version of a system that AT&T has been selling to the divested Bell operating companies for their use or resale since August 1984. The system includes a 6-GHz digital microwave radio that transmits at 45M bit/sec., or T3 speeds, at distances up to 40 miles, supporting up to 672 voice channels at 64K bit/sec.

AT&T reported that it would provide in-

Continued on page 72

■ Wang Laboratories announced the Wang Telephone Message Exchange, an operator-attended communications facility for telephone messaging and directory services/73.

Few MIS execs manage both voice and data functions

Poll shows most firms expect no integration

By Paul Korzeniowski

The MIS manager who oversees both corporate data and voice communications functions represents the exception rather than the rule.

That was a finding from a *Computerworld* survey sent to a random sampling of subscribers in July. The 1,000 surveys were mailed with a dollar incentive, and 422 readers replied.

The survey found that in a slight majority of companies, separate departments manage voice and data communications (see chart). Few of the companies that manage the two functions with different departments plan to integrate the two functions (see chart).

As one may expect in companies where the two functions are split by department, the MIS manager rules data communications. Close to 85% of the companies listed data communications as the responsibility of the MIS department. Less than 2% said a communications department was responsible for data communications.

In the cases where voice and data functions were split, the department overseeing voice communications was less clearly defined. In 35% of these companies, the director of operations or administrative services supervised voice communications. Other titles mentioned were vice-president, assistant vice-president and telecommunications manager. In three out of four cases, these people worked in general administration.

Where voice and data functions are merged, two-thirds of the companies said the MIS department supervises both functions. In 20% of the cases, general administration oversees both functions.

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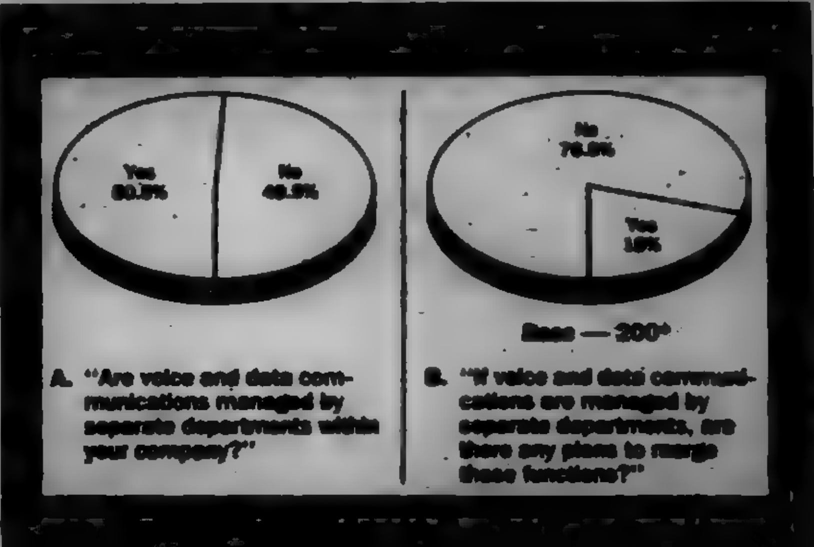
MITCHELL J. HAYES



A. "Are voice and data communications managed by separate departments within your company?"

B. "If voice and data communications are managed by separate departments, are there any plans to merge these functions?"

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[illegible]

ITT

MIS/DP and communications are peer operations under a single executive.	35.3%
MIS/DP and communications are separate operations in separate groups.	30.5%
Communications is under MIS/DP.	29.8%
MIS/DP is under communications.	1.0%
Other	3.4%
Base	416

From page 67

Few executives manage both voice and data

Overall, only 30% of the companies surveyed said their MIS managers also oversee communications responsibilities (see chart). In 65% of the companies, MIS and communications are ruled by different groups. Of these companies, roughly half have communications and data processing as peer groups in the same department; the rest have MIS and communications reporting to different departments, with MIS typically reporting to finance and communications to general administration.

Interestingly, few companies reported they had a telecommunications director. Asked what the title of the person was that manages voice, more than 35% said director of operations/planning/administrative services. Only 12% said they had a telecommunications manager.

The survey also examined how local-area networks and private branch exchanges were used at these companies. These results will be printed in next week's *Computerworld.*

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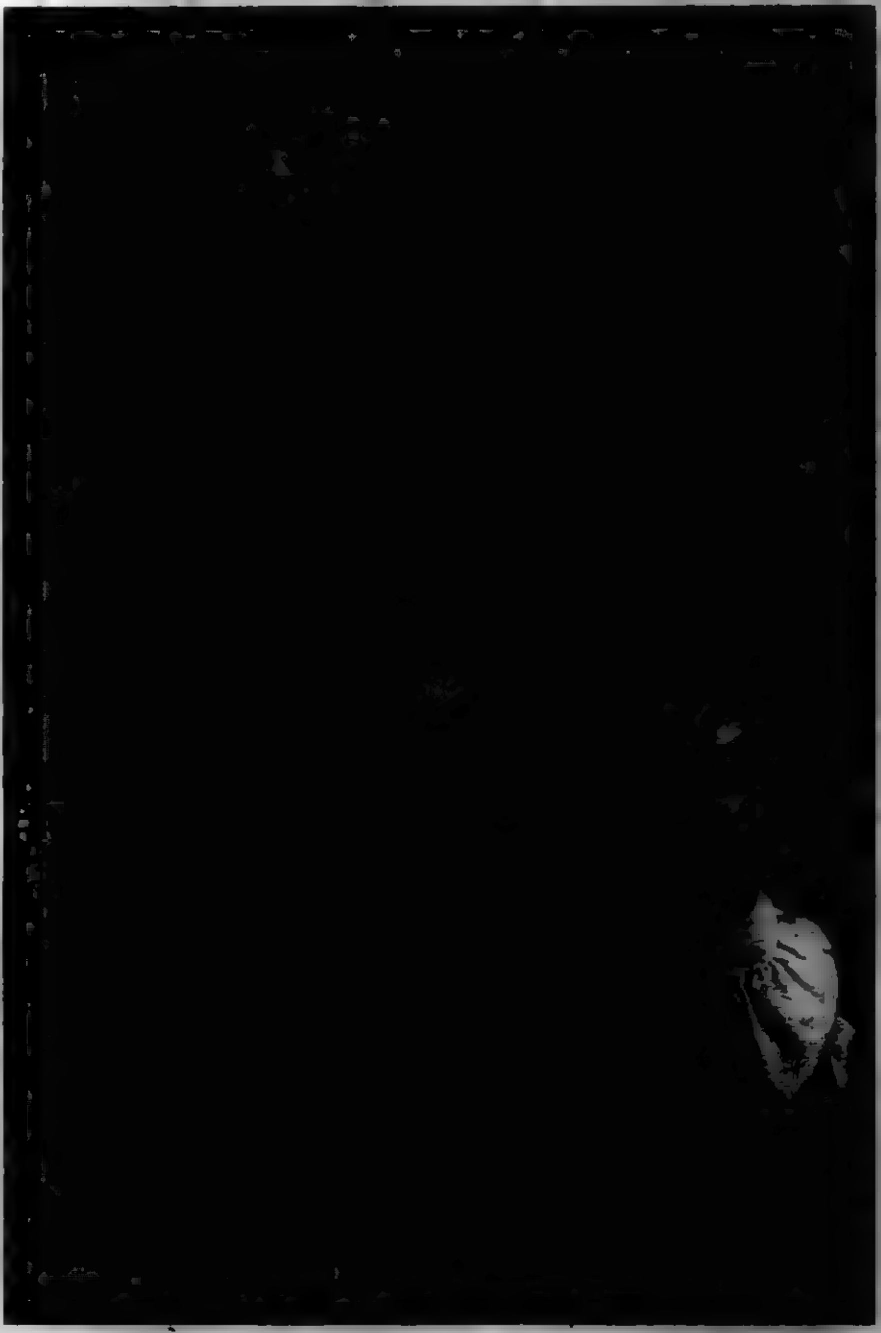

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From page 67

Peer-to-peer protocol debuts

Physical Units are used to describe types of devices used within an IBM SNA-type network. Equipment based on the Physical Unit 2 standard can only address IBM 370-based architecture in a hierarchical master/slave relationship. The Physical Unit 2.1 emulation enables peer-to-peer communications between a range of systems, including System/36 minicomputers and System/38 superminis, IBM 5520 Office Administration Systems, IBM Displaywriters and IBM Scanmasters.

Although Physical Unit 2 supports only a single communications link and one logical session per link, Physical Unit 2.1 can support up to 512 concurrent logical links, enabling that number of users to share the expense of a single physical cable.

"We don't think hardware, storage or the operating system are the constraints today. The constrained resource today is access to data," Rampel said. He noted that microcomputer board manufacturers can put the Orion software onto chips, and developers of local-area networks can use the facility as a gateway to connect two nets.

The principal advantage of LU6.2 is its accommodation of intelligent, low-cost network devices. "These days, data must be shared. The LU6.2 network design recognized this by permitting any device to talk directly to any other device without intervention."

The company offers its SNA6.2 Peer Communications Facility on a license and royalty basis.

Wang rolls out TMX facility

Wang Laboratories, Inc. of Lowell, Mass., has announced the Wang Telephone Message Exchange (TMX), an operator-attended communications facility for telephone messaging and directory services. The product features 24-hour telephone message retrieval without operator assistance.

With the Wang TMX, a telephone call is forwarded from a person's telephone to a Wang TMX Message Desk operator. The operator's workstation, a Wang Professional Computer linked to a Wang VS minicomputer supporting Wang Office Software, displays a personal profile created by the called party. The operator uses the profile to give a customized response and appropriate information, such as a relayed message or alternate contact.

The caller has the option of leaving an electronic message in the user's Wang Office mailbox, forwarding the call to a designated alternate or directing the call to the Wang DVX voice mail system for the caller to leave a personalized voice message.

The Wang TMX permits notification and retrieval of messages from any workstation in the Wang Office network. Wang Office messages can also be sent to a printer from a workstation or push-button telephone, according to the vendor.

The Wang TMX package consists of hardware and software for the Wang VS and Professional Computer. Hardware requirements include a VS with 2M bytes of main memory and a minimum of 147M bytes of disk storage, Wang Office software and a Wang Professional Computer with 640K bytes of memory.

The Wang TMX package will be available in the U.S. in the first quarter of 1986. The Professional Computer portion of Wang TMX costs $3,500 per workstation. The VS portion costs $500 per VS processor for a stand-alone system and $1,600 per VS processor when integrated with Centrex or the Meridian SL-1.

From page 67

Communications tool for file transfer bows

file names rather than learn specific vendor file naming and attribute conventions. It features interactive facilities for users to enter simple transfer requests and more complex sequences where request dependencies are required.

SNE File Transfer also allows a data processing professional to implement procedures in the product that automatically refresh file inventories within information center processors from production systems.

The system, which runs as an IBM Vtam application under MVS, supports IBM RACF security software and other Wang and DEC security systems.

The Software Research spokesman said that future releases in the SNE line will include electronic document interchange capabilities and support for IBM's VM, both of which are slated for release in the first quarter of 1986.

SNE File Transfer is currently available. The initial license fee is approximately $17,500 for an MVS host, $6,000 per minicomputer and $400 per personal computer.

From page 67

AT&T adds microwave bypass systems

dividual components, such as stand-alone radio products, or complete engineering, installation and maintenance. Options include local and remote alarms, centralized maintenance, hot standby protection, power options and signal encryption.

The Network Distribution Systems are custom priced and are available now from AT&T's Large Business Systems direct sales force. Prices for the simplest configuration start at $30,000.

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SYSTEMS & PERIPHERALS

SHOP TALK/BAO T. NGUYEN

DBMS vs. data base machine

Despite advances, the technology of software data base management systems still has problems. These problems include excessive overhead and limited performance. A software DBMS consumes a significant portion of the resources of a general-purpose computer.

Performance suffers when many users access data and when the information required from the system calls for data relationships different from those originally defined for the system. Although the relational DBMS is much easier to use than its Codasyl counterpart — reducing both initial program development costs and long-term maintenance costs — the flexibility of the relational DBMS is appreciably slower. This is due to a fundamental mismatch between the architecture of CPUs designed for the sequential execution of algorithms and the architecture required for data management. Data management is inherently a parallel activity.

In other words, the general-purpose processor is asked to do something it was not designed to do.

Data base machines attempt to overcome the deficiencies associated with conventional architecture by using a special-purpose, functional architecture designed to handle different functions of data management simultaneously. They are used as back-end machines, freeing the host computer to perform the functions for which it is better suited, and as data base servers in a collection of networked workstations or cluster minicomputers.

The data base machine is one of two major categories of data base processors. While the data base machine offers all DBMS functions, the I/O off-load processor, the other category, is limited to the physical retrieval of data. The I/O off-load processor system does not offer DBMS, data dictionary or nonprocedural facilities.

The data base machine places the data base management function on a separate processor with exclusive access to the data base. The host machine collects data management requests and transmits them across an inter-

Continued on page 82

Nguyen is a specialist in information systems technology and information movement and management for the U.S. Air Force assistant chief of staff for information systems.

Single-vendor service

MIS execs report growing interest in concept

LEXINGTON, Mass. — The single-vendor service concept, where one vendor maintains all of a customer's equipment regardless of the manufacturer, is of increasing interest among management information systems directors, according to the Ledgeway Group, a market research and consulting firm.

In a recent telephone and mail survey of MIS directors in Fortune 1,000 firms, Ledgeway found a growing interest in having a primary vendor maintain other vendors' products, according to Ledgeway managing director Richard C. Munn. Ledgeway noted that 46% of the surveyed MIS directors indicated that they might be interested in the single-vendor concept. That 46% figure was obtained by combining the 15% who said, "yes" they would consider single-vendor service, and the 31% who answered "maybe" to the same question.

Munn said the most common benefits cited in connection with single-vendor service were elimination of finger-pointing among vendors and better coordination of diagnoses and repairs.

In addition to increasing interest among customers, the single-vendor service concept is gaining popularity among vendors, according to Munn. Among those vendors, the idea receiving "considerable attention" is that of having a single vendor act as the customer's service manager. Munn said that in such a role, the single vendor is responsible for fault diagnosis and isolation, repairing or managing a subcontractor making the repair and areas such as service contract administration.

But Munn noted that the service-manager concept is less popular with customers who prefer having their primary vendor service all equipment.

He also cited two surprising findings of focus groups conducted in conjunction with the survey. Those groups, one with customers and another with district and branch service managers, re-

Continued on page 81

■ Free exchange of information between systems is the key to true computer-integrated manufacturing/79

■ Honeywell Information Systems will offer Storage Technology tape drives on its mainframe products/82

Off-site storage protects data

HARD TALK
Donna Raimondi
CW Staff

Information is as important a resource as labor, capital and raw materials. As users begin to accept the need to protect their data, they would be wise to investigate storing copies of their magnetic media in safe places.

That is the advice given by Reginald Weller, president of National Safe Depository in San Jose, Calif., in a paper titled "Off-Site Data Storage: A Changing Industry."

Although Weller is president of a storage company and, therefore, has a vested interest in how people store their information off site, it is worth looking at his views. Too many companies still trust the Fates to keep their data safe and feel that they need not participate in disaster planning.

Information is one of the most fragile, volatile and easily destroyed of all corporate assets, and yet it is among the easiest of resources to preserve. Management can quickly calculate the cost of hardware and software, but few can state the value of their data base.

A key element in disaster planning and management should be an off-site storage program for one — or preferably two — sets of duplicate backup records, Weller advised. Off-site storage costs less than on-site storage, he said. He pointed out that the average storage account costs $200 to $300 per month, while a single in-house security guard could cost $1,800 per month.

The odds of a company's data base being destroyed decrease dramatically if the data base is stored in two or three locations, the paper said. One common yardstick for how far off site that storage should be is that data should be retrievable in two to four hours. This criterion varies from company to company, but most companies

Continued on page 81

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Three important questions:

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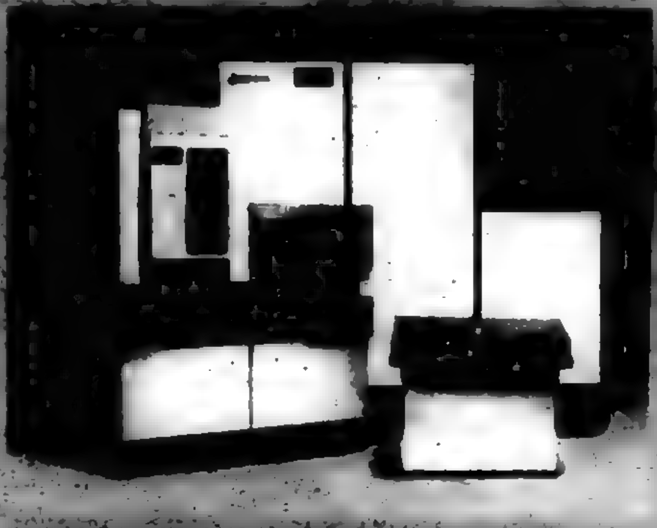
Our recently enhanced 3B Computers offer the performance advantage of UNIX™ System V in a departmental system, yet can be networked with existing MS-DOS™-based PCs.

Built on the principle of non-obsolescence, the DATAPHONE® II System is a full line of high-performance modems, multiplexers, data service units, and diagnostic control devices. These combine data transmission and sophisticated network management capabilities, thereby maximizing uptime of either simple or complex networks.

2. Will these products deliver the capabilities I need today? Am I getting my money's worth in terms of price and performance?

AT&T can answer "yes" to both questions.

reality of your computer needs. bought is just as important



THE COMPUTERS WITH THE FUTURE BUILT IN

[illegible] Computers

Our line of high-performance computer products can be linked together to cost effectively deliver end-to-end communication and information management—from desktop to department, and from department to mainframe.

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Taking advantage of the UNIX System's multi-tasking, multi-user features, the AT&T UNIX PC offers a unique combination of power, ease of use and communications capabilities.

Our UNIX System V-based 3B Computers—five new or enhanced supermicro and minicomputers—provide distributed and departmental computing at a competitive cost per user.

We also offer full-featured, reliable peripherals—synchronous and asynchronous terminals, printers and plotters. Compatible with AT&T Computers and other vendors' systems, they deliver a full range of solutions to your peripheral requirements.

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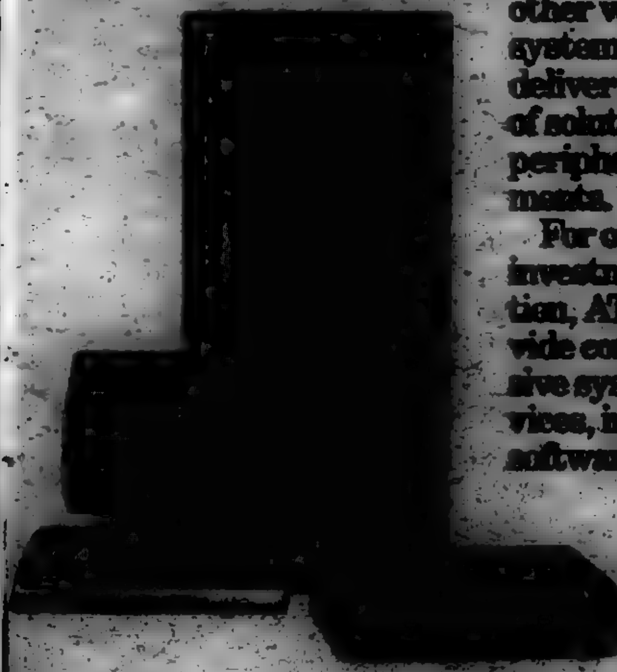

AT&T DATAPHONE II System

3. What about tomorrow? Will these products keep my growth path open to accommodate future needs, especially in terms of networking capabilities?

No need to worry about the future when you start with The Computers With The Future Built In from AT&T.

As technology advances, AT&T will enhance and support its products, increase performance, and maintain compatibility with industry standards.

Our commitment to an open architecture and support of industry standards—MS-DOS, UNIX System V and SNA/3270 and BSC/3270 protocols—gives you the flexibility to satisfy your applications needs.

The power of the AT&T 3B Computer family can be networked in a variety of ways. Because they run UNIX System V, the 3B Computers offer an opportunity to build an open system with hardware independence and software portability.

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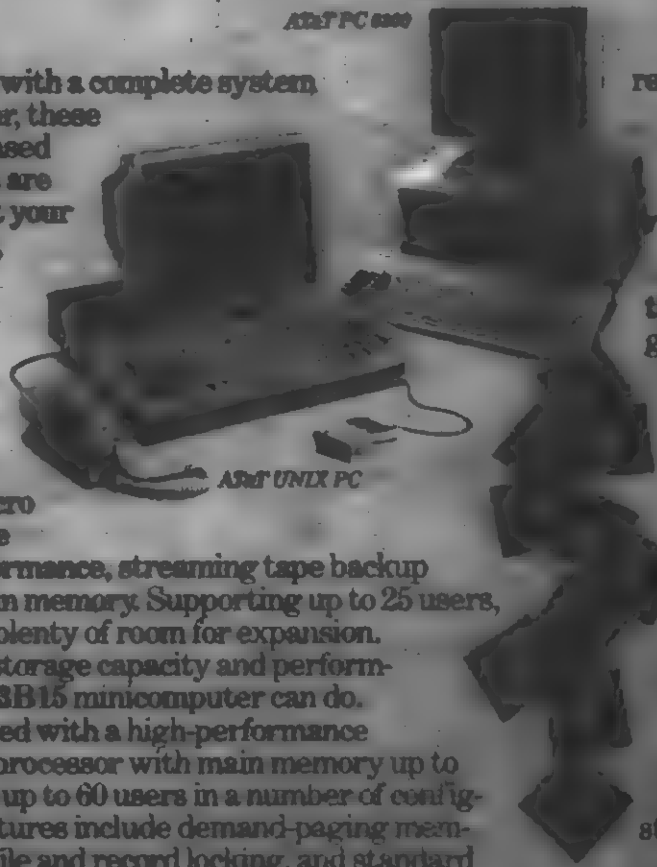
For a more detailed look at what AT&T computer products can do for you, just turn the page.

See what makes AT&T computer products a sound investment.


AT&T PC 6300

AT&T UNIX PC

Whether you start with a complete system or a single computer, these communications-based computer products are designed to protect your investments—past, present and future.

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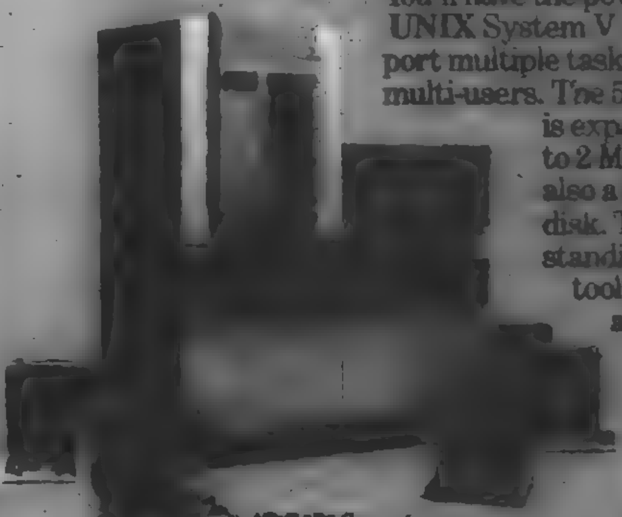
AT&T 3B5 Computer
AT&T 4418 and 4425 Terminals

The DATAPHONE II System is a family of digital and analog modems, multiplexers, data service units, and diagnostic control devices for multilevel network management and control. We have added the **DATAPHONE II [illegible] and 2600 Series Digital Data Service Units** to the family. An integrated DSU and channel service unit in one compact, easy-to-operate unit. It features a graphic LCD display for instant recognition of test results and is compatible with DATAPHONE II equipment.

The AT&T 6540 family offers true 3270 compatibility, and a choice of keyboards, controllers and screen colors. With Asynchronous Host Adapter option, you'll be able to switch back and forth easily between synchronous and asynchronous applications.

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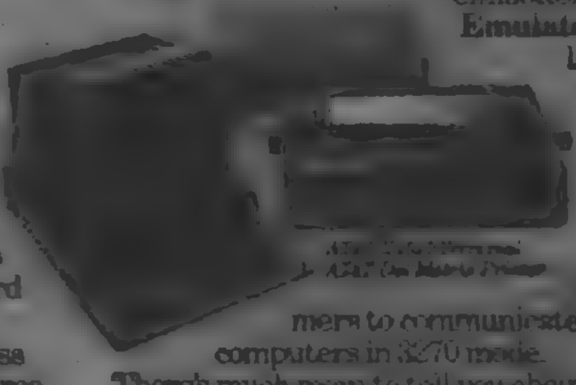
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AT&T Application Program Interface access routines allow C language programmers to communicate directly to host computers in 3270 mode.

There's much more to tell you about AT&T computer products, and how they can help solve your business problems.

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True CIM hinges on information link between systems

By Sheila L. Cotter
and Charles S. Skinner
Special to CW

True computer-integrated manufacturing (CIM) will not become a reality until manufacturers can freely exchange detailed product, manufacturing and other information among a variety of systems, be they computer-aided engineering (CAE), design and manufacturing or others.

For example, product data is needed to perform numerous manufacturing tasks such as numerical control equipment programming, process planning, tool design, production planning and control, quality control and assurance and the like. Similarly, manufacturing data is required by the engineering/design function to achieve cost-effective products.

The information link between CAD, CAE and CAM systems, unless on a system purchased from a single supplier, is still maintained largely with paper documentation using engineering drawings. This method requires a great deal of product definition interpretation. Automating this link requires a common product description that must be characterized by the following:

- Complete from a manufacturing as well as a design perspective.
- Usable by all the applications that need product data.
- Understandable by both people and the computer.

Issues to resolve

Even though the CAD marketplace is substantial, growing and includes some powerful key players, it has some fundamental issues to resolve:

- Failure to capture all product definition data needed for manufacturing and other functions of the enterprise.
- Inconsistent product information formats.
- Lack of compatibility of CAD equipment and software supplied by a variety of manufacturers.

Risks involved

Committing to a single supplier for one's CAD/CAM systems to acheive compatibility and integration is fraught with risks:

- The supplier may not continue to offer the most cost-effective systems available.
- Systems from a variety of suppliers may be required to meet a broad array of needs by numerous units of the enterprise.
- Compatibility of multisupplier CAD and CAM systems is required for the enterprise to interact effectively with customers and vendors.

Taking CAD systems as a case in point, communications between dissimilar systems are made possible through compatible networking and a common language like Iges.

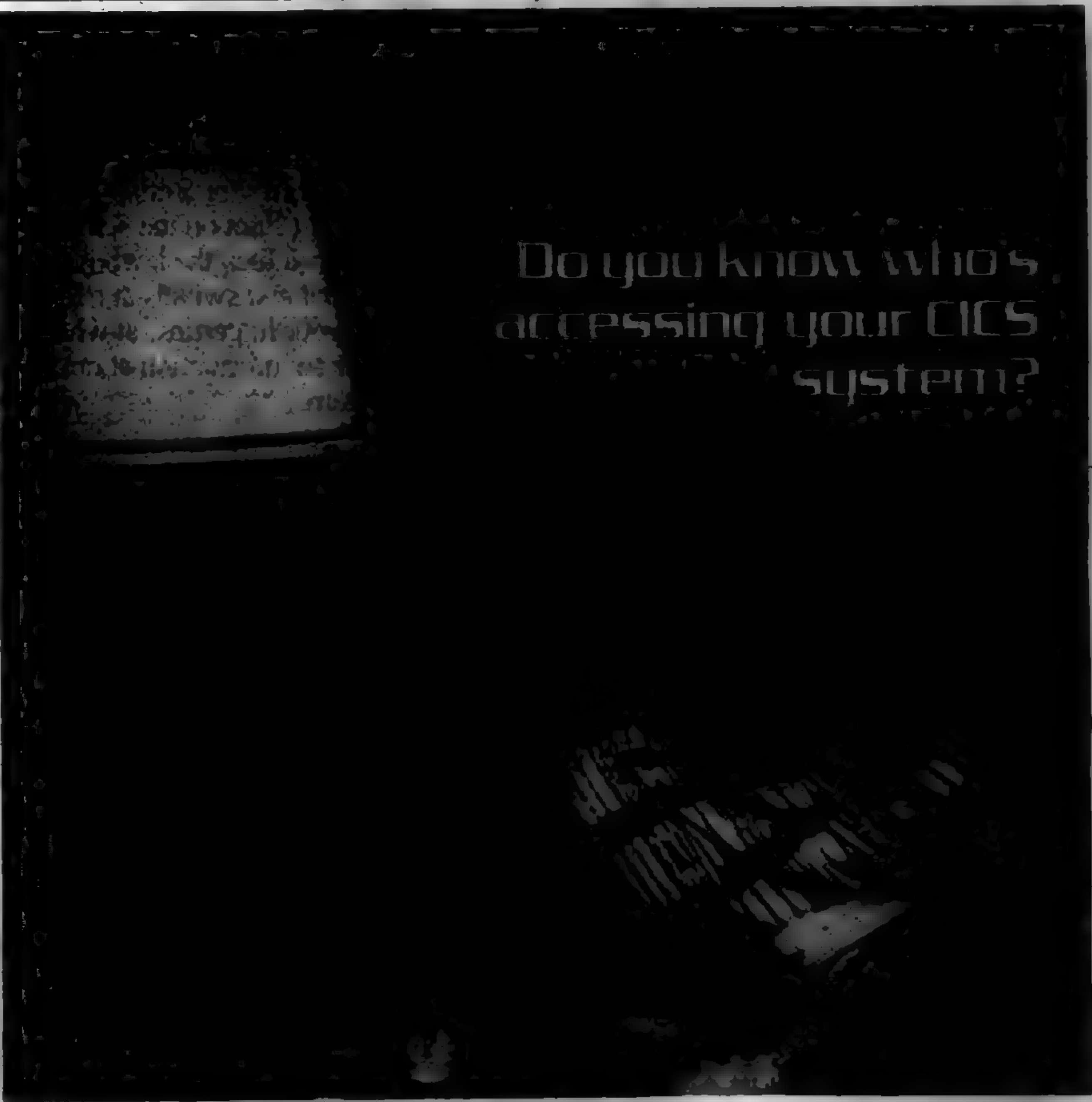
Booz, Allen & Hamilton, Inc. conducted a nine-month study to test 12 different vender and user-developed Iges translators to determine the degree of compatibility between dissimilar CAD systems and thus the quality and level of implementation of the Iges standard.

The effort was performed under McDonnel Douglas Automation Co.'s Product Definition Data Interface project funded by the U.S. Air Force.

Based on these tests, which did not exhaustively examine every aspect of Iges but did provide an in-depth evaluation of its implementation, problems were found with both Iges itself and with the translators developed by the suppliers and users. At the time of the tests, no participant had completely implemented an Iges Version 1 pre- and postprocessor. There was wide and generally successful implementation of wire-frame geometry and annotation, but not of sur-

Continued on page 81

Cotter is an associate, and Skinner is vice-president for Booz, Allen & Hamilton, Inc. of Cleveland.



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From page 73

Off-site storage protects information

want access as quickly as possible.

According to Weller, storage customers should be aware that if data is stored in an on-site vault, the vault may remain intact in case of a fire, but the contents could be destroyed by heat. Buildings that have suffered fire, flood, earthquake, smoke or toxic gas damage are sometimes closed by health or fire authorities for several days — or even weeks — after a disaster, Weller said.

Del Monte's experience

That was the case with Del Monte Corp. in May 1983. The $3 billion food processing and distribution company's users were completely cut off from their main computer system for eight days that month when a transformer blew, leaving the systems intact but also leaving the threat of chemical contamination that made health authorities close the building.

The threat of damage by a company's employees should also be considered, according to Weller. Human-caused catastrophes include vandalism, arson, riots, strikes, sabotage, accidents, oversights and human error.

A company should undertake a careful risk analysis that identifies and measures the economic impact of various risks, Weller said. Management should ask itself the following questions:

- What will it cost if certain data is lost?
- How long can the company be closed, in whole or in part, without threatening its ability to survive?

Records should be classified by order of their importance to the company, Weller said. Critical data should receive off-site storage backup.

Noncritical data — data that can be regenerated if needed at a cost that is less than off-site storage costs — can be backed up on site in a way that keeps it protected as much as possible.

In selecting a backup site, companies should do the following:

- Visit all available sites within a chosen area, eliminating storage companies that will not allow a tour of their facilities.
- Check out the site for fire protection, climate control protection, access and delivery services.
- Meet the people who run the business and make sure you are comfortable with them.
- Obtain references from present customers.

From page 79

True CIM relies on data link between systems

faces and structure. Most were generally successful in dealing with the Iges format and translating the test cases.

Even though most of the identified problems were specific to certain sites, there were some generic Iges issues that required future resolution.

Wire-frame, two-dimensional and three-dimensional geometry has been successfully implemented because it is similar to and adequately replaces engineering drawing product design information. As a result, many CAD users are content with this well-developed aspect of Iges, thus minimizing the pressure on suppliers to develop more difficult surface representations.

Furthermore, Iges is not truly neutral in that it was based on early commercial CAD systems representations. Systems substantially different from Iges have greater difficulty processing some Iges entities.

Several development needs were identified from this survey that are key to achieving CIM. Many boundary representation solids are still approximations not suitable for numerical control programming because of product precision requirements.

There is a clear need for greater integration of shape and nonshape data structures and a definition of manufacturing data in computer-understandable form. Part features need to be defined. And, finally, product definition data formats need enhancement, and a single format needs to be agreed upon as an international standard.

From page 73

Single-vendor service concept growing in MIS

vealed that there is a degree of skepticism of single-vendor service and a feeling that the operations staff may be threatened by such coverage. The groups also showed that there is "considerable cooperation between service personnel representing different vendors at the local level." Munn theorized that that cooperation stems from the service representatives' allegience to their craft and a desire to avoid wasted time.

Munn noted that companies including AT&T Information Systems, Control Data Corp. and Digital Equipment Corp. have introduced single-vendor service and that other companies are offering such service on an ad hoc basis.

"This is a very difficult service to offer successfully, and there are a number of risks for any service vendor considering these concepts. At the same time there are opportunities to expand the range of services offered and certainly help gain more control over an account. As vendors expand and promote these services, there will be much greater competition for third-party service companies, and many smaller vendors will be relegated to subcontractor roles," Munn said.

The study, "Service in a Mixed Vendor Environment," and videotapes of the focus groups is priced at $2,750.

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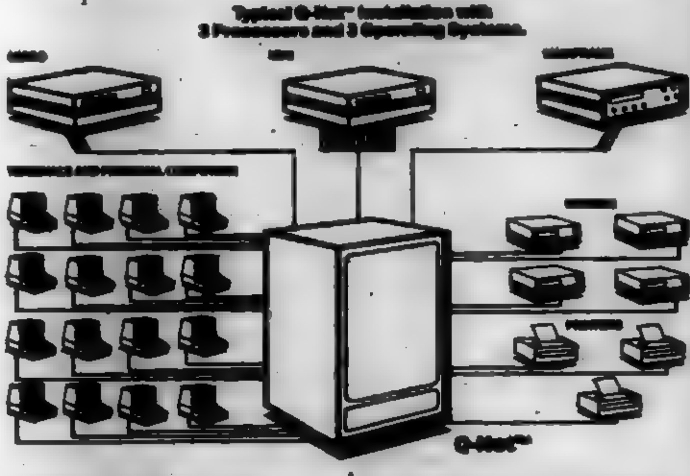

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From page 73

DBMS vs. data base machine

face to the data base machine. Status and results are accepted from the data base machine by the host and sent to the appropriate application programs.

The more a data base machine does in off-loading work from the host computer the better. However, there is a limit. The host machine should handle query translation, end-user facilities support, terminal communications, scheduling, formatting of user output data, system integrity and security and application logic.

The benefits of using a data base machine include the following:

- Host independence. A data base machine can interface with a wide range of machines.
- Flexibility. When expansion or upgrading is needed, the data base machine is more economical than the next larger computer.
- Performance. The architecture was designed to perform only data base management functions, so data base machines can perform data base operations much more quickly than a host computer can, and less powerful hosts can support required levels of response.
- Shared data base. Many different computers can share the same data base.
- Off-load host or isolation of DBMS overhead. Data management requires large programs and consumes a large percentage of a host computer's capacity. Moving the work into a data base machine frees the host to perform other tasks.
- Reduced cost. Data base machines cost substantially less than the hosts they off-load. Also, the intangible costs of a computer system's resources must be added to the tangible costs of a software DBMS, while the data base machine can support multiple hosts without duplicating peripheral equipment.
- Efficiently supported relational models. Relational data bases are powerful and flexible but are slow performers and heavy users of computer resources. Data base machines can efficiently support the relational model.
- Security. Data base machines provide a second level of security control:
- Speed. The processing speed of data base machines is limited only by the speed of the secondary memory.
- Central control. In a net environment, the data base machine provides a central data management facility. Several computers can share access to data stored on the data base machine because concurrency control and protection functions are implemented within the machine.
- Improved recoverability. As the data base management functions are separated from the host, the recovery of these functions becomes feasible without impacting the system.
- Modularity. The separation of functions enhances the concept of modularity through the system and translates to future growth by data base sharing through multiple machines.

In some cases a host processor must be connected to multiple data base servers, and, since many installations already have host processors interconnected on a local-area network, the data base machine should be connected in this environment.

To accomplish this, local network hardware must be standardized, since data base machine designers and manufacturers cannot afford to offer interfaces for more than a limited number of network types. Fortunately the Institute of Electrical and Electronics Engineers, Inc. is making progress in local-area network standardization.

The second level of standardization requires standardization of the communications protocol used by the host processors to communicate with the data base machine over the local-area network. For the U.S. Department of Defense, even with TCP/IP as a base, a higher level protocol — an application protocol — will be needed for standardization.

Specifications, development and adoption of such protocols by data base machine vendors will provide tremendous flexibility in purchasing and using data base machines.

There are several data base machines now, or soon to be, in production. These include the following:

- The Teradata Corp. DBC/1012.
- The Valence data base machine being built by Ordain, Inc.
- The IDM-500, built by Britton-Lee, Inc.
- Data base machines being built in other countries. There are two projects in France, two in Japan, one in West Germany, one in Italy and one in the UK.

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STC to supply tape subsystem to Honeywell

In a $15 million multiyear OEM agreement, Storage Technology Corp. (STC) of Louisville, Colo., has contracted to supply tape subsystems to Honeywell Information Systems, Inc.'s Large Computer Products Division of Phoenix.

Under the agreement, STC will supply Honeywell with its 4600 series Fips tapes subsystems, a 200 in./sec. dual-density 1.6K and 6.3K bit/in. recording formats. Introduced in 1983, the 4670 features an optional 3M byte/sec. throughput rate.

A Honeywell official said the tape subsystems will be available in early 1986 with Honeywell's DPS 8, DPS 88 and DPS 90 systems.

COMPUTER INDUSTRY

Giants not ready for war

By Paul Korzeniowski

NEW YORK — Before AT&T and IBM can begin to compete directly, both must overcome challenges evident in the traditional markets each has dominated.

Archie McGill, who served in executive positions at both companies and is now president of Rothschild Ventures, Inc., a New York investment firm, made that claim recently at "IBM — AT&T, New Technologies, New Directions," a seminar sponsored by the New York-based market research firm, Eastern Management Group.

Even if both companies do make the necessary moves, head-to-head competition will not take place until 1990, he said, adding that analysts have underestimated how much effort is needed for either company to forge a presence in the other's market.

A primary challenge that IBM faces is that mainframe sales have peaked and are now the slowest growth area in the industry. "I expect that the 3090 series announcement will increase IBM's mainframe sales, but sales will not grow more than 7% a year," he said.

Users are confused by changes in the industry and are looking to companies like IBM for answers, but the big companies have failed to deliver on promises, he said, citing IBM's yet-to-be-introduced local-area network.

Many analysts have praised the purchase of Rolm Corp., but McGill claimed that IBM will have problems digesting the communications company. "IBM will need a few years before it realizes a profit from that acquisition," he claimed.

Rather than purchasing companies; McGill predicted, Big Blue will enter more joint marketing agreements like those inked with MCI Communications Corp., Stratus Computer, Inc. and Bytex Corp. "Not even IBM has the breadth to compete with all companies on all fronts," he noted.

AT&T, on the other hand, faces the most complex and complicated challenge in the history of American business, according to McGill. "The company has to change revenue and profit streams that have existed for more than 100 years," he explained.

Compounding the problem is that every one of AT&T's revenue streams is under pressure. The

Continued on page 87

'Fit' vital in buy-outs

Acquisitions should complement strategy

By Clinton Wilder

NEW YORK — The most successful corporate acquisitions are motivated by strategic rather than financial considerations, according to an executive of one of the most active corporate buyers of software and services firms during the last five years.

Peter Lessler, director of acquisitions for Dun & Bradstreet Corp., told a recent industry forum that regardless of how attractive the cost of a potential purchase may be, financial issues should only be considered after measuring the strategic fit of the buy-out candidate.

"Understand the dynamics of the market you're thinking about entering — who's gaining market share, who's losing and the position of the acquisition candidate," Lessler said at the Association of Data Processing Service Organization, Inc.'s (Adapso) annual seminar on mergers and acquisitions activity in software and DP services. "The company to be acquired must fit the acquirer's profile in marketing, product direction, operations and, most difficult to assess but perhaps most importantly, in management characteristics."

Lessler noted that Dun & Bradstreet, after making 33 acquisitions during an 18-month shopping spree, including McCormack & Dodge Corp., is now trying to build on its existing businesses rather than continuing to diversify.

Considerations to assess the proper fit, Lessler said, include the current and potential product and geographical overlap in marketing and the potential for sharing technological resources. In market position, the most likely software and services acquisition candidates have small to medium

Continued on page 92

Global-Ultimacc looks ahead

By Peter Bartolik

The management team at Global-Ultimacc Systems, Inc. gained a new lease on life recently when the U.S. Bankruptcy Court in Denver approved the sale of Storage Technology Corp.'s (STC) majority ownership in the firm.

Charles J. Siefert, chairman of Waldwick, N.J.-based Global-Ultimacc and one of the five company executives who bought out STC, said in a phone interview that he expects Global-Ultimacc to regain profitability by the end of the year.

"The major change, and we've already seen it happen, is the perception in the marketplace," he said. "Customers are no longer concerned about us being pulled into bankruptcy; technically, STC could have done it any time. All they had to do was call their debt."

Global-Ultimacc absorbed the customer base and field engineering force of bankrupt Magnuson Computer Systems, Inc. and markets IBM 4300 plug-compatible systems and turnkey systems. Siefert said the company hopes within weeks to be able to announce an OEM agreement providing a next-generation processor but said he could not provide details until the deal is finalized.

After watching revenue almost double in 1984 to $29 million, the company was essentially left out in the cold when STC filed for reorganization protection last winter. The situation was critical because Global-Ultimacc depended exclusively on STC for most

Continued on page 92

■ Tandon finally lost a round to a foreign disk drive manufacturer before the International Trade Commission, but the company said that skirmish was moot and looked ahead to a pending antitrust action/86

■ Digital Switch was awarded a major contract by one of the first Japanese companies to go into competition with the Nippon Telegraph and Telephone giant/91

■ Posting its first operating loss in 10 years, Advanced Micro Devices said it will try and spark the depressed chip market by introducing a product each week beginning in October/91

Adapso winning Pyhrric victories?

INDUSTRY INSIGHT
Peter Bartolik
News Editor

Let's face it, sometimes industry lobbying groups get carried away with the thrill of victory and neglect to consider the seeds of discontent that could someday lead to the agony of defeat.

A case in point — the Association of Data Processing Service Organizations, Inc. (Adapso) in the latest issue of its newsletter, "Adapso Data," begins with the headline "Adapso victorious on California warranty bill."

The text thereunder went on in more humble terms to explain that "due in large part to Adapso's coordinated opposition," a California Assembly committee suspended any action on AB 1507. That bill, for those who haven't been following the revolutionary actions of its sponsor, Assemblywoman Gloria Molina, would have, Adapso explained, "dramatically changed the relationship between buyers and sellers of computer hardware and software by prohibiting the disclaimer of implied warranties while requiring developers to provide a refund or replacement if a product did not meet users' expectations."

Perish the thought that the seller of a product should be required to actually deliver on his promises!

Here's a typical disclaimer, taken from a Microsoft Corp. package, of the type that Adapso is so committed to preserving: "The program is provided 'as is' without warranty of any kind. The entire risk as to the results and performance of the program is assumed by you. *Should the program prove defective, you (and not Microsoft or its dealers) assume the entire cost of all necessary servicing, repair or correction* [emphasis added]. Further, Microsoft does not warrant, guarantee or make any representations regarding the use of or the results of the use of the program in terms of correctness, accuracy,

Continued on page 93

Major lessors shun Comlease

By Maura McEnaney

NEW YORK — During a year of waning trade show attendance, a group is venturing into untested waters, launching what it claims to be the first trade show on computer leasing.

But like many of the shows this year, next week's Computer Leasing Conference and Exhibition (Comlease) seems to hitting a period of vendor apathy. Some familiar names, such as Citicorp Industrial Credit, Inc., Greyhound Capital Corp. and World Leasing Co. will be present. But Comlease will debut without the participation of several leasing giants, including IBM Credit Corp.; Comdisco, Inc.; Dataserv Equipment, Inc.; and CMI Corp.

Show manager Ken Burroughs told *Computerworld* approximately 20 exhibitors have accepted booth space at the show, scheduled for Sept. 30 to Oct. 2, at the Marquis Hotel here.

An IBM Credit spokesman said Big Blue received information about Comlease after the com-

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Contracts key for clarifying software owner's rights

FOURTH IN A SERIES

By Jerome J. Roberts,
Marianne D. Paine
and Michael P. Brownell
Special to CW

A contract provides two indispensable elements in any software protection plan: It implements and amplifies the rights and duties arising from intellectual property law; it also provides a mechanism to create additional rights and duties, enabling the software owner to protect elements of software products not otherwise protected by intellectual property law.

Contract protection provides the glue to bring together all available protective tools into a comprehensive and cohesive proprietary protection plan.

Contract protection of software should be in writing, preferably signed by both parties. Written contracts should be used for any transaction involving the disclosure or development of proprietary software such as software licensing, software development projects, marketing and distribution arrangements, beta test site situations and employment and independent consultant relationships. Confidentiality agreements of a general nature can be utilized for miscellaneous circumstances in which proprietary information is to be disclosed.

The presence of a written agreement does not automatically ensure adequate contract protection of the relevant software proprietary interest. Often, unfortunately, such contracts fail to allocate the parties' respective rights and duties relative to important proprietary rights issues. Without contractual guidance, such issues will be resolved by statutory and/or common law principles, often yielding uncertain, unexpected and undesirable results.

Each software-related contract will present certain proprietary rights issues specific to it. Consequently, specific contractual measures necessary to protect software require a case-by-case analysis. The following, however, are some of the topics that should be addressed:

- Proprietary materials should be defined as completely as possible. Such definitions often address the following considerations: the type of software element, for example, programs, documentation or report formats; medium of expression, for example, source code, object code, microcode; media on which the software resides; and accompanying manuals and other documentation.

The definition should extend to all copies of the software and related materials made by the recipient, as well as to all software modifications furnished by the owner — and possibly created by the recipient. Finally, the applicable proprietary rights existing in and arising from the software and related materials should be recited.

- The respective rights and interests of the parties in the proprietary materials to be disclosed and/or created must be delineated carefully. In a software license, the

Continued on page 85

Roberts, Paine and Brownell are attorneys with the law firm of Berman, Roberts and Kelly in Chicago. The firm's practice deals with legal issues related to procurement, development, distribution, management and protection of computer resources.

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From page 84

Contracts key in software mart

owner should reserve ownership and require the licensee to acknowledge the same. The issue of ownership may be a subject of debate in contracts calling for software development. In employment agreements, the employer should retain ownership of materials created by the employee in the course of his employment.

■ The purposes for which the recipient is permitted to use the software must be defined clearly, and measures used to protect the owner's interests in the software should be specified. Restrictions on use, copying and disclosure of the software may be in order.

Examples particularly appropriate for the software license include the following: Use of the software should be limited to those activities reasonably related to the purpose of disclosure; if copying is permitted, it must be limited to specific purposes and quantities, and all copies should contain the proprietary legends appearing on the original software or as otherwise directed by the owner, and the recipient should notify the owner upon suspicion of misuse.

■ A provision should be inserted that requires the recipient to return or destroy the software upon the termination or expiration of the purpose of disclosure.

■ The recipient is often required to indemnify the owner against any loss or expense incurred as a result of the recipient's failure to comply with its proprietary protection obligations.

■ The agreement should state that the recipient's proprietary obligations survive termination or expiration of the agreement for a specified time period or until the software ceases to be proprietary to the owner.

ITC drops Tandon's trade suit

WASHINGTON, D.C. — The U.S. International Trade Commission (ITC) recently dismissed Tandon Corp.'s unfair trade practices suit against South Korean disk drive manufacturer Gold Star Tele-Electric Co.

The ITC refused to bar imports of Gold Star disk drives, upholding a previous judge's ruling that Gold Star did not violate international trade regulations by importing its 5¼-in., half-height, double-sided drives into the U.S. in 1984. But Tandon's related $150 million civil lawsuit against Gold Star is still pending in U.S. District Court in Los Angeles.

An attorney for Chatsworth, Calif.-based Tandon said the ITC case had essentially been moot since December 1984 when Gold Star stopped importing the drives in question. But Gold Star spokeswoman Darlene Rabe said the ITC's ruling should help in the federal court case, in which Gold Star has filed counterclaims charging Tandon with abuse of process, antitrust violations, business and contractual interference and unfair competition. "The ITC ruling upholds what has been our position throughout the case," Rabe said.

The case stems from Tandon's allegations that the Gold Star products were based on technology stolen from Tandon by current and former Tandon employees. The employees helped to found now-defunct Format, Inc. of Los Angeles, which manufactured the drives for Gold Star, according to Tandon attorney Raymond Lupo. Tandon also accused some of the Format founders with sabotage and industrial espionage while they worked for Tandon.

The Gold Star case is not related to Tandon's pending cases before the ITC and in federal court against several Japanese disk drive vendors.

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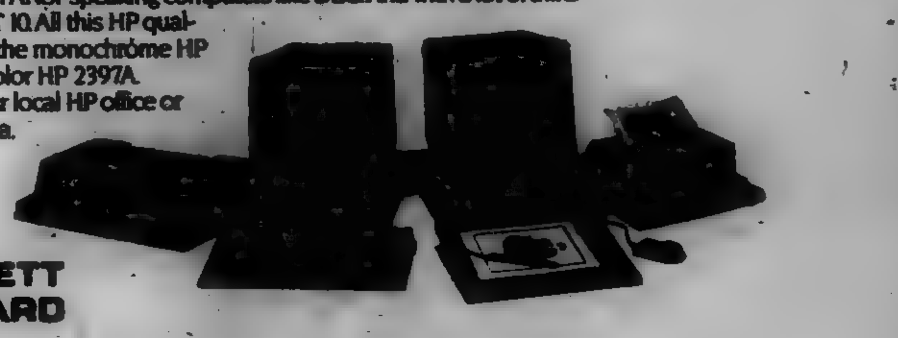

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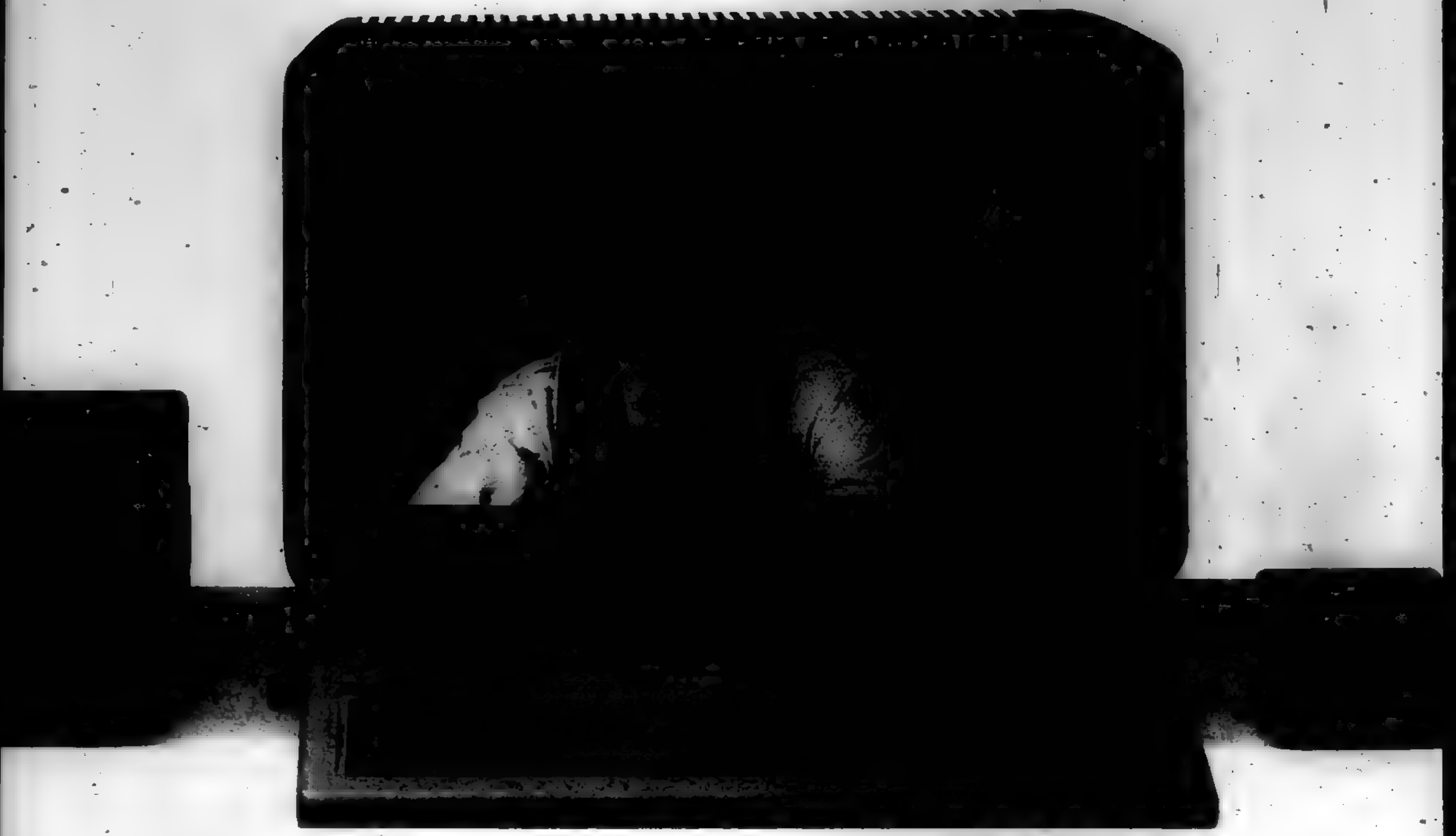

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AT&T strong in large user mart, weaker on other fronts

NEW YORK — AT&T has defended and strengthened its hold on the large user long-distance marketplace but has not made significant inroads in other areas, according to a market research firm.

Approximately 1% of the communications company's customers supply AT&T with 40% of its revenue, according to Eastern Management Group of New York. The firm presented its analysis at a recent seminar titled "IBM and AT&T, New Directions, New Technologies," held earlier this month.

Most large customers have experimented with long-distance services from common carriers such as MCI Communications Corp. John Malone, president of Eastern Management, claimed that eight out of every 10 of the Fortune 100 companies have some type of agreement with a carrier other than AT&T.

However, AT&T controls 96% of the market that consists of companies spending $80,000 a month on long-distance calls. "Large companies tested services from vendors like MCI but have returned to the AT&T fold," Malone said. Poor service drove those companies back to AT&T.

Since divestiture, AT&T has entered a number of new markets. The company competes with Digital Equipment Corp. in the minicomputer market, IBM in the personal computer arena, Ungermann-Bass, Inc. in the local-area network niche and foreign telephone companies. However, these moves have done little to increase AT&T's profits, according to Malone.

A better way for AT&T to improve its financial position would be by cutting costs, Malone claimed. A principal area to reduce costs would be in fees paid to former regional operating companies. AT&T is spending close to 60 cents on each long-distance dollar for access charges to the operating companies. "That 60 cents is money disappearing out the back door," Malone noted. If AT&T could bypass the local connection, it would significantly cut costs.

Also, AT&T is paying the operating companies $2 for each bill sent to AT&T customers. "AT&T has to be losing money billing residents who make few long-distance calls," the analyst noted. By taking the billing function in-house, the company could eliminate the $2 charge.

AT&T does not have any avenues for rapid revenue growth. Eastern Management does not think that the private branch exchange market represents a great opportunity. "AT&T has done a better job selling its PBXs this year than in any other year and has increased its market share," he said. "But the rate of growth in the PBX market has declined and will continue to decline."

In 1984, the communications company announced 100 products primarily directed at the computer industry. Despite the slew of introductions, sales from 3B or personal computers accounted for only 3% of AT&T's revenue. Malone estimated that AT&T Information Systems, which delivered most of these products, lost $1.5 billion dollars in 1984.

The analyst concluded by predicting that AT&T will have to sharpen its focus on its communications services and choose a few markets to enter rather than competing on a number of fronts.

— Paul Korzeniowski

From page 63

Grants not ready for war

communications company is losing its stranglehold on the long-distance market, which is growing at a rate of only 5% per year. The company could face severe cash-flow problems as it attempts to diversify its business, according to McGill.

AT&T has always been action oriented and would immediately announce products that were technical breakthroughs. In 1984, the communications company launched technically oriented product thrusts rather than marketing-oriented product entries.

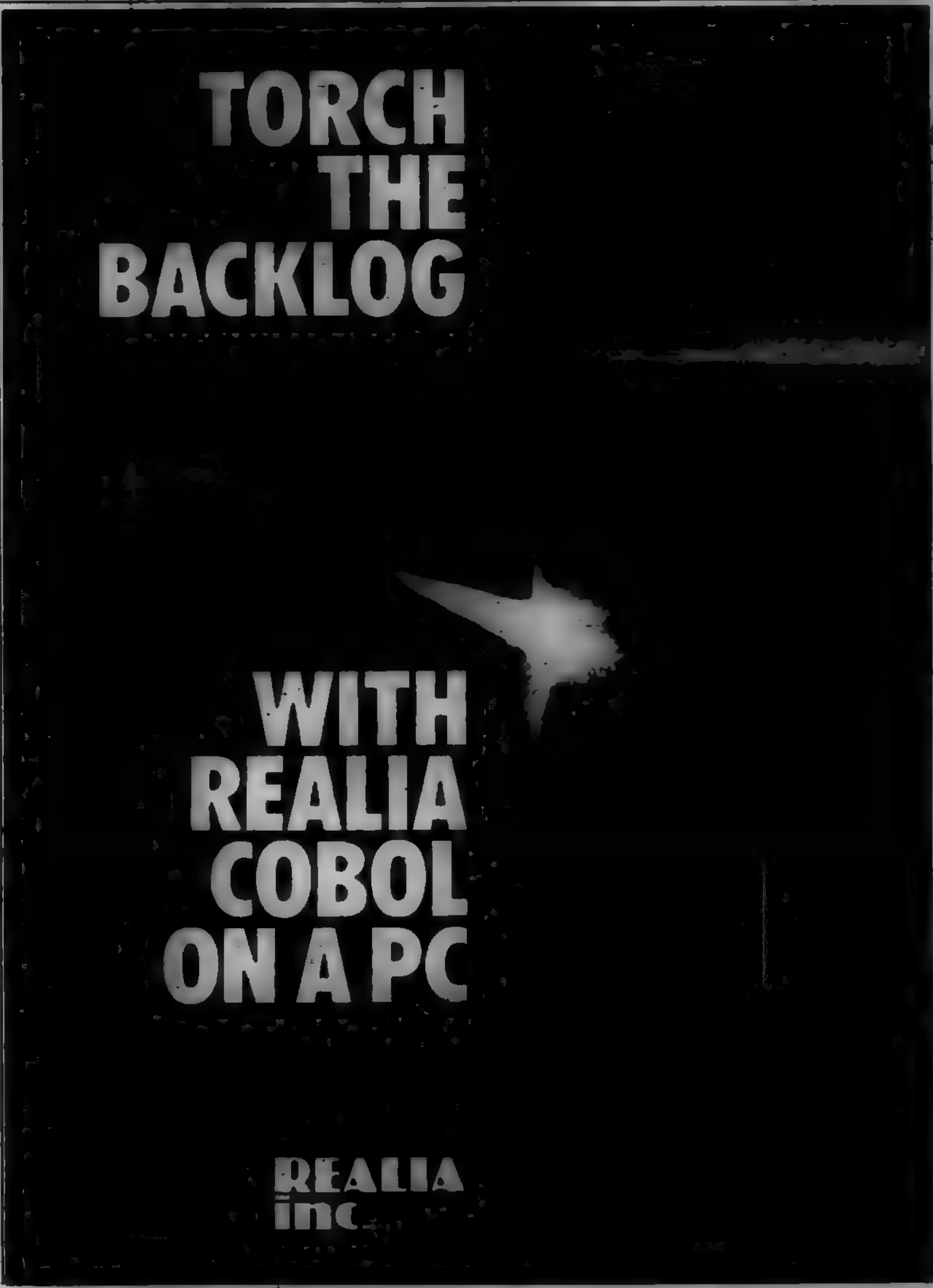
"Technically, the 3B line has some very nice machines," McGill noted. "Its problems are software and AT&T's inability to convince companies to write for the machine."

He said AT&T has saddled each positive step with negative connotations, pointing to the recent layoff of 24,000 employees. "The company knew in 1984 that such a move was needed," he said. "I don't understand why it waited so long to make it."

McGill also classified the AT&T-Ing. C. Olivetti & Co. partnership as a stroke of genius. "AT&T needed an entrance to foreign markets and Olivetti provided it," he said. Even though that was a good move, AT&T has not worked that or other partnerships to the fullest advantage.

McGill echoed the views of other analysts who claimed that AT&T needs an office automation partner like Data General Corp. or Digital Equipment Corp. to make inroads into large corporations.

For either IBM or AT&T to succeed, each must be able to throw away old methods of doings things and quickly adapt to new marketplaces.



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AMD announces plan to unveil one product per week

By Clinton Wilder

SUNNYVALE, Calif. — In the midst of its first operating loss in 10 years and the continued pessimistic indications for the semiconductor industry, Advanced Micro Devices, Inc. (AMD) recently announced an ambitious scheme to introduce one new product per week during the fiscal year beginning Oct. 1.

The new chips, which would represent roughly twice the number of products AMD introduced in the past year, will include bipolar Cmos and Nmos technologies.

AMD unveiled the plan in conjunction with the announcement of its operating deficit, a $14.4 million pretax loss for the quarter ended June 30. With the loss, AMD became the latest major U.S. chip maker to post an operating loss in the current semiconductor slump, the industry's longest and deepest ever.

After tax credits, AMD was able to post a bottom-line profit of $739,000, or 1 cent per share, for the quarter. Revenue was $150.5 million, a 36% fall from $234.2 million in the same quarter a year ago. AMD earned $38.2 million, or 66 cents per share, in the year-earlier period.

The slackened demand cited by AMD in announcing its results showed little sign of abating in the industry's leading growth indicator, the book: bill ratio. The ratio of new chip orders to shipments in August was .74, up barely from .72 the previous month, but still lower than any other month since February.

The San Jose, Calif.-based Semiconductor Industry Association predicted that semiconductor billings in the third quarter will be down 28% from 1984 levels.

With the worst slump in demand coming in so-called commodity chips, such as 64K-byte random-access memory circuits, AMD is reportedly attempting to move more agressively toward sophisticated, application-specific products in the next 12 months.

"Even with demand down overall, it turns out that you can sell new products," AMD spokesman Elliott Sopkin said. "The computers that are being sold are the ones that have a technology advantage, and those improvements are achieved by technologically advantageous circuits."

One industry analyst expressed skepticism about AMD's product goal. "If you're considering every rerouted gate array a new product, that's one thing," said James Feldhan, vice-president of In-Stat, Inc. in Scottsdale, Ariz. "Their goal gets harder and harder to achieve as applications get more specific. Even a new gate array takes a couple of weeks to run through. But if it's possible, AMD is one of the better companies to try it."

Japanese firm to buy exchanges

By Takahiko Kondoh
Special to CW

TOKYO (CWN) — Daini-Denden, Inc., one of the first Japanese companies to step into direct competition with Nippon Telegraph and Telephone Corp. in the now-private telecommunications marketplace, recently announced it will purchase digital exchange systems in an estimated $10 million deal with Digital Switch Corp. of Richardson, Texas.

Daini-Denden is a group of 225 corporations, led by Kyocera Corp., Sony Corp. and Mitsubishi Corp.

Daini-Denden reportedly made its debut after a series of three telecommunications business laws were enacted in Japan last April, forcing Nippon to go private and withdraw from its decades-old monopoly of domestic telephone and telegraph services.

Open procurement policy

Apparently to soften U.S. complaints about closed markets in Japan for foreign-built telecommunications equipment, Daini-Denden had committed itself to an open procurement policy with which to treat overseas vendors without bias.

Major manufacturers, such as AT&T, Northern Telecom of Canada, NEC Corp. and Fujitsu Ltd., reportedly had vied for a Daini-Denden contract for digitized telephone exchanges.

The two other new telecommunications companies, Japan Telecom Co. and Japan Teleway Co., previously decided to purchase similar equipment from undisclosed Japanese makers.

Contract in the U.S.

In the U.S., according to Digital Switch, the turnkey contract calls for the firm to provide four DEX 600 switching systems and a network control center, as well as training and support.

The contract also provides for options, the company said.

Kondoh is international editor/Asia for CW Network.

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'Fit' imperative in buy-outs

shares of a high-growth market. Companies with higher shares in growth markets are generally not for sale or are available only at a prohibitive price, he added.

The two most important criteria in evaluating a potential partner's financial future are cash flow/return on investment and earnings per share, Lessler said.

Although Dun & Bradstreet has added handsomely to its bottom line with acquisitions, other firms have been much less successful in their acquisitions. Heading the list of such companies is Control Data Corp., according to George Grodahl, a partner in Broadview Associates, the Fort Lee, N.J., merger consulting firm that conducted the Adapso seminar.

"CDC is the best example that the most important factor in acquisitions is how well you integrate them," Grodahl said. "For years, their acquisitions seemed totally lacking in focus. Now, they've come full circle and have a vice-president of divestitures."

The flurry of recent mergers and acquisitions activity in the software and services industry can be attributed to changing attitudes among entrepreneurs about selling their companies. "More and more often, selling your company means you are still able to run it," according to Gilbert Mintz, a founder of Broadview. "Being acquired has become a sign of success, not failure."

Within that context, however, the seller must realize the fundamental changes inherent in a deal, according to Dataline Corp. President Gerald O'Connell, whose Wilton, Conn., turnkey accounting-systems firm was recently acquired by Display Data Corp.

"There is a lot of opportunity on both sides, but remember there is no such thing as a merger," O'Connell said. "The fact is, you have sold your business. Don't be naive about that, or you'll be very disappointed."

Acquisition is rapidly replacing venture capital as the growth mechanism for privately held software and services firms, Broadview's Edward I. Metz said. "Five years ago, the typical start-up strategy was the business plan, three rounds of venture capital and then a public offering," Metz said. "Today, venture capital is much harder to come by, and you see far fewer initial public offerings."

From page 83

Major lessors shun Comlease

pany's annual trade show schedule had been set. Decisions to attend trade shows are often made up to a year in advance, the spokesman said.

According to Bob Bardagy, senior vice-president of marketing at Comdisco, one of the nation's largest independent computer leasing companies, a trade show for leasing was inappropriate for Comdisco. "We do a lot of education seminars on our own, and we don't see the need to throw ourselves into a trade show," he said.

Bardagy added, however, that the show could achieve some success. "It may be a very palatable opportunity for a small leasing company that may not have the ability to get their message across on a national basis, but I would question how many people would travel a long distance to go to something like this."

Dataserv Vice-President Tim Gegner said that although the concept of a leasing show was a good one, his company also passed up Comlease. "It would almost have to be done on a real large scale to make it worth our while," he said.

But scale is of no concern to Tom Martin, president of Computer Financial, Inc. and Comlease chairman. A show like Comlease is necessary, Martin said, because of the changing facets of the computer leasing industry.

"The responsibility for leasing computers traditionally falls within [DP], whereas with other companies, leasing assets are the responsibility of the treasurer. There are a lot of things that users need to know," he said.

Martin said the slim showing of exhibitors could be attributed to the fact it is sometimes difficult to sell services at a trade show. "It's a hard concept to sell an intangible product in a booth," he said.

From page 83

Global-Ultimacc looks ahead

peripherals and owed STC $20 million.

That dependence may not last much longer, Siefert indicated. "At the present time our systems will include STC peripherals, but over time we will be shopping around for other vendors' products that are more competitive or better priced."

Seifert said the transaction added up to $2 million. The management team put up $336,000 for the stock, and STC received about $1.8 million in cash accumulated by Global-Ultimacc as repayment of the debt. "That's roughly five to 10 cents on the dollar, which is a pretty good deal," he said.

"We expect to continue the momentum we had going back in 1983 and 1984 prior to the STC bankruptcy," he said. "The bankruptcy impacted us greatly; there was the perception that we couldn't guarantee we were going to be around."

Joining Siefert in the buy-out were Thomas A. Nagy, executive vice-president of operations; Thomas A. St. John, executive vice-president of sales and marketing; Richard G. Snow Jr., vice-president and general counsel; and William O. Sweeney, vice-president of technology.

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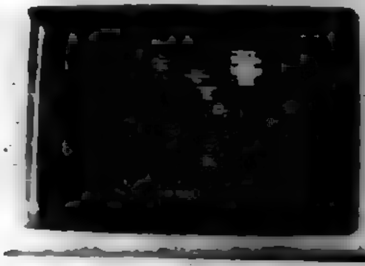

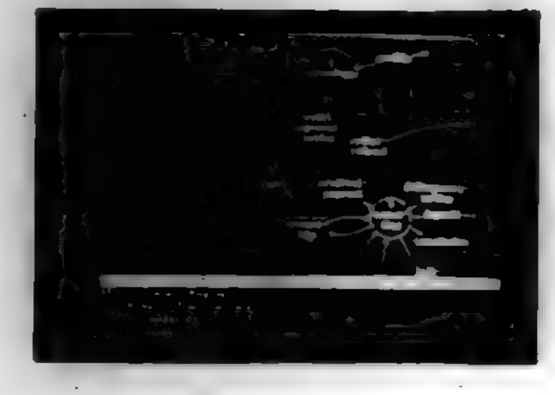

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OEM brings Mitsubishi back to court

By Donna Raimondi

BOSTON — Leading Edge Products, Inc. has again instituted court proceedings against its equipment supplier, Mitsubishi Electronics America, Inc., seeking to recover funds.

Leading Edge, which is an OEM for Mitsubishi products, requested that U.S. District Court find Mitsubishi Electronics in contempt of the court's order originally issued in February and modified Sept. 4. The order requires, in part, that Mitsubishi pay an adjustment to Leading Edge.

The two companies have been battling in the courts since Leading Edge charged Mitsubishi Electronics, a California-based branch of Japanese firm Mitsubishi Corp., with trying to cut off its supply of components in 1984 [CW, Feb. 25]. Mitsubishi was the sole supplier of the major components in Leading Edge microcomputers at the time.

According to a petition filed Sept. 9, Leading Edge charged that Mitsubishi had failed to pay them $638,707 due to a yen adjustment. The adjustment was to offset the higher value of the yen to the U.S. dollar over a period of time.

The adjustment was ordered by the court to be retroactive to Jan. 1, 1984, Leading Edge stated. It further said that Mitsubishi had paid such a yen adjustment to its only other customer, Sperry Corp.

The petition claimed that Mitsubishi offered Leading Edge a yen adjustment effective Feb. 11; that the court-ordered adjustment clearly and unambiguously called for an adjustment retroactive to Jan. 1, 1984; and that Mitsubishi has conditioned payment of any adjustment on a business matter not related to the reason for the yen adjustment.

Returned products reportedly refused

According to Leonard Ross, senior controller for Leading Edge, his company returned some terminals and other products that were not covered under any court-ordered agreement to Mitsubishi, and Mitsubishi refused to accept the returned products. Leading Edge stopped payment on a delivery of other products in order to offset the cost of the returned products, he said. Mitsubishi is using that transaction as a basis for refusing to pay the retroactive yen adjustment to Leading Edge, Ross said.

A lawyer for Mitsubishi in Boston, Zachary Karol, claimed that the Sept. 4 order was a modification of the Feb. 11 order and therefore dealt only with orders subsequent to Feb. 11. Karol said that Mitsubishi never made payment of the amount of Leading Edge's stopped payment a condition of receiving the yen adjustment. He sent a letter to Leading Edge Sept 6. asking for an explanation of why Leading Edge did not pay for the order that it did receive. "I suggested a setoff, but it was never a condition," he added. The response from Leading Edge was the petition to the court, with the letter from Mitsubishi attached to it.

From page 92

Adapso winning Pyrrhic victories?

reliability, currentness or otherwise; and you rely on the program and results solely at your own risk." Microsoft does, however, warrant that the actual disk be free of defects.

This is not picking on Microsoft, because the disclaimer is pretty standard on microcomputer software packaging.

Furthermore, the point of this column is not to further berate such antiuser disclaimers, but rather to point out to software developers the brazen double standard they are holding customers to.

Adapso has been in the forefront of efforts to combat the evil empire of software piracy. Don't be naughty, the organization tells users — any time you copy a program, you are stealing money from the developer, or, as in most cases, the company that bought the rights to the program from the developer.

Adapso has weighed in heavily on the immoral and illegal aspects of denying vendors their pound of flesh for overpriced software packages that too often are "me-too" products that really are approaching commodity status in terms of originality and usefulness.

Yet this same organization that wants users to hold the high moral ground hypocritically denies those same users any guarantee that the goods they are buying actually work and live up to company claims.

Let's go back to the disclaimer cited above: "Microsoft does not . . . make any representations regarding the use of or the results of the use of the program . . ." That is pure bull! Microsoft and every other vendor that buys advertising in no uncertain terms make representations regarding what their products will do, why they are better than other products and so on.

So, before Adapso gets carried away on this victory, maybe it had just better sit back and think about what it is willing to give users in exchange for what it wants from users. Perhaps Adapso members should point out in their disclaimers what states actually prohibit such claims. And maybe — I admit this is really a radical proposition — just maybe there are some leading vendors out there with the guts to actually back up marketing claims and promise users a full refund or replacement in the event of any dissatisfaction.

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Responsible for implementing the tasks defined below on software development projects. These engineers will report to project leaders. BSCS, EE or Math with six plus years experience in definition, design, development and delivery of software systems, utilizing VAX or Motorola 68000 computers. Required fluency in PASCAL, structured FORTRAN, MACRO-11 or Assembly languages. Experience with MIL-SPEC standards required.

SENIOR VMS SPECIALISTS

Responsible for definition, development and enhancement of software development environment on VAX systems, BSEE (MS) or CS with seven plus years related experience with VAX systems in PASCAL fluency required. Must be VMS internalist within I/O driver systems. Defense environment background a plus.

Babe McCarrell will give you more information regarding the following:

SOFTWARE ENGINEER

Responsible for design, coding, and testing of systems level software. Position requires minimum of BSCS or BSEE degree with at least two or more years experience with the VAX 11/750 or 780 and VMS operating systems. Experience in one or more of the following areas is desirable: MIL-Standard documentation, UYK series computers and real time signal processing architecture.

BUSINESS PROGRAMMER ANALYST

Responsible for development and maintenance of on-line systems in an IBM OS/MVS IDMS CICS environment. Must have a college degree in Business, MIS or related field, and three to five years experience developing/maintaining on-line systems, supporting Accounting, Manufacturing or Purchasing/Inventory control.

DATA BASE ADMINISTRATOR

Responsible for the installation of IDMS in an IBM OS/MVS environment, for the design and maintenance of the data base and related data dictionary, and for the development and enforcement of standards and procedures for its usage. Requires a college degree and three to five years data base Design/Administration experience.

The Garland Division of E-Systems is impacting the future of electronics with exciting new projects that offer challenge and recognition. You can participate in an advanced human resources program which includes a flexible employee benefits package (FLEXCOMP), and a company-paid Employee Stock Ownership Plan. With Dallas recognized as being one of the most enjoyable and livable areas in the United States, the Garland Division of E-Systems can offer the senior engineering professional what is needed.

If joining E-Systems in Dallas means a move, E-Systems will offer you a personalized relocation program. We realize the difficulties of acclimating an individual or a family group to a different living situation. Our staff makes it a point to assist you and your family members after you have made the decision to join a company embarking on the most advanced programs in existence. Our dual assistance program is designed to ensure your move to E-Systems in Dallas will be a step forward in every area of your professional and personal life. For immediate consideration please write in confidence to: **Professional Staffing, E-Systems, Inc., Garland Division, P.O. Box 660023, Dept. 41, Dallas, Texas 75266-0023.**

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DP & MIS DIRECTOR
Position #[illegible]

Prince William County, located in Northern Virginia, is inviting qualified applicants to apply for the senior level position responsible for managing expanding Data Processing and Management Information Systems functions for the County Government. [illegible] This position also is responsible for management analysis and internal audit activities of the County. Responsible for an annual budget of $1.5 million, staff of 35 and reports to the County Executive. Qualified applicants will possess a strong technical background and undergraduate degree with a graduate degree desired. Must have progressively responsible experience in DP and MIS. This is a position of major responsibility and challenge with a rapidly growing jurisdiction in the Washington, D.C. area SMSA. Annual salary [illegible] with excellent fringe benefits. Please respond with resume and cover letter to Personnel Director, [illegible] Manassas, VA [illegible]. Call (703) [illegible].

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Fedders-USA, a major manufacturer of heating, air conditioning and energy conservation products has openings for analysts/programmers. The individuals will play a major role in the process of upgrading our manufacturing, marketing and financial systems in accordance with a long range information plan.

The successful candidates should have experience in DOS/DSE operating systems, be proficient in COBOL and knowledgeable in command level CICS/VS. Experience with manufacturing systems would be a plus.

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415 West Wabash Ave., Effingham, Illinois 62401
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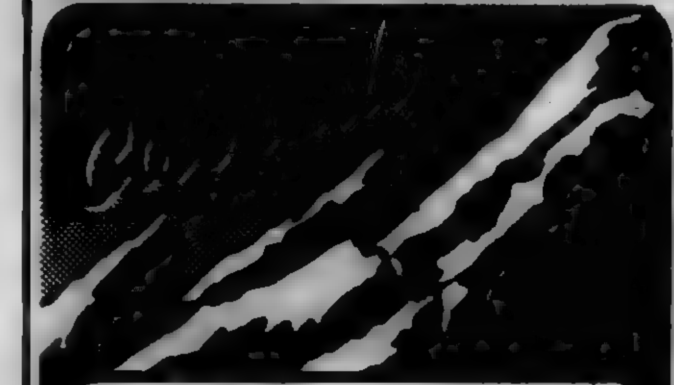

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Department 4SFT

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We offer a competitive benefits package including life, medical, dental and optical insurance, stock purchase plan, retirement savings plan, and an opportunity to grow with a successful company. Qualified candidates should send a resume, with salary history and requirements, noting department code on envelope, to:

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3450 Mitchell Lane
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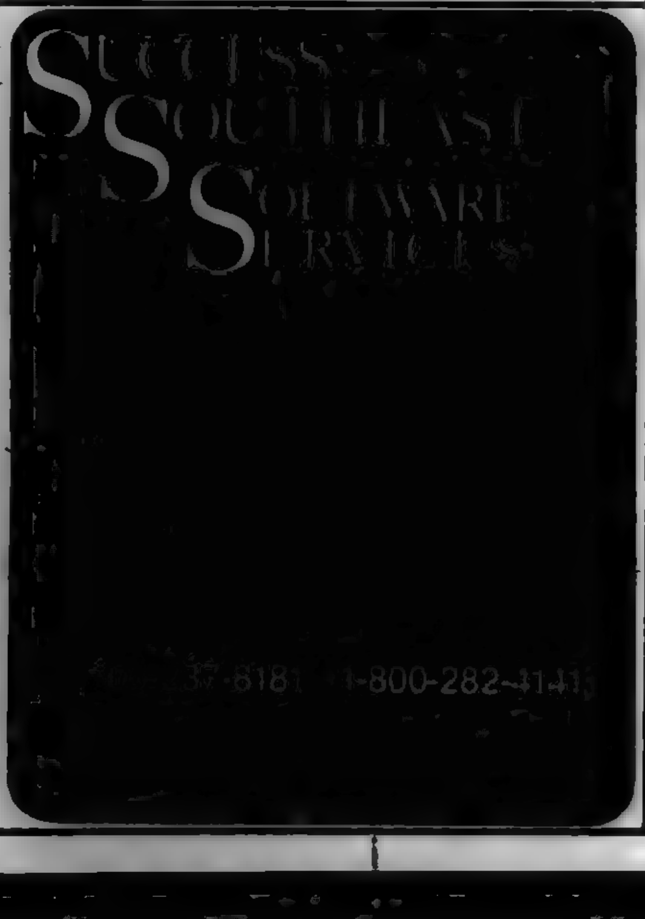

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The Department of Correction of the City of New York is seeking a Project Manager to [illegible] Data Processing development and operation in the area of administrative data systems. Requires solid management and [illegible] experience and good data processing experience in hardware or software. The systems environment is [illegible]. [illegible] Position located in lower Manhattan. Send resume to:

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Programmer/Analyst Supervisor for an IBM System 36 shop with 3 programmers. Position will be responsible for [illegible] development and project management and supervision. [illegible] Degree desired with at least 4 years of data processing experience including a minimum of 1 year supervisory experience. Salary [illegible] plus [illegible] benefits. Send resume to: Jackson County Administrative Office, Jackson County Courthouse, Room 214, Medford, OR [illegible], by October 11, 1985.

PL1 - BAL
COBOL/CICS
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PROGRAMMERS/ ANALYSTS

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P/A-COBOL, FORTRAN	[illegible]
P/A-DOS, CICS, DL-1	[illegible]
P/A-CPCS	[illegible]
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P/A-[illegible], P/C, Assembler	[illegible]
Data Comm Mgr	[illegible]
Sys Developer-P/C, software	[illegible]
Sys Prog-VM	[illegible]
Comm Sys Prog-ACF-VTAM	[illegible]
P/A Burroughs, COBOL, Banking	[illegible]
P/A Burroughs, DMS II, COBOL	[illegible]
Sr. P/A-CPS-[illegible], Design, [illegible]	[illegible]
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Sr. P/A-COBOL, CICS, BAL	[illegible]
P/A BAL, COBOL	[illegible]
P/A COBOL, CICS	[illegible]
P/A-mfg, COBOL, CICS, Total	[illegible]
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P/A WANG, COBOL	[illegible]
P/A CICS, IDMS	[illegible]

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Also several openings in our Contract Programming Staff are available.

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Southern California

Northrop Advanced Systems Division, dedicated to advancing technologies and resolving complex challenges to America's defense, offers new opportunities within our Computer Systems Department for Database Specialists.

These highly visible senior-level positions involve the acquisition and implementation of major manufacturing and business systems. You will help us combine network and relational database technologies with personal computers and an information center to satisfy operational and management requirements.

Your technical background will qualify you for these immediate openings if it includes extensive experience in data administration, data modeling, IDMS systems installation and tuning, ADSO application development, and prototype base development methodology.

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The candidate will act as liaison between our Database Development Division and the Acceptance Testing area. Responsibilities include technical maintenance of the acceptance testing environment, development of additional testing tools and techniques, plus the technical training of non-technical personnel. 3-6 years experience in a technical liaison capacity required. Also, knowledge of IMS/DL1, CICS, JCL, VSAM, OS/MVS and basic ASSEMBLER language required.

PL/1 & ASSEMBLER APPLICATION PROGRAMMERS

These positions require 2-4 years experience in a large IBM mainframe environment utilizing PL/1 or ASSEMBLER. You should possess good TSO/SPF and JCL skills and have solid communication skills. CICS is helpful.

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Current openings are available to top level professionals to broaden your base of expertise while working on diverse projects for military logistics, satellite command and control and integrated systems.

Senior Database Analyst

From initial definition of requirements through physical implementation, your expertise will guide the database design process. After deriving requirements from functional specifications, flow diagrams and related materials, you'll provide logical and physical database models. Proven ability in this area a must. Your control and documentation of all phases will ensure the implemented database design meets our high standards for performance, reliability and integrity.

Ten years computer data systems development experience, including 6 or more years involvement with various phases of large database design required, along with a BA/BS in Computer Science, Math, Physics, Engineering or related discipline. MSCS preferred. Working knowledge of structured, top-down methodologies (Yourdon, Gane, and Sarson, etc.), normalization/optimization and/or tuning of database structures highly desirable. Database design work in a distributed systems environment a plus.

Senior Systems Analyst

You'll define requirements for large data systems based on analyses of customer documentation and information obtained through interviews. Outlining various architectural components (with an emphasis on software) and allocating requirements will be key. This involves developing functional descriptions, data flow and component block diagrams, and interface control documentation. Requires 10-12 years computer software systems development experience, including 4 years of requirements analysis and large data systems design. BA/BS in Computer Science, Physics, Math, Engineering or related discipline required; MSCS preferred. USAF/DOD systems design/development expertise desirable. Familiarity with MILSTD 490/483 a plus.

Data Systems Modernization

The upgrade of the Satellite Control Facility through Data Systems Modernization (DSM) which incorporates DSM-Transition and Sustaining Engineering, is a project that requires the expertise of quality professionals who are skilled in systems analysis, specifications development and application programming with real-time command/control systems.

Senior Systems Analyst

Team Leader in systems development to support software design, software development practices and software management. Responsible for the software functions of a real-time interactive command and control system, to include transition, integration, and requirements analysis.

Responsibilities include the investigation and analysis of operational software support; providing plans for development and design of software; reviewing modifications for implementation and integration; the validation of satellite support requirements for space systems; developing operations concepts; and supporting PDRs and CDRs. You will also be responsible for system operations support, training, and will support test and validation and hardware interface analysis.

Requires BS in Computer Science, Math or Physics; 12-15 years technical and administrative management experience; and knowledge of AFSCF/DSM operations.

Systems Analyst

A Team Leader responsible for real-time system definition and design for Commanding and Telemetry. Perform detailed technical analysis addressing satellite operations software support. Responsible for system architecture, system concepts and improvements. You will be involved in software requirements definitions; software design description; software development planning; engineering change proposals; and design reviews and network modifications.

The position requires a BS in Computer Science, Math or Physics; 8 years experience in operational analysis, studies and requirements; and knowledge of AFSCF/DSM operations.

In addition to real opportunities for career growth and exciting technical challenge, we offer competitive salaries and an excellent benefits program. Please send your resume with salary requirements to Kim Pulbrese, Litton Mellonics, P.O. Box 3407, Sunnyvale, CA 94088-3407. U.S. citizenship required for most positions. Mellonics is an equal opportunity employer.

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Litton Systems Development

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Boston based div. of internat. conglomerate seeks accomplished mgr. for multi-site, 30+ staff directorship. Profile must include tech foundation w/ blue chip co. & extensive sys. devel. utilizing structured methodology. You will manage $2MM budget in rapidly expanding corp. environ. Requires excellent education bkgrd. Northeast candidate pref. Base to $70K.

[illegible]

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Personnel Consultants

SYSTEMS PROGRAMMER/ ANALYST

Provides technical support for a DEC VAX-11/780 computer system. Maintains VMS operating systems, analyzes performance, configures system, [illegible] procedures, and administers systems. Assist users at various levels in making [illegible] use of the system. Will have some responsibility for the Fund-Raising Information System. Experience with hardware and data communications desirable.

Requires Bachelor's Degree and 1-2 years of experience with BASIC and VAX/VMS. Evidence of strong analytical skills and ability to communicate effectively orally and in writing.

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Primary experience should include: ACF2 Data Security, OS/JCL and OS Utilities; TSO/SPF, and ROSCOE, IBM PC's, M&D Millenium, SDSF, RUSCO Access System, and Telecommunications.

Mail resume and salary requirements to the Employee Relations Department, or call 214-754-1171. Principals only please.

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Currently recruiting experienced computer pros with background in any of the following: [illegible] COBOL, Mainframe applications; Macro or Command CICS, VM/CMS applications development; IDMS [illegible]; Operations Analyst; [illegible] applications with [illegible] Mainframe [illegible]; DEC VAX Systems Mgmt; Data Base Analysts and Specialists; MVS or VM systems programming; NOMAD OS Analysts; [illegible] or Network Software; Software Engineering. Partial listing of the paid positions. Call or write:

The [illegible] Group, Inc.
[illegible]
Suite 7
[illegible], NC [illegible]
(919) [illegible]

SENIOR PROG./ANALYST CENTRAL MISSOURI

[illegible] position with a mfr. located in rural Missouri. This opening requires 3 years experience with MSA software support, 2 yrs CICS and [illegible]. Any exposure to DOS-OS conversion is a definite plus! IBM 4341 shop, this position is a major role in the DP organization. Excellent benefits and relo package. Salary to $40,000.

[illegible]

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Applications are being accepted for Software Systems Analyst, UNS Computing Center, Reno, Nevada. Responsibilities include [illegible] software. Primary responsibilities will be in support of language compilers and application [illegible] software. Requires a minimum of a Bachelor's degree and in-depth knowledge of two or more computer languages or [illegible]. Salary: up to $24,[illegible]. Application deadline: October 25, 1985. Send letter of application, resume, and the name, address, and telephone number of at least 3 professional references to: Christopher [illegible], UNS Computing Center, University of Nevada, Reno, Nevada 89557-[illegible]. The University of Nevada System is an Equal Opportunity/Affirmative Action Employer.

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PROJECT LEADER – SCIENTIFIC

The Cleveland Clinic Foundation, internationally respected for its dedication to excellence in research, education, and patient care, has a challenging opportunity for an experienced Project Leader.

The successful applicant will be responsible for supervising the group, performing shared system management functions for a VAX 11/785, troubleshooting hardware and software problems and on-going user support.

Qualified candidates will have advanced VAX system management experience (large VMS system) and excellent working knowledge of FORTRAN, BASIC, and VAX-DATATRIEVE, knowledge of statistical packages (SAS, SPSS-X, BMDP, SIR) and excellent oral and written communications skills.

We offer a dynamic work environment, competitive compensation and outstanding benefit program, including 30 days paid time-off per year, Sport Facility, Tuition Assistance and much more.

Qualified candidates send resume to Jennifer Paparella, Recruiter, Cleveland Clinic Foundation, 9500 Euclid Ave., Cleveland, OH 44106.

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For several immediate positions, steel industry experience will be helpful.

PROJECT MANAGER

You will manage the development, implementation and start-up of factory automation/process control projects. Our large integrated systems projects require practiced management skills, coupled with depth in control systems technology. A BS degree and 7+ years' experience in the development of real-time control systems is required.

These positions offer technical challenge, competitive salary and excellent benefits. For immediate consideration, please send your resume and salary history in complete confidence or call 412/566-4659 for additional information.

**Human Resources
Department CW-923**

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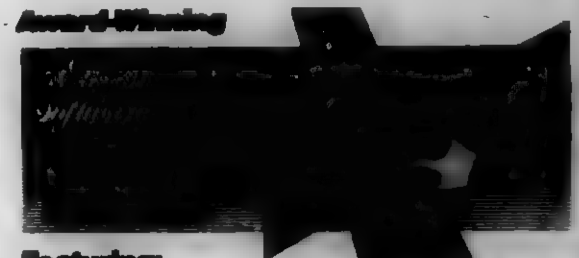

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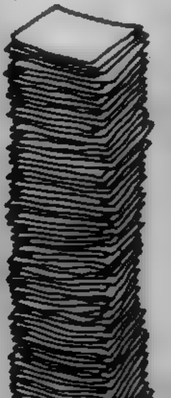

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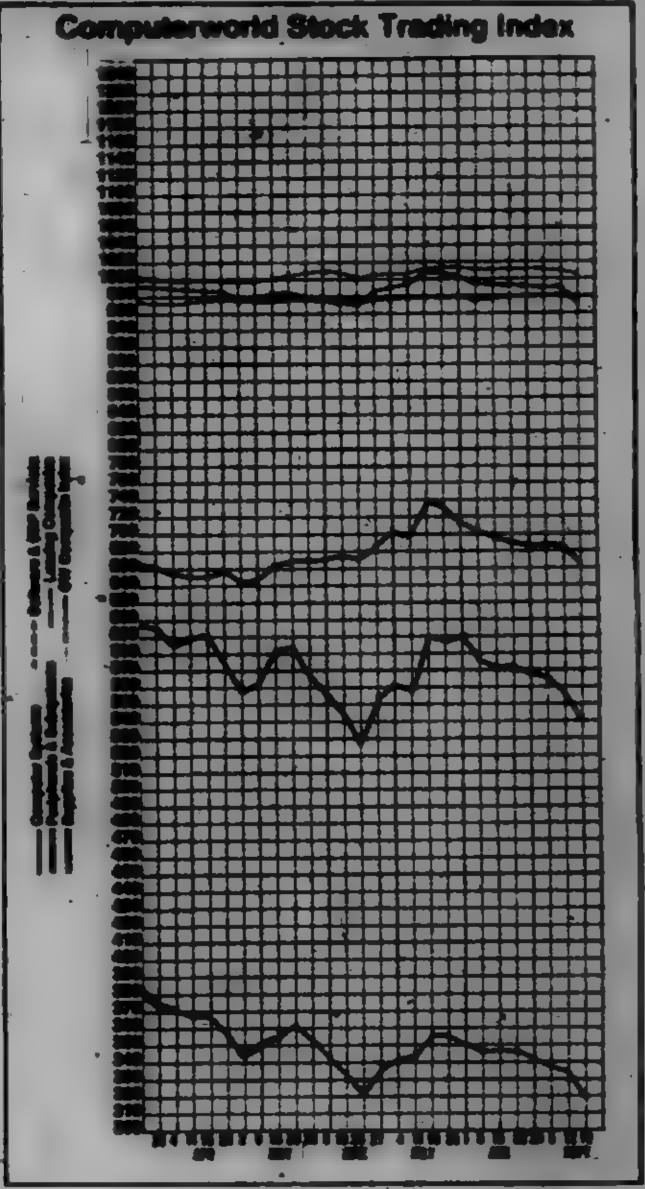

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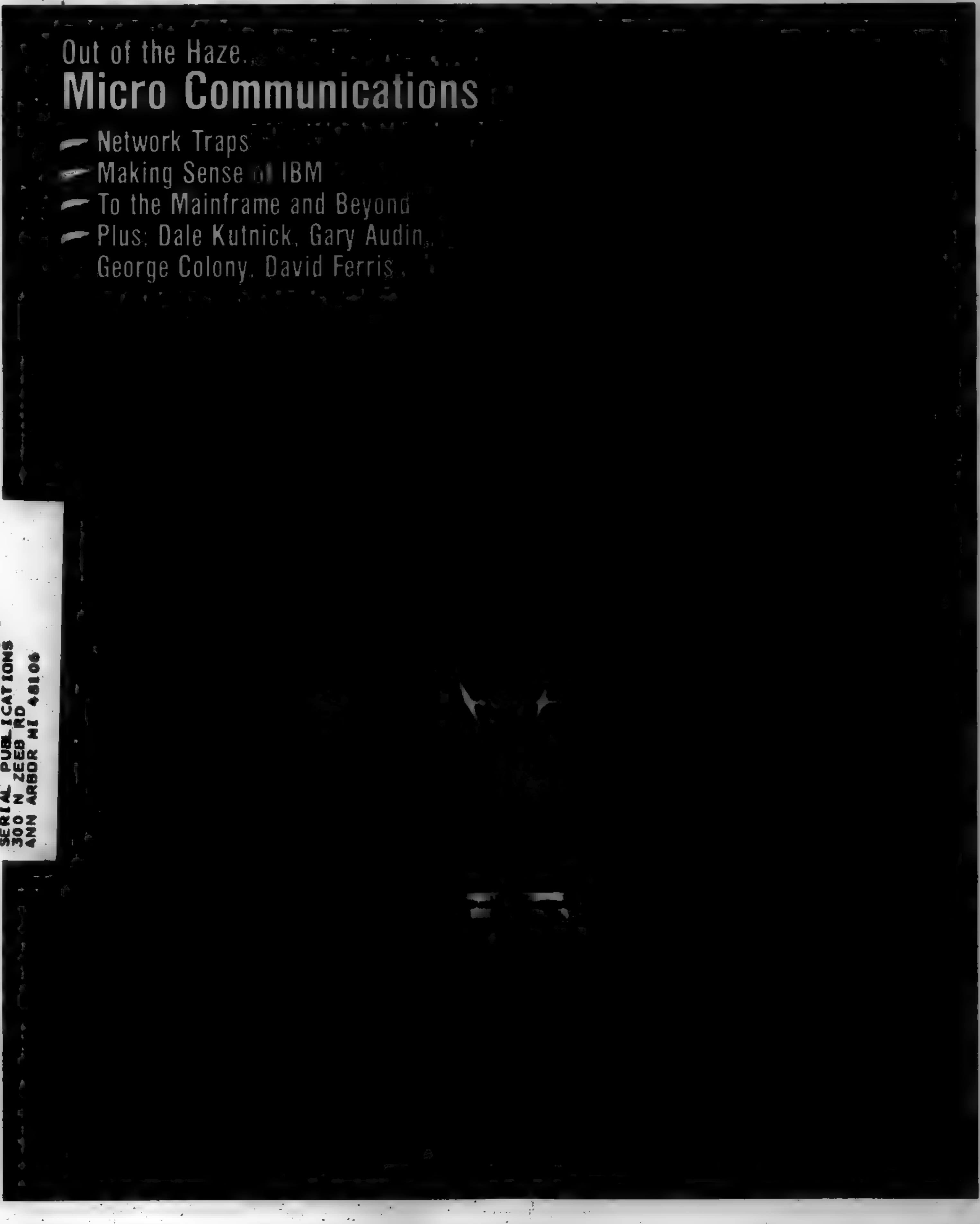

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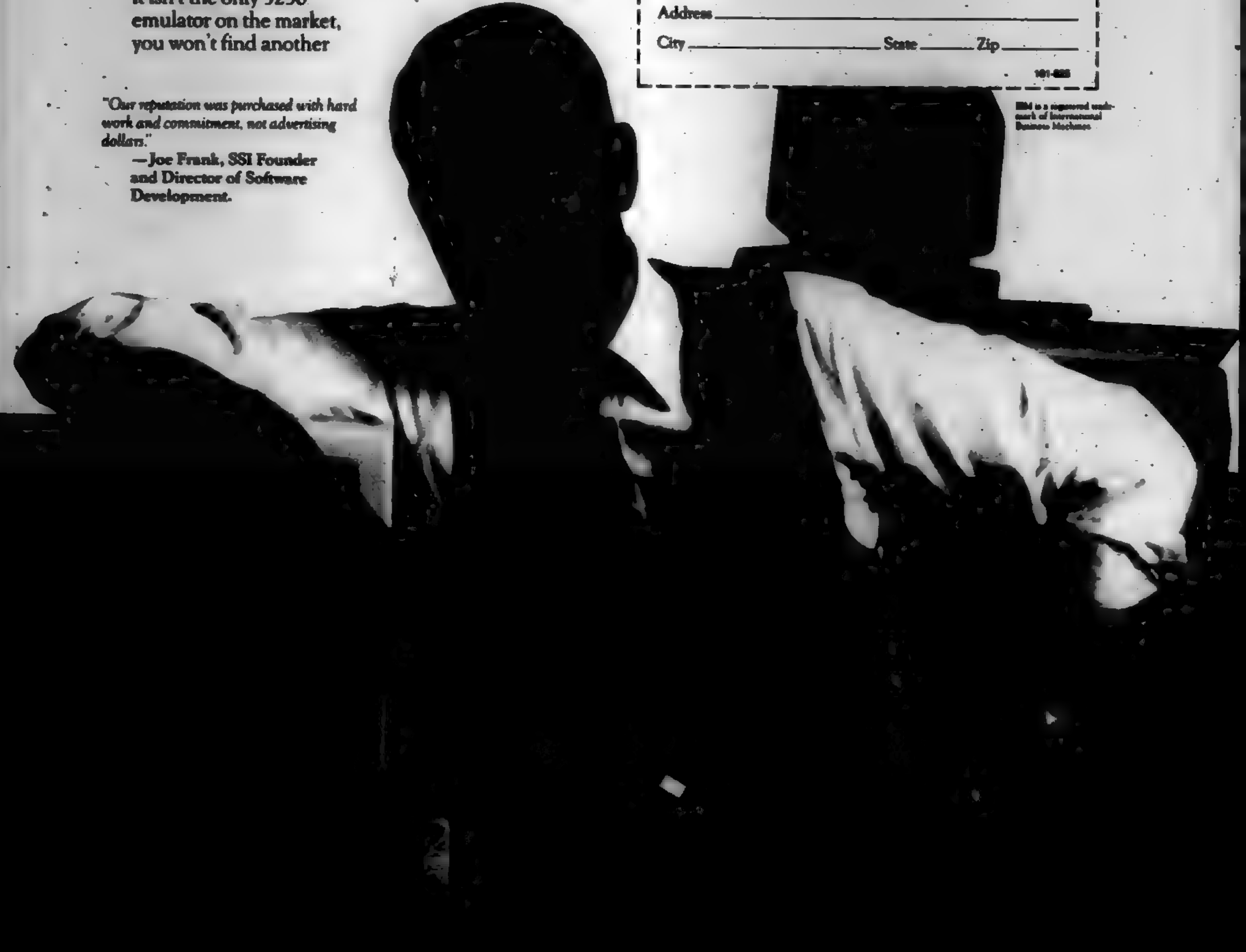

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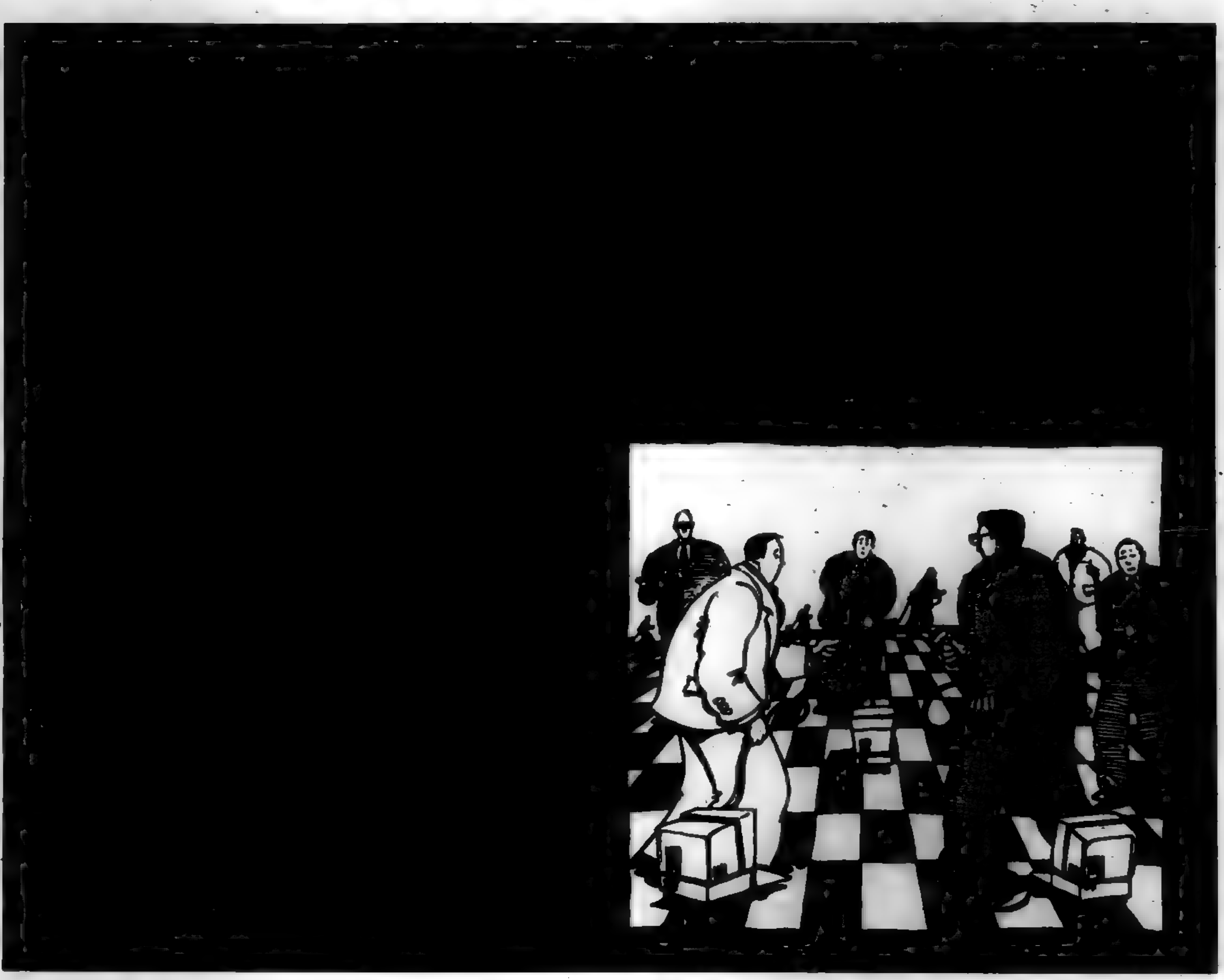


Comment

Two steps from utopia

By Dale Kutnick

The next major phase of the microcomputer revolution will be the cooperative or logical integration of these powerful desktop devices into mainstream information processing environments. This movement will be a four-stage evolution, with many promises and false starts. It will demand a total systems solution that today exists only on paper.

Just a few micro-to-mainframe vendors will adopt this perspective successfully and be able to compete against the large systems hardware and software vendors; the rest will become "niche players," primarily supplying multivendor environments.

The first stage of the logical integration of micros — simple communications links — is well under way with the proliferation of 300 and 1,200 bit/sec. modems, and more recently, 2,400 bit/sec. models.

While this stage has given users rudimentary connections, it has definitely impeded the progress of integrated networks. As individual users attempt to solve their own communications problems, their investment in and commitment to limited solutions take away the impetus for integrated corporatewide networks, which by nature require a top-down strategy.

Stage two is still in its infancy. In this phase, personal computers are attached to some kind of network and can load data from other network resources into their applications. While this loading is still cumbersome and often requires two, three or even four steps, protocol and format conversion exists, as does limited context switching between programs (loading a CICS file into a Lotus spreadsheet).

In stage three, whose development is occurring in parallel with stage two, micros share the same applications/facilities software with minis and/or mainframes. This sharing enables very smooth context switching, but the network software is not yet sophisticated enough to manage defaults and loading from one program to another.

Stage four will bring true cooperative processing — the ability for two or more intelligent devices to share resources and to load-balance applications processing efficiently and transparently between their users. The multimegabytes of memory and high-speed processors required to support these transactions are available now, but the software is far from ready.

In the future, personal computer users requiring information to fill in data base or spreadsheet application programs will simply request that information (using a familiar query facility) as though it were resident on a local disk. If it is not, the personal computer applications program will automatically default to a network program that will initiate a search in the next processor level (a file server, minicomputer or mainframe).

The network software will take care of security, logging, audit trails and so on and then oversee the delivery of the information in its appropriate form to the personal computer. The end user will be unaware that this complex process has taken place. Undoubtedly this configuration will be slow at first.

This "applications architecture" is quite analogous to distributing a large, homogeneous computer system — which has long been the promise of local-area networks. But the current network management, information delivery and application software is, in most cases, still two levels away from this utopia. It is slowly, painfully evolving.

During the past three years, the haphazard and uneducated buying of micros — personal computer anarchy — has outstripped vendors' ability to develop appropriate software. Constantly changing operating environments and applications software exacerbate the problem. Rather than buying now, users are awaiting true solutions, which has contributed to the current industry malaise.

In general, the popular application software packages are used primarily in stand-alone mode. Moreover, most communications programs are simply messengers (stage two in the evolutionary hierarchy), not true network

Comment

software that integrates applications. They require users to suspend their personal computer applications and to sign on to the mainframe or mini. The users then must have a good idea of where the desired information is located, what application contains it and how to extract it. This process can be cumbersome even for experienced users, and it explains why many professionals have been reluctant to embrace micro-to-mainframe links.

Some software, hardware and local-area network vendors are taking different approaches in beginning to address these issues. Mainframe software suppliers such as Oracle, Information Builders and Mathematica have put either full implementations or subsets of their data bases on the IBM Personal Computer.

IBM's LU6.2 protocol — which enables intelligent file transfer between distributed CPUs — is a good example of this new "logical" network software. It will form the basic link for IBM's upcoming token-ring network and for application and facilities interchanges between processors on an SNA network. But implementation of LU6.2 has been painfully slow.

Minicomputer vendors such as DEC and DG support their office automation programs (All-In-One and CEO, respectively) on both their minis and their supermicros, but the latter are generally too expensive for the average commercial user.

The local-area network software vendors, such as 3Com, Ungermann-Bass, Novell, Nestar Systems and Banyan have taken a different approach, using higher level local-area network software (typically "atop" Ethernet) and sophisticated file servers. Their network software efforts aim toward more virtual network access for personal computer users.

Not surprisingly, network software companies are one of the few groups that have managed significant growth during the 1985 computer industry recession. Still, their inability to control the higher level "applications environment" dominated by Cullinet, Applied Data Research, Cincom, IBM and so on will necessitate closer ties with those vendors if they are to move successfully to the next stage.

There are many issues to be resolved in the move toward cooperative, logically linked software. Transparency, information management and control, information delivery, application/facilities compatibility and security must all be addressed before this phase can become a natural extension for microcomputer users.

The message is now becoming clear: Independent software and hardware vendors that do not develop their products to link cooperatively with software running on mainframes and minicomputers will increasingly be locked out of the corporate world.

Dale Kutnick is an independent consultant based in Wayland, Mass., specializing in strategic planning and technical/market analysis. Formerly, Kutnick was research director and a principal of The Yankee Group.

Of things that don't quite work

By David Ferris

It's one thing for a DP manager to plug in an isolated personal computer in a senior manager's office so he can do spreadsheet analysis or compose documents with a word processing package. It's another matter entirely to turn the micros into full-fledged executive workstations that maximize work efficiency and put end users in touch with the information they need.

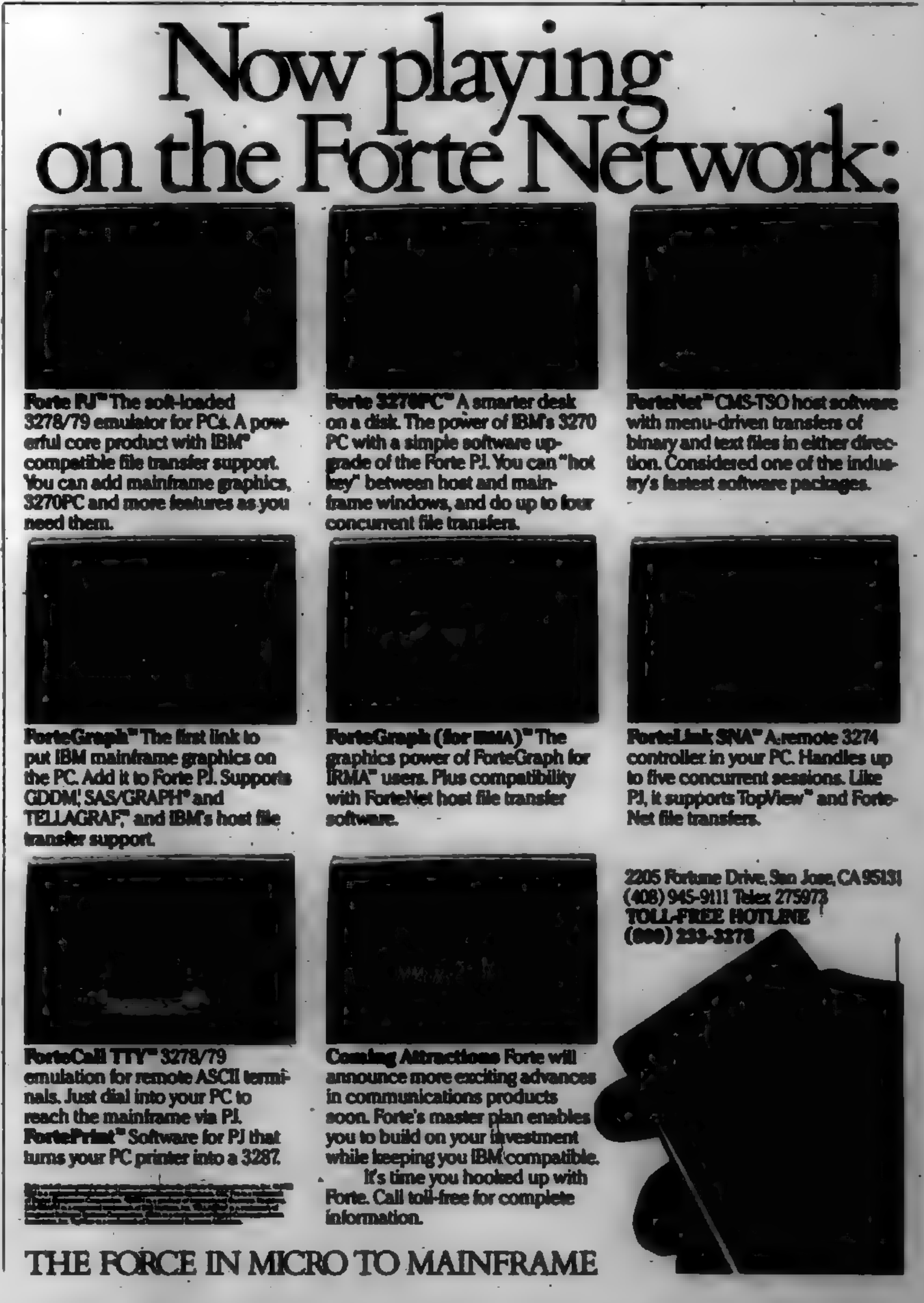
A key difference is the need for the personal computer to communicate with in-house computing facilities and with external resources. The workstation should represent a powerful, comprehensive set of support tools without placing too many of its own demands on the executive's time.

Eventually, micro-based executive workstations will incorporate many of the promised new technologies, ranging from advanced telephony and graphics to artificial intelligence. But the realities of implementing a real, live, functioning executive workstation today, next week or next year require more down-to-earth planning.

To minimize the risk of failure in an industry afloat in things that don't quite work yet, it's important to stick to relatively tried-and-true personal computer and 3270-style components. Start by implementing a conventional menu-driven front end which includes standard housekeeping functions. Then it should provide access to two classes of applications: generic packages that must be tailored by the user and those customized to specific in-house requirements.

Avoid the temptation to offer exotic generic applications just because they're available. It's probably true that, come 1990, many people will use project management and linear programming packages. But unless the company is already familiar with them, it's best to keep to mainstream end-user tools because, in practice, any others are likely to be ignored.

Furthermore, when defining the applications, remember that one of the executive's most important roles is to communicate ideas. As an analyzer and planner who then delegates tasks,



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THE FORCE IN MICRO TO MAINFRAME

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the executive needs to receive, process and pass information along. Consider providing several of the following:

Electronic mail greatly facilitates communication with the executive's colleagues. The store-and-forward capability is most often based on either a package such as Applied Data Research, Inc.'s E-Mail or IBM's Professional Office System on a corporate mainframe or on a third-party facility such as The Source or Dialcom.

Word processing, at least for simple note-taking, should be personal computer- or mini-based via terminal emulation. In time, many executives will achieve a high level of keyboard fluency and may choose to enter document text as they compose it.

Spreadsheet analysis: The best choices are personal computer-based, such as Lotus' 1-2-3. Terminal emulation to access mainframe-based packages such as Oxford Software Corp.'s Maxicalc is much less effective for this type of processing.

Automated Rolodex — user-friendly list management packages, such as Software Publishing Corp.'s PFS:File, used for storing names and addresses, major capital expenditures, personnel resources or other types of information for quick reference.

Proprietary data base services, such as Nexis and Dow Jones, provide access to financial, investment, economic and general news.

Corporate data downloading: Unfortunately, implementing downloading is awkward, particularly if you need an ad hoc, general-purpose facility. Informatics General Corp.'s Microanswer appears to be the best general-purpose solution.

The custom, in-house applications should be accessed from the front-end menu in exactly the same way as the generic applications. They fall into two general categories. Mainframe report menus are tied to preformatted reports containing operational, planning and personnel data. These services are available to the workstation user via terminal emulation.

Personal computer-based programs also offer a selection of reports which can best be written with application generators such as Ashton-Tate's Dbase III, Information Builders, Inc.'s PC/Focus or the programming languages embedded within Lotus' 1-2-3 and Symphony. It is usually unwise to turn to languages such as Basic or Cobol as implementation vehicles.

Personal computer-based programs are generally stand-alone. A 2,000-line program is not unusual. Some are sophisticated enough to perform a simple level of networking: A Symphony application can retrieve information from external data bases in a process transparent to the user.

The final result is a powerful tool for the executive, who can access information quickly and spend less time getting it and more time putting it to good use. The spreadsheet facilities and access to remote data bases improve the quality of decisions; the electronic mail speeds up communication time with colleagues; and the word processing facilities can, in the hands of a keyboard-fluent user, greatly enhance the quality of documents and speeches.

As simple as this workstation sounds, successful implementation is still far from simple. Microcomputer batch languages are much too rudimentary. What's needed is a good language in which to define menu screens, menu-to-menu control flow, interprogram communications and external communications.

For a start, the command language available with MS-DOS and PC-DOS is inadequate: People sometimes have been forced to program the entire front end. End users often have to type confusing key sequences when accessing mainframe applications because of the difference between most micro and 3270-family keyboards.

A deeper problem is the variety of different application languages that end users must learn. Electronic mail packages have one way of doing things, Dow Jones another, 1-2-3 another and so on. Here, the micro offers better potential than unintelligent terminals because it can provide a more consistent cross-application interface as an executive workstation.

So our personal computer-based executive workstation approach is deliberately conservative. There's no talk of local-area networks, Discos or paperless offices. We don't even include presentation graphics, the use of which is best delegated to the executive's clerical staff. Our workstation uses conventional hardware, typically an IBM Personal Computer XT, a Compaq or equivalent, with a draft- or letter-quality printer.

A critic might characterize this setup as merely stringing together unimaginative applications by means of a top-end menu, with little attempt at integration. I would agree. Our technological caution stems from the fact that the infrastructure required to offer better integration is still being developed and debugged. Personal computer-based executive workstations are now practical and useful, but those implementing them should try to minimize costly experimentation with the unproven.

David Ferris is chairman of San Francisco-based Ferrin Corp., consultants specializing in the integration and support of personal computers and end-user computing tools.

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Comment

A call to arms

By Thomas Cross

To wait is often the best policy — and certainly it has turned out to be so for some DP departments in managing personal computers. But now the challenge of interconnecting micros, among other issues, forces the MIS director to make a move.

Personal computer users have "had it their way" for the last five years. They achieved independence by taking control of their own applications, proving to DP that they could accomplish a great deal on their own.

But the question remains: Who should direct the growth and usage of personal computers and toward what purpose?

Each department within the company has its own view of the microcomputer's purpose. Top management seeks to determine the "real" benefit of linking personal computers together. The MIS/DP department favors intelligent terminals for interactive programming. The office automation department seeks solutions for office tasks on a departmental level. Farther afield, the information center uses personal computers as massive information repositories.

Each view implies a different approach to designing and implementing personal computer networks, and at present, both end users and DP management are demonstrating myopia in their consideration of network installation. If the micro is seen as a window to an on-line world that links ideas, decisions and policies, then the network proposals emphasize extensive disk storage for holding large amounts of data. If the micro is viewed as a management communications "power tool," the inclusion of X.25 gateways and protocol conversion mechanisms are presented as critical.

Ironically, the personal computer's greatest virtue, personal processing, can be its greatest limitation. Too often the person equipped with a stand-alone micro works in isolation. The answers and insights provided by the computer never get beyond that person's office.

But the stand-alone personal computer has only about four or five years left in its usefulness to the large organization. Users of stand-alone micros will ultimately work in a vacuum.

At this point, there is a critical mass of knowledgeable stand-alone micro users. Now they want to share their information and their expertise. Personal computer networking is about to explode.

The future lies in high-speed networks that integrate voice and data with video (such as the IBM 7730 PC-XT Video Conferencing System) and blur the distinctions between the telephone and the computer.

But networks add new dimensions to the management problem already sparked by personal computers:

- Data security — End users are concerned about security, of course, but not to the point of wanting to enter 10 different password levels.
- Data integrity — Who gets to change what and when? Bureaucracy could not have found a better home.
- Capabilities — Graphics, video and other image technologies throw a wrench into efforts to make terminal emulation work.
- Validity — Was the data sent and received accurately? Did you get a "yes" when you should have gotten a "no"?
- Devices — Someone needs to have the last word on where the extra disk drive went to and who is supposed to fix the printer.
- Applications — Will the application that operates adequately today still operate tomorrow when Unix or another new operating system is used?
- Systems failure — Lost any data lately to static, power surges or pushing the wrong button? Has anyone forgotten to do a backup before the head crashed?
- Management and control — Who is really in control? Now that end users are actively involved in day-to-day data processing, human communications need to be well maintained, too.

It's time for the MIS director to seize the moment — to take charge of the situation and direct long-term strategy. The personal computer user needs help.

By the same token, DP/MIS has no mission without the end user. The end user is looking for long-term solutions more than quick and easy fixes, so opportunities for developing alliances exist today more than ever before.

But in order for that bargaining to begin, DP/MIS and the end user must approach the table on a peer-to-peer basis. Corporate long-term strategies dictate an end to hostilities and the enforcement of a well-earned truce.

Thomas Cross is managing director of Cross Information Co., Boulder, Colo., which develops telecommunications services and presents symposia on information technology. He has authored several books and articles, most recently Networking Personal Computers in Organizations *(Dow Jones-Irwin), co-authored by James Weidlien, and* Intelligent Buildings and Information Systems Executive Report.

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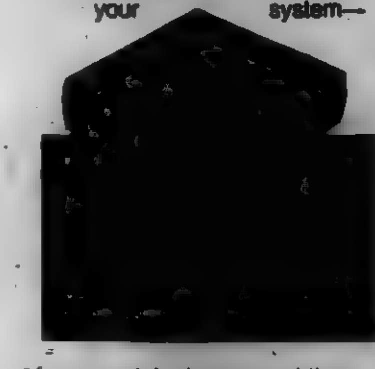

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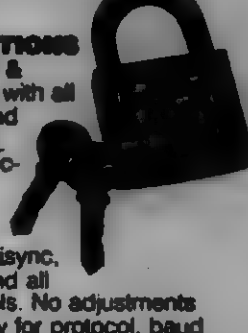

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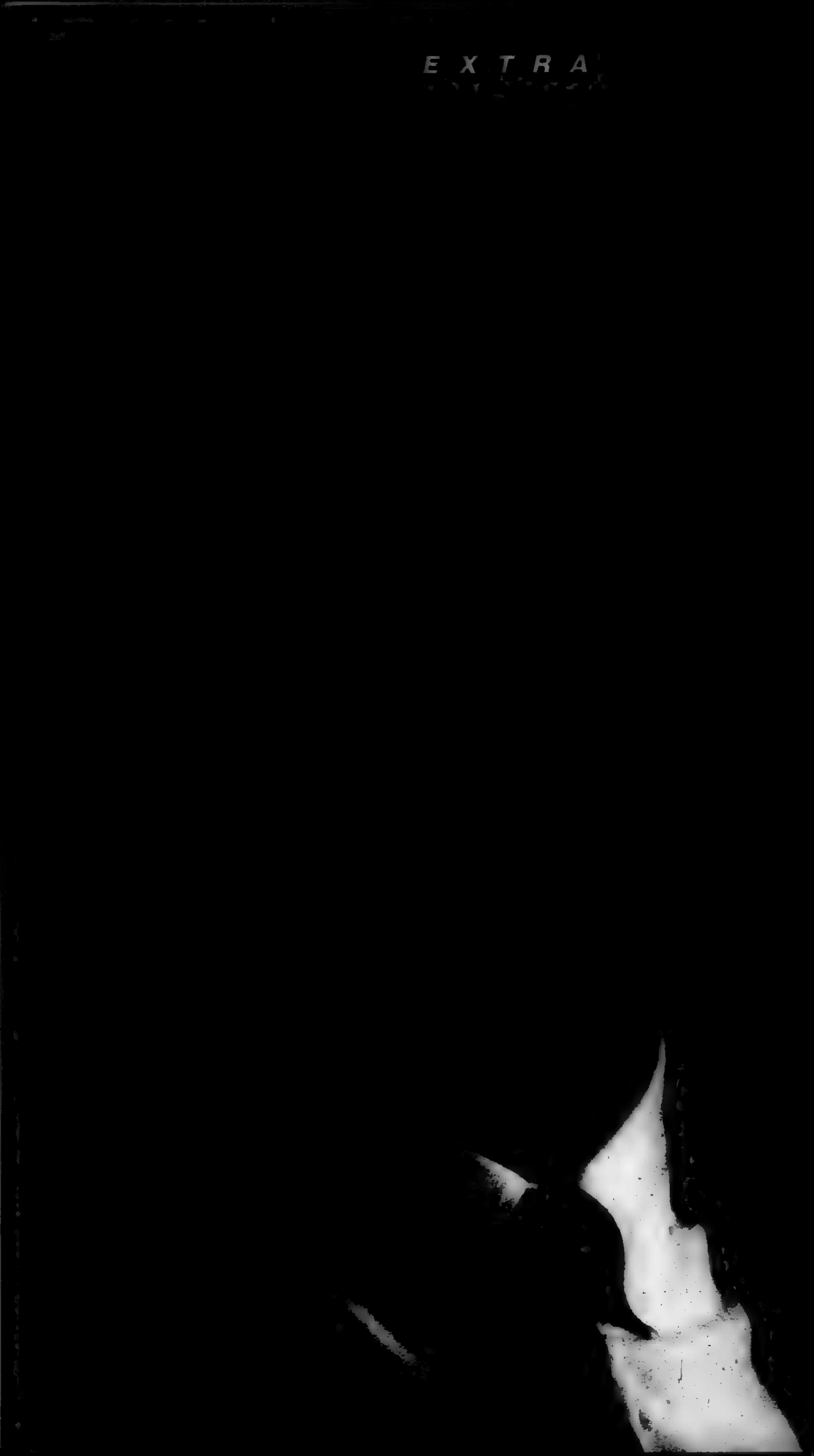

EXTRA

War stories from the network front

By John Dounis and Sharon Efroymson

In the battlefield known as micro networks, these users have lost, won, lost and won again. There are lessons here.

The corporate controller's office at Continental Grain Co., a multibillion-dollar international corporation, received a local-area network about two years ago. With a newly installed 3Com Corp. network, the controller can perform more in-depth financial analyses and produce more reports in a significantly shorter time.

"To consolidate information before we had the network, we walked floppies from machine to machine or shuffled it together on one IBM Personal Computer. With the network, we can consolidate without the footsteps and the shuffling," says Larry Stouder, Continental Grain's senior business technology specialist. Savings in time meant that actual output from the office — analyses and financial reports — sharply increased.

The network was the first in the company, and everyone loved it — until it crashed. Routine diagnostics failed to detect the problem, and after numerous attempts at repair, the authorized service representatives recommended by 3Com threw up their hands.

"I yelled and screamed," Stouder recalls. "They kept hitting us with charges and not solving the problem." The culprit turned out to be the file server, which Stouder finally had to fly from Continental's headquarters in New York to 3Com in California.

"We were back in service in about a week," Stouder says. "But a week for repairs in a controller's office is not too good." Repairs included restructuring the hard disk — unfortunate news for the department, which was backing up files on floppies. Prior to the crash, the department had shied away from investing in a tape backup system to keep costs down. After the experience of reconstructing the disk files from floppies, a tape backup seemed a necessity.

The network ran for six more

CW PHOTO BY O'CONNELL/LAROUSSE

months without a hitch then crashed again. Because of an engineering flaw, a gasket had been left out of the server. Stouder endured another round with the service organization without result, then shipped the server off to California again for another week of repairs.

This time, the network ran without major problems for a year before the server was out again because of a motherboard problem. Back to California.

"By this point, the server had had three trips — first class — to California, and I'd had none," Stouder quips. "That bothered me."

War stories like this one are becoming a hallmark of the local-area network industry. Veteran network users like to recount them in detail to anyone considering installation, in an attempt to balance the puffery and promises of network vendors.

It is true that even the best installations have been plagued with all kinds of bugs — simply because there have been virtually no standards. Compatibility has been tenuous between networks and third-party software or peripherals, and vendors and dealers have had little real world experience supporting the networks they are selling.

Surprisingly enough, despite the war stories veteran users stay loyal to the network vendor of their choice.

Brand loyalty

Given the option, most say they would stick with the original vendor, especially as technological advances continue to increase the reliability of networks and as experience improves dealer support. Networks are basically serving the functions for which they were purchased, and in this light, can be considered successful.

Stouder, for example, has tried other networks by installing loaners in his office, including the IBM PC Network and Orchid Technologies, Inc. PC-Net, but he still favors 3Com. However, he has changed dealers to get better service and blames the original server problem on the vendor's use of an OEM.

Continental Grain plans to trade its current server for the newly announced 3Server, which will allow Stouder to upgrade to some of 3Com's not-yet-announced products. 3Com's upgrade policy provides a reasonable discount on the 3Server.

And the industry as a whole is gaining from the experiences of the early local-area network buyers. Some standards are evolving as the technology advances, and many users who held off on installation can now consider it more realistically.

New users can also take advantage of current network users' experience to avoid certain pitfalls. These suggestions include better ways to install and configure networks — what experienced users would have done if they knew then what they know now.

Stouder has specific advice for corporations: Don't use a dealer who focuses on retail as well as corporate trade. He notes, "When a dealer caters to retail, some of his services and policies are colored by it" — to the detriment of the corporation. Retail customers with small installations may be satisfied to have their systems repaired or replaced within a week, so the dealer may not be set up to handle the hour-by-hour demands of the corporate DP environment.

Some local-area network vendors are planning to offer a "warm standby," a secondary system that will come online when a primary system fails. For years mainframe in-

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stallations have relied on this option.

Also, certain standards are emerging. With the introduction of the PC Network and DOS 3.1, many network vendors will be emulating the IBM and Microsoft Corp. standards in their systems.

But this era has not yet arrived, and human communication difficulties complicate already complex technical issues. For example, when a vendor says that the desired software package will run on a local-area network, many users interpret the statement to mean that the software will provide record-level lockout. The vendor may actually mean that the software will run on the network properly only as multiple single-user systems — in other words, file-level lockout.

Deceptive packaging

As a result of such ambiguous vendor statements, network users who have bought Ashton-Tate's Dbase III, for instance, expecting it to provide record-level security, have been disappointed. Two users attempting to write to a file simultaneously find later that their files were corrupted. Of course, there are data base packages that have been successfully adapted for use on networks, and some that have been written specifically for multiuser environments (See story page 31).

Lyle Anderson, a manager with the Office Business Systems Group at Peat, Marwick, Mitchell & Co. who specializes in micro- and minicomputer planning and implementation, has installed Novell, Inc., 3Com, the PC Network and Corvus Systems, Inc.'s Omnitalk for clients. Across the the board, Anderson finds that getting software to run on the network can be a problem because a lot of software packages write intermediate files during use.

"This can be a problem if you have two users using the same software, and both packages try to write the same intermediate file at the same time," he points out. Anderson's solution is to replicate the software on different directories for each user.

"Sometimes you have to trick the system into thinking you're still single-user by setting up paths on DOS. This takes a lot of trial and error." Adding another software user could mean repeating the replication process, and it will often take a generation of corrupted data to remind users to set up additional directories.

Copy protection and licensing is another consideration in setting up a network. Most software packages are not designed for networks, and legally a separate copy is required for each workstation. "It would be nice not to have copy protection on each diskette so that you could boot right off the network," Anderson says. "We either get one copy per workstation or look for site licensing," which is an alternative many vendors of popular software packages are now providing as a compromise.

In a recent installation of the PC Network, Anderson ran into difficulties using non-IBM software and third-party equipment because Installation-Aid, the PC Network's installation program, will not run with third-party disks. "We needed to go with third-party and non-IBM software because IBM doesn't provide high-capacity disk drives for the Personal Computer and doesn't have a competitive spreadsheet product," he explains.

"We've tried to get support for third-party products on IBM's hot-line number, and the answer I get is to talk to the hardware dealer who provided the product."

You're going to need a lot of support over the first six months to a year. You'll need a vendor who's reliable and close by.

Third-party vendors were able to provide the answers, however, and Anderson says he is very pleased overall with the PC Network. He does suggest that when planning installation, users get in contact with the third-party vendors ahead of time to make sure they will provide support.

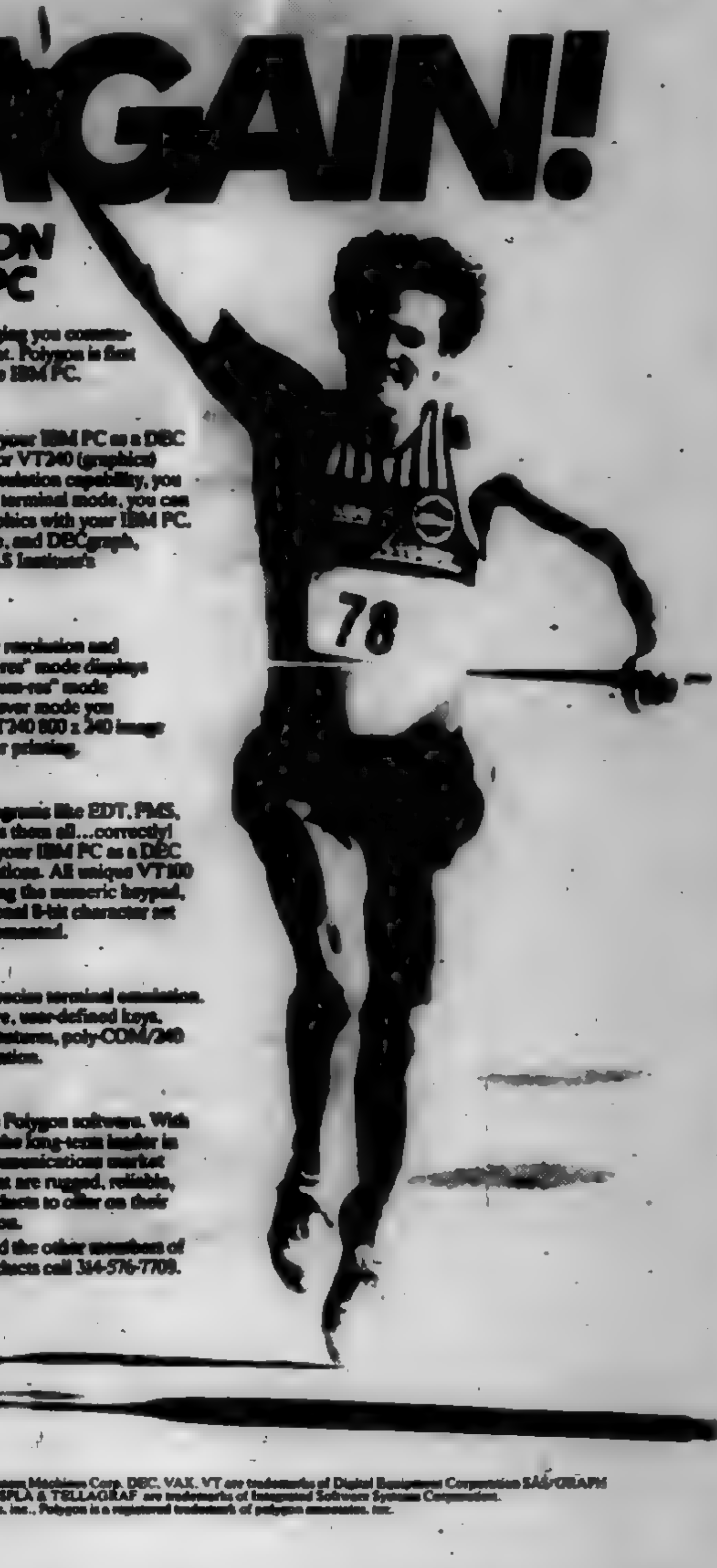
Growing with the vendor

Chuck Fielding, systems analyst at Jayco Management Co., a real estate developer in Houston, has watched the evolution and growth of his network over the past year from its initial six-node installation. Although firmly committed to Novell's Netware, Fielding has had his own challenging time with the network.

"I wish to thank Novell for making us a beta test site without our knowing about it," Fielding says wryly, referring to his recent experience with Novell's Advanced Netware. Fielding asked for the advanced version of Netware as soon as it was available because of Jayco's pressing need for a remote application.

While the local dealer did caution that there were still problems with the product, Fielding assumed they would crop up in the network's new remote features. He was therefore quite surprised to discover problems with basic interfacing commands such as FORMAT and LINK.

Furthermore, a popular word processing program that ran perfectly on the previous version caused the new network to crash when used with the



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Retail customers with small installations may be satisfied to have their systems repaired or replaced within a week, so some dealers are not set up to handle the hour-by-hour demands of the corporate DP environment.

spooler. Novell took a few months to debug Advanced Netware, but Fielding now has the upgrade, which he says is working fine.

Fielding's experience points to the hazards of working on the front lines of advancing technology. "We've always stayed on the edge of technology, as long as it's reasonable," he says. Reasonable, for Fielding, translates to a willingness to use a new product as long as it comes from a growth company he trusts. However, he doesn't recommend users take that risk unless they have an in-house technical staff for troubleshooting and support.

The process of fine-tuning

Back in March 1984, the same willingness motivated Jayco to be one of the first on the block to install a network. Managers needed a powerful multiuser data base application that would allow them to access up-to-date tenant and property information quickly, and the new personal computer-based network technology was the answer.

Jayco began with a six-node Gateway Communications, Inc. G-Net system, utilizing Novell's Netware/G software and an IBM Personal Computer XT as the designated file server. This linear CSMA/CD system is recommended for small installations. Three users were running a data base; the other three, spreadsheets and word processing.

The network ran into a few start-up snags, and installers ended up making adjustments to both hardware and software. First of all, the network was set up to share a single printer, but the printer unit was under heavy use, often grinding through a box of paper every 1½ hours. Fielding soon realized that the Okidata Corp. Microline 84 did not have the capacity to withstand the usage and upgraded to the vendor's Pacemark 2410.

Fielding says file-level lockout security, one of Novell's main assets, proves to be a nuisance in some instances. "If the person working with a file walked away without exiting from the application, another user would be prevented from accessing that file."

Also, he finds that new system administrators tend to have difficulty conceptualizing the definitions for public and private volumes and security rules. For example, if a program runs on the network, the rules for the program should be defined as shared/read-only. However, for each user, files should be defined as nonshared/read-write. This definition will allow all users to use the programs on the network and still protect files from being accessed and edited by other users. Fielding recommends that COMMAND.COM be installed in a public volume; otherwise, when exiting a program the user may have to reboot. "The manuals are somewhat vague about that," he observes.

Another problem is the training that is required for all network users. Fielding finds the nontechnical user would rather not be saddled with network commands in addition to DOS commands. He sidesteps the training issue by building front-end menus that control the desired network tasks for the users.

A 12-second wait

Even after these kinks were ironed out, there was still one overriding problem. "Our own users found the network too slow," Fielding explains. "Plus, we have a lot of investors who drop by our offices, and we like to show them our technology. A 12-second wait didn't look too good."

Because they realized that they were heading toward outgrowing the practical limits of the G-Net, Jayco's managers decided to upgrade to Novell's proprietary Netware/S Server, a Motorola, Inc. 68000-based token-passing star system, one year after the original installation.

Fielding found the same applications ran 30% faster on the new server. Benchmark tests showed that while accessing an 11K record through a data base application, the Read took 13 seconds on the six-node G-Net. It took 10 seconds on the Netware/S system. Even on a stand-alone Personal Computer XT without any network overhead, it only ran one second faster.

For Fielding, the potential for expandability is one of the true benefits of a network. Local-area networks don't require the steep initial investment of a minicomputer; a company can start with a small, serviceable network and invest more as time goes on.

Fielding does recommend that anyone installing a network make sure that the vendor has a good trade-in policy for upgrades. Other suggestions include:

Don't try to cut costs by mixing and matching hardware. Fielding says Anderson's bad experience with third-party peripherals is not isolated. "People mix all kinds of parts together without the experience to make it all work together," he says. "If a vendor suggests combining products, that's a danger sign. When you try to squeeze bucks, you get burned."

Check that your vendor has a good inventory to use as loaners when your network needs servicing. "You're going to need a lot of support over the first six months to a year," Fielding warns. "If you're buying a proprietary system and one piece goes down, it can take eight stations with it. You'll need a vendor who's reliable and close by so that you can be up and running by the next day."

Don't pay for anything until it works. "A lot of dealers don't know what they are doing. It is hard to understand a network until you've worked on one for a long time." Having been burnt a few times, Fielding has learned to dig in his heels. "I tell the vendor I'll hand the check over when the net works." He admits that one could only do this with a small system; the hardware investment for a large network would be so steep that no vendor would agree to these terms.

Bullish on networks

Another battle-scarred veteran, Laurie Antonell, is in charge of a larger installation. She is manager of micro networks for Merrill Lynch & Co. on Wall Street. The current network environment at Merrill Lynch, consisting of four Novell Netware/S networks that support 80-plus users, has been in place for about two years. The network is used for calendar programs and electronic mail, and the company has plans for new applications to take advantage of multiuser record-lockout capabilities.

In general, the S-systems provide Antonell with good response time for the 18 to 22 users connected to each of the three production systems. A fourth system is used to test new releases of software on the network and to perform regression tests during upgrades.

It is essential that new software be tested prior to migration onto a production network or when a new copy of the software is being installed. Antonell is currently planning a migration to the new Advanced Netware so that all of the independent networks can be linked together, enabling users to access all data simultaneously.

Cable installation

One of Antonell's recurring network problems is cable installation. For example, if someone moves to a different office, she doesn't want to reinstall that cable in the new location. The solution was to install cable within the wall, allowing it to be terminated with an outlet, and routing through a patch panel so users can switch a computer port onto an active line.

"Now I have cables hooked into each office. As people move, I just switch them to their new locations through the patch panel," she says. New users simply plug into an existing outlet. Installation of cable connectors continues to be a problem. When a connector on a cable severs, it is difficult to pinpoint the faulty connector.

Antonell advises that preventive maintenance be a standard practice. Simple maintenance such as backing up all the information on the disk, reformatting it to detect the newly damaged sectors and then restoring the files to the disk saves a lot of sleepless nights.

With six or seven disks in the system, the Merrill Lynch network has had three disk failures in two years. Much to Antonell's satisfaction, her dealer immediately supplied her with

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replacement drives, so the network was up and running in 24 hours each time. Service support is high on Antonell's checklist for dealer qualifications. Her suggestions include the following:

- Make sure your dealer maintains adequate inventory. "Go into the closet and see his supplies. The vendor should have at least one set of disk drives, all parts of a file server and a few workstation cards. Of course, if he services a hundred companies' networks, he should have a much larger inventory."
- Check that the vendor employs technicians to handle problems specific to a local-area network. The technician should be able to tell, for example, if your problem is with the controller board, the memory board, the read-only memory chips or the disk drive.
- Choose a vendor who knows how to set up the network for the expected load and for optimum performance, taking into account factors such as the file server's hashing and caching schema, the number of files that can be open at the same time, and disk and block sizes.
- Designate a system administrator for every 25 users. Ten percent or less of an administrator's time will be spent adding and deleting new users and making sure that files are backed up and restored. The administrator should make sure that rules for public use are documented and should know how to add and delete software, how to add files in the proper directories and how to give people rights to it.

The system administrator is responsible for space management and for informing people to erase superfluous files but should not be responsible for doing so. The supervisor needs a data base of the serial numbers of the hardware and software and who has what file or directory access rights.

Wiser now

Richard Watson, chief of computer services at the U.S. Department of Commerce's Eastern Administrative Support Center, has installed a 35-node network from Network Development Corp., with an IBM Personal Computer as a server. He intends to upgrade to a Personal Computer AT but is waiting to see what other technologies emerge.

Watson tells his own war stories. The network ran very smoothly for the first four months — until it reached "some mystical point of activity.". Then, as Watson describes, "It started showing symptoms like random failure — people would go to print a word processing file, and the file would disappear. The error interrupts were really nonstandard."

The department tried a number of solutions. "We suspected the word processor — or perhaps an incompatibility problem," Watson explains. But troubleshooting was of no avail.

"Once we called in the vendor and told them, 'We give up,' they were here right away," he says. The vendor quickly determined that the problem lay with the hard disk, manufactured by a third party. The vendor installed a temporary 135M-byte loaner drive until the other is replaced.

What would Watson have done differently, with hindsight? "I'd have hollered sooner," he said.

Dealers witness many user problems from a unique perspective. Feridan Uygur, district manager for the New York office of Microserv Technologies Corp., a distributor of networking products, has coached a number of dealers on handling network installations.

No place for a novice

Most network problems Uygur has encountered come from improper cabling. People sometimes use homemade cable that offers inadequate shielding and has improper impedance characteristics, making it susceptible to noise. Often the running of the cables themselves has not been done correctly.

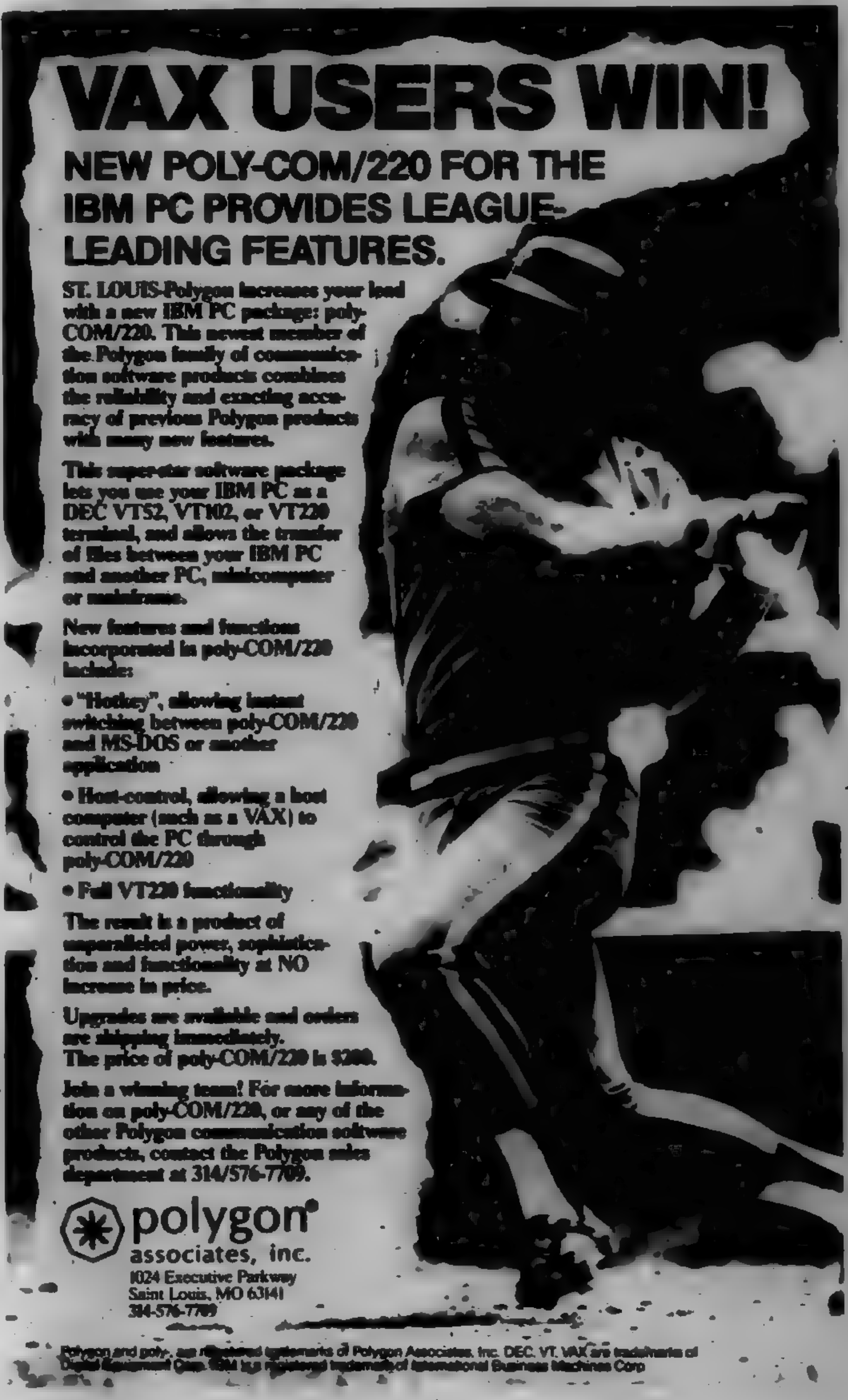
Another problem category is boards. Any time a new board is introduced into a personal computer on the network, there is a threat of incompatibility from conflicting interrupts. Some boards are designed so that their interrupts are changeable, and a technician can alter them. Boards without changeable interrupts are best left out of a network.

Most network problems come from improper cabling. Another problem category is boards.

Programs often requires configuration during installation to gen the software properly for the network. Often, different versions of the software require a patch to make print routines and screen handling work properly. These comments quickly make it clear that network installation is no task for a novice user.

Uygur trains his dealers to run through a checklist each time they install a system for a client. Network purchasers should expect questions like these from consultants; if a dealer or consultant doesn't ask them, it might be cause for concern.

- Do you have cable already installed? If so, what type?
- How many users will be on the local-area network? What number of nodes and how many concurrent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users? To what size do you expect the network to grow in the foreseeable future?

- What types of applications will be used on the system? Will there be any that are disk I/O intensive?
- What type of server will be required? Will it be dedicated or nondedicated?
- What will be the physical layout and the resulting topology? What are the distances between machines? Will it run on separate floors?
- Is there a need for remote access? Is there a need for gateways or bridges?
- What kinds of multiuser software do you need? Is it available from a third-party vendor?
- What are the cost parameters in the long run? In the short run?
- What kind of technical support will be needed? How much training will end users require?

The experiences of the veterans show that network installations are tricky, even when procedures are followed precisely. For the first-time network user, installations mean making challenging adjustments, including boards and master programs that need to be modified. Often the documentation is not updated properly by the vendor, and software releases are sometimes sold without being thoroughly tested.

Into the fray

However, the industry is maturing. More vendors are rallying behind the major players. With the emergence of standards, software incompatability will be less of an issue. Furthermore, new users now have a body of experience to draw upon to ease the transition to a fully integrated system. With the proper support from competent dealers and consultants and careful planning, a network may be implemented with much less difficulty than in previous years.

Already, the users who broke the ground in linking microcomputers are moving on to new levels of network technology: gateways to the mainframe. Stouder at Continental Grain is planning a network gateway to large-scale IBM computers the company maintains in Chicago. His purpose is to avoid having personal computer users dial into a protocol converter and then transfer the data between the file server's disk and the mainframe.

It is becoming evident that volume users are pleased enough with their network installations that their battles have produced no bitterness, war stories notwithstanding. These users are now going back into the fray, ready to tackle new technologies in the effort to maximize the potential of the personal computer as a business tool.

◆

John Dounis is a director of the Center for Advanced Data Processing in New York. As a consultant there, he has designed and implemented multiuser personal computer applications using local-area networks.

Sharon Efroymson, an instructor at the Productivity Center at CADP, has developed its PC Communications courses, and trained corporate users in networking and communications concepts.

Support: Beyond Band-Aids

By Stephen Thurston

Most users of personal computer networks today could be classified as "early adapters." Intrigued by the technology, these pioneers purchased local-area networks soon after they were announced and before the path had been well-worn. By nature, they have been to a large extent self-sufficient in terms of installation and ongoing service and support.

But the customer profile is expected to change over the next two to three years, as personal computer networks are installed in greater numbers among smaller companies and office environments.

A key role in network maintenance is played by the network administrator. If that person is technically proficient and can diagnose problems effectively, there is less need for comprehensive on-site service. But in most cases, it is impractical to plan on installing a network without outside help.

Many local-area network users start by establishing a strong relationship with a local software consulting firm or independent consultant. Even if users are self-sufficient in terms of technical expertise, most rely on a consultant for initial network design, customized application software and ongoing support.

Hardware service has proved less of an issue to date. The mere fact that personal computers are operating in a network doesn't seem to imply greater service requirements, although critical network components — particularly file servers — should be covered by an on-site service contract.

Total system approach

The most appropriate type of service, however, takes the total system approach. From one service vendor's perspective: "What we're really offering here is support of a company's business environment rather than specific hardware and software components. We're offering protection against such things as user error, power irregularities — any number of things that might have an impact on that company's overall productivity and profit/loss."

The users' viewpoint, as expressed by one businessman, echoes the same need: "The computer views the network as a peripheral that is highly reliable. If the network is within one department only, service issues are simple — they're treated as an extension of the processor. But if multiple departments have access to the same network resources, there often is no interest in cooperating on such issues as service and support. It tends to be MIS that can work things out with a service vendor."

Estimates from network vendors indicate that the typical factory-level board repair/replace service has been sufficient to handle 75% to 80% of the customers who elect a self-maintenance approach. But as the network becomes more of an information utility, MIS groups will regain control, and those vendors recognizing the system approach will be the most successful.

Several such vendors have recently enhanced their offerings to accommodate changing requirements:

- Corvus Systems, Inc. now offers an on-line program, extended limited warranty, exchange warranty and on-site maintenance through Decision Data Systems.
- Nestar Systems, Inc. offers on-site maintenance (through RCA Service Co.), factory maintenance and a "rent-a-part" option, in addition to standard time and material rates.
- 3Com Corp. is establishing a program to provide service through a network of authorized dealers in conjunction with the availability of its 3Server product, a more critical network component.

The ultimate objective will be establishing single-source responsibility for network installations — from the planning/design stage through implementation and including ongoing support.

Retail/dealer organizations are best described as still being "on the learning curve" in terms of finding their optimal role in delivering service and support for personal computer networks. For some dealers, network support expertise will differentiate them in the market. Others find that a joint relationship with a local software consultant who provides support works best.

Learning the hard way

Many dealers have learned the hard way that a network sale requires considerable pre- and post-sales support. Having once underestimated the task of network installation and service, dealer service organizations are now wiser. They have also become cautious of naive customers wishing to jump on the network bandwagon who may later balk at installation hang-ups.

One dealer's comment is typical: "You don't rush a network sale. We'd rather turn the business away now than take on an unprepared network customer. Support is not a one-person job — it involves departments such as technical support and training. Our network specialist is now part of the service organization."

Third-party maintenance firms may never become that active in the network service market for personal computers. As a rule, third-party firms are participating primarily by making national agreements with local-area network vendors rather than actively marketing end-user contracts.

While they may be able to offer the advantage of multivendor hardware service, these companies lack diagnostic capabilities as well as the systems orientation for the "soft support" required for networks. Their forte lies in fixing broken machines, not in answering open-ended questions such as, "Why isn't my network running today?"

Third-party software consultants can add value in the form of programming expertise, tailoring industry-standard software to a multiuser environment. Use of such consultants is a common thread among many personal computer network users, and some have joint efforts with a major retail/dealer organization. Continued opportunity for such organizations to provide planning/design services and support is expected.

The ultimate objective, as local-area network users connect to other local and wide-area networks, will be establishing single-source responsibility for installations — from the planning/design stage, through implementation and including ongoing support and management of the "information utility."

Single-source capability

One group will shoulder complete responsibility for diagnosis and correction of any problem in the network, regardless of location and equipment involved. A designated service vendor, in essence acting as the customer's agent, would manage this whole process, including any subcontracting required. The customer would make only one call and hold only one contract.

In fact, some of the systems manufacturers already have this goal in mind as they develop their support services.

The real question is what value customers will place on such a single-source capability and whether they are willing to relinquish overall responsibility for managing these problems.

While a broader range of support services is an indication of the maturity of vendors and markets, users need reassurance that there will be continued service and support available. Those vendors who have effective service and support programs now are better positioned to be the long-term survivors in this emerging marketplace.

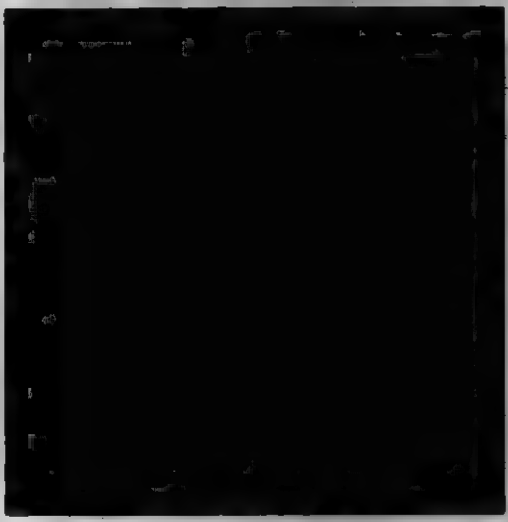
◆

Stephen H. Thurston is a principal with The Ledgeway Group, Inc., Lexington, Mass. The market research/consulting firm specializes in service issues and recently published a report, "PC Network Service and Support."

EXTRA

IBM's grand scheme

By Eric Killorin and Paula Musich



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Printer Attachment, Cluster Program, PC Network, Cabling System, SNA — welcome to IBM products in search of a strategy.

IBM's helter-skelter development approach toward networking is changing slowly into a comprehensive solution.

It used to seem as if there were no overall strategy from IBM about how to link its computers. Different corporate divisions apparently pursued their own networking answers independently, each group concentrating on connecting the equipment it was responsible for supporting.

IBM now has a vision for corporatewide networking. Users expecting a big splash soon will be disappointed, however. IBM's solution will evolve rather than burst onto the scene as a single new product.

Like most large corporations, IBM will move ponderously, weeding out some products and adapting others. To piece together IBM's various Personal Computer network offerings, it's useful to put the needs they serve into a framework — a directory of needs and solutions. The "solutions matrix" defines four levels of networking needs and shows current products corresponding to each level of need.

The lowest level of the solutions matrix represents the need to share resources such as printers and modems. Here IBM offers the Printer Sharing Attachment, a data switch. The device enables four Personal Computers to share the Displaywriter letter-quality printer.

Solutions matrix: A directory of network needs and solutions

Primary User Requirements	Chief Rationale	Domain	Typical Implementations
		Level I: Resource Sharing	
Output Devices Share printers and special-purpose output devices, modems	**Economic** Amortize cost and use shared devices over multiple personal computers	**Work Area** Small cluster (room, office); primarily small stand-alone group (fewer than 10 personal computers, one printer, one modem)	**Data Switches** Switches between personal computers and shared devices; support for standard interfaces (RS-232, RS-423, CCITT V.24). Examples: DEC Mini-Exchange; Advanced Systems Concepts Amps-11; IBM 5218 printer attachment; Apple Appletalk
Secondary Storage Share hard disks, diskettes, tape backups, printers, modems	**Economic** Amortize cost and use shared devices over multiple personal computers; eliminate need for hard disk in each personal computer; share systems and applications software	**Work/Local Area** Small cluster, (building, campus); primarily small to medium-size stand-alone networks (fewer than 25 personal computers, mass storage subsystems, two printers, modem)	**Network Servers** Disk/file servers (typically personal computer-based) or personal computers with onboard network interface units; twisted-pair or coaxial cable media. Examples: Corvus Omninet; IBM Cluster Program; Novell Netware/S; AT&T Starlan
		Level II: Information Sharing	
Local Area Transfer and exchange information, messages, software between personal computers and other processors	**Data Access/Performance** Information sharing in multivendor environments; requirement for high performance; conformity to standards	**Local Area** Intra- and interdepartmental (building, campus); primarily medium-size stand-alone networks (fewer than 100 personal computers, several hosts and shared devices)	**Local-Area Networks** Coaxial cable-based local-area networks with or without servers; baseband or broadband. Examples: IBM PC Network; Interlan NET/Plus; Ungermann-Bass Net/One; 3Com Etherseries; Proteon Pronet
Local/Wide Area Transfer and exchange information as above, with expanded requirements for end-to-end communications across multiple environments/architectures/media — at personal computer level	**High-Level Network Functions** End-to-end message delivery; internetworking (bridges and gateways — local-area network-to-wide-area network, X.25); network management; multivendor support; conformity to Open Systems Interconnect model	**Wide Area** Intra- and interfacility (city, state, country); bulk of communications occurring locally (host systems with several hundred workstations)	**Layered Architectures** Hosts (personal computers if supported) as network nodes, multiple classes of processors/devices on network; routers used for internetworking; gateways used for connection to X.25 or other networks. Examples: IBM Systems Network Architecture; DEC Digital Network Architecture; Honeywell Distributed Systems Architecture; HP Advancenet

Source: Hyatt Research Corp.

Each IBM Personal Computer connected to this small device-sharing network requires the IBM Printer Driver program. The network will route print requests via the Personal Computer's asynchronous communications port to the data switch for subsequent dispatch to the printer.

The IBM 5218 Printer Sharing Attachment competes with the Mini-Exchange from Digital Equipment Corp. and the Amps-11 from Advanced Systems Concepts, each of which perform similar functions.

Network dark horse

The next level of networking need calls for sharing secondary storage, such as centrally located disk drives. IBM's Cluster Program fills this need.

Perhaps because IBM never referred to this product as a "local-area network," it generated little excitement within the user community on its arrival. Its chief strengths lie in its low cost and easy installation and operation. With the Cluster Program, half a dozen microcomputer users can share storage economically.

The IBM Cluster Program consists of software that permits the Personal Computer, Personal Computer XT, Portable Personal Computer and PCjr to share storage and exchange files. The Cluster Program requires single-board network interface units called Cluster Adapters and Cluster Attachments. In its fullest configuration, the Cluster Program supports file transfer, electronic mail and secondary storage sharing (virtual diskettes).

A server-based network configuration uses a Personal Computer XT as a nondedicated disk server, supporting up to 20M bytes of shared storage. In this setup, cluster users can access one private volume and one public volume. Alternatively, the network can be configured to support information sharing only, eliminating the need for a disk server since the network software resides in each workstation.

The Cluster competes with Omninet from Corvus Systems, Inc. and Netware/S from Novell, Inc., two well-established personal computer local-area networks.

> ***Neither the Printer Attachment nor the Cluster Program is destined to survive in IBM's future networking plans. Neither is well suited as a foundation for network expansion, and IBM may not ensure their coexistence with future products.***

IBM freely admits that the Cluster's performance will suffer during I/O-intensive sessions. Having I/O duties performed at the disk server degrades the performance of workstations, and conversely, I/O processes being completed by workstations will affect disk server performance. What all this amounts to is that the Cluster can reasonably support about six users, despite a theoretical limit of 64 users and some marketing recommendations of 20 to 25 users.

Neither the Printer Attachment nor the Cluster Program is destined to survive in IBM's future networking plans. Neither is well suited as a foundation for network expansion, and IBM may not ensure their coexistence with future products.

Off to a slow start

With two low-level personal computer network offerings from IBM, the market was anxious for a flagship local-area network and pinned its hopes on the PC Network, announced late last summer. Unlike the Cluster Program, the IBM PC Network targeted the next level of need — sharing information locally — and was much ballyhooed on its introduction. On closer examination, however, industry observers criticized the network for its use of broadband technology and its limited services. Subsequently, interest in this network declined.

The PC Network uses a different access scheme and different media than IBM's planned token ring network. Market experience so far has shown that the PC Network is not well suited for unsophisticated end users or for distribution through retail channels. It began shipping in limited numbers late in April, eight months after it was announced. It competes with a token-ring network called Pronet, from Proteon Associates, Inc., in addition to the various Ethernet vendors' micro offerings, such as Net/One from Ungermann-Bass, Inc. and the Etherseries from 3Com Corp.

Some dealers blame the product's slow start on a lack of multiuser applications software. However, the network's use of DOS Version 3.1 means that problem shouldn't remain for long. DOS 3.1 appears to be the standard for which personal computer applications developers have been waiting, with an unusually high number of multiuser applications packages for the PC Network already announced.

Other dealers blame the network's slow start on users' uncertainty about IBM's direction in networking. Historically, IBM has developed a multiplicity of incompatible networking solutions to sustain different areas of its product line. Users may be reluctant to invest in what they perceive as yet another limited offering with questionable future use and support.

And they are not wrong about IBM's own lack of commitment to the PC Network. If market and dealer response was lukewarm, the network's acceptance inside IBM has been even chillier. Produced by the maverick Entry Systems Division (the Personal Computer's originator), the PC Network is not considered a strategic network product by IBM's top management; in fact, the PC Network project was nearly canceled when IBM corporate executives learned of it.

Since the PC Network hit the market, it has been a transparent product, with IBM generating little publicity on its availability or use and little support for dealers selling it. IBM's dealer support rests primarily on a three-day training course. Very little else is being done to help dealers sell complex broadband technology to unsophisticated end users.

Selling the network successfully through retailers will require out-of-store sales people who are well versed in the network's operation. In all likelihood, only the full-service dealers who can give users plenty of hand-holding without much support from IBM will do well with this product.

Buy now, pay later?

The real cloud on the PC Network's horizon lingers in the ongoing debate over whether this network is merely a stopgap product that will be orphaned as was the PCjr, or if it will be supported even after IBM's token ring network is available.

Last summer IBM offered the token ring as the solution for end users needing to share information locally. Simultaneously, the company released the Cabling System, a partial media distribution plan for the token ring network. IBM's message was, "This is the network we'll be seriously selling two years from now. Here's the media it will run on. Buy it now, install the cable and wait for the rest of the product."

Only IBM would try such a move;

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whether the company will get away with it is questionable. Arch-rival AT&T offers a competitive wiring scheme, the Premises Distribution Wiring Plan. Moreover, the Cabling System is expensive to install: The drop cabling (that portion of cable linking the workstation to the wiring closet) is thick and inflexible, making it difficult for cable installers to manage more than one drop at a time.

Although IBM will not aggressively push the PC Network in the marketplace, it may be the primary Personal Computer interconnection product for some time.

Where does that leave the PC Network? Although IBM will not aggressively push the PC Network in the marketplace, it may be the primary Personal Computer interconnection product for some time to come, even after the token ring product is available. Key to its longevity — in addition to the standard forming around DOS 3.1 — rests in its use of Netbios, the network interface specification at the core of the token ring. In addition, some important software vendors offer packages specifically tailored to the PC Network.

SNA at the highest level

IBM's Systems Network Architecture is an 11-year-old communications architecture for passing information between terminals and hosts. It recently was expanded to support the growing line of IBM office systems and Personal Computers. SNA targets the highest level of networking needs — sharing information in a wide area.

SNA initially grew out of the need to interconnect IBM's hosts with terminals located some distance away. It was designed to distribute access to central processing at the host. As such, it uses a hierarchical structure — a master/slave relationship not well suited for peer-to-peer communications. Despite this dependence on the host for "permission" to establish connections, IBM has chosen SNA as the foundation for integrating its network offerings.

Consequently, SNA is evolving. It provides improved peer-to-peer communications to interconnect IBM's vast array of processors efficiently, and — most notably — the architecture now competes with distributed access models of network architectures such as DEC's Digital Network Architecture (DNA), best known under the product name of Decnet.

SNA has advanced significantly in the area of support for office applications as well. These features markedly improve the way SNA deals with documents passing among office clusters. Key aspects of SNA's office communications functions include the Document Content Architecture (DCA), the Document Interchange Architecture (DIA) and the Distributed Office Support System (Disoss) — all document interchange capabilities.

These specifications within SNA provide the essential ingredients for transferring the power of SNA down to the personal computer level:

DCA defines an encoding scheme for the document's content (what's in the "envelope"). The scheme is divided into two levels: "revisable" or level 3, which allows for editing and modifications, and "final text" or level 2, for print or display, which does not allow for modification. Revisable DCA has advantages in that it permits several stages of editing to be made by different users as the document is passed from one workstation to the next.

DIA defines the document's packaging and, consequently, the method for moving it across systems (the "envelope" itself). Four DIA services are offered: session, library, distribution and application processing.

Disoss acts as a centralized filing and retrieval system for devices in an SNA network. It defines an acceptable environment for passing information among hosts and workstations. Disoss/370, as it is often called, provides applications such as calendar management for managers and executives.

The IBM Office Systems Family (OSF) products permit document passing between Personal Computers, System/36s, and 370s. Among the most significant OSF offerings are the document interchange functions. Personal Services/36, for example, supports a document exchange-based network of System/36s, personal computers, Displaywriters and 5520s. Personal Services/370 allows file transfers from Personal Computers and 3270 Personal Computers to 370s in a Disoss/370 environment.

In spite of SNA's new capabilities, IBM is still far behind some competitors in supporting multiple operating systems on a single network and in allowing network users file transfers and shared peripheral access. Herein lies IBM's network challenge: to support many bus structures and operating systems — mostly incompatible — within a single communications scheme.

Each of the Personal Computer

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Personal Pearl on a VAX?
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R:base 4000 on a VAX?
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PL/M on a VAX?
SuperCalc 3 on a PRO?
T/Maker Integrated on a VAX?
MS BASIC on a Micro VAX?
Milestone on a PDP-11?
Palantir on a PDP-11?
SpellStar on a PRO?
MailMerge on a PDP-11?
PMS II on a VAX?
dBASE II on a PDP-11?
Lotus 1-2-3 on a PDP-11?
Open Access on a PRO?
MS FORTRAN on a VAX?
Condor on an MV/10000?
Multiplan on a PDP-11?
WordStar on a VAX?
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network offerings meets an end-user need in the solutions matrix, ranging from simple to complex and from inexpensive to quite costly. These products make up the significant pieces of IBM's networking puzzle. IBM also plans factory networks, private branch exchange-based networks and links to public services networks.

As IBM develops its grand strategy to interconnect all of its processors from the Personal Computer to the large-scale systems, some of those pieces will fall into place; others will be discarded once they no longer fit. Some experts predict that the token ring, running over the Cabling System, will be the premier Personal Computer network offering and will be capable of linking nodes in an SNA environment.

The future of the PC Network is unclear. Some argue that it was doomed from the start because it doesn't fit into IBM's networking strategy of linking multiple classes of systems. They note that its progenitor has been removed from responsibility for the product and replaced by a "true blue" networking executive.

Others believe that the PC Network will survive at least the initial release of the token ring network, that this first release will not include network interface units for Personal Computers. VLSI chip development has been slow to materialize, making such an interface too costly. The token ring will use network interface units and software for medium- and large-scale systems, but Personal Computers will be linked via a bridge to the PC Network using the Series/1.

The PC Network may also never produce the long-awaited blossoming of the local-area network market. That blossoming will require a catalyst with a network architecture that meets the needs of IBM's key customers, runs on the installed Cabling Systems and supports SNA.

When available, the token ring network will provide the fundamental connectivity in IBM's effort to link its systems. The updated SNA, which will look quite different from the SNA brought out in 1974, will be the cornerstone of that network.

In the personal computer network marketplace, IBM may make a number of moves acknowledging AT&T's presence. The Cabling System, IBM's answer to AT&T's Premises Distribution System, will drop in price.

Despite IBM's acquisition of Rolm Corp. and the new MCI deal, IBM is not making overtures to become "your voice company." IBM is trying to maintain control and learn what's necessary to continue being "your data (in other words, information) company."

No single product or event will produce a final solution. However, the future of data processing is inexorably intertwined with data communications, so IBM must lead here as well.

Eric H. Killorin is president of Hyatt Research Corp., an Andover, Mass.-based firm that tracks the personal computer and network marketplaces.

Paula J. Musich is editor of "PC Netline," a Hyatt Research newsletter that analyzes the market for personal computer and office networks.

IBM's LU6.2 the new super link?

By John Doherty

[illegible] printout into a personal computer spreadsheet is still a novel procedure in today's offices. Connectivity can no longer be a buzzword — it must become a [illegible] corporate [illegible].

IBM's answer to [illegible] micro communications in the distributed processing environment is its Physical Unit 2.1/Logical Unit 6.2 (LU6.2), also called Advanced Program-to-Program Communications. LU6.2 is one of several technical additions to IBM's Systems Network Architecture (SNA), which has evolved into the *de facto* communications standard for large systems.

LU6.2 serves as a foundation for IBM's overall office strategy: distributed automation, including the Distributed Office Support System (Disoss) and its supporting cast: Document Interchange Architecture, Document Content Architecture and SNA Distributed Services.

Under Disoss, these new packages standardize data formats and distribution protocols across different classes of computer systems. LU6.2's role is to integrate distributed computers into SNA as intelligent peers, not to have them emulating fixed hardware slave devices.

Surveys show that effective micro links to mainframes are at the top of MIS shopping lists, ranking higher than hardware and off-the-shelf applications. But today most personal computers are really only used as adjuncts to, not active participants of, mainframe systems.

Terminal emulation is still the most widely used micro-mainframe link. When linked to the host in this way, the personal computer loses most of its independent processing power and often functions as no more than a display-only terminal.

Terminal emulation strips the personal computer of the versatility and power that first made it attractive as a desktop workstation. This emasculation of the fledged personal computer is the natural result of prior levels of SNA dictating a slave relationship to a specific device type, such as 3270 terminals. In order for a micro to access host information, it had to "trick" the mainframe into thinking it was one of the host's 3270-type terminals. There was no standard way of allowing micro applications actually to integrate with mainframe applications.

The key to establishing strong micro-to-mainframe links is to have local programs talking directly to networked applications beyond 3270 mainframe slave device restrictions. LU6.2 — designed for exactly this purpose — will allow true distributed processing for the first time.

While today's micro links can download data, the information doesn't make its way to the micro in ways that are easily manageable by local applications. Because the host thinks the micro is a terminal, a dumb input device, [illegible] are formatted to 3270 communications protocols.

The main aim of micro-link developers, therefore, has been to allow micros to move data directly into local applications [illegible] host-linking [illegible] to move host data to local files. With these links, host applications can talk directly with local applications, and the link serves as the interface.

Micro users, by using links that have program interfaces compatible with IBM's Applications Program Interface, could select data from a large host file, transfer it to a micro spreadsheet application to create a special report and then print the report on a local printer, all in a single mainframe session.

Regardless of the type of link, micros are still tied to the mainframe in a master/slave relationship for controlling data distribution functions along the network. Although the end user is insulated during this process, there is much work to do before the link is completely automated. For now, the applications developer still has to treat host data as if it were just 3270 terminal readouts.

LU6.2 is the direct application-to-application interface to mainframes and will ease user dissatisfaction with the drawbacks of today's links. With LU6.2, users running a micro program can call data directly off the disk drive in the mainframe and process it on the local application. This means that users can sit at a micro and structure an Information Management System (IMS) call or query as if it were on the mainframe. To access the host data base, users only have to query the local data base. This peer-to-peer feature of LU6.2 frees the micro from the mainframe's data management controls and places network resources on an equal status for accessing and distributing files.

Under LU6.2, data processing is shared throughout the system, reducing the host's processing load so the mainframe no longer has to move an entire file to relay information to the micro user's [illegible] a [illegible] to be used at all.

The key to establishing strong micro-to-mainframe links is to have local programs talk directly to networked applications beyond 3270 slave device restrictions. LU6.2 is designed for exactly this purpose.

LU6.2 also provides program-to-program communications. Any two programs on any two machines can communicate on the network, regardless of the operating systems or languages used. For instance, a C program that runs on a Unix machine can talk to an IBM 4300 machine running a Cobol program. The programmer does not have to know the language or the operating system of the target program.

In the past, whenever IBM developed a large system, it used proprietary operating systems and was very protective about them. However, IBM found that by releasing its hold on MS-DOS and allowing other companies to use it, the market for MS-DOS naturally expanded, creating greater interest, understanding and revenue from end users than had previously existed.

IBM is doing the same thing with its LU6.2 machines, which include Systems/36 and 38 and Displaywriter. In addition, by letting other vendors use non-IBM micros to access mainframe data as if the disk were locally attached, IBM is establishing an incentive for software developers to provide the industry with interfaces to SNA. These companies are supplying the gateway to Disoss, including LU6.2, and applications developers will follow with products for local applications use.

Essentially, the micro-communications business is at a major junction. On the one hand, communications developers for large systems must continue to market sophisticated links based on current SNA 3270 communications standards. By making these links compatible with LU6.2 for micro applications in the near future, the transition to LU6.2 will be that much easier and swifter.

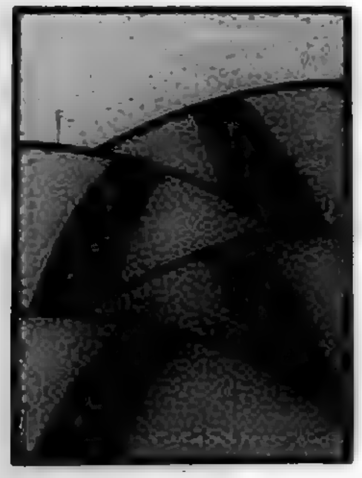
On the other hand, software suppliers must simultaneously help clarify and define future environments for office communications, especially as software solutions to network communications such as LU6.2 and Disoss begin to supersede the hardware boundaries of SNA.

In this new environment, communications software suppliers will play a key role in providing multiple data routes between computers and programs. And traditional applications vendors will continue to create the end-user vehicles. Data communications will continue to change, with more-complex elements but with more productive results.

John Doherty is vice-president of marketing and sales for [illegible] Software Corp., a Malvern, Pa.-based manufacturer of business communications software for micro-to-mainframe links and local-area networks.

On the road to the mainframe

By Gary Audin



The simplest approach is through a cluster controller. Users have made protocol conversion another popular alternative. Networks finish last.

The search for a quick, transparent, powerful micro-to-mainframe link leads users down many a winding path. Today no one alternative presents an ideal solution for personal computer users needing to link to a host. The micro-to-mainframe market is still in its adolescence. Users who need to make connections right away must contend with certain technological issues.

The most familiar approach to micro-mainframe links is straight terminal emulation, where the personal computer mimics a terminal on the host network. In some cases, the mainframe can be programmed to support specific micro communications protocols, but most often the emulation package includes host protocol capabilities for the micro. The exceptions are usually held for higher performance asynchronous protocols such as Xmodem and Communications Research Group, Inc.'s Blast.

A second alternative is to connect the personal computer to a protocol converter, which allows the micro to function as an already supported mainframe terminal. Protocol converters provide the same capability as terminal emulation, but the protocol converter approach can be less expensive and can provide a few extra capabilities as well.

A third approach is to connect the personal computer to the host via a cluster controller, such as the IBM 3274 and 3276 CRT cluster controllers, which involves equipping the personal computer with a special adapter card. This approach has the advantage of exactly emulating an existing mainframe environment and does not require any changes to the host. However, there may be some applications changes needed to make better use of the personal computer. Any approach that restricts the micro to dumb terminal functions reduces its power and effectiveness.

A fourth approach is to take a local-area network supporting personal computers and provide a gateway to the mainframe world. Gateways usually emulate a cluster controller, but other emulations are also available. *[The gateway as micro-mainframe link is covered in depth in "Gateways," p.35.]*

A fifth approach uses a public network service as a conversion mechanism. Services such as Tymshare, Inc.'s Tymnet and GTE Corp.'s Telenet provide protocol conversion as part of their communications function. This approach, however, has a limited number of conversion capabilities, fewer than the other approaches.

Adding terminal emulation software to a personal computer is the original solution to the problem of delivering mainframe access to a desktop micro. The communications program itself may be made up of several components including protocol software, user interface and set of procedures, automatic dialing and directory support, file transfer and in many cases a text editor for deleting and inserting special control codes as necessary.

Personal computers can communicate in one of three modes: text, native or transparent. The text mode allows the personal computer to communicate printable and displayable information. However, it usually requires the filtering out of any word processing, spreadsheet or other control codes prior to transmission. The receiving personal computer or mainframe can usually display or print the information, but all executable codes, such as spreadsheet formulas, can only be displayed, not processed.

Native mode uses a modified protocol to transfer word processing, editing and control codes. The receiving machine can process the information as well as display it. Native mode is limited to specific applications and programs.

Transparent mode, sometimes called binary mode, allows any combination of applications to be transferred between two machines. Transparent mode is especially useful in moving programs and files, since it places no limitations on the data transferred. Transparent mode is the most versatile, but it does not guarantee that the receiving machine can process the data, only that the protocol does not interface with its transfer.

Most terminal emulation software for personal computers provides asynchronous communications, specifically TTY-compatible emulations. TTY-type terminals that are commonly targeted for emulation include IBM 3101, Televideo Systems, Inc.'s 910, Tektronix, Inc. 4010 and Digital Equipment Corp.'s

Figure 1

VT52 or VT100 terminals, but most packages allow the end user to set up particular attributes for the desired protocol. Others provide prestored menus so that end users need only select the type of terminal to emulate. TTY emulation packages vary in their range of capability and are usually, but not always, text mode transmission, sending one message at a time rather than breaking data up into blocks.

There is a second group of asynchronous protocols designed specifically for personal computers. Xmodem, Blast and others fall into this category. These are block-oriented protocols with automatic error detection and retransmission. They are generally transparent as well.

Xmodem is a half-duplex single block acknowledgment protocol resembling the Bisync protocol. It comes with two forms of error detection, a checksum or cyclic redundancy check (CRC). Many additions have been made to the Xmodem protocol, which is in the public domain. Most are compatible with each other, but the user should verify compatibility prior to purchase.

Xmodem and its variants are also available as mainframe software packages, which reside behind the mainframe protocol software operating as an application program.

Blast is a more modern protocol, with many of the attributes of IBM's Synchronous Data Link Control (SDLC). It is a transparent, full-duplex protocol with multiple block acknowledgment; up to four blocks can be sent before transmission will stop. Blast uses the CRC mechanism for error detection. Because of its multiple block feature, Blast is far better than Xmodem and similar protocols at handling satellites.

Xmodem, Blast and their variations are primarily file transfer protocols. The are usually designed with block numbering to ensure no data loss. Many have block number error checking independent of data error checking. The cost of these programs ranges from $35 to $250 per copy, with the bulk costing from $100 to $150 each. Some of the programs are offered with companion mainframe software packages, which integrate smoothly but which usually cost 10 to 40 times more than the personal computer package.

On the other side of the coin are terminal emulation packages that use synchronous protocols such as Bisync and SDLC to emulate specific terminal types. The most common support IBM terminal protocols for the 3270 family, both standalone terminals and cluster controllers, and the 2780, 3780 or 3777 batch terminals. Other vendors, such as Burroughs Corp., Honeywell, Inc., NCR Corp., Digital Equipment Corp. and Wang Laboratories, Inc. also provide support for their own personal computers to connect to their mainframes.

The products themselves work well, but many users have overestimated their capability or expect them to work in environments for which they were not designed.

The synchronous protocols allow devices to communicate at much higher speeds than asynchronous programs can. They require a different kind of communications adapter for the personal computer, one that costs $300 to $400 and may handle both Bisync and SDLC. The number of software packages available and the vendors supporting synchronous protocols are considerably smaller, and the cost of these packages is considerably higher than their asynchronous counterparts, ranging from a minimum of $500 to more than $1,000 per copy.

Aside from price, the greatest difficulty associated with these protocol packages results from polling, which virtually all synchronous protocols use. Polling can make personal computer transactions unusually awkward.

If the communications program is removed from the personal computer so the micro is no longer operating as a terminal, then the micro will no longer respond to polling and selection. The mainframe will continue to try up to a limit, usually seven retries, before it enters a failure detection mode. During this time, it usually locks up the communications circuit so other terminals or micros cannot use it. Once the personal computer in question has failed to respond beyond the specified limit, the mainframe may turn off that personal computer as a terminal or even go as far as terminating all transmission on that communications line.

Mainframe operations personnel must then reinitialize communications for the personal computer. If an end user toggles back and forth between process mode and terminal mode randomly throughout the operating day, this approach becomes not just cumbersome but unworkable.

A multitasking communications program could alleviate this problem but can also place undue limitations on the applications programs. Very few multitasking programs are yet on the market, and they remain largely unproven. Thus, the best candidates for synchronous terminal emulation are users who usually stay within one mode or the other.

More recently, protocol converters have been marketed for personal computers to link to hosts. But most of those on the market assume that the device that is operating in the TTY mode is a dumb, nonprogrammable terminal; in other words, they are not tailored to the personal computer's wide range of capabilities and so fail to take full advantage of them. The success of protocol converters depends in part on which two protocols are being converted and what kind of dumb terminal is assumed.

A protocol converter does more than convert the protocol: It generally performs function and format conversion as well. The most typical protocol converters are for TTY-compatible terminals to communicate to mainframes and in most cases support IBM 3270 series terminals. The typical configuration allows TTY-compatible terminals to communicate through the converter and emulate Bisync or SDLC 3274/3276 Cluster Controllers, 2780/3780/3777 terminals or X.25 devices.

Configurations for protocol converters normally place them between the terminal and the front end or communications adapters on the mainframe. The converter itself could be located at the terminal site with the terminal directly connected to the converter. It could be in the network connected by modems, or it could be coresident with the front end attached locally. In any of these cases, operation is identical. Up to eight dumb terminals can be connected to the typical protocol converter, but smaller sizes supporting just two or four terminals are available.

The protocol converter vendor who supplies the hardware and system may also supply the appropriate software for the personal computer. The personal computer-resident software is designed to work through that converter, but it may not always have all the features that are expected.

Converter systems are available from a wide range of companies, including protocol converter companies, multiplexer companies, those who manufacture packet assembler/disassembers and AT&T and the divested Bell operating companies, as well as IBM and other computer manufacturers.

The cost of these converters varies considerably. A few years ago it was $1,000 per terminal,connected, but the price is now hovering near $350. In the past 18 months, much attention has been focused on tailoring protocol converters specifically to personal computers, making it an easier, more popular choice for users. Now it actually may be cheaper to make the personal computer TTY-compatible and pass information through a protocol converter for about $500 per terminal rather than program the personal computer to operate in a Bisync or SDLC mode costing close to $1,000 per personal computer.

The protocol converter also solves the polling problem that occurs with personal computer-resident software connecting to mainframes. The converter stands between the personal computer and the mainframe and automatically responds to the polling and selection. Even if the personal computer is in processor mode or disconnects, there is no failure condition, since the converter satisfies all the normal conditions on the communications circuit.

Protocol converters have their disadvantages as well. Any kind of conversion system has to store and then forward the information through the conversion process, so protocol converters may cause a noticeable slowdown in response time. The protocol converter generally has to do downspeed conversion, slowing down the mainframe transmission so that it does not overload — typically from 9.6K to 1,200 bit/sec. Doing so extends the transmission time from the mainframe to the personal computer, making it much longer than if the personal computer were operating with the synchronous (higher speed) protocols.

Another problem occurs when the personal computer is dialing the protocol converter. The personal computer connects to one of the available ports on the converter and then signs on to the mainframe at a particular mainframe port (for example, Port 1). If for some reason the personal computer is accidentally disconnected from the converter and the user wants to continue the session, there may be a problem dialing into a different port on the converter. The mainframe only recognizes the terminal on the port it originally came in on, so the end user may have to back up and restart part of the session.

Another problem occurs if the personal computer disconnects and someone else accidentally connects to Port 1. The mainframe does not know that a new user is connected to Port 1 and does not force the user to go through the access procedure. The second end user will be signed on as the first user, which creates a security problem.

Furthermore, while protocol conversion systems can make up for anything that is different in a communications facility, they cannot rearrange keyboards or change the amount of display on a screen. If a terminal can only handle fewer than 25 lines of display, for example,,then it is difficult to emulate the 3270 product line because these terminals normally convey 24 lines of data and a 25th for control.

These problems should not discourage the use of protocol converters but point to a few snags in combining them with personal computers and mainframe operations. Some snags have yet to be ironed out and currently require manual procedures at the personal computer end.

Many existing mainframe systems in the IBM world include 3274 and 3276 cluster controllers, each of which support eight or 32 local CRTs. The communications link between the CRT and the cluster controller is unique to that environment and does not use a normal modem or communications adapter-oriented connection.

If a personal computer is to be attached in place of the CRTs, it must emulate a 3178, 3278 or 3279 terminal. A different form of communications adapter is required for this connection. One of the most common is the Irma board from Digital Communications Associates, Inc. The Irma board is a special processor interface that plugs into the back of Personal Computers or compatibles, substituting for the 3278 terminals. Some newer models of interface boards allow a personal computer to connect to multiple sessions through a common cluster controller — windowing.

The cost of the interface board and its associated software is between $750 and $950 per board. Additional software can be procured for transmitting files and programs between the personal computer and the mainframe through the cluster controller environment. The Irma board is becoming a de facto standard, and many of the descriptions for these software products specify the board as a requirement.

The cluster controller approach solves many of the problems of the protocol converters. Although cluster controllers do store and forward information, their higher speed transmission reduces the delay significantly. The personal computer is always connected to the same port, so the disconnect problem and the security problem of dialing into protocol converters disappear.

The interface board satisfies all the requirements for the cluster controller, so the personal computer can operate in process mode whether or not it is also communicating through the cluster controller. This particular approach is of greatest interest to those who already have installed a cluster controller network.

However, cluster controller connections depend on coaxial cable, which may effectively slow personal computer operations. Although the transfer speed on the coaxial cable is in the 1M-bit range, it is not safe to assume that the transfer to the personal computer will operate continuously at that speed. The cluster controller is servicing other devices and sends bursts of transmission to and from each of the CRTs. The transfer rate will also be affected by the programs placed in the mainframe and by the cluster's connection to the mainframe, which may be limited to 9.6K bit/sec.

Some users may opt to reach the host by tying into existing enhanced network services such as Tymnet, Telenet, Uninet and other service companies that provide conversion and interfacing as part of their communications function. These services offer interactive and file transfer capabilities through worldwide networks. This approach is perhaps the most convenient.

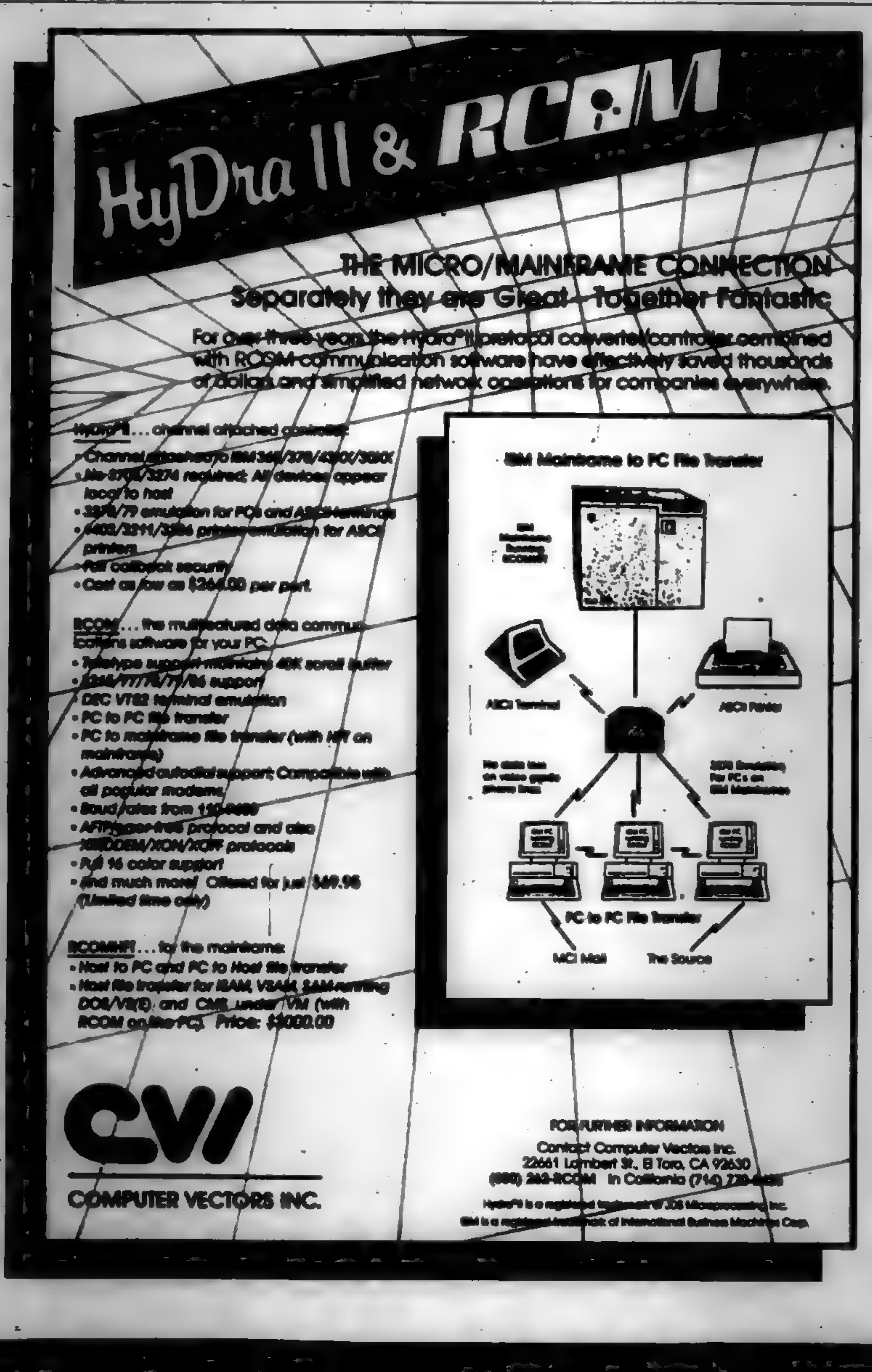
The services predominantly support TTY-compatible devices. At any given moment, approximately four out of five connections in operation nationwide are using this protocol. The network services provide a limited number of conversions to other protocols such as Bisync, 2780, 3780, X.25 and in some cases emulate 3271 and 3275 stand-alone CRTs.

The micro/mainframe connection works best when the personal computer- and mainframe-resident software packages are provided by the same vendor.

The network services have some of the limitations of the protocol converter systems. They do cause delay, and the delay can be significant depending on traffic. It may at times exceed three seconds in one direction, making the round trip delay exceed six seconds.

These networks were designed as terminal-to-mainframe communications services, so their support of mainframes is straightforward. A number of products are available that allow the mainframe to connect to other networks. The network can be perceived as a series of TTY terminals or a number of Bisync devices or even as an X.25 device.

The personal computer user pays per minute for connection time to the network. The connection cost varies from about $4/hr to $9/hr. A second charge is made for the transmission of the data itself, which may be $.05 to $.10 per thousand characters or about $1.50 to $1.60 per thousand blocks or packets of data. Communicating within the U.S. costs the same, no matter what the distance. Thus, it is far more attractive to the regional or national connection and less attractive as presently priced to local or statewide communication.



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Since the deregulation of this type of service in 1982, companies such as General Electric Information Services Co., Compuserve, Inc. and ADP have entered the field. This service may also become more attractive as more of the divested Bell operating companies are allowed to implement packet networks within their territories.

The primary disadvantage of this pay-as-you-go service is that the bills can eventually escalate beyond the cost of protocol converters or cluster controllers. The cost will probably go up as the price of private lines increase. Finally, the number of possible protocol conversions available from public networks is more limited than from protocol converters.

Once the basic micro-to-mainframe connection is made, users must look for ways to smooth operations. There are many programs available from software houses to support communications to personal computers.

Typically, the packages are available for IBM mainframes, although there is a scattering of packages available for the DEC PDP-11 and VAX series and occasionally for Control Data Corp., Sperry Corp. and Burroughs computers as well. The packages normally run as application programs behind the communications software, so they do not disrupt the mainframe environment in most cases. However, if the personal computer user wishes to communicate with existing applications, it may be necessary to revise the resident application program to work with the new communications packages.

As with any new venture, there are going to be difficulties, especially with the earlier products. The products themselves work well, but many users have overestimated their capability or expect them to work in environments for which they were not designed.

For example, not all communications products with the same modems and the same communications circuits perform equally. Depending on the design of the protocol and the operation in the mainframe as well as the personal computer, there can be as much as a 2:1 difference in transfer speeds. Users will see that two different software products operating at 1,200 bit/sec. have measurably different throughput time for files or transactions.

In addition, compared with the documentation DP managers are used to seeing, the manuals for many of these products can be extremely difficult to read. Users may resort to trial and error. Another weak area surfaces as users try to pin down errors and failures and the procedures for responding to such conditions. Most are difficult to understand or just poorly thought through.

Most of these products were introduced within the last two years. The experience level of most users is rather light, and there is very little available information as to the quality and performance of the products. Compatibility is the major issue for the mainframe user, but often it is difficult to ascertain from vendor literature how compatible the products are with the existing environment.

Many communications programs, because they are relatively low in cost, come with little vendor support. Support may be through telephone help lines, which in many cases costs $25 to $250 per year to access. Updates may or may not be included.

And although many of the products are the plug-in-and-go variety, they are not necessarily flexible. It may be difficult for the user to modify the operation, and he may have to work around the facilities rather than develop new ones. The micro/mainframe connection works best when the personal computer- and mainframe-resident software packages are provided by the same vendor. This option may not necessarily lead to increased flexibility but certainly reduces the interfacing and compatibility problems.

But the products and the vendors are improving rapidly, especially those mainframe software vendors who are now entering the personal computer market. Companies such as Applied Data Research, Cullinet and others should be watched closely to see how they produce and support these products in the mainframe environment.

> ***Not all products with the same modems and the same communications circuits perform equally.***

For now, the simplest approach for communicating to the mainframe is through devices such as the cluster controller, which produce the least impact on existing networks. Users who lack experience — or the time to gain experience in a hands-on situation — may be better off waiting for market forces to drive the natural selection process.

Gary Audin is president of Delphi, Inc. and a seminar leader for Datapro Research Corp., the American Management Association and others. He has developed video-assisted instruction and computer-based training (CBT) modules in microcomputer applications and in data communications and telecommunications. The first CBT is in micro-to-mainframe connections.

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Dialogue

Joseph Brophy
Senior Vice-President, The Travelers

What happens to a user who is out in front of his industry and his major computer supplier as well? He grows a lot of his own software, for one thing. He weaves integration into a crazy quilt of networks and machines. That's the story of the Hartford, Conn.-based insurance giant, The Travelers, as related here by Joseph Brophy.

Consultant George Colony of Forrester Research, Inc. in Cambridge, Mass., surveys and analyzes how large corporations use technology today and suggests how they could use it tomorrow.

Brophy and Colony discussed practical problems and solutions of micro communications with Extra Editor George Harrar.

ILLUSTRATIONS BY ALAN WITSCHONKE

George Colony
President, Forrester Research, Inc.

Extra: What applications are driving companies to link personal computers?

Colony: One of the problems is that there are very few applications today that really require communications. We're finding that most Fortune 1,000 users have focused on stand-alone applications. With a few exceptions, such as electronic messaging, there's really no driving force.

We're missing the key element. I expect that's going to change over the next two years.

Extra: What will be that key element?

Colony: You're going to see networkable software emerging from companies like Lotus and others we haven't heard of yet — new third-party software vendors — which will have networkable data bases, networkable spreadsheets, better electronic messaging systems.

Coming into play will also be what I call "departmental resource processors," what we now consider minicomputers, acting as software distributors for networkable software.

Extra: Is there a driving force in The Travelers for linking personal computers?

Brophy: Yes, there are two driving factors affecting networking here. We have about 9,000 personal computers; about 4,000 of them are in the offices of independent agencies. They can place their business with The Travelers or a number of other companies.

In our business, traditionally we've had a lot of paper flow from the independent agencies into our field offices and from there to the home office. We've eliminated the leg between the field office and home office by having people in the field office key information directly into our computers through remote CRTs.

We also want agencies to transmit directly to us rather than printing and mailing paper for us to key in. We had a practical business opportunity to have agencies interacting directly with our mainframes. We have turnkey applications that provide our independent agencies with office functions — payroll, insurance rating, policy issuing — and a good deal of interface software.

That has had a beneficial impact in terms of reducing paper flow, redundant keystrokes, printing and so forth. So there has been a practical need to link personal computers from a service point of view, from a cost point of view and from an accuracy point of view.

That's one side of the equation. The other side is that over the years we've had a high level of personal computing in our end-user community — business technicians, actuaries, accountants, marketing analysts. At one time we had as many as 8,000 IDs in our personal computing network, much of it for interactive timesharing.

Now the end users can do a lot of office functions on a personal computer. They do a lot of spreadsheet work, but they also have to communicate with each other. They still have a tremendous reliance on the host computer because they access data and upline and downline load.

Since they are coming from a highly networked environment and moving into a personal computing environment, we've had to provide them communications service.

Colony: Are most of your personal computers communicating by a dial-up link?

Brophy: We've got five environments, one of which is dial-up. We recommend dial-up if you're going to transmit less than two hours a day.

Some personal computers are networked — some are on a local-area network and have a gateway. We're an SNA shop, with about 20,000 terminals. We're also a heavy user of packet networking.

Our fourth environment involves mailing diskettes around. Our executives, for example, conduct some of their business meetings around a diskette, instead of sending a paper report. We have a machine that cuts the diskettes. We probably mail thousands of diskettes every month because it happens to be a very economical way for us to communicate.

The fifth environment is really stand-alone. Many new people using personal computers have no need for communication. As they become more comfortable with the personal computer, they begin to develop communications needs, and we give them four choices: the local-area network; the diskettes; the dial-up; or being actually hard-wired to our network.

Extra: Is that a typical situation in a corporation — multiple options for communicating?

Colony: I don't want to compliment Travelers too much, but I would consider it to be the No. 1 or 2 company in implementing communications for personal computers. Perhaps Aetna and Equitable are on that list as well. Joe's case is distinct among the Fortune 1,000.

We need the most cost-effective way to make logical connections to personal computers in the field. We've solved the physical problem. As far as the logical problem, no!

— Brophy

Extra: You just mentioned three insurance and financial companies.

Colony: Insurance companies are leading in this area. We just did a survey in the chemical industry. We're finding that the level of communications for personal computers in manufacturing is much lower than in information-intensive businesses such as insurance and banking.

In manufacturing for 1985, only about 14% of the personal computers are communicating. By 1987, the companies are estimating it will be 35%. In the service side of the economy, in 1985 it's about 17% communicating and 55% by '87. So there really is quite a difference between the two sectors.

Extra: The Travelers is a strong IBM shop. How is IBM helping you to accomplish the integration of personal computers?

Brophy: I don't want to sound negative, but IBM really hasn't contributed a whole lot of software. Unfortunately, we've been out in front, which has caused us a good deal of frustration. We've had to resort to probably five or six different hardware/software solutions here.

If we're going from asynch to X.25, we go over packet to get into our SNA environment. If we're in a bisynch environment, we'll go through a Series/1, and we've got some pretty powerful software to do these protocol conversions. If we're in an asynch environment in the field and we're dialing in, we might go through a Protocol Computers, Inc. box to get to SNA. We're anticipating help in the future, but we've had to do it in-house so far.

Extra: What would you like from IBM?

Brophy: Fundamentally we'd like IBM to make this whole process of communicating transparent to us. We're anxiously awaiting more details on the free token-ring architecture. We've wired most of our buildings now for token ring. We'd like a lot more networking and applications interface-type software and support from IBM.

Colony: It sounds like you have the physical connection pretty well licked with local-area networks, SNA and dial-up. What about what I call the "logical connection" between personal computers and departmental systems and mainframes? I'm talking about moving documents with a high level of compatibility and perhaps in the future actually moving applications among those three types of systems.

Brophy: We do all that today, but we do it with a lot of homegrown software. There are very complex aspects of moving software around. Keeping data bases in synch, for example, is probably the most complicated transaction we have. If you have data in a remote node and a data base in a host — I don't see anything on the horizon that's going to simplify the integrity and compatibility issues.

We've solved the physical problem. As far as the logical problem, no! We are pleased that we can ensure we are capturing all the data and transactions that we transmit, but we have no guarantee of interim synchronization of data and programs.

Colony: We're observing that a number of the Fortune 1,000 companies are not accepting the System/36 solution IBM is offering, which is basically their logical communications solution. Safeco in Seattle has thrown all their System/36s out, saying that the system isn't performing. Is Travelers going to accept the System/36 solution? Are you buying that solution from IBM?

Brophy: Our need is for the most cost-effective way to make logical connections to personal computers that are distributed in the field and in the home office. To do that, we developed an emulator that runs in the personal computer and a relay program that runs as an application under Vtam, so that we can use a micro over an X.25 network and make it look just like a 3270 terminal. We have made the logical and the physical connection through our own software.

To provide the interhost relationship, we have built — under Vtam again — a host switch that allows the personal computer in the field to access numerous applications through our own software.

There are few applications today that really require communications. We're still missing the key element. But that's going to change over the next two years.

— Colony

Colony: I consider your emulator, your Vtam, your X.25 communications and so on to be the physical side of the communications problem. What I'm talking about here is moving, for example, a Multimate document up into a departmental system and then retrieving that document, perhaps through Disoss, or taking a Lotus 1-2-3 spreadsheet and moving it with full compatibility among a number of different systems. What I'm asking is, is Travelers buying off on the System/36 Personal Services and Displaywrite solution linked with Disoss?

Brophy: I believe the System/36, from what I've read, is a great product. But from a conceptual point of view, I don't see it fitting into our fundamental architecture. We see two nodes — very powerful micros and a great network capability, and our host computers. So I question why we would want another node in a network when one of these powerful micros can serve as the gateway or the office controller.

The departmental computer is a conceptual problem I'm having difficulty with. The System/36 may prove to be an important factor in departmental processing, but right now I don't see it. Moving a Lotus program from one personal computer to any other one — that problem we've solved. We do move files, but we do it through a non-IBM solution at this time.

Colony: I think we're going to have a fundamental disagreement here, because what we're observing in the Fortune 1,000 is not a two-tiered architecture, as you're explaining for The Travelers, but rather that there will be some sort of local resource processor for personal computer users within their sight.

If personal computer users want to get up to the mainframe, they will go through that departmental processor, which will give them SNA or X.25 or your emulation package. They will not connect directly through their own link to the mainframe.

Brophy: We do have a fundamental disagreement. I'm thinking ahead — and it may be wishful thinking — looking for follow-on products to the Personal Computer. The Personal Computer, including the Personal Computer XT or the AT, is not powerful enough in some cases today — and in a lot of cases in the future. I'm assuming that we can extrapolate from the Personal Computer to the Personal Computer XT to the AT and so forth and look for follow-on products that will have sufficient extra power.

I can see file servers and print servers. I can see distributing some of our host computing power into a field office, using a low-end 370-type product, but that would be done for performance reasons — response time, economics and space. I would not see that as a fundamental architectural issue.

Basically, we're going to have very powerful micros, a sophisticated network and large host computers. The host may be in one of our data centers or in fact it could be in the field as well. But we would be thinking of that host as a corporate processor and not as a departmental computer.

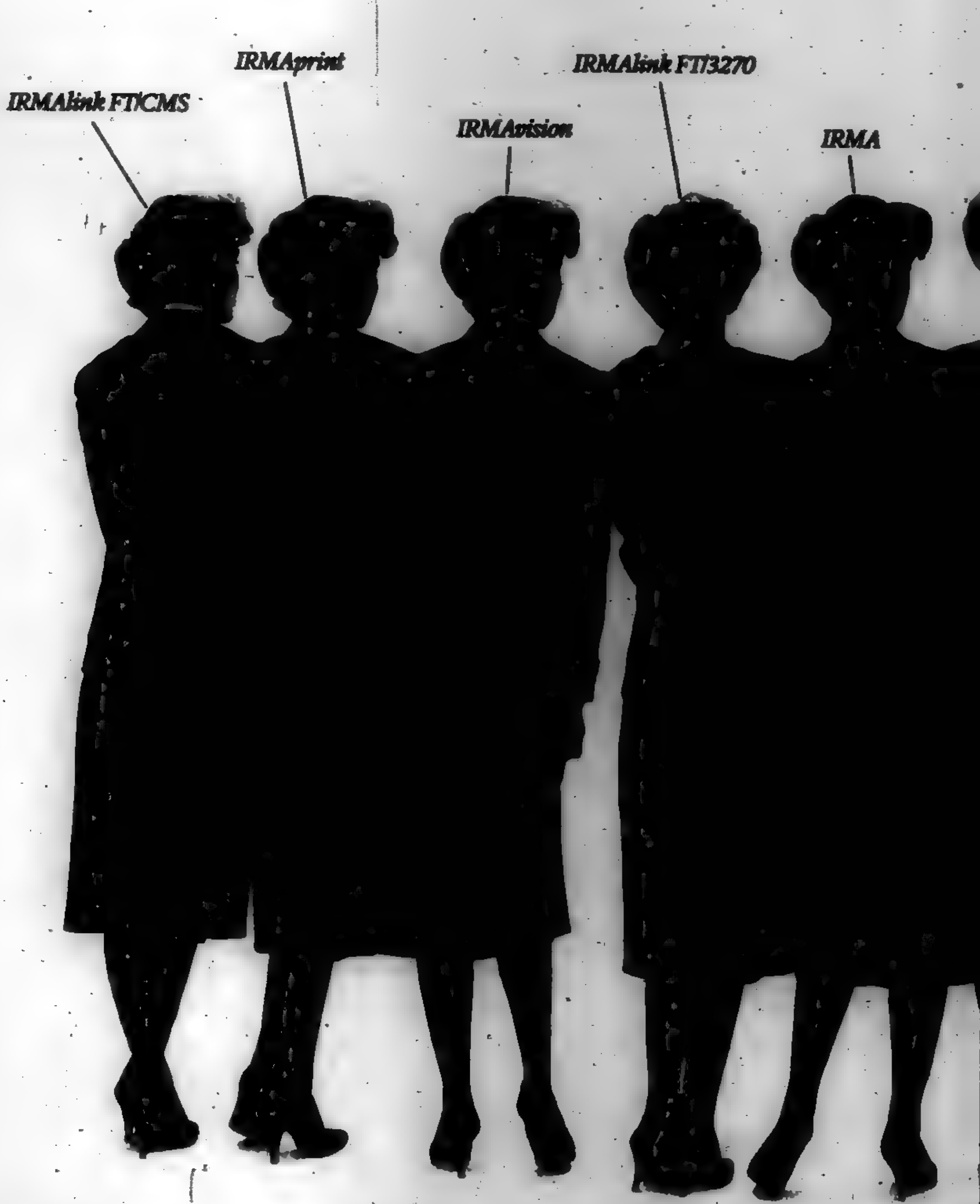
Colony: American Express Co. has a number of personal computers in their New York facility, and at least some of their mainframes are located in Fort Lauderdale, Fla. One of their problems is that if those personal computers start dialing up the mainframe for two to four hours per day or even one hour per day, the communications costs are going to be prohibitively high. So their solution is to take a piece of the mainframe and shove it out into the site of the personal computer user and minimize the communications cost for each user.

Brophy: They may very well want to do that. But I don't see that as an architectural question; it's really a cost/performance problem, and there are other alternatives. I do not interpret your example of American Express as meaning you fundamentally need three levels in your network; rather, it's just a practical problem of where you want to situate your mainframes.

Colony: A couple of things I see coming down the road here: One is site licensing of personal computer software, because again we're talking about corporate customers who want to take their Lotus, put it on their departmental system and let end users simply dial in and downline load that application. Of course, Mitch Kapor doesn't want to do this; he wants to keep his margin on the product. But I see that coming, and you'll need a departmental computer to do it.

The second is the distributed data base. If in fact that animal is coming down the road, we will take a piece of that data base, shove it out to the departmental machine, and 95% of the data base requirements of each personal computer user at that site will be met by that departmental machine. When that extra 5% is required, then yes, they would go out to the departmental system, into the corporate network, out to the mainframe, get that information and bring it back down to the network.

Brophy: If I were Lotus or another vendor, I



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wouldn't see a distinction between having site software on a departmental machine and on a host. If we have 20 people using that site software going into a departmental machine or going into the host, I'd want to charge them the same.

On your second point, the data base is independent of a departmental computer. The data base, if we distribute one, will be on a file server attached to a microcomputer. I don't see a departmental machine having anything to do with that. The data base is a data base, and it's going to reside on a disk pack.

In our environment, I suspect we'll have it in both places. We'll have a data base on our host computer, and we'll downline load a portion of that data base to a microcomputer. We've got 550 [IBM] 8100s in the field, and they have data bases out there. They're updated during the day and upline loaded at night so we have a copy in the home office. Then, host data bases are downline loaded again — of course, not the entire data base, just the items that change.

Today we could view the 8100 as a departmental computer, but I don't see it in the future, as we have more powerful micro software and more local networking. There are going to be situations where people on the network are going to want to access a common data base, and the economics are going to say it should be on a disk drive sitting out in the field office as opposed to being on the host or vice versa. But it has nothing to do with departmental computing.

Colony: You don't seem that worried about the communications costs between your mainframe and each personal computer. What if every day a Lotus user had to downline load his application from your mainframe — we're talking about 500K bytes. You don't see that as a problem as far as the cost to communicate?

Brophy: I wouldn't encourage that user to downline load his Lotus application. It should be on a diskette locked in his desk, or it should be on a hard disk on his micro.

Colony: What if the site license is so arranged that Lotus only gets money every time that application gets loaded off of some control processor, whether a mainframe or departmental system?

Brophy: I suspect that the economics in our case would favor each person having his own copy of a Lotus package because we could get such a big discount.

If we had 9,000 copies, I'm sure we could work it out with Lotus that it's more convenient to give everyone a copy, but we want the same price or better as a company that had it on a departmental machine and was going to downline load it.

Extra: George, earlier you heard Joe describe generally what he would like in terms of help from IBM in the next couple of years. What can we expect from IBM?

Colony: Despite what Joe has been saying, what the IBM strategists are telling me is that they believe most IBM users will want a three-tier architecture. So I expect IBM to be pushing departmental computing very strongly — based on the System/36, of course, in the short term, and now the System/38 has been brought in. I believe you will see a VM-based, very small 370 offered by IBM in the next 12 months as a departmental system.

What IBM is doing here is divorcing the architecture, and I'm really talking about software — Personal Services and Displaywrite, PC/Attach — from the machines, so that IBM will be able to move that software from the System/36 to the 38 to the small 4300, if required.

Number two, IBM sees itself in a pitched battle with AT&T. AT&T is trying to sell its Premises Distribution System.

I see IBM and AT&T in a direct fight to wire corporate America in the next two to three years. The cable system will be a very important element. IBM will describe that system for third parties and also for users like Joe but not deliver the product until sometime in late 1986 or early '87.

Extra: Joe, you say you are already wired to accept, I presume, the token-passing ring.

Brophy: I guess in the home office we're probably 80% to 90% wired.

Colony: We've found there are about 150 to 200 token networks already installed in the U.S. It has been a big surprise how fast IBM is wiring accounts like Travelers.

Extra: Wiring with IBM cabling but using someone else's token network?

Colony: Wiring with the IBM cable system. Most users who have it are using it for 3270 cabling today.

Extra: There are non-IBM token-passing ring solutions that work, too.

Colony: My feeling is those will be irrelevant after IBM begins delivering its network.

Extra: Would you say they are they irrelevant right now?

Colony: They can be a short-term solution for perhaps one department of 20 to 200 people. If users want to

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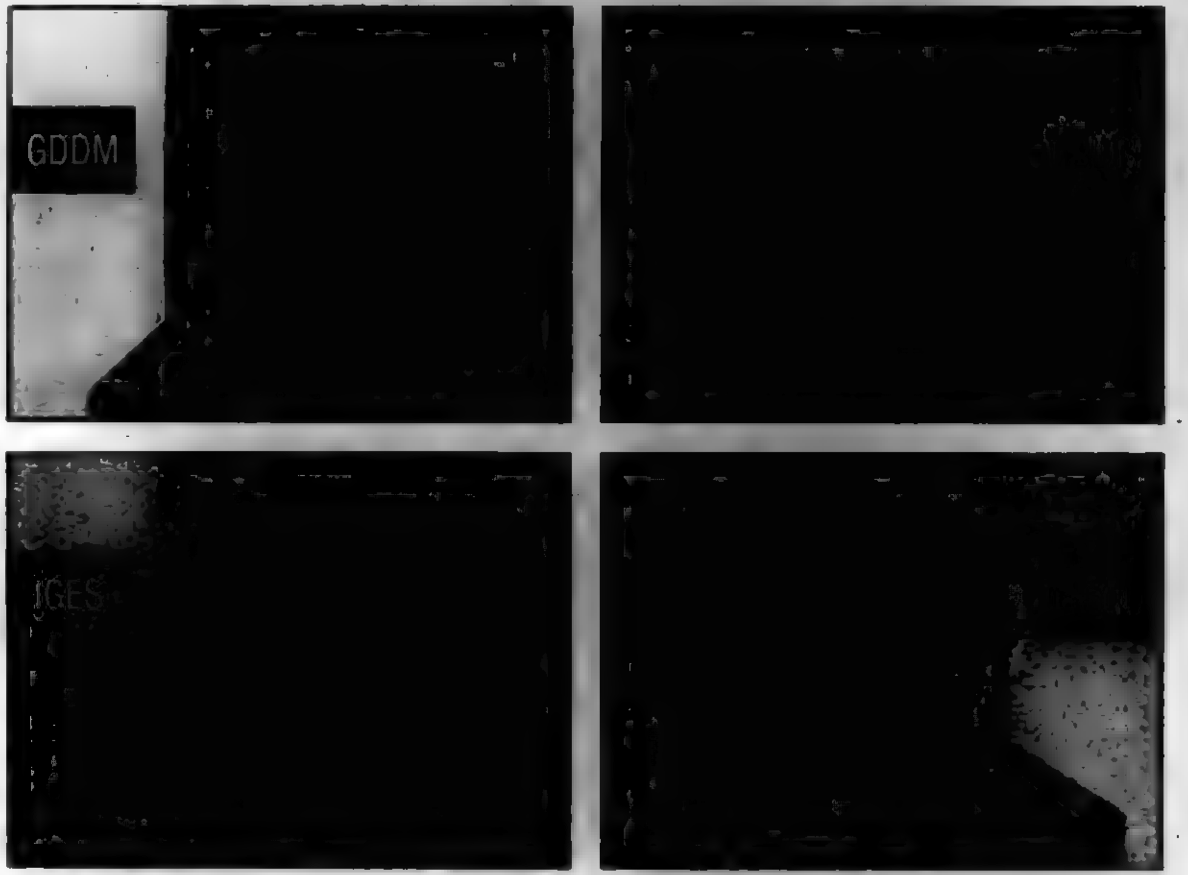

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get some education in local networking and also token access, and they have money to spend, it may be a good idea. But as a long-term solution, the IBM cable system will be the dominant force in the market.

Extra: That doesn't imply a long life for some of the current personal computer network vendors.

Colony: That's right. And in fact, IBM's National Accounts Division has refused over the last six months to sell the PC Network. They believe it's not strategic, it's a short-term product, an Entry Systems Division product, not a viable solution in the long term for large companies such as Travelers.

Brophy: I would agree.

Colony: What do you estimate the cost per year would be for personal computer, interfacility communications at Travelers?

Brophy: It's across our SNA backbone, and personal computers are contributing only an insignificant amount of traffic.

Colony: How many nodes are on your SNA network?

Brophy: We have about 20,000 devices on it. We ran out of address space about two years ago. We were faced with the option of starting up a second network. We had to put in some additional [IBM] 3725s, and we had to do some creative wiring between them to get around the addressing limitations of SNA. We were an [Early Support Program] for [Extended Network Addressing], and it is implemented.

Colony: You've got to be the largest SNA network in the country then.

Brophy: Maybe as an integrated network, yes. In 1975, we had six different networks and network protocols. The economics were such that it was very attractive to convert to a single network and develop the protocol conversion software we now have.

Extra: How many local-area networks do you have?

Brophy: Four types. I'm sure there are more — we have a lot of creative people around here. Then in each field office we have the R loop, so you could argue that we have 550, if you count our installed base of 8100s.

Extra: What are the four types?

Brophy: Our standard is the IBM PC Network. The first one was installed as a test facility as soon as the network came out last fall. Fundamentally, we're thinking PC Net for the immediate future, but we have others, and some are in experimentation. For example, we have the 3Com Corp. Etherseries, the AST Research PC Net2, a couple of Nestars.

Colony: We've found that one reason users weren't installing networks was that the cost to connect was too high. They wanted a cost-to-connect that is 10% to 15% of the cost of the workstation attached. Are those accurate percentages for you?

Brophy: I can't relate our costs directly to your percentages. A driving factor for us was the cost and delays of pulling cables and the other problems of moving a terminal from point A to B. That's one of the reasons we installed super wire. I'm not thinking in terms of percentage costs; I'm thinking in terms of accommodating a transient end-user community.

The competitive pressures in our business caused us to reorganize. We've got 4,000 independent agencies interfacing with our mainframes. Those transactions now bypass our field offices.

So we found it very convenient to consolidate from 300 field offices to 16 processing centers.

Colony: When IBM announced the PC Network last summer, I beat on them because I said they were now offering two cabling schemes. One is the special cabling for the cable system and then broadband for the PC Network. Are you installing broadband cable behind walls for the PC Network, or are you putting it in the floor or ceiling so you can rip it out when you go to the cable system?

Brophy: It's a temporary installation, out of the way.

Colony: That's what I thought. How many nodes are on the networks?

Brophy: The largest one has 15 personal computers connected to it and the smallest about eight.

> *I think it has been a significant advantage to be a one-vendor shop because we can free up good people to work on business as opposed to interface problems. If we can eliminate these interface problems, we can get on with real office automation.*

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Extra: Early on in the conversation, you brought up network software, George. What is on the market now, and what you would like to see in terms of optimized network software?

Colony: Most of the networkable software out there today is running in the Ethernet environment — from companies like TCS Software, which writes accounting packages to run under Ethernet. My feeling is that most vendors in the Ethernet environment are going to be belittled by the IBM cable system. I'm expecting to see a new fleet of third-party software vendors who are going to write around the cable system and, perhaps in the early going, around the PC Network.

The major point here is that what is coming will be primarily in the area of licensing software. I expect to see the personal computer software residing on a departmental system and being distributed from that point.

In the area of distributed data base for personal computer users, I think that's going to be the second major area in networkable personal computer software.

The third point here is bridge software, enabling personal computer users with specific documents to move up to a departmental system and then bridge from there up to mainframe or Disoss or Document Interchange Architecture/Document Content Architecture (DIA/DCA). A good example is Digital Equipment Corp.'s External Document Exchange, or EDE, which is an exchange between the All-in-One environment through the VAX up into Disoss with full revisable form text DCA. That's the type of software we really see coming. I consider DEC to be the leading developer of what I call "IBM bridge software."

Extra: Is bridge software the same as gateways?

Colony: It's a question of semantics. I consider gateways and bridges the same thing at this point.

We are observing a number of large companies out there, such as Equitable and American Express, who are in a multivendor environment. They're telling me that one of their major problems is the bridge — how do they get a DEC document over to IBM or Wang documents over to IBM? One thing I've advocated is going with one vendor because then you won't need all these bridges. I will presume Travelers is pretty much a one-vendor shop. Do you consider yourself at an advantage or disadvantage in communicating documents?

Brophy: I think it has been a significant advantage to be a one-vendor shop because we can free up good people to work on business problems as opposed to interface problems.

In 1970, we had no IBM equipment. We had mainframes from all the other vendors. We consumed a great deal of energy interfacing. Many of our top technical people are doing business jobs now.

I'm not sure it's going to be that way in the future. As AT&T gets into the act more fully, I believe IBM will open up its architectures because it's in the company's best interest to do that. If we can eliminate these interface problems, we can get on with real office automation and all the good things that are going to flow from that — and we're going to buy more IBM equipment in the process.

Colony: As a one-vendor shop, do you feel you have been burned on products such as Disoss or the 8100?

Brophy: I told IBM I was very disappointed in the 8100. I'm not disappointed in Disoss — except to the extent it has been slow in coming. We've made a heavy investment in the 8100s, and we're going to begin phasing them out of operation in the next few years. Yes, I've been very disappointed.

We made a commitment to distributed processing technology to reduce communications costs and get better response time. I don't think we'd make the same decisions again in terms of 8100s, considering our networking expertise with microcomputers.

I am disappointed, but I wouldn't say we were burned, because the 8100 has been a good investment. We set out to achieve certain economies and productivity, and we achieved all that. More important, during the life span of the 8100 we changed our host computers three times. Some of the 8100s will be around for 15 years.

We've got a number of distributed applications that will be in production for another five years because they're doing the job. In terms of achieving business objectives, it was great; from the point of view of having a building block, a technology in place as a platform to build future technology on, it's been a big disappointment.

Colony: Is it possible you are gun-shy about departmental computers because of the 8100s?

Brophy: It's not a question of being gun-shy. I'm not adverse to departmental computing if it makes sense. I just don't see the advantage. Why put in three tiers when we can do what we have to do with two?

Colony: One of the issues that comes up is that personal computer users don't trust the DP manager to deliver the resources they need at the mainframe level. So those users want to own a machine that sits in a corner of their office and that they probably

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buy and manage. They'll get some resources from the mainframe, but they want to be able to control their local resources. Is that a factor for Travelers or not?

Brophy: It may be — if you could get inside the head of each end user, they may think that way. But certainly it's not manifested. You can't do your job here without having access to a mainframe.

Basically our people are knowledge workers. We've got 2,500 data bases; we've got 2,800 disk drives; we've got five mass storage systems; I can't tell you how many decision support systems we have which are host-based, driven by end users.

We made a decision in 1979 that we would no longer program reports. We said that it was an end-user responsibility. If anything, I think we have the brakes on, trying to slow down host utilization — not the personal computers. We're trying to encourage personal computers at home and the office, providing assistance through the computer store.

What we're trying to put the brakes on is utilization of our host computing requirements. Personal computers create a latent demand for host resources. I don't think people are concerned about central data processing because we've been the biggest supporters of the personal computer phenomenon and encouraged end users to do their own thing.

Colony: By our accounts, we believe 75% to 80% of the personal computers in the Fortune 1,000 are, in fact, IBM.

Extra: Do you find that the remainder are not being integrated through networks?

Colony: Well, another 5% are Compaqs and other compatibles. The second most installed personal computer in the Fortune 1,000, believe it or not, is Wang. Most of those Wangs are attached to VSs, so they are communicating — with Wang equipment, of course, not with the IBM mainframe.

Brophy: Wang has a great product. The reason I know is that my daughter is a saleswoman for Wang. Unfortunately, Wang has not penetrated our environment, although they have put products in our corporate store.

It's not the quality of the product. I think it's just the momentum of having so many Personal Computers and so much dependence of one Personal Computer on another. So much of our environment is integrated — work is developed on one Personal Computer and displayed on another.

Colony: My baseline comment about Fortune 1,000 personal computer integration is that it's going to revolve around the departmental solution. You're going to have a departmental computer that is going to act as the gateway to the mainframe above. The personal computer will be moved through that departmental system when it communicates to higher level systems. Joe and I are directly opposed in this area.

Brophy: I am not disagreeing. IBM people, from what I've seen from the representatives here, are enthusiastic about the concept of departmental computing. I have no disagreement that a lot of companies may very well use a departmental computer like the System/36.

I think when the dust settles, in many situations it's not going to be necessary to have one. Micro-based products are going to have sufficient capability that you really won't need a departmental computer.

Colony: My scenario for the seven- to 10-year time frame is that communications links will improve so much that we will have basically one very intelligent device in our personal computer talking directly to that very large computer someplace in the country. But now, while the communications costs are still quite high, it will be important to take a piece of that mainframe and shove it out to the local site.

Brophy: You've been saying departmental host. If you would substitute the words "departmental gateway," I would not disagree with you.

Colony: But it's not just a gateway, it's also running a local data base, distributing micro applications, acting as a file server and maybe even as a printer server. It's a lot more than just a communications gateway.

Brophy: I would suggest you look at what IBM is doing as far as the gateway. It includes all of the above. I think the problem is only within IBM, and it has to do with the differential between the System/36 to 38 series and the Series/1. The Series/1 as a gateway does everything you said.

Colony: Give me a good data base running on the Series/1 that Personal Computer users can actually get good quality out of.

Brophy: IBM hasn't announced it, and I'm not going to announce it for them.

Joseph Brophy and George Colony were brought into dialogue for Extra by National Trade Productions of Alexandria, Va., and Intech, the annual integrated information technology conference held in San Francisco Aug. 26-29.

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EXTRA

Gearing software to networks

By David Lytel

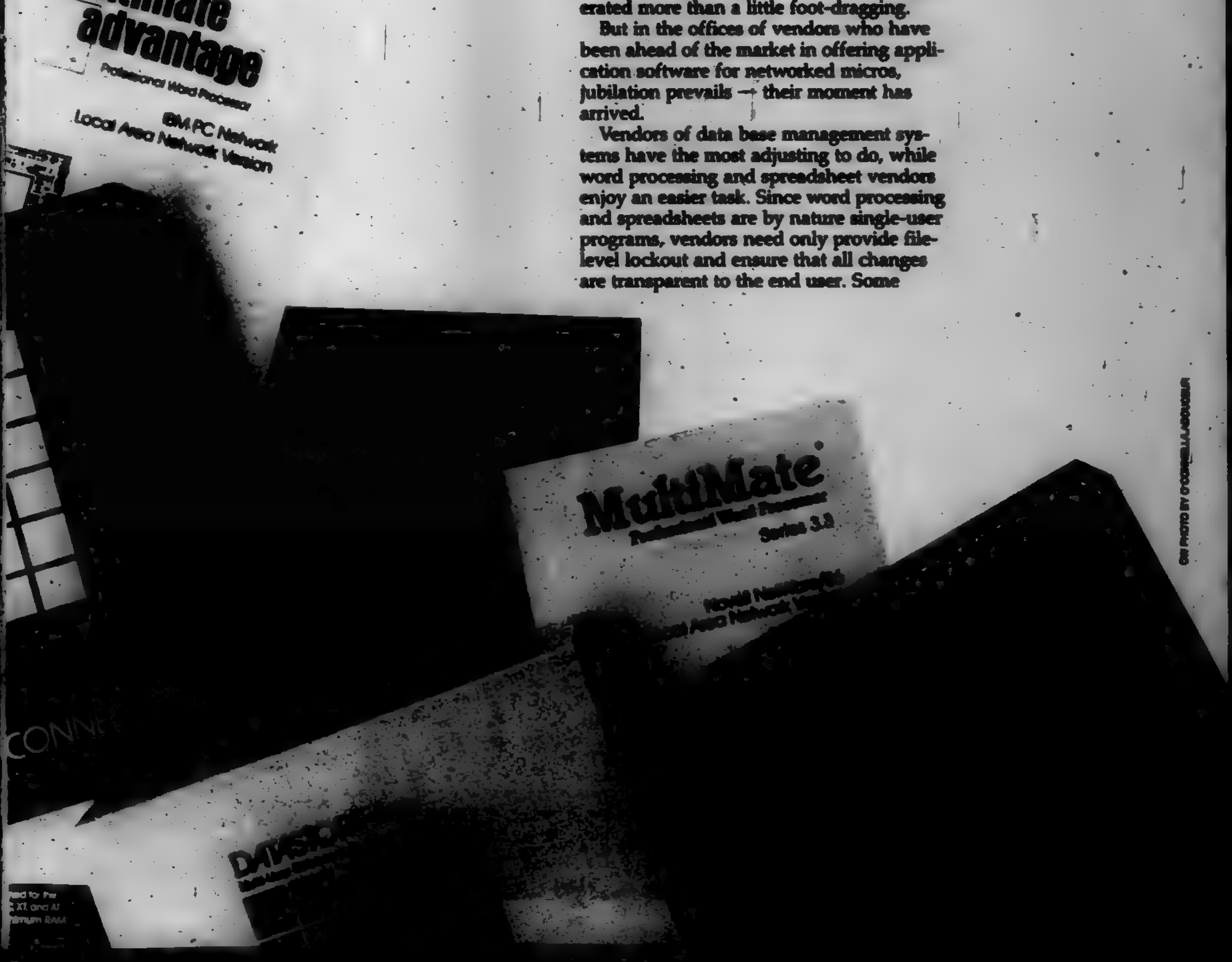
Some software vendors are rushing to meet the growing installed base of networked micros. And some vendors are running the other way.

When micros were stand-alone devices and networks only existed for minis and mainframes, each micro user had to buy his own copy of a software package — plain and simple. But now that microcomputer networks are sprouting up, customers are starting to demand multiuser and network versions of the software they've known and loved.

Some software vendors are obliging, but others clearly are not. Conflicts over site-licensing and fear of lost profits have generated more than a little foot-dragging.

But in the offices of vendors who have been ahead of the market in offering application software for networked micros, jubilation prevails — their moment has arrived.

Vendors of data base management systems have the most adjusting to do, while word processing and spreadsheet vendors enjoy an easier task. Since word processing and spreadsheets are by nature single-user programs, vendors need only provide file-level lockout and ensure that all changes are transparent to the end user. Some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get away with even less, leaving file security duties to the compatible network operating system. And still there are few network versions of word processing packages on the market.

Keeping the status quo

Software and data sharing traditionally has been handled via site licensing in the mini and mainframe worlds. Vendors license software to a network, rather than an end user, and then don't worry about who is connected to that network. But many micro software vendors are struggling to maintain the status quo — the revenue that comes from licensing individual packages.

Vendors can't afford to have network versions of their software, but users can't afford not to. Using a single-user version on a network puts users in violation of their licensing agreement and jeopardizes their data. Without file locking and record locking as well as appropriate levels of security, data is easily corrupted or lost.

> ***Vendors can't afford to have network versions of their software. Users can't afford not to.***

One word processing software vendor that has worked out a network policy is Samna Corp. Samna's software is marketed directly to major accounts, which has forced the Atlanta company to develop a network policy quickly.

"We would've lost a lot without a network version of our software," says Marketing Vice-President John Day. Samna introduced network versions of its word processing products last spring and sells them based on the number of network nodes that will be sharing the product. The price of the three-user version of Word III is $1,250 and scales up to $5,750 for as many as 15 users. The more powerful Samna+ is priced at $1,550 for three users and $7,250 for 15.

Multimate International Corp. announced a network version of its popular Multimate word processing package in May and began shipping in July. "It was basically a response to requests from our Fortune 1,000 customers," says Marketing Vice-President Suren DerAvedisian.

The idea behind the multiuser version is that it be indistinguishable from the single-user original from the user's standpoint. Single-user versions of Multimate 3.3 and the more capable Advantage product will be priced at $495 and $595, respectively, and $995 and $1,195 for versions licensed to a three-user network. The cost for each additional user will be $295.

These two are the only leading word processing vendors who have made specific arrangements for networks. Microsoft Corp., for example, has not yet announced a network version of Microsoft Word or Multiplan. As the developer of the operating system for the IBM PC Network, the company is "heavily committed to networks," according to Product Marketing Manager Dave Melin.

But Microsoft continues to consider placing its software on a file server as a violation of the licensing agreement. When the company does announce a network version early this fall, Melin says, "I doubt we'll be making specific changes to our products for networks other than our own MS Network/PC Network."

Micropro International Corp. is equally tight-lipped about plans for network versions of Wordstar. Vice-President for Product Development Bill Crowell says, "The technical part has been resolved. It's the marketing part that is a tough nut to crack." In his case, marketing includes selling the idea of multiuser software to his retailers, who also have been accustomed to the one-user, one-package sales income and who are equally threatened by an additional loss of control through site licensing.

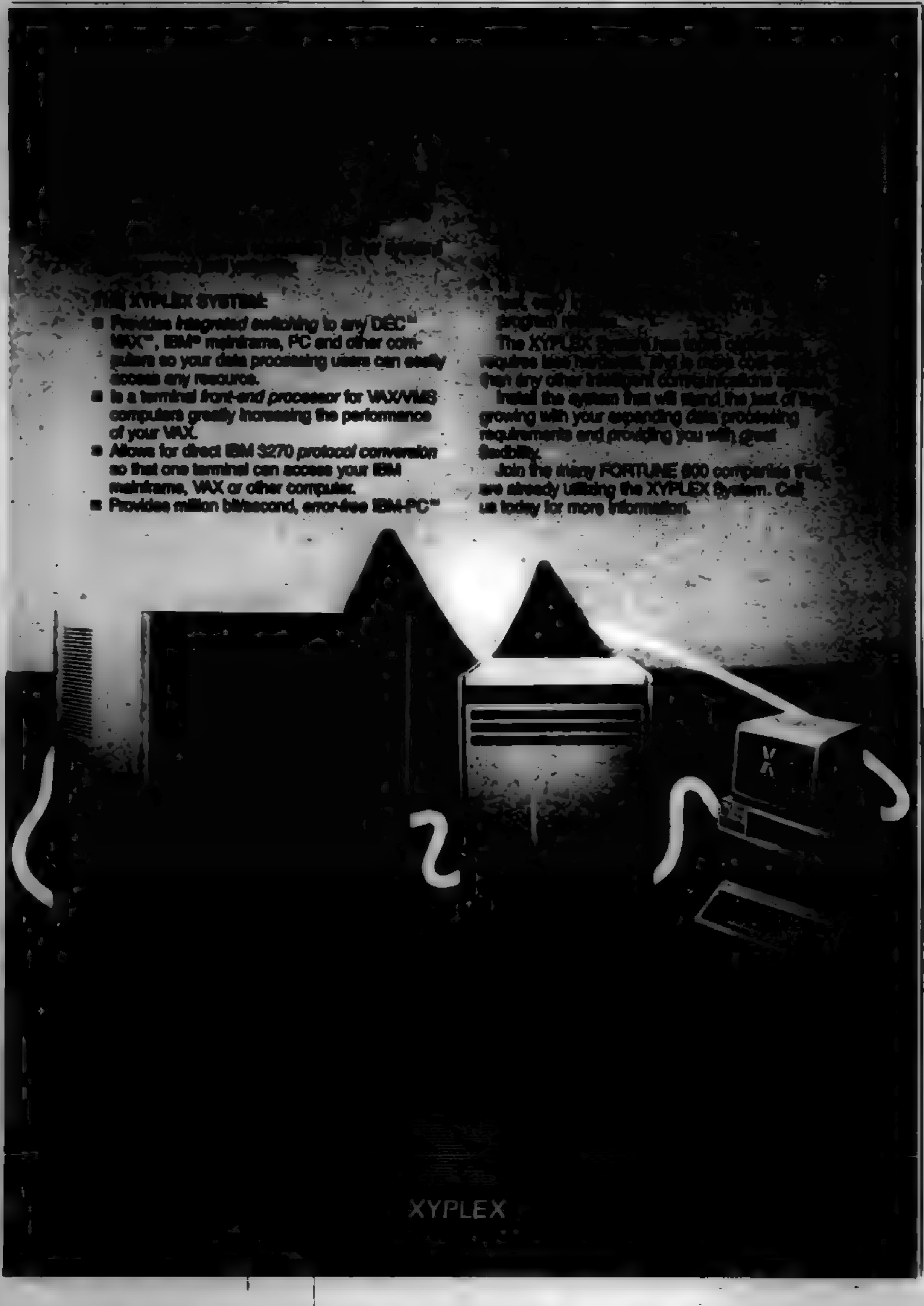
Compromising position

Software Publishing Corp. joins other companies who are hoping to pass the buck. Software Publishing has no network versions of its popular PFS series, which Director of Marketing Signe Ostby admits "is a bad position to be in." But the company also produces the Assistant series for IBM. Says Ostby: "We're hoping they'll solve the network licensing problem for us."

Ostby acknowledges that by not having a network policy, Software Publishing has put networked customers who might install the single-user versions on shared hard disks in an awkward position legally. But she does not foresee the company moving against those users. "We don't believe in prosecuting our customers," she says. "I think Lotus is shooting itself in the foot."

Lotus Development Corp., which has more than a million copies of its 1-2-3 and Symphony programs installed, is not only the leading microcomputer software vendor but is also the vendor most publicly resistant to developing a network policy.
"They've been dealing with networks two ways," comments consultant Eric Arnum of International Resource Development, Inc. "Lawsuits and stonewalling."

Lotus has not only gone after customers who place their software on a file server but has also copy-protected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One vendor's research showed that 88% of network users actually run single-user software on their network, some with disastrous results.

certain parts of the programs so they cannot be loaded onto a hard disk. Lotus spokesman Jim O'Donnel reports that the company has "been meeting with key corporations and customers and hammering out arrangements on site licensing" and will announce that policy early in the fall. Communications marketing specialist Chris Noble warns, "We will still require one license per workstation in a network situation."

The new Symphony 1.1 will rely on its compatibility with MS-DOS 3.1 for many of the features required of a network software package. Rather than rewrite Symphony from the ground up, Lotus has written the interface so that the operating system will take care of record locking. With these steps, Lotus is moving with the rest of the software industry toward networking. Says Nobel, "We hope we never have to litigate again."

Vendors of integrated packages enjoy a special challenge. If the multiuser version is to achieve the goal of transparent networking (no functions from the single-user version lost), end users' editing changes will have even greater impact.

If User A raises a figure in User B's spreadsheet to reflect greater sales, the change will affect User B's bar chart as well. Large-scale accounting packages have built-in audit trails, but personal computer spreadsheet packages do not; without totally rewriting the software, there may be no way to trace the changes that have been made to a given file.

One vendor's research showed that 88% of network users actually run single-user software on their network, some with disastrous results. Placing a single-user version of a DBMS on a file server can be a lot more than just a potential legal hassle. If the DBMS doesn't support the network's scheme to prevent two users from updating simultaneously, serious data corruption problems can develop.

Recipe for success

To run effectively on a network, a DBMS package must have — at a minimum — schemes to lock out other users when one user is changing a field or a record. To take maximum advantage of network features, a DBMS vendor can restructure the program from the ground up. Several vendors are moving to meet the growing demand for network data sharing with new DBMS packages.

Microrim will release a network version of its Rbase 5000 DBMS this month. Microrim's multiuser product will provide concurrent access and will be licensed on a per-file-server basis. The $2,100 price of the multiuser version is three times the cost of the single-user version.

Ashton-Tate, however, is not moving as quickly. It offered a multiuser version of Dbase II for sale for almost a year, then pulled it from the market in January. "Basically it was just a patched version of Dbase II," says Scott Brown, Ashton-Tate's technical public relations manager. "The developer had to do a lot of his own customizing and debugging to allow for record locking." The product was only available for one type of network, and Brown says the company found there was little interest in it.

"We haven't jumped on the multiuser bandwagon yet," he notes, "because we want to be able to take full advantage of the network environment when we're ready" — presumably when network hardware settles on a standard for software to follow.

Several smaller companies always have sold multiuser versions of their software and been ahead of the market, which is now arriving to meet them instead of the other way around. Florida software vendor Data Access Corp. markets a DBMS called Dataflex that has been multiuser since the product was introduced in 1981. It runs on 15 different networks and is priced at $1,250 per file server. Account Executive Diana Wilcox reports their shrewd anticipation of the market has yielded 22,000 copies already installed. She predicts 1985 will bring three times the sales of 1984.

One vendor with a very sophisticated understanding of the local network software market is Software Connections, founded in 1981 to target the network market specifically. Gary Kwok, product marketing manager, explains that during the design process, "data security is No. 1. You're now off the floppy, and a lot of people have access to your data and programs. There has to be a way to prevent hackers' tampering." According to Kwok, the DBMS should also provide levels of access for individual users to different files so that personnel files, for example, can be held confidential.

The other most important feature? "Believe it or not — ease of use. A network has end users at a range of experience levels. The user interface has to be easy enough for people who are used to PFS but at the same time offer more advanced features."

Kwok advocates finding software that has been rewritten for networks from the ground up. "It's nearly impossible to do a good job retrofitting. Audit trails and other security and privacy features — we haven't seen these with any retrofitted package."

Software Connections prices its DBMS, called Datastore:LAN, at $1,000 for five users and $2,000 for 16. "We tried per-user pricing," says President Buck Gee, "but it just did not work. It was impossible to police." The company's LAN:Mail Monitor electronic mail package can be used between networks as well — an advantage to software designed by a third-party independent.

Another sophisticated network software vendor is Fox Research, Inc., which began as a vendor of network hardware. Fox brought out a network version of its 10-Base DBMS in the spring of 1984 to run on its local-area network, called 10-Net. 10-Base is available for $895 in a version that supports up to five users.

User at the helm

To many software vendors, networking is a vexing problem. But at least one vendor is making a deliberate strategy out of calling it a nonissue. Lifeboat Associates, Inc.'s Chief Executive Officer Edward Currie insists that unless a vendor sells a product that demands concurrency, it should ignore the problem of multiple users and multiple copies and continue doing business as before.

"Oddly enough," Currie says, "we believe in that approach. We believe that networking will force software vendors to add value to their product, substantive value: life documentation and technical support and updated versions." He expresses the hope that software vendors will stop thinking of their product as a single diskette, a one-shot sale. In his opinion, the product includes updates, and a network version should be handled by the software vendor as just another update to provide for the customer.

In this line of thinking, the ability to copy and share software, rather than being a threat, has been a key element to the development of the software market. "The strongest form of advertising is still word of mouth," Currie says. "Our experience has been that many of our new users first came into awareness of our product by borrowing it from a friend."

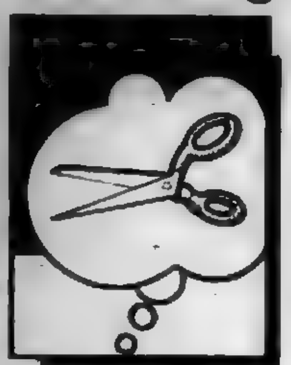
To Currie, this kind of a customer-oriented approach is critical to the future of the computer industry. "We've lost momentum in this industry," he says. To wit, some observers are witnessing a generational change in the leadership of the software marketplace.

As Arnum of International Resource Development puts it, "The dominant software vendors in our present 16-bit IBM world may not be dominant in the local-area network world, in the same way that the vendors who led when CP/M was the dominant operating system are not the same people who are leading now that MS-DOS is dominant."

Senior Analyst Meg Lewis of Future Computing, Inc. says, "Opportunities are now being created for software vendors who will treat their corporate customers the way they'd like to be treated."

Since for many corporate users that means networking, the future seems clear. If the presently dominant vendors don't move to meet the demand for multiuser applications software, there are people in the wings who are ready to pick up those customers and move the industry forward.

David Lytel is a freelance writer based in Ithaca, N.Y., specializing in data communications.



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Gateways

By George Elgar

Bridges and gateways give personal computer users universal access to shared resources and one-connection access to the host. Wait till they hear about hybrids.

Bridges and gateways are doing for networks what networks did for micros: eliminating isolated processing.

Today, the local-area network market is crowded with more than 50 vendors offering myriad topologies, access protocols and cabling schemes. Gateways and bridges are required to accommodate users demanding universal vertical and horizontal resource sharing.

The arguments over network architecture — baseband vs. broadband, CSMA/CD vs. token passing and so on — that stymied network development have to some extent calmed down. Custom applications software, "firmware" and intelligent sharing devices are solving these difficulties, freeing network installers to innovate further.

The issue now for the general user is: Will my personal computer run the applications I need and am accustomed to in a multiuser environment? As the market responds in the next year or so, the industry will see a virtual explosion of bridges and gateways.

There remains a great deal of gray area

EXTRA

in the distinction between bridges and gateways in users' minds, partly because the terminology is often used interchangeably. One definition holds that a bridge links two similar networks, whereas a gateway links two different networks.

In a bridge, the protocol passed between the networks is transmitted in its original format; no protocol translation occurs. Bridges can be used to increase the number of addressable nodes on a network or to link two geographically distinct networks.

The benefits bridges offer are substantial. For example, branch offices in Los Angeles and Chicago can send sales data from their respective networks to the main office in New York or perhaps request targeting data, via a bridge. One branch office can address the other directly, as another node on the network, without signing on to a communications service, dialing through a modem or learning new software commands and menus.

Smart router

Bridges now are a combination of both hardware and software. A typical purchase will consist of a "black box" that sits between the two network servers and is connected to each. The bridge has its own processor, memory and software, and its operations are transparent to the network user.

Bridge Communications, Inc.'s Gateway Server/4 product, for example, can be used to connect two Ethernet local-area networks located in the same building. The GS/4 sits between the networks, running two Ethernet cards and a shared memory card off a Multibus. Internal software allows the GS/4 to route data and commands without network users being aware of its interference at all. No additional software is required for the network nodes, and the bridge does not place an additional limitation on the number of users in the network.

The same system could be used to supplement a single Ethernet network. If a very long Ethernet cable were stretched throughout a building, the network installer could choose to break the cable at a point and use the GS/4 to connect the branches.

Bridge Communications' GS/3 product, on the other hand, links Ethernet networks that are miles apart. A GS/3 box would reside at each network, and they would communicate via one of a number of standard communications carriers: telephone lines, T1 connections, microwave and so on. Again the network users are unaware of the transaction, except that the transmission's speed will be dependent on the carrier used. (It will, in any case, not match the 10M-bit speed of Ethernet.)

Further development of bridges will follow the traditional pattern for computer evolution. As the software becomes standard, much of it will be embedded in the hardware, and new facilities will be added. Current bridge products are sold as both standard off-the-shelf products and customized devices.

Although somewhat of a virgin industry in the eyes of users, bridge technology is commanding an ever greater proportion of the computer industry's attention. Several manufacturers offer products that are well established and tested. 3Com Corp. and Novell, Inc. both offer bridges to link their own local-area networks through telephone

The existence of gateways now becomes a factor in the type of local-area network users select. If communication to the outside world is crucial, a local-area network must be chosen not only on its own merit but also on its ability to run through an appropriate gateway.

lines. Other bridge manufacturers such as Ungermann-Bass, Inc. and Associated Computer Consultants provide bridges to connect their own and other vendors' similar networks.

Gateways go further

A gateway does what a bridge can't do — interface two dissimilar networks. Gateways translate one network protocol to another network protocol, bridging both hardware and software incompatibility. This advanced technology goes to the heart of the problems encountered in micro-to-mainframe/mini communications.

Gateways, like bridges, are combination hardware/software products based on powerful processors of their own. Pathway Design, Inc., for example, has recently introduced Netpath, a local-area network gateway that allows IBM Personal Computers and compatibles to communicate with IBM hosts through a dedicated Personal Computer XT. Besides the basic gateway functions, Netpath provides multiple sessions, customized presentation services and an option for multiple host gateways to one local-area network. The Netpath can communicate over dial-up, leased, point-to-point or multidropped lines.

In general, gateways are designed for transparent operations. Gateway users need not know the protocol or medium of the network from which they are requesting or sending data. Some gateways even take care of Ascii/Ebcdic conversion. Furthermore, the conversion may be to a protocol not normally associated with networks — Ethernet gateways to television or FM radio — so connections are not limited to micro-to-mainframe or network-to-network.

The emergence of gateway technology is, in many respects, a result of the closed IBM environment, which has traditionally not furnished outlets to other worlds. There was a strong impetus from users who wanted to connect their IBM equipment with hardware from other vendors. This pressing need gave rise to SNA gateways, which can connect local-area networks to IBM mainframes using Systems Network Architecture (SNA).

Besides adding convenience, an SNA gateway enables microcomputer network users to access mainframe applications, data and peripherals at much lower costs than a direct link. Without a gateway, each personal computer must have its own 3270 hardware card, coaxial cable and mainframe controller port. The SNA gateway requires no additional hardware for the personal computer and needs only one connection to the host, since all data is sent through the central gateway box. The benefits of 50 users on a local-area network sharing a single port on a mainframe are obvious.

X.25 gateways solve more generic connection issues. X.25 is a packet-switching protocol widely used for long-haul data communications. X.25 gateways allow a local-area network to connect to public data networks that use the X.25 protocol, such as GTE Telenet and Tymnet. Again, by using a common passage, the gateways reduce the cost and complexity of connecting dissimilar environments.

Because gateways are used to link two different local-area networks, such as a 3Com Etherseries network and an IBM PC Network, they may eventually help ease the standardization crunch. If and when IBM becomes the industry standard in networking, local-area network manufacturers like Novell and 3Com may provide gateways to IBM's network instead of radically changing their own architecture to conform to IBM specifications. This development should give some relief to users and software vendors alike who are afraid to commit to a single architecture.

It is doubtful that a single universal data communications solution will ever emerge, and in fact, one may not be desirable. No single protocol can accomplish all the required functions. An insistence that all hardware must conform to a single protocol seems impractical; thus, gateways are as inevitable as they are invaluable.

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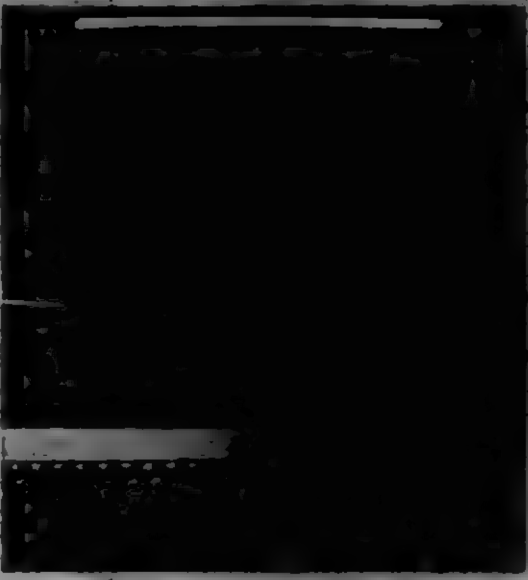

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The recent Ungermann-Bass/Microsoft Corp. joint gateway offering may be indicative of trends to come. The product combines the former's Net/1 and the latter's PC Net. The combination hardware/software, bridge/gateway points to a series of joint ventures and mergers resulting in the blending of the two technologies.

Another likely trend will be price drops. Just as the cost of microcomputers and local-area networks has decreased over time while performance has increased, gateways will become both more affordable and effective. As their popularity and acceptance increases and more vendors break into the market, gateways in the $10,000 to $15,000 price range will become available at a lesser cost.

Because gateways are used to link two different local-area networks, they may help ease the standardization crunch.

At the moment, bridges and gateways are being distributed almost exclusively through specialized dealers or through the manufacturers themselves. The complexity of the technology prevents most end users from selecting, installing and maintaining the hardware independently. However, if local-area networks are any indication of future trends, it won't be too long before gateways and bridges may be found in retail outlets, making them even more available to a broad range of customers.

Hybrid networks, perhaps the network architecture of the future, hinge on gateways. Hybrids combine a variety of network environments and protocols in a single network, utilizing each type's strong points to the fullest advantage. For example, a single hybrid network could be composed of a broadband backbone with a dozen or so dissimilar baseband "ribs" running off of it and a fiber-optic link to Europe.

Bridge Communications' GS/6 is already available for such baseband/broadband interconnections. Under this configuration, users can be logically grouped by department to capitalize on the higher speed, lower cost and easier maintenance of Ethernet and still communicate over a broadband backbone with other departments up to ten miles away.

Hybrid networks will also help simplify long-term network planning. Multiple channels on broadband cable can be used to transmit a variety of mediums. Thus, the ability to transmit voice, data and video is immediately available to accommodate changing communications requirements. Other examples of hybrids expected to emerge will bundle voice, data and video environments, with AT&T the most likely leader.

Added pressure

Gateways are beginning to have a real impact on the network industry. The existence of gateways, for instance, now becomes a factor in the type of local-area network users select. If communication with the outside world is crucial, a local-area network must be chosen not only on its own merit but also on its ability to run through an appropriate gateway.

Although gateway technology is rapidly becoming more available, gateways and will not exist to and from every network. Gateway manufacturers will focus their technology on major local-area network players such as IBM, AT&T and 3Com, placing added pressure on the minor network players who can no longer operate in a stand-alone environment.

Of course one of the main factors holding back mass acceptance of gateways in the marketplace has been the delay in the necessary prerequisite — lots of local-area networks. Meanwhile, it will be the value-added dealers, value-added resellers and systems houses that will lead the way for users, particularly as long as sharing resources involves overcoming unfriendly user interfaces.

To the user, the issue boils down to information transfer. The end user's involvement in bridges and gateways should be as transparent as electrical outlets in the home. There is now no technical reason why one computer's resource cannot be shared by another, whether the second computer is a clone of the first or a completely different kind of computer — and no matter how remote.

Incompatible protocols or architectures can no longer be seen as stumbling blocks. The hardware is all there. It is now up to the software industry to develop reliable, practical programs to control and take advantage of this resource sharing, while the hardware industry reduces the user's responsibility to entering an occasional command on the keyboard.

George Elgar is president and chief executive of Microclear, Inc., a New York-based computer consulting and software firm specializing in turnkey services and networking. He is also editor of "Micronews/Views," a monthly software industry newsletter.

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User Views

Hidden costs of networking

By Girard Liberty

Not until you start networking and interfacing personal computers to a host do the major hidden costs of personal computing begin to accrue. These costs include micro-to-mainframe link software, centralized direct-access storage devices (Dasd), shared data base systems, host CPU cycles, telecommunications hardware, network services and, of course, staff support. Such costs can easily become two to three times greater than the original cost of the personal computer and its software.

At Monet, we installed a micro-to-mainframe link called Panlink, Pansophic Systems, Inc.'s adaption of Micro Tempus, Inc.'s Tempus-Link. At a cost of $800 to $1,200 per user, depending on the number of concurrent users, Panlink allows us to use mainframe packages such as Pansophic's Easytrieve data base retrieval language and data dictionary tools through a transparent distributed processing link. Users can either download data for processing on their micros or upload an updated file without needing to know the intricacies of file access techniques or CICS.

The hidden costs don't remain hidden for long after the purchase of micros. The mainframe link, among other things, enables our end users to expand their storage capacity through the use of virtual diskettes residing on central Dasds. During an early experience with this new link, one of our personal computer users managed to consume nearly half of an IBM 3375 disk drive! We have since learned to limit both the size and number of virtual diskettes any one user may have, but we are under constant pressure to raise these limits.

A more subtle cost is the use of mainframe power. As the number of active links grows, cycles are quickly gobbled up. We initially ran Panlink under CICS. In vying for the same address space, our Panlink users were slowing response times for our normal CICS users. Transmitting data at relatively slow speeds was "stealing" CPU cycles.

The resource drain on both Dasd and mainframe cycles should not be overlooked when developing capacity plans. We are now running Panlink under TSO, which has a lower priority than CICS. Currently, we give our MIS applications development personnel and our personal computer users the same priority. Under TSO, however, we have the ability to modify individual user priorities as circumstances dictate.

As more users seek access to mainframe data, we are also finding a greatly increased demand for MIS services. Since we do not allow personal computers to interface directly to production data bases, our end users are pressuring us to provide them with subsets of data that they can download and manipulate. It requires central MIS effort to extract, summarize and format data that our personal computer users can access directly. Employing the staff to provide this service is another cost often overlooked in planning to support personal computer users.

In all, Monet is getting excellent value from its personal computer use. In a recent survey, only 16% of the personal computer users could pinpoint hard dollar saving, but 80% considered the value excellent or very good.

The benefits most frequently cited were work eliminated, return on time and improved decision making, quality of life and competitive edge.

In central MIS, our backlog continues to be heavy, which is surprising in light of the high percentage of departmental micro applications. I believe that pent-up demand existed prior to the proliferation of micros. Users had simply stopped asking for MIS help when the backlog got too large. Most users of MIS services didn't understand the capability of computerized systems until they had the opportunity to develop their first "personal" application.

Girard Liberty is director of MIS for Monet Jewelers of Pawtucket, R.I.

Priced out of the promised land

By Dennis Bizeray

The full costs of an integrated network wouldn't be an issue if we could easily show a realizable offsetting cost saving, but we can't — easily — do that.

Of course, all of us seasoned DP professionals know in our bones that the information age represents profound qualitative changes in the way business can be conducted. Everybody says so, especially the journalists, the marketers, the gurus and the consultants. And we all know someone whose brother's neighbor already enjoys this promised land.

But proving the benefits before incurring the costs turns out to be no easy matter. If we can't talk the benefits up, maybe we'll have to wait for the costs to come down.

At my place of business, we have a formal policy controlling the purchase of micros, and we track what each one is used for. The policy recognizes that micros are not inexpensive when fully configured, endowed with software and equipped with links to our mainframe-based synchronous communications network. They become even less inexpensive when we try to establish companywide standards.

Strictly speaking, we are not supposed to provide a micro to anyone who can't show a clear, matching cost reduction up front. "Merely" saving people time in getting their jobs done doesn't count — there must be a bottom-line saving.

But in practice, we recognize that it takes time to develop benefits, and we allocate micros on a provisional basis to those who can state a decent case. Then we extract a quarterly rejustification for retaining the micro and its complement of software.

We like to imagine fully equipped micros with color screens replacing most of our on-line terminals, with each micro able to access our mainframe (a Sperry 1100) and auxiliary systems (DEC, Prime and others). We'd like to provide multifunction workstations with workmanlike integrated software, too, but we'd need the capacity and I/O speed of hard disks with streamer tape backup or file servers and local-area networks.

Our networking requirements would then threaten to outrun our ability to install and continually modify, maintain and troubleshoot our systems, let alone allocate and justify the costs. We can't afford open-checkbook computing for the rank and file, and the real present-day costs of all the good stuff we'd like to do is way too high for most of our potential users to justify.

We suspect we're not alone in taking hard-nosed corporate attitudes toward costs. If the concern that costs be demonstrably offset by benefits is widespread at the grass-roots level, then maybe the next phase of microcomputer evolution will not begin until fully featured micros — with built-in speed-sensing multimode modems, hard disks with streamers and truly integrated software — are much more aggressively priced.

Certainly we haven't reduced the load on our mainframe by installing micros. Such movement as we are able to make toward a fully integrated, corporatewide system will be accompanied by a significant increase in mainframe load as network traffic builds up and the mainframe application base swells. Our fourth-generation language (Sperry's Mapper) really does live up to expectations and is the vehicle by which most new applications are mounted, but it certainly doesn't lighten the mainframe load.

The on-line networking of micros, and the growth of on-line applications in general, now concentrates processing into the normal hours that people work, meaning that our prime-shift loadings could triple within our planning horizon. You can't blame the micros for this situation, but they are an integral part of the whole scenario.

And that perhaps is the most significant change — how quickly micros have emerged as key system elements. Now, if only we can get their costs into proper perspective.

Dennis Bizeray is director of MIS for Nova Scotia Power Corp. in Halifax, Nova Scotia.

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Market Trends

Satisfied customers

By Harry Henry

A survey of 268 communications managers at U.S. user organizations found a large installed base of micros waiting to be networked. User attitudes seem to be: "Now that we went on a spending spree and bought all these micros, let's do something with them before we buy any more."

Information systems managers are now thinking more economically about how better to utilize current resources to satisfy end-user demands. The local-area network solution is popular — 40% of respondents currently have installed a network, and another 29% answer that they are planning do so.

Results of the survey, conducted by the Market Information Center of Framingham, Mass., peg the following as the top three reasons for implementing a local-area network:

- To share the data base
- To share hardware resources
- To see a return on investment

These issues do not involve productivity, standards or stringing cable; they are practical issues (Figure 1). Users are looking for products that can help them manage their current resources more effectively.

The satisfaction level of current users with their networks is high — 74% indicate their network met their expectations after installation (Figure 2). Apparently the user community is finding solutions to networking problems with current products. Vendors may not agree on standards, but users report the products are working and serving their purposes.

This finding may surprise market watchers observing fairly slow growth rates. Because relatively few companies have installed local-area networks, it appears there must be something technologically wrong with the networks. This negative attitude probably stems from the installation stories. Nearly every company suffers installation problems, however minor, and these problems continue to be reported.

The four major problems users encounter most often are software support, cabling, resource limitations of the local-area network and, finally, the user inertia factor (Figure 3). Yet the same high percentage — 73% of those surveyed — would recommend their systems to other users.

Users are actively looking for the IBM answer. Less than 10% of companies with networks installed indicate IBM as the primary vendor, but among companies planning to install a local-area network, more than 20% (twice as many as the next vendor) will consider IBM in their product decision. Other vendors being considered include Ungermann-Bass, Inc., Digital Equipment Corp., 3Com Corp. and AT&T, with Sytek, Inc., Novell, Inc., Corvus Systems, Inc. and 3M Co. not far behind.

The two major suppliers of installed systems are DEC (with the Ethernet influence) and Sytek (with an IBM tie-in). Following them are IBM, Wang Laboratories, Inc. and others. Nine percent of users develop network solutions internally.

While the vendors and standards committees continue to sort out issues involved in network technology and interfaces, customers must deal with choices regarding wiring costs, protocols, cabling media. Their buying decisions will make users the final judges of the products' success and utility.

Judging by outward appearances, communications managers are managing the business of local-area networks quite nicely. Systems are being installed, end users appear satisfied, and the market (at least so far) is being driven by the need to use resources effectively. This purchasing pattern contrasts with the "micro fever" of the past few years, when many micros were purchased without careful attention to how they would be used. As the market matures, so do the products within it. The users are exercising their considerable influence to good effect.

Harry Henry is a cofounder and principal of The Market Information Center, a Framingham, Mass., market research and consulting firm that specializes in vertical markets and communications.

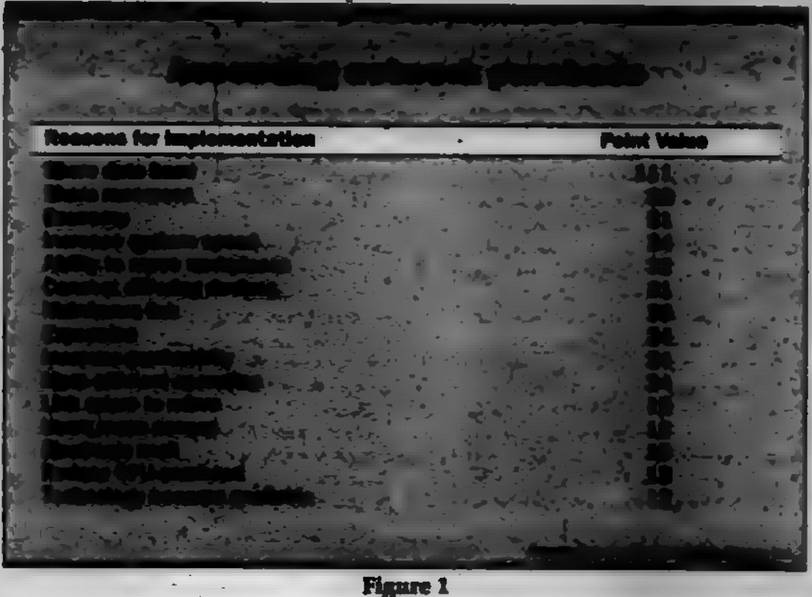
Reasons for implementation
Point Value

Figure 1

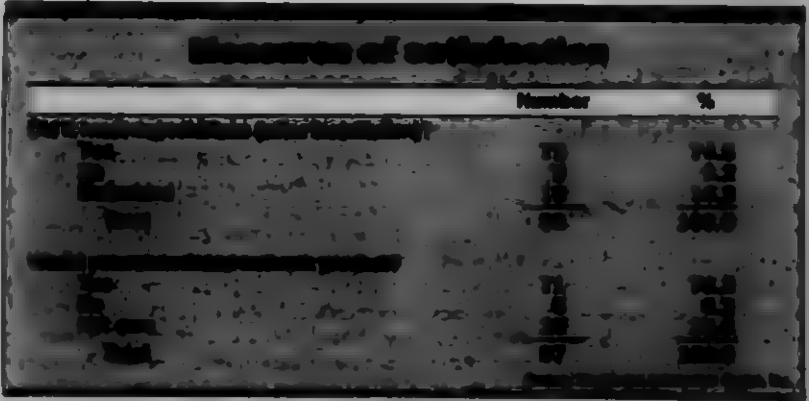
Measures of satisfaction
Number
%

Figure 2

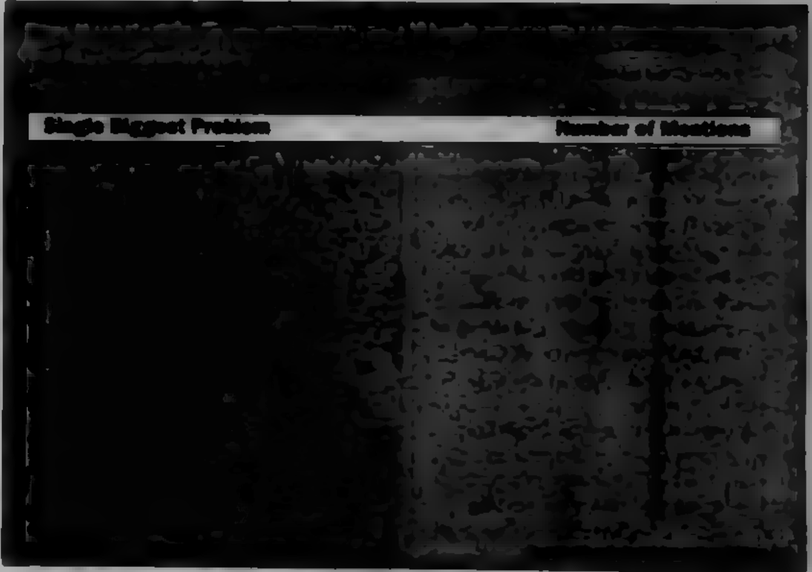
Single Biggest Problem
Number of Mentions

Figure 3

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Market Trends

The multiuser alternative

By Andrew Chatha

Multiuser microcomputers, though available for several years, just recently have begun appealing to a broader audience. New multiuser systems from IBM and AT&T, the two companies with the greatest market share, are mainly responsible for gaining users' attention.

Using multiuser systems, corporate business managers can share information and resources without the difficulties of networking: fluctuating industry standards and tenuous compatibility between micro brands.

Once multiuser micros were overshadowed by personal computers in the corporate environment. But the spread of personal computers during the past two years itself quickly revealed the inherent limitations of these single-user systems. The need to share data and software as well as expensive peripherals sent users looking for alternatives.

As it turned out, users' findings created a new level of interest in multiuser micros. In many cases, multiuser systems run more efficiently than a mass of workstations. Personal computers connected by local-area networks can prove inadequate and user-unfriendly.

In practice, the choice between networked personal computers and a multiuser system depends on the investment a company already has made in equipment and on the types of applications that will be performed. Multiuser systems can often be assembled at a lower cost than a local-area network with the same number of workstations. But a local-area network is a good alternative for companies that have already made a substantial investment in personal computers, since a network represents only an incremental expense.

Lack of standardization in local-area networks has also contributed to the high growth rate for multiuser systems — almost 52% during 1985 and higher during 1983-1984 and before. IBM's token-passing local-area network is being eyed as a possible standard, but production units may not be available for another two years. Right now multiuser systems vendors are cashing in on users' reluctance to purchase networks before the IBM version becomes available.

Multiuser systems best serve applications that require users to access a centralized data bank of shared information simultaneously, such as an inventory control system. Networked systems, on the other hand, are more efficient in applications such as electronic mail, where information must be passed back and forth among a large number of end users.

A drawback to multiuser systems is that they tend to be confining: workstations must be within a few hundred feet of the computer. Moreover, everyone's work is interrupted when the central processor of a multiuser system fails. Networks are less vulnerable to single system failures, span greater distances and offer a wider variety of features.

Because they are fully developed already and are currently less expensive, multiuser microcomputers will continue to challenge network-based personal computers through the rest of this decade. Shipments of multiuser systems will increase sharply over the next five years — from less than $4 billion in 1985 to over $12 billion in 1990. However, as communications compatibility issues are resolved and more products become available, network-based systems will prevail.

Andrew Chatha is manager of the computer division at Venture Development Corp., a Natick, Mass. market research and industry information firm. He recently directed several market studies on computer and communications products.

MITCHELL J. HAYES

Figure 1

eForum is a simple cost-effective way to tie together PCs.

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Electronic meetings continue the automation of knowledge transfer which started with electronic mail.

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Vendor Views

A random selection of local-area network and micro-to-mainframe software vendors were asked to comment on their products, corporate strategies and the direction of their markets as a whole.

Network vendors

Ungermann-Bass, Inc.
Santa Clara, Calif.

"We don't view personal computer networking as enough," declares James Jordan, executive vice-president. "You've got to offer a communications system for the whole corporation. We are not interested in selling five-station network clusters."

Ungermann-Bass produces two Personal Connection cards, either of which can be used to link personal computers to its Net/One local-area network.

"What Ungermann-Bass believes," Jordan says, "is that the personal computer is the universal workstation of the future. If you are going to offer general purpose local-area networks to corporate users, you better be able to link personal computers."

The company can configure a small network, but the target market is the corporationwide Net/One marketplace with Personal Connection acting as an extension of Net/One.

Ungermann-Bass allows greater flexibility than competing companies, Jordan says, with the possibility of connecting to varied networks (such as baseband Ethernet or broadband networks), use of different media and compatibility with both the Microsoft Corp. MS-DOS 3.1 networking standard and an IBM Basic I/O Subsystem (Bios) interface.

He reports that the coming months will see the company offering additional functionality for personal computers and more interfaces with IBM 3270 devices.

AST Research, Inc.
Irvine, Calif.

"We produce a departmental local-area network, AST PCnet II, that could handle 160 users, but typically is used for five to 20 users," explains Mark Stieglitz, director of local-area network marketing. "It's easy to install, even for nontechnical users." Connections are simplified through use of telephone-type RJ11 jacks and twisted pair wiring.

"Our features include an [IBM Systems Network Architecture] gateway for bisynchronous communication with a host. We supply software for printer sharing and file sharing on a personal computer, which is used as a nondedicated file server. That's important when people have perhaps five personal computers and don't want to make a big capital expenditure for a new personal computer.

"We also use the same [IBM PC-DOS] commands that would be used on a single-user system, so a person doesn't have to learn a new set of commands to use the network," Stieglitz adds.

AST has installed between 15,000 and 20,000 PCnet nodes, including an earlier version of the network, according to Stieglitz.

He also points out that AST will focus future development on compatibility with IBM's PC Network, rather than with IBM look-alikes, because that will be the benchmark by which compatibility is judged.

Stieglitz compares the network compatibility issue to the situation with IBM's Personal Computer, where use of the IBM Bios was the key to compatibility.

3Com Corp.
Mountain View, Calif.

Roselie Tobes, vice-president for marketing, reports, "We have a series of products called the Etherseries, which allows personal computer users to access, share and store information in a local-area network environment. It is intended for two to 200 users, which means we usually target small to medium-size firms.

"The products are based on Ethernet, the industry standard for 10M bit/sec. transmissions. We feel that's fast enough to meet most users' needs."

Tobes notes 3Com's emphasis has shifted in recent years from hardware to software in an effort to maintain compatibility with protocol standards, such as those developed by the International Standards Organization.

"Last year our primary focus was on the first-time user. But this year we are extending our reach to the software engineers and application developers who serve the users we targeted last year," she explains.

"It turns out that as we move into providing more products, we see ourselves more as software vendors targeting different types of local-area networks, rather than being tied to Ethernet-oriented hardware."

Tobes predicts that personal computer-oriented networks will increasingly be used to integrate office automation and distributed data processing functions, replacing low-end minicomputers.

She describes 3Com's plans to increase its ability to move across different types of networks such as Ethernet, AT&T Starlan, Apple Computer, Inc. Appletalk and token passing ring networks. She notes that 3Com is using networking standards outlined

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Vendor Views

by Microsoft and IBM for third-party software developers.

"The industry is moving more toward this business of giving micro-based networks minicomputer-type functions, such as data base management. We are going to further distribute processing across the networks with products we will be introducing in the next year. The software — the way it is achieving truly distributed processing and power — is going to be the exciting part," she says.

Novell, Inc.
Orem, Utah

Marilyn Capell, Novell's manager of public relations, reports, "We announced our Advanced Netware 86 in the spring. It is a high performance networking product based on the Intel [Corp.] 8088 processor." The Advanced Netware 86 product is designed to support the PC Network while adding functionality.

"Since then, we have introduced more products enabling the use of multiple file servers for internetworking dissimilar hardware configurations." One such product is Advanced Netware/PCN, operating system software that supports Netware Bridges for PC Network users. Netware products are installed at 9,000 sites, according to Capell.

Novell has established OEM relationships with various vendors, including Proteon, Inc., Gateway Communications, Inc. and Standard Microsystems Corp. Under those agreements, Novell bundles its Netware operating system with the vendors' hardware.

The bundled products include Netware/S, a star configuration network based on Novell's own hardware, Netware/Pronet based on Proteon hardware, Netware/G Net using Gateway hardware and Netware/Arc Net, using Standard Microsystems hardware. Other third-party vendors have introduced hardware and software products that require the Netware operating system in order to run, extending Novell's penetration even further.

"We want to offer our users flexibility. We feel one configuration doesn't give customers enough options," Capell says. The key to interconnecting dissimilar networks is Novell's software bridge.

Corvus Systems, Inc.
San Jose, Calif.

"Our recent merger with Onyx Systems, Inc. gives us an interesting perspective in terms of not just being big in the personal computer local-area network business but being in the cluster or departmental work group multiuser microcomputer business," says Bill Lanfri, director of marketing for Corvus.

Corvus's premerger networking product, Omninet, has the advantage of twisted-pair wiring, Lanfri says. Many competitors rely on coaxial cable, which is more difficult to install. "We agree with AT&T that twisted-pair technology is the technology for the desktop into the 1990s."

In the first quarter of 1986, Corvus expects to announce the first products resulting from a joint venture with NEC America, Inc. The research is aimed at developing a very large-scale integrated (VLSI) circuit chip to boost Omninet's transfer speed from 1M bit/sec. to 4M bit/sec., "a next-generation type of thing," in Lanfri's words.

But most of Corvus' efforts in the near term will involve the Onyx merger, approved by the companies' boards of directors in July, according to Lanfri. Onyx manufactures 32-bit microcomputers supporting up to 11 users.

"We obviously have an integration task ahead of us," Lanfri explains. "For the next few months, we have to bring the Onyx and Corvus technologies together . . . under the single banner of departmental computing."

Software vendors

Management Science America, Inc. (MSA)
Atlanta, Ga.

"We've had various releases of our Expert Link micro-to-mainframe product since 1983 and have continued to enhance the product throughout that time," notes Larry Smart, MSA's senior vice-president for development.

"We originally came out with a screen-snatching ability, where the microcomputer user could pull down a screen from the mainframe. Later, we added a dictionary-driven function that allows users to define what data they want."

He adds, "Expert Link is a component of our overall Expert product technology. It allows us to download data and upload data. We can download files from the mainframe to the personal computer and upload from the personal computer to specific application systems on the mainframe.

"We also have a comparatively new function — the ability to do personal computer data entry. With that function, the menus and functionality that the users see are normal personal computer screens on an off-line basis. When they are done, they can upload data to the mainframe. They don't have to be hooked up using mainframe cycle time and connections the whole time."

In the coming months, MSA will be enhancing its Information Expert, a "more generalized personal computer link" designed to work in conjunction with non-MSA applications as well as MSA systems.

Other announcements are likely to involve new development agreements with microcomputer software vendors as part of MSA's move toward links that allow software packages such as Lotus Development Corp.'s Symphony and Ashton-Tate's Dbase II and Dbase III to control the Expert Link activity.

Industrywide, Smart anticipates activity will focus on joint ventures between mainframe software houses such as MSA and microcomputer software vendors. Greater emphasis on security and the acceptance of IBM technologies as standards at the physical link level are also in the works, he says.

Cullinet Software, Inc.
Westwood, Mass.

Cullinet produces a micro-to-mainframe link package that includes its mainframe-based Information Center Management System (ICMS) and its micro-based Goldengate program.

"ICMS and Goldengate provide the micro-mainframe link while giving the information center the means to manage information," explains Jack Armstrong, manager of information center product planning. Nobody else has offered a tool that allows the personal computer user to access the mainframe without having the MIS department step in and perform tasks such as abstracting data.

"ICMS are two pieces of software designed to work together," he notes. One almost couldn't work without the other," he adds. "They enable the end user to interact with the host purely through the interface provided by the software. If I am the user, I don't want to have to look at things like a logon screen.

"We want to completely eliminate the need for the user to know anything about the mainframe. For one thing, it means MIS doesn't have to offer additional user training."

He says of the coming six months, "We are basically doing two things. We are generalizing our communications interface so we can support a wider variety of emulation boards and communications protocols. We are trying to keep the data transfer level independent of the software itself.

"We also will be including in Goldengate a reporting facility for more general use with products such as Dbase II, Dbase III, 1-2-3 and Symphony. We will then be able, for example, to have spreadsheets updated by the mainframe whenever needed.

"For instance, to the user working with a production data table, it will look like the data table is on the personal computer, but it actually will be on the mainframe as an extension of the spreadsheet. The user will only have to press the RECALC key to update the spreadsheet," he notes.

> *The industry is moving more toward this business of giving micro-based networks minicomputer-type functions . . . The software is going to be the exciting part.*

Informatics General Corp.
Canoga Park, Calif.

Rich Shapero, director of marketing for the Answer Division of Informatics, reports that one new offering in the Answer line of micro-to-mainframe links is Alpha Link. The package is Informatics' version of Micro Tempest, Inc. Tempest Link.

Shapero says that when paired with Informatics' Answer Personal Reporter, Alpha Link provides almost 30 communications environments with upload and download capabilities previously available only in 3270 environments.

Alpha Link is a data processing department reporting tool that provides improved file transfer and virtual diskette capabilities in conjunction with whatever microcomputer applications are being used. According to Shapero, Alpha Link "fills in" a gap in the micro-to-mainframe product line.

On the micro side, he explains, "Our Micro Answer product line is primarily the end-user tool. It is for someone who is constantly using 1-2-3 or another spreadsheet. What they are after is mainframe data to manipulate. We are saving them keystrokes and integrating the personal computer into the mainframe environment."

Informatics has 700 mainframe installations and 3,000 users running Answer products on microcomputers, according to Shapero.

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Vendor Views

"The next need to be met is moving information through intermediate machines," he says. "We feel an awful lot of people out there are making commitments to intermediate machines, so there certainly is interest in shipping data to and from Vsam systems to HP 3000s and other intermediate machines."

For the industry, there remains the burden of responding to customer needs and demands. Shapero says, "The responses we are getting back from users and DP departments are horrendous. We have major technological hurdles that we must overcome."

Digital Communications Associates, Inc. (DCA)
Norcross, Ga.

"The Irma card was the very first of a general series of emulation products for us," reports Robert Zack, director of corporate communications. Irma allows an IBM Personal Computer to attach directly to an IBM 3270 controller.

"It originally was meant to allow you to avoid the hassle of having both a 3270 terminal and a Personal Computer," Zack says. But as it has evolved, it has gone beyond that with functions such as file transfer, and the product line has expanded beyond the card itself."

Examples of the product line growth cited by Zack include Irmaprint and Irmakey. Irmaprint allows a printer attached to a personal computer to emulate an IBM 3287 printer, while Irmakey is a 3270-type keyboard that replaces the personal computer keyboard and allows the user to avoid using combination key-shift commands.

DCA's plans are focused on developing multisession products. "At Comdex/Spring," Zack notes, "we announced Irma X — the second generation of Irma. At the moment, the only announcement we have made is for a graphics product. It does not support multisessions, but we will [soon] be announcing a multisession product which will allow you to have up to four different windows, each one representing a terminal session with the host.

"You would have the effect of four different terminals all on the screen of a personal computer running over a single piece of coaxial cable," Zack points out.

He predicts that the industry of micro-to-mainframe links will focus on IBM's LU6.2 standard, which he says is well defined in IBM's SNA environment but not at the personal computer level. "Anybody who is in the protocol conversion business has got to be looking at and planning for the implementation of LU6.2," he says.

Techland Systems, Inc.
New York, N.Y.

Techland Systems features the Blue Lynx line of terminal emulation products. Product Manager Michael Krieger recalls, "We started out a few years ago in the remote communications market and expanded into the direct-attach game by making personal computers look like any type of terminal."

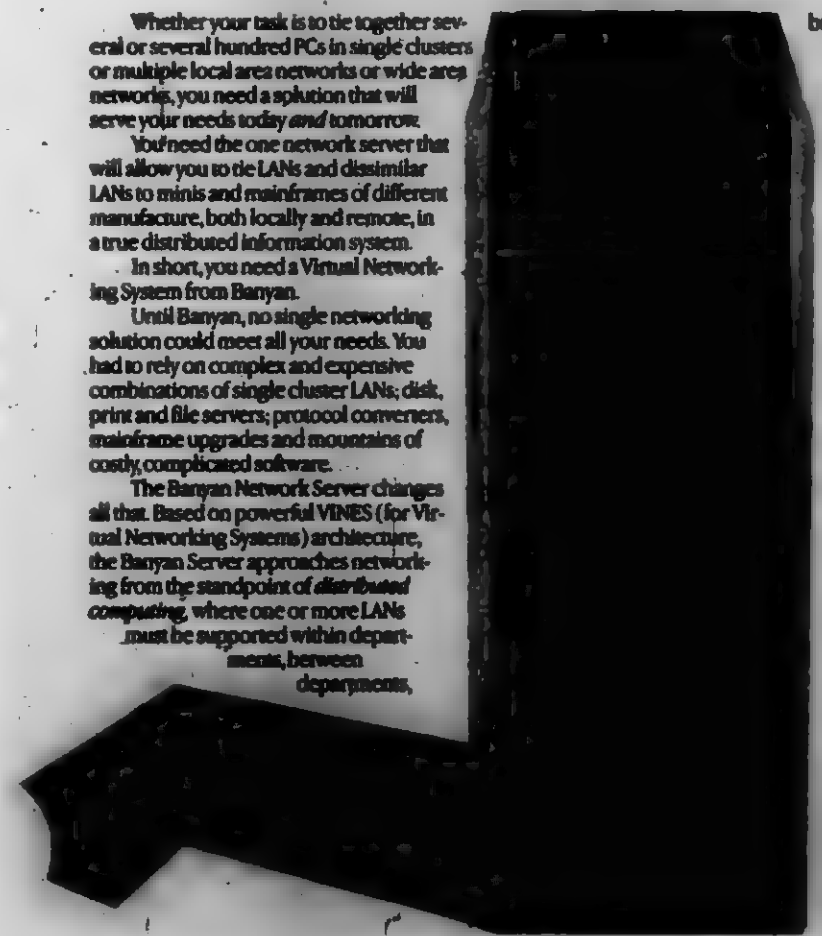
One of the more recent product additions, the Blue Lynx 5251 Model 11, was designed to allow a range of data transfers by emulating an IBM 5251 Model 11 terminal and allowing the personal computer to appear as up to four devices.

Krieger cites the 5251 Model 11 as an example of how memory demands on emulation boards have been reduced. The product's Zilog, Inc. Z80 board uses only 22K bytes of random-access memory (RAM) rather than the 180K-byte RAM used by older competitor boards.

Krieger reports that Techland is preparing to release a 16-terminal 5250 gateway for use in IBM Series/1 and System/38 environments.

The company already sells a gateway product for IBM 3080 series environments, supporting up to 255 personal computers and terminals but with a practical limit of 32 devices.

Of the industry, he notes, "I think you are going to see more emphasis on gateways with one of the personal computers on a network operating as a gateway by emulating an [IBM] 3274 controller."



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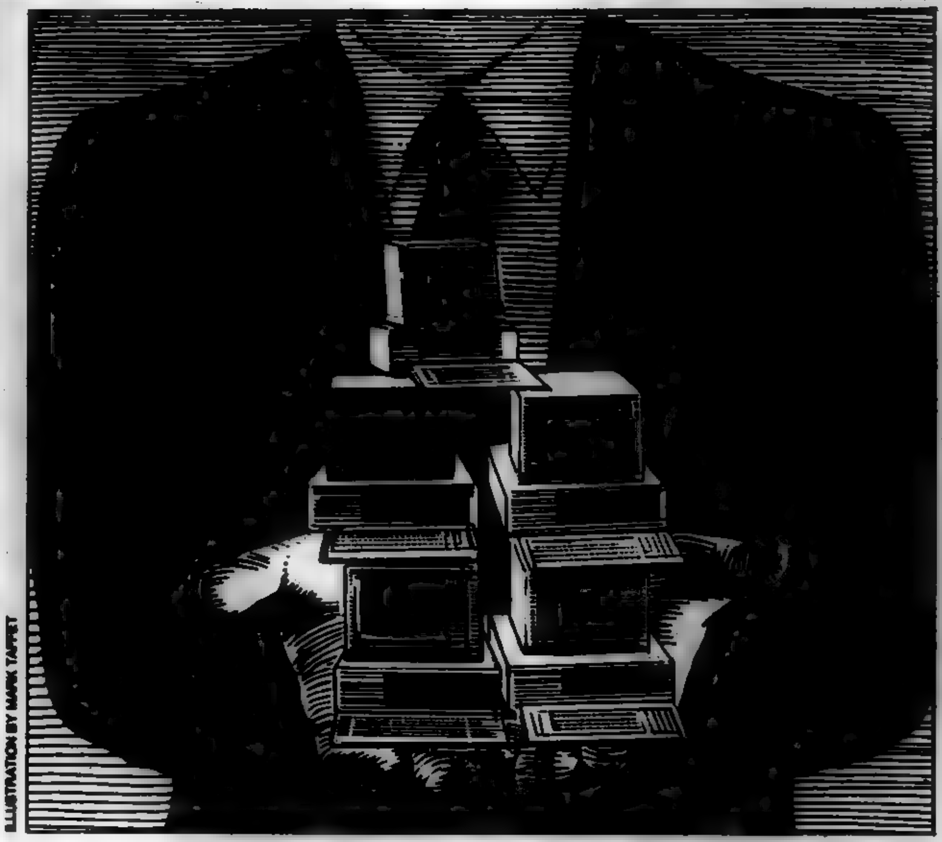

ILLUSTRATION BY MARK TAPPET

able to input their own data, do their own spreadsheet analyses and make recommendations and decisions based on whatever information they themselves have developed. Managers are able to accomplish all this without any participation or oversight by the company CIO or any other MIS professional.

This revolution has already fostered in some organizations what could be called "creeping chaos." The strict controls over data purity, traditionally exercised by MIS professionals, are not being enforced. Top-level staff meetings can degenerate into arguments over numbers, leaving the decision makers unable to agree on whose data to accept, much less which actions to take.

Crossing over

In a typical scenario, one Fortune 500 CIO authorized the use of specific brands of micros and software for his company's regional offices. Six months later, he admitted to being amazed at what the managers there were doing with their machines.

Like many CIOs, he had presumed his regional managers would use their personal computers as word processors or as a means of storing local report data. Instead, some managers supplemented the official software with a variety of spreadsheet and statistical modeling systems. Others equipped their micros with telecommunications capabilities and were exchanging unedited sales data among themselves, inadvertently crossing over district lines.

> *The strict controls over data purity, traditionally exercised by MIS professionals, are not being enforced. Top-level staff meetings can degenerate into arguments over numbers.*

The complaints of senior MIS professionals are rarely aimed at simply curtailing middle manager initiative. Most often they center on the inaccuracy of data and subsequent analyses. When inexperienced lay people use computers and spreadsheet programs, they often make mistakes, and these errors tend to get compounded along the way.

A leading packaged goods company, investigating discrepancies in a product marketing report, found that the data dictionary cross-reference file — kept on the marketing manager's personal computer — had not been updated in more than two years with new marketing files. "It was as though you were using a 1976 phone directory to find the newest restaurants in town," complained the frustrated head of marketing.

A financial services company found that an internal report included information on a competitor gathered from a variety of outside sources, including projections from brokerage firms, investment newsletters and business publications, none of which the company could verify. The manager responsible had simply input investment information he had received at home.

What lay managers seldom appreciate is that for 20 years information services professionals have developed effective ways of catching errors and verifying data they use. Most middle managers using popular microcomputer packages don't think to use "reasonableness" checks, validity checks or audit trails. A one-tenth of one percent error may not seem significant, but when it is compounded over a six-month period by many end users, it takes on new dimensions.

Dreaded task

Most corporations will soon face the monumental task of reorganizing and consolidating information from personal computers as control returns to central MIS. A growing number of CIOs dread the day when they will be asked to replace, displace or take possession of personal computer hardware and software in their organizations. They may be in the position of unwelcome policemen, enforcing corporatewide choices for approved software packages and vendors. Even straightening out data integrity snafus — clearly in everyone's best interest — can produce conflict as roles change and end users are told they can no longer operate autonomously.

The inevitable task need not be viewed as a battle between the corporate CIO and middle managers. Rather, each side can now take advantage of what the other has learned in the recent past.

Recall the reason for the proliferation of personal computers in the first place: Middle managers had grown impatient with unkept promises made by MIS management. Rather than wait years for proposed microcomputer networks, these managers purchased their own stand-alone micros, often out of their own pockets or departmental budgets.

Needless to say, as end users gained control, they lost a good deal of MIS/DP support. But the personal computer movement took off and non-information systems executives gave it their corporate blessing.

It is naive to think companies can now return to a disciplined, centralized MIS function that operates without the involvement and personal input of those "lay" executives. The solutions can be developed — but only in concert with these end users, who are now much more sophisticated in their understanding of microcomputer capabilities and limitations.

Some suggestions:

- Provide guidelines on authorized software to make it universal among the various personal computers in your organization. Adhere to a standard means of using such software. (Look for products with validity and error checks built in.)
- Gain senior management support, financial and otherwise, to provide middle managers with the training they require, including regular seminars and refresher courses.
- Most of all, include middle managers in decisions relating to systems and software. Their input can be sought in a variety of ways, including surveys and requests for suggestions.

By 1988, microchips will be built with submicron densities capable of internal memories in the 10M- to 30M-byte range, or about 20 times faster than today's models. Companies must get a handle on the data integrity problem today or face the prospect of losing even more control in a few short years.

William de Gruchy is president of The Rand Group, Inc. in Stamford, Conn., a management consulting firm specializing in information management and customized software. He is also chairman of the CIO Roundtable, an association of chief information officers of major corporations.

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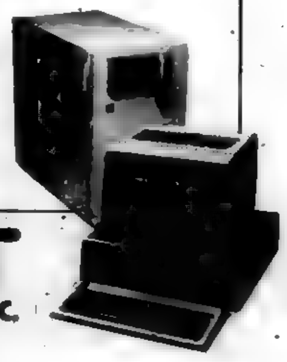

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COMPUTERWORLD

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Special Report
Minis and small business systems: Off-the-shelf technology catches on/SR/1

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In Depth
RJE scrambles for the top/57

HP unveils AT clone

Word processing package, local network also debut

By Jeffry Beeler

SUNNYVALE, Calif. — Hewlett-Packard Co. last week entered the IBM-compatible micro fray with the introduction of an IBM Personal Computer AT look-alike that the company said provides 30% greater performance than its Big Blue equivalent for a 20% to 60% lower price.

Formally unveiled at press conferences in New York and California, HP's single-user Vectra PC micro is based on the Intel Corp. 80286 microprocessor. It supports the Palo Alto, Calif.-based vendor's Advance Write word processing software and its Office Share local network, both of which were also an-

Continued on page 8

Ingres out for IBM VM

By John Gallant

ALAMEDA, Calif. — Relational Technology, Inc. last week took aim at the burgeoning information center market with the introduction of an IBM VM-compatible version of its widely used Ingres relational data base management system.

The introduction of Ingres/CMS for VM marks the company's first foray into the IBM world. With an installed base of more than 1,200 Ingres systems, RTI is the leading supplier in the Digital Equipment Corp. VAX DBMS market and in the high-end Unix-based DBMS arena. Company spokesman Randall Livingston said RTI decided to focus on VM, a cornerstone in many information centers, because the information center market is the fastest growing mainframe market segment.

The Ingres/CMS version for VM offers a capability that may help users in multi-

Continued on page 8

New Jersey motorists in software jam

By Charles Babcock

TRENTON, N.J. — A bureaucratic snafu of epic proportion has been created for New Jersey drivers, allegedly owing to a system design consultant's inappropriate use of a fourth-generation-language-based application.

As a result, more than a million drivers have been unable to register their cars or have registered them and are incorrectly listed in the state's computers as operating unregistered vehicles. So many New Jersey drivers have been forced to drive without registrations that the state attorney general's office has ordered state police to cease citing drivers for the offense.

The controversial registration system was designed for the New Jersey Department of Motor Vehicles by a consultant under contract from the Price Waterhouse & Co. accounting firm. The consultant used Ideal and the Datacom/DB relational data base management systems, both products of Applied Data Research, Inc. of Princeton, N.J.

The system was designed to notify automatically the state's five million drivers of license and registration renewals and to update daily, instead of weekly, New Jersey's merit rating surcharge system. This system keeps track of violation points against individual drivers and penalizes bad drivers with higher insurance rates.

The Department of Motor Vehicles wanted to expand to 1,000 the number of terminals able to access the system. Instead, officials said, they found the new system foundering with 200 terminals. Response times went from the three to five seconds targeted to as long as five minutes, spokesmen said.

The new $6.5 million system "is simply not

Continued on page 6

TOP OF THE NEWS

One of the very few minicomputer vendors without a microcomputer product is about to take a small step in that direction. Prime Computer spokesmen say that the company will "within weeks" introduce a hardware option for its Performance Terminal 200 business terminal that will make the unit compatible with the IBM Personal Computer XT. The option consists of an add-on board and a storage device — either a floppy or a hard disk.

■

According to West Coast sources, *Newsweek* magazine's exclusive interview with Apple wunderkind non grata Steve Jobs came about when the weekly gave Jobs an offer he couldn't refuse — his picture on the cover. Jobs' visage was ultimately relegated to the upper right-hand corner of said cover when *Newsweek* editors felt compelled to bump their much-ballyhooed interview and give top cover billing to the Mexican earthquake. This may or may not have compelled Jobs to stretch the exclusivity arrangement by calling a news conference at his Silicon Valley estate the day *Newsweek* hit the stands. For

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PROFILE

Whiz kid, 22, runs Longman Group operation

By Paul Korzeniowski

CHICAGO — Joseph Stith is at an age when most people begin to look for their first job. But Stith is not like most people.

As the 22-year-old computer operations manager at Longman Group U.S.A., Inc., he has a position that many older computer professionals would covet. Stith is overseeing conversion of the company's hardware as Longman Group implements a distributed DP operation (see story page 10).

"Accelerated" best describes the tall, thin, bearded professional's rise to his current position. Stith began taking college-level courses in the summer between his junior and senior years of high school. At the time, he was contemplating a career in physics or science.

An introduction to computers course sparked his interest in DP. That initial course was supplemented with programming courses at the University of Missouri and Washington University in St. Louis.

Upon graduation from high school, Stith entered Aurora College in Aurora, Ill. "I was looking for a medium-size college with a good computer science program, and Aurora fit the bill," he said.

At college, he majored in computer science and worked in the college's computer operations department. Aurora College's equipment was from Digital Equipment Corp., so Stith became familiar with DEC's PDP-11 series minicomputers and their operating systems.

Stith: He fits Longman's DP bill.

Stith's summer courses gave him sufficient credits to graduate at age 20. His first full-time employment was at Moline Corp. in Chicago, where he worked as a maintenance programmer.

The job supplied insight to the type of career he did not want to have. "I wanted to be more involved with the operating system and the design of the computer systems than with simple coding," Stith remarked.

So approximately a year after he joined the company, he began to search

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NEWSPAPER

Apple split brings bitter charges

Analysts see upturn despite company rift

By Maura McEnaney

CUPERTINO, Calif. — The bitter rift between Steven Jobs and the company he cofounded may leave Apple Computer, Inc. without its colorful figurehead, but Apple will survive the turmoil, observers said.

The Apple saga raged on last week, when the company sued Jobs and former senior design engineer Richard Page, alleging that the two breached their fiduciary obligations and misappropriated confidential and proprietary information from Apple.

Filed in Santa Clara County Superior Court in California, the suit accused Jobs and Page — one of five Apple managers who resigned last month to join Jobs in the formation of a new venture — of planning a "nefarious scheme" to create a company. The suit said Jobs falsely told the board that his enterprise would not compete with Apple, use any of its proprietary information or hire away key employees. Jobs publicly refuted the allegations and called the suit "absurd." Contacted by *Computerworld* at his home last week, Page refused comment on the suit.

In Stockholm Thursday, Apple President John Sculley told a press conference that Jobs had presented a proposal at a board meeting and explained that his new company would focus on the educational market and would not be a competitor to Apple. According to Sculley, Jobs said he would not take any key employees with him.

Within 24 hours, however, it became known that five key employees were being recruited by Jobs, Sculley said. "When it was evident that very little progress could be made, our company saw it necessary to sue Jobs," Sculley said.

Formerly close to the Apple cofounder, Sculley explained his reason for backing Jobs' removal from operational functions: "Steve Jobs thought it was up to Apple specifically to decide how computers were going to be used. I saw it necessary to open up and let the market decide on the uses."

But despite the Apple cartharsis, analysts are saying things are looking up for the company, particularly in light of Apple's anticipated fourth-quarter earnings. Apple recently announced it expected earnings in the last quarter to be above Wall Street predictions of between zero and 10 cents per share.

"Apple bottomed out several months if not several years ago," said former Apple employee Trip Hawkins, who now heads up Electronic Arts, a software company in San Mateo, Calif. "It is now in the process of rebuilding."

That rebuilding began more than a year ago, after Jobs brought in Sculley. The company laid off 1,200 employees this year, merged its Apple II and Macintosh divisions and announced plans to close its Apple II manufacturing plant in Dallas.

Even with the ongoing restructuring and the Jobs exodus, "I don't think things will change drastically," Hawkins said.

But, critics said, Apple must begin taking some steps to ensure its position within the business market. John Girton, an analyst with Birr, Wilson & Co. in San Francisco, said Apple "should try to put the full [AT&T] Unix System V on the Mac and make it a Unix workstation. They have to show that [the Mac] is a good workstation that can communicate with the mini and the mainframe world."

Even with the affair of the past few weeks, "The overall mood at Apple is one of relief," said an Apple employee, who asked not to be identified. Employees were not suprised by Jobs' actions or the company's legal response, he said. "Everybody felt Steve Jobs wasn't going to tuck his tail between his legs. He's kind of used to getting his way."

Contributing to this report were Computerworld *West Coast correspondent Peggy Watt and Peter Tagelberg, a contributor to* Computer Sweden, *a Stockholm-based publication affiliated with* Computerworld.

Walker Interactive shuts branch offices

SAN FRANCISCO — Walker Interactive Products, Inc. last week pulled in its horns with a consolidation that centers all of its operations at its home base.

The company issued a terse statement acknowledging a consolidation and declaring its intent to continue to provide service and support. Attempts to contact the company for further details were unsuccessful.

But one Walker customer said he had been informed that the company closed its four regional offices, effective last Monday.

Brad Blackburn, manager of computer services at Sunflower Electric Cooperative, Inc. in Hayes, Kan., said a Walker marketing representative informed him early last week that on Monday "officers of the company were at each of the regional offices closing all three regional offices effective immediately. Everything will be handled out of the San Francisco office." He later received a second call from a company official in San Francisco confirming the consolidation.

Last week *Computerworld* reported Walker has been offered for sale and that several of its leading competitors are bidding for the financially strapped company.

Blackburn said he was told that a sale of the company is no longer expected and that Walker has attempted to cut back expenses so it will be self-supporting and not require further infusions of venture capital.

NCR adds dyadic 32-bit supermini

PARIS — Moving into the European market first, with plans for an announcement in the U.S. in October, NCR Corp. has introduced a high-end system for its NCR 9000 line of superminicomputers.

The 32-bit NCR 9500 was designed as a tightly coupled dyadic processor with a single memory of up to 16M bytes. It supports 24 to 100 users.

The company said that the 9500 is the first member of the 9000 family to feature a dyadic processor and the first to use 256K-bit memory chips. The earlier 9000 series processors, the 9300 and 9400, use 64K-bit chips but can be upgraded to the 9500.

Comparing the 9500 with other large NCR systems, a company official said the 9500 performs 1.1 million instructions per second (Mips) while the 9300 offers 0.37 Mips and the 9400 0.67 Mips. He also noted that the 9500 runs under a multiprogramming, dyadic processor version of NCR's ITX/DP. The 9300 and 9400, which like the 9500 are oriented toward interactive applications, run ITX, while NCR's 8500 family of mainframes runs NCR VRX.

The company said ITX/DP appears as one operating system to the user and the native Cobol compiler in the operating system gives the 9500 twice the performance of the 9400. ITX and ITX/DP are said to feature Virtual Look Ahead, a virtual memory access function.

An entry-level system is said to include 2M bytes of memory, a 45M-byte streaming tape drive, a 405M-byte fixed disk drive, 24 communications lines, a 600 line/min. printer and the operating system for $162,000. The system is scheduled for delivery in April 1986.

With NCR's Link Level Communication Subsystem, the system supports communications protocols such as X.25, IBM Systems Network Architecture and 2780/3780 Remote Batch System and provides distributed data processing capabilities.

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CORRECTIONS

A chart that ran with the Network Management product spotlight [CW, Aug. 12] should have listed the number of circuits that are supported by Codex Corp.'s DNCS as 124.

■

The Hardware Roundup section dealing with mainframe systems [CW, Aug. 19] included incorrect information about Sperry Corp. products.

The Sperry 1100/70 H2 was incorrectly labeled as the 11/70 H2. The quoted lease prices for the System 11UP and the System 11MP are for three-year lease terms. The correct price per 1M byte for the company's System 80 Model 4 and the System 80 Model 6 is $20,956. The disk cache memories for the various systems should be listed as 4M to 64M bytes.

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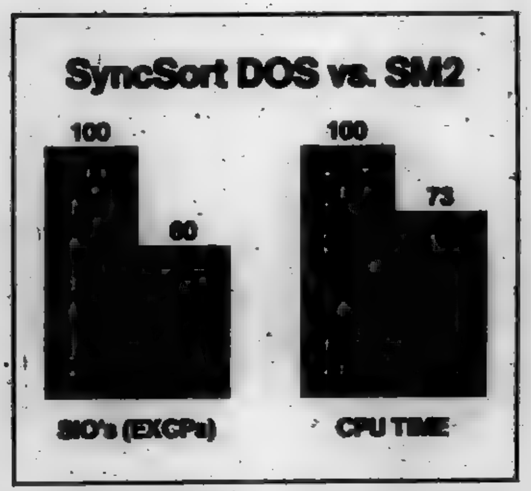

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DOD discloses Soviet effort to acquire U.S. technology

Soviet Ryad computers said to model IBM 370

By Mitch Betts

WASHINGTON, D.C. — The Soviet Union has carried on a massive campaign for the past decade to acquire U.S. computer technology, according to a U.S. Department of Defense report released recently.

Turning up the heat in its own campaign against Soviet bloc technology acquisition, the Defense Department revealed that the Soviet Union used IBM's 360 and 370 architectures as the basis for its Ryad series of computers. Pentagon officials would not disclose exactly how the Soviets copied the IBM mainframes. Generally, the Soviets obtain technical documents or hardware or both, Pentagon spokesman Cmdr. Bob Prucha told *Computerworld* last week.

At a Sept. 18 briefing, Secretary of Defense Caspar W. Weinberger described the Soviet campaign as being a "far more serious problem than we had previously realized." According to the Defense Department report, which is based on new declassified intelligence reports, the Soviets also targeted U.S. semiconductor, communications and fiber-optic and military computer technology.

"By their own estimate, more than 5,000 Soviet military research projects each year are benefiting significantly" from technology acquired from the U.S. and its allies, Weinberger said.

Illustrating the Soviets' strong interest in the 370, Weinberger's report said that in the mid-1970s, the Soviet ministry responsible for producing mainframe computers specifically asked the Soviet secret police and intelligence agency, the KGB, to obtain technical documentation on the IBM 370 Models 145, 158 and 168 and operating system data.

The KGB was asked to get documents dated 1974 or later from IBM in the U.S. and to obtain information about new IBM projects, the report said. By 1974, IBM's 370 architecture had virtual storage and the Systems Network Architecture. However, Prucha said the document request was not directly linked to the copying of the IBM 370.

Officials could provide no additional information about the Soviets' Ryad computers, except that the KGB also acquired Western technology for disk memory systems that improved the "military Ryad series disk drives."

The report, which is part of a Reagan administration campaign to restrict high-technology exports and to cut the number of Soviet bloc spies in the U.S., was written by the 22-agency Technology Transfer Intelligence Committee.

The Soviet campaign has enabled that nation to acquire computer disk memory systems, fiber-optic systems, bubble-memory technology, computer-controlled integrated circuit testers and a complete set of manufacturing equipment for printed-circuit boards. The report said the technology was used for military purposes.

The Soviets have selected major defense contractors as targets of the acquisition program, as well as high-tech universities such as MIT in Cambridge, Mass., and Carnegie-Mellon University in Pittsburgh; electronic data bases; and scientific conferences, according to the report.

The report specifically cited the U.S. Department of Commerce's on-line data base of government research abstracts and the Conference on Integrated Optics, which reportedly helped the Soviets to improve their fiber-optic communications devices.

Furthermore, the report said, Soviet collectors have easily obtained U.S. and Japanese integrated circuits, which can be copied through reverse engineering. Evidence showed that the Soviets' KR580IK80A microprocessor is a modified version of Intel Corp.'s 8080A 8-bit microprocessor.

The report predicted that the Soviets will increase their attempts to gain access to on-line data bases directly from the Soviet Union. One countermeasure would be to prevent sensitive research from appearing in public data bases — but that may inhibit U.S. research efforts as well, the report noted.

Encore exec splits from Fisher's trio

By James Connolly

MARLBORO, Mass. — A high-level shake-up hit Encore Computer Corp. last week, only two weeks after the tardy formal introduction of the company's first superminicomputer multiprocessor.

One of the three founders of the young company resigned last Wednesday, while a second founder was having discussions "concerning the nature of his relations with the company," according to a brief press release issued by the seven-member board of directors.

The board cited differences in operating styles when it said that it accepted the resignation of Henry Burkhardt III, a director and senior vice-president for finance and operations.

C. Gordon Bell, a director and vice-chairman for technology, was the second founder reported to be engaged in discussions about his future with the firm.

Encore's vice-president for corporate affairs, Charles T. Casale, said that a determination of Bell's status might be made within days. In a published interview, company Chairman and Chief Executive Officer Kenneth G. Fisher said he believed Bell would remain with the company in some capacity.

"Some people may interpret this as negative. Henry [Burkhardt] made a tremendous number of contributions to the company. Bell, likewise, has made a number of valuable contributions, although his are of a less direct nature," Casale said. He said the differences of opinion between Fisher and Burkhardt involved management of the two-year-old company and that resulting changes would be unnoticed by outsiders.

Neither Bell, who, the company said, was traveling on the West Coast, nor Burkhardt could be reached for comment.

Fisher, the third founder listed in a prospectus issued when Encore made a public stock offering in April, will assume Burkhardt's duties on a temporary basis.

Prior to the time that the three united to form Encore in 1983, Fisher was chief executive officer and president of Prime Computer, Inc.; Bell was vice-president for engineering at Digital Equipment Corp.; and Burkhardt was cofounder of Data General Corp.

On Sept. 10, the company announced its Multimax superminicomputer and several related communications and workstation products. The Multimax is scheduled for October deliveries, Casale said.

Unveiled later than originally planned, the future of Multimax was clouded somewhat several weeks ago when Sperry Corp. pulled out of a deal to buy much of the company's output.

Casale said Burkhardt also is resigning his directorship and that a replacement may be named within weeks. He said Burkhardt retains his approximately 10% interest in the company.

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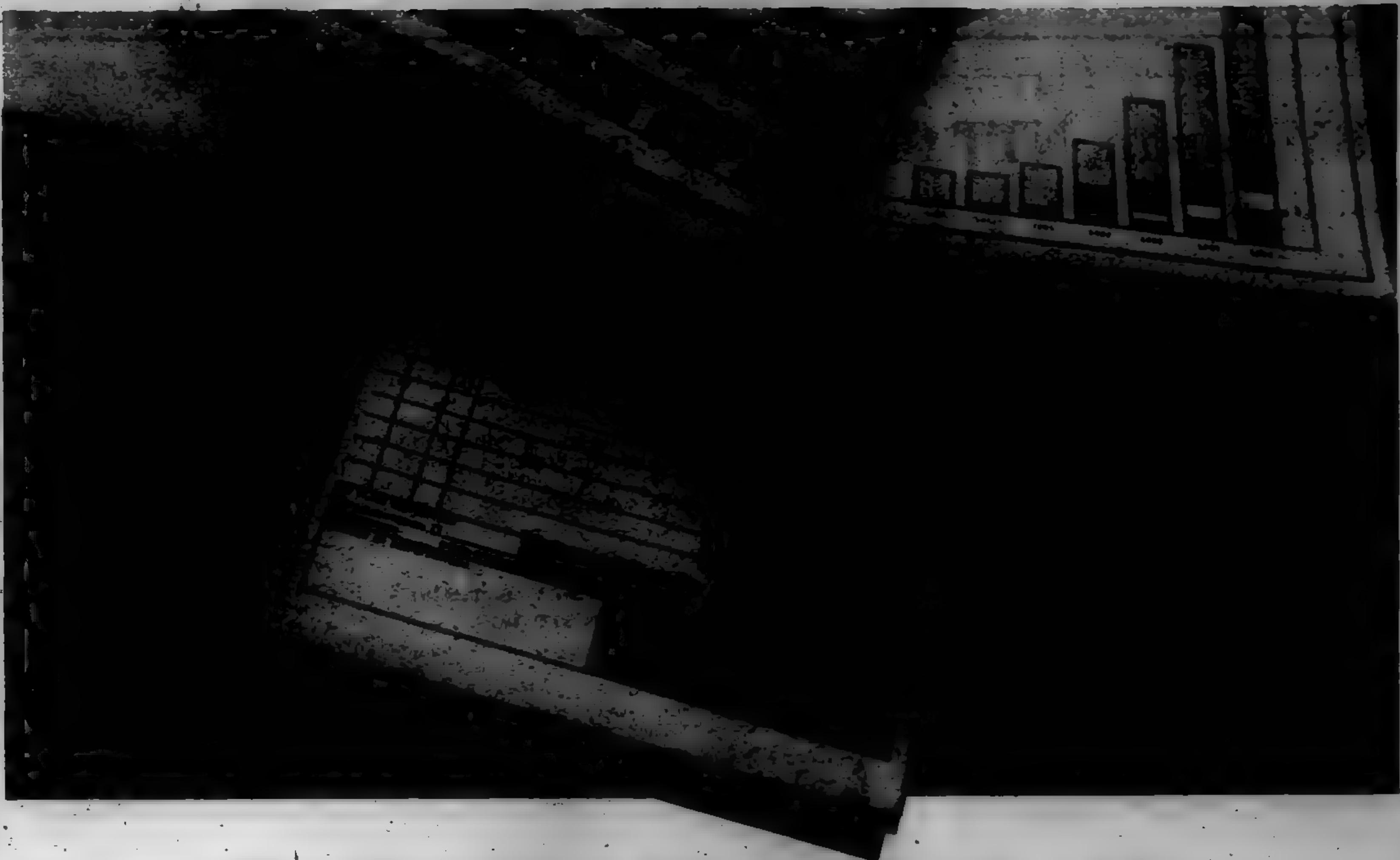

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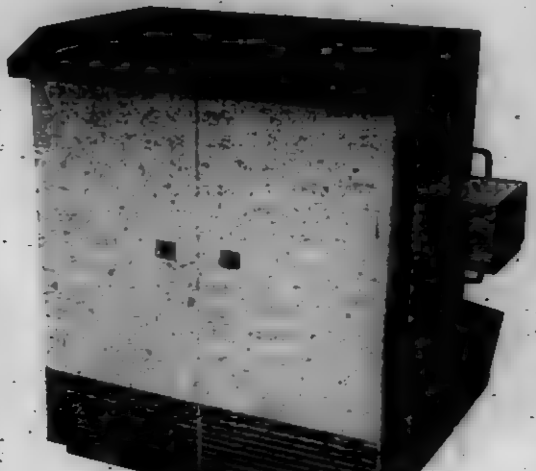

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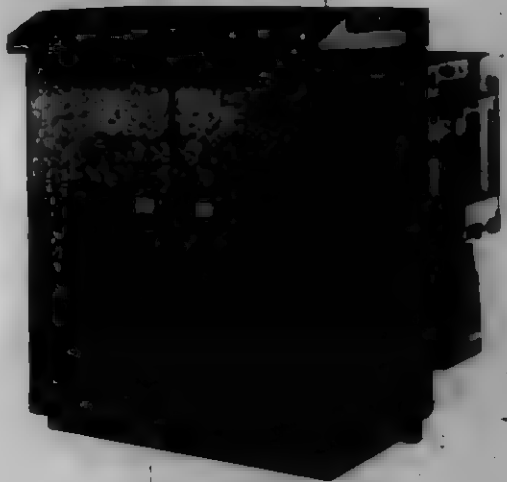

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NEWS

IBM Japan, NTT form value-added network venture

By Takehiko Kondoh
Special to CW

Tokyo (CWN) — Nippon Telegraph and Telephone Corp. (NTT) announced last week that it has reached a basic agreement to establish a data communications joint venture with IBM Japan Ltd. The new firm, to be financed equally by the two companies, will go into service later this year.

The venture, with an estimated initial budget of $2.6 million, will provide integrated data communications services by linking up IBM's Information Network with NTT's value-added network.

The pact may carry the brewing confrontation between AT&T and IBM to Japan. In July, AT&T formed a venture with a consortium of more than 200 Japanese companies to establish a value-added network.

The new firm, the details of which remain unknown, also will provide Japanese users with separate access to the Information Network, an NTT official said. For the planned service, the agreement requires that IBM Japan provide software and hardware resources to the physical network maintained by NTT.

Meanwhile, NTT, which went private in April under new telecommunications business laws, apparently will offer peripheral data communications know-how and be responsible for the development of user software.

Architectural differences between IBM's Information Network and NTT's value-added network have blocked interconnection of the two networks. This prohibited NTT from taking orders for its computerized value-added network systems from existing Japanese users of IBM equipment, because NTT, as the country's largest value-added network operator, has made exclusive use of Japanese-built computers for its network.

An industry analyst said that the latest agreement will benefit IBM, which is pursuing expanded presence of networked data communications in the Japanese market and also is stepping up efforts to boost sales of computer hardware to NTT.

Kondoh is international editor/Asia for CW Network.

From page 1

New Jersey motorists in software jam

capable of handling the volume of work generated each day," Department of Motor Vehicles Acting Director Robert Kline said last week. "Even working overtime and on weekends, the system is not keeping up," he said.

State administrators and spokesmen for ADR both claimed that the system designer used ADR's Ideal fourth-generation language in ways it was never intended to be used, and they questioned Price Waterhouse's reliance on Ideal before the new system was installed. "We found ourselves in the unusual situation of our advice not being followed on our product," said Joseph W. Farrelly, vice-president for research and development at ADR.

A spokesman for Price Waterhouse said last week that the accounting consulting firm has agreed to redo the system and will have further comment. "Frankly, we don't want to get into all the details. We don't feel that would serve any useful purpose," said Kenneth Doyle, director of communications at Price Waterhouse headquarters in New York.

At a hearing in Trenton Tuesday, the attorney general's office aired March 1984 correspondence from Price Waterhouse justifying the selection of Ideal on grounds of "productivity gains anticipated during the coding and testing phases."

"We've got pages and pages of things we feel are wrong with the system," said Bruce Jones, deputy administrator of the state Office of Telecommunications and Information Systems, which now oversees the state's computer operations.

'Barn-burner application'

"It was a barn-burner application, and I'm not sure Ideal was the right technology to use," Jones said.

Said ADR's Farrelly: "The batch sequential processing should have been written in Cobol."

Farrelly said it takes the same number of lines of code in Ideal to accomplish batch processing as in Cobol and that there was no inherent advantage in using Ideal in such a way. He said the 20% of subsystems that required heavy processing should also have been written in Cobol rather than Ideal.

In a Dec. 10 *Computerworld* report on large-scale applications development systems, ADR said Ideal is a "functional replacement for Cobol" and was recommended for developing large-scale transaction-oriented applications. "There is virtually nothing you can develop in Cobol that you cannot also develop with Ideal," the firm said at that time.

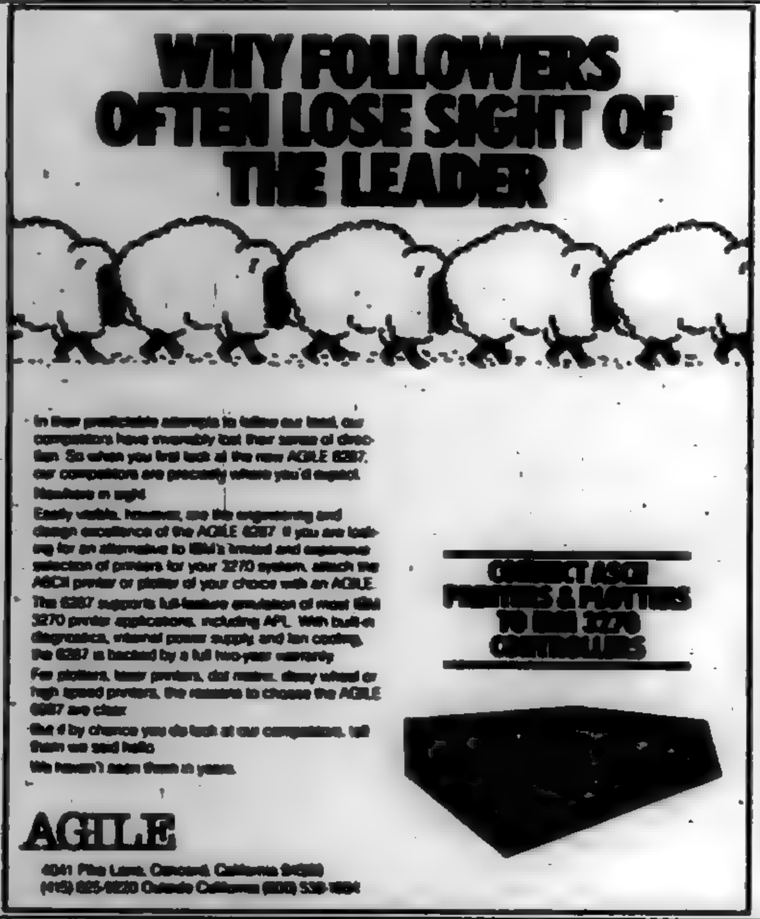
Farrelly said last week the company stands by the Dec. 10 statement "for most applications." However, he added, "In ADR's opinion, the [DMV] has special processing requirements, and ADR recommended that portions of them be put in Cobol and the rest in Ideal."

Jones said the state also ran into problems with the way Price Waterhouse interfaced Ideal with IBM's CICS.

Department of Motor Vehicle spokesmen have acknowledged that renewal notices have been sent to the wrong drivers, and many police cars and other public vehicles have been registered to the wrong municipality, prompting some to question the integrity of the state's entire data base.

"I'm surprised Price Waterhouse didn't do a better job of benchmarking Ideal and analyzing the kind of code it generated," said Mary Heminway, managing editor for Datapro Research Corp.

Price Waterhouse did a computer master plan for the department prior to being assigned the $6.5 million system redesign contract. The selection was made without competitive bids, state officials said.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Boston	Oct 15, Nov 12, Dec 11
Chicago	Oct 16, Dec 12
Cleveland	Nov 5
Columbus	Oct 8
Dallas	Oct 8, Nov 13
Dayton	Oct 9
Denver	Oct 29, Nov 20
Detroit	Oct 22, Nov 12
Houston	Oct 31, Nov 21
Kansas City	Nov 6
Los Angeles	Oct 22, Nov 19
Minneapolis	Oct 10
New Orleans	Nov 19
New York City	Oct 10, 25, Nov 6, Dec 12
Newport Beach	Oct 17
Oklahoma City	Nov 7
Omaha	Oct 24
Orlando	Oct 15
Phoenix	Oct 9
Portland	Oct 10
Rochester	Oct 10, Dec 5
Sacramento	Oct 8
St. Louis	Nov 14
Salt Lake City	Nov 14
San Antonio	Oct 23
San Diego	Nov 7
San Francisco	Nov 5
San Jose	Oct 24
Seattle	Oct 2, Nov 26
Syracuse	Nov 7
Tulsa	Oct 29
Washington	Oct 10,24, Nov 7, Dec 10
Wichita	Oct 3

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From page 1

Relational Technology unveils Ingres for VM

vendor computing environments make better use of their existing hardware resources. According to Livingston, data base applications written in Ingres' fourth-generation language can run on all systems that support Ingres, including DEC VAXs and microcomputers that run Unix.

Beta site lauds portability

A spokesman for one beta site user of Ingres/CMS — the Federal Systems Group Information Services division of Nashua, N.H.-based Sanders Associates, Inc. — lauded that application's portability and said his organization intends to use the product in the future to bridge diverse machine environments.

Relational Technology's Livingston noted that Ingres/CMS provides an active data dictionary, a fourth-generation language, a query facility, implementations of IBM's SQL and Quel languages, a report writer, a facility with which to embed SQL or Quel statements within Ingres-developed applications and a screen painter. An optional graphics module is not yet available with Ingres/CMS, which is scheduled for production shipments in mid-October.

In addition, Ingres/CMS users will in the near future be able to use the Ingres/PCLink to browse Ingres data bases on the host and transfer data from a data base into popular micro packages, such as Lotus Development Corp.'s 1-2-3 and Microsoft Corp.'s Multiplan, with automatic data reformatting.

The relational DBMS is also said to use VM performance facilities such as block mode I/O and the Inter-User Communications Vehicle for Dasd I/O. Data from CMS files and OS sequential data sets can be transformed for Ingres/CMS data bases, the vendor said.

> *'Ingres saves us from the headaches of [IBM's] IMS and a hierarchical data base structure.'*
>
> — Dan Callahan
> Sanders Associates, Inc.

According to Dan Callahan, principal software engineer at Sanders Associates, the beta version of Ingres/CMS was installed in late May on an IBM 3083 running VM and MVS concurrently. Sanders was using Ingres on four VAXs, and Callahan said the company's recent porting of VAX-based Ingres applications and data bases to VM was something of a tedious chore but one that went smoothly.

Performed migration

Callahan said a Sanders team performed that migration by transferring files from a VAX to the IBM mainframe via DEC's Systems Network Architecture Gateway. The company plans to put Ingres/CMS and the systems developed for use with it during beta testing into production use in October. Both the VAX and VM versions of Ingres were selected, he said, because Sanders' engineering group was looking for productivity tools for both end users and programmers.

"Manufacturing and engineering systems really lend themselves to a relational system," Callahan said. "Ingres saves us from the headaches of [IBM's] IMS and a hierarchical data base structure. The major goal we have for Ingres is bridging the gap between machines so users do not have to worry where data resides."

Initial licenses cost $90,000 for Ingres/CMS for VM/CMS and $60,000 for VM/Entry. The Ingres/PCLink for Ingres/CMS will be available 90 days after production release of the VM version and will have an initial license fee of $12,000.

From page 1

HP introduces IBM AT clone

nounced last week. The products were designed to tie into the company's Personal Productivity Center distributed processing concept.

According to Srinivas Sukumar, a program manager with HP's Personal Office Computer Division in Sunnyvale, the Office Share LAN conforms to the IEEE 802.3 communications standard and is compatible with Microsoft Corp.'s MS-Net software. The local networking product also enables work group members to use their micros to gain access to HP 3000 departmental processors, Sukumar said.

In an interview with *Computerworld* in New York, HP President John Young said the Vectra was not designed as a stand-alone competitor to the AT. "I wouldn't say we were set up as a company to do battle in the loose iron business; that's not what we're focused on at all." Vectra, and accompanying software, was designed as an upgrade path to the Personal Productivity Center office automation network concept, he said.

Vectra, like HP's existing Touchscreen personal computers, supports a version of Microsoft Corp.'s MS-DOS but is the first HP machine that can run off-the-shelf IBM PC-DOS applications without modification. HP is not offering a version of Microsoft's Xenix operating system as IBM is doing with the AT.

Unlike the Personal Computer AT, which incorporates a 6-MHz 80286, Vectra is built around an 8-MHz version of the 16-bit microprocessor, providing a 30% performance edge, Sukumar said.

Vectra is currently available in a choice of three models — the System 25, 35 and 45. An entry-level System 25 starts with 256K bytes of main memory and a 360K-byte floppy disk unit, while a System 45 can hold up to 3.64M bytes of central storage and a 40M-byte hard-disk module; the 40M-byte hard disk will not be available until early 1986.

A minimum System 25 configuration and a full-blown System 45 cost 20% less than and 60% less than, respectively, their IBM Personal Computer AT equivalents, Sukumar said. The Vectra Systems 25, 35 and 45 start at $3,199, $3,399 and $2,599, respectively.

When bundled with Advance Write in two configurations, with or without hard disk, the AT-compatible micro becomes a Vectra Office Workstation. Advance Write, jointly developed with Samna Corp., is available in three versions.

Advance Write supports IBM's Document Content Architecture and thus can coexist with industry-standard applications like Multimate Corp.'s Multimate and the IBM Displaywriter. Documents produced with Advance Write can be distributed to HP or IBM micros and then read but not revised under Multimate and Displaywriter, Sukumar said.

With the existing HP Access product, meanwhile, the word processing package can download data from an HP 3000, merge the material with a microcomputer-resident document and then return the information to its origin, he said.

The word processing software forms part of HP's Advance Net communications architecture, which allows different processor models to exchange files and programs across an entire organization.

Similarly, Office Share also fits within the Personal Productivity Center concept by permitting Vectras, HP Touchscreens and IBM micros to be networked locally. Also announced was HP Advance Link 2392 software, said to allow Vectra PCs and IBM Personal Computers to emulate the HP 2392 terminal and to communicate with the HP 3000 system through Office Share.

Advance Write versions are priced from $295 to $695; an Office Share starter kit for the Vectra PC costs roughly $2,300 for hardware and software. Prices start at $5,229 for the Vectra Office workstations. Advance Link 2392 is priced at $295.

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HP staffing moves, Apollo results show slump lingers

By Clinton Wilder

Adverse news from Hewlett-Packard Co. and Apollo Computer, Inc. last week did not bode well for expectations that the computer industry is emerging from its 1985 slump.

Apollo, the Chelmsford, Mass., vendor of 32-bit engineering workstations, laid off 300 employees and predicted an $18 million fourth-quarter loss — its first ever. HP extended its previously announced furlough program for U.S. employees.

Meanwhile, the U.S. Department of Commerce announced that July orders for office and computer equipment fell 11.3%, seasonally adjusted, from their June level. Shipments decreased by 14.1% while inventories remained flat.

"Things are still pretty sluggish; we are by no means out of the woods yet," said a spokesman for Apollo. The company projected an after-tax operating loss of $4 million and a one-time charge of $14 million as a result of the layoffs.

Apollo attributed the sluggish sales to cancellation and deferral of orders by engineering system OEMs, which make up the bulk of Apollo's market.

Sandra Gant, an industry analyst with Infocorp in Cupertino, Calif., said the slightly improved U.S. economic climate and weakened dollar have not sparked computer sales.

"There's been a lot of talk and hype from the vendors about networking and other pitches to the end user, but very few real solutions have been delivered," Gant said. "The major users decided to spend 1985 just thinking. It appears that they still are."

An additional squeeze on minicomputer profits, according to Gant, is the trend toward lower priced products such as the Digital Equipment Corp. Microvax II. "The Microvax II is selling, but you have to sell a lot of them to bring in a lot of dollars," she said.

In Palo Alto, Calif., HP announced that all non-sales offices in the U.S. will close for the entire weeks of the Thanksgiving and Christmas holidays, giving 45,000 employees a total of four unpaid vacation days. Employees will be required to take one paid vacation day in each week, in addition to the paid holidays of Nov. 28-29 and Dec. 24-25.

The announcement continued HP's ongoing plan of furloughs that was begun last July and is expected to continue at least through the end of January 1986.

"Our business picture remains about the same as it has been," said Dean O. Morton, HP's executive vice-president and chief operating officer, in a statement. "Overall business levels do not support the expense of a full work schedule."

The company also announced its worldwide hiring would be scaled back to a minimum, effective immediately.

Borland OKs site licensing

By Eric Bender

SCOTTS VALLEY, Calif. — Bowing to "a tremendous amount of requests from corporations," Borland International, Inc. last week unveiled site licensing options for its Sidekick and Superkey microcomputer packages, according to Sales Vice-President Spencer Leyton.

Under the new program, companies can purchase a Sidekick or a Superkey master disk and make up to 2,000 copies for $25,000 or an unlimited number of copies for $50,000. Alternatively, they can license the two products together at a price of $35,000 for up to 2,000 copies and $70,000 for unlimited quantities.

It is difficult to specify the effective discounts because of uncertainty about the number of users, Leyton pointed out.

No specialized support arrangements

Primary software upgrades, such as from Version 1 to 2, will be available for 30% of the site license fee, with secondary upgrades, such as from Version 1 to 1.5, costing 10% of that fee. Borland said it does not intend to offer specialized support arrangements beyond designating a specific technical person for the site license customer, Leyton said.

Companies that sign an up-to-2,000-copy agreement will be provided with 1,000 manuals, with additional copies priced at $5 each. Firms that buy unlimited licenses will probably receive 2,000 manuals.

Arthur Andersen & Co., a Big Eight accounting firm headquartered in Chicago, is one of the first Borland site licensees, signing an agreement for Sidekick, the best-selling desktop manager program.

Sunil Subbakrishna, a manager in computer aids for tax preparation at Arthur Andersen said the company has roughly 3,700 personal computers worldwide, and "we have the trouble of trying to keep track of where every program might go."

Site licenses offer the promise of reducing administrative overhead and help lead the way toward standardization, Subbakrishna said.

How $20 worth of system-development ideas can save you a bundle on programming and maintenance

The methods you use to analyze, design, and implement new systems can have a tremendous effect on programming and maintenance time in your shop.

For example, suppose a new system is already being programmed when you find you need a few more fields in a record...or you need another file. At the least, you have to recompile the finished programs with the new record formats. And you may be in for weeks or months of re-programming. That means productivity goes down and probably so does program reliability (you just can't revise a program as well as you write it in the first place). That, in turn, means future maintenance problems. All because of faulty file/database design.

Or suppose the system documentation is so long and complex that (1) it was never finished, (2) no one keeps it up-to-date, and (3) no one bothers using it because they can never find anything in it. Then, when a change has to be made, the maintenance programmer has a tough time correcting...or even pinpointing...all the affected programs. And it's likely that one change will lead to a new problem somewhere else. All because of bad systems methods, not bad programming.

What made the difference in our shop

If you cut problems like these to a minimum, you'll improve program development in your shop and save maintenance time and dollars. And you can cut down on these problems if you use the system-development ideas presented in a $20 book called *How to Design and Develop Business Systems.*

I know because we used these ideas to develop our inhouse system 2 years ago. Now, one person maintains about 600,000 lines of COBOL code in less than 2 days per month. And most of the maintenance would more properly be called program enhancement. As you can imagine, that frees up plenty of time for new program development, so we don't have a months-long backlog.

I'm convinced *How to Design and Develop Business Systems* will help you, too. Here's just some of what you'll learn in this practical book:

- an 8-phase development method that helps you make the critical decisions that affect the development time... and *reliability*...of your system the most
- how to use an *analysis data flow diagram* (DFD) to analyze an existing system in days or weeks...not months
- how to use a *model DFD* to logically design a new system in a fraction of the time you need using your current design methods
- why users can easily understand DFDs and point out mistakes in them...so you can correct problems long before programming starts
- how to use your model DFD to figure out what data elements you need in the new system
- how to use your model DFD to create a *system structure chart* that breaks the system down into logical functions
- how to use your system structure chart as an index to the system (each box on the chart is a program in the system, a menu in an interactive system, or a procedure)
- how to use your system structure chart to design procedures for: (1) time-dependent processing, (2) security, and (3) backup
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- how to cut system, database, and program documentation to the essentials ...and package it so it's easy to use

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From page 1

Whiz kid, 22, runs Longman Group

for another job. As he was examining the "help wanted" section of the local newspaper, Stith noticed Longman Group's advertisement for a manager of computer operations.

In an effort to expand its business, Longman Group had begun acquiring companies with annual revenues of approximately $10 million. In conjunction with the changes, the company devised a three-year plan for integrating its subsidiaries' DP departments. The company needed someone to oversee hardware conversion.

Stith was very interested in becoming that someone. "I almost did not apply for the job because I was afraid I would not get it," he said.

Competition for the position was fierce, and Timothy Honaker, director of information resources at Longman Group, reported that there were at least three candidates suited for the job.

Stith's age and relative inexperience were deemed more of a benefit than a disadvantage. "Since he hadn't been working very long, he was not locked into a set pattern of doing things, which was important since we do not run a typical DP department," Honaker noted.

In September 1984, Stith joined Longman. Subsidiaries had worked with various brands of hardware, including NCR Corp. and Qantel Corp. systems. As manager of computer operations, Stith has overseen migration from that equipment to DEC VAX series superminis.

The position has had its challenges. "I don't get home as early as I should, and there are times when I am on the road longer than I planned," Stith related.

Honaker has been satisfied with Stith's performance but said that there are areas for improvement.

"Since he is so young, he has been taken advantage of," the director of information resources noted. Stith has trouble saying no to people, according to Honaker. Rather than concentrating on one item and seeing it through to completion, he tends to juggle a number of unfinished projects. Honaker said that this problem could be solved as Stith gains more experience.

As he gains more experience, other positions will become available to him. Eventually, Stith would like to move more into a management position and away from the day-to-day operations.

"I am gaining a lot of experience with items such as negotiating contracts with vendors," he noted. "That experience may become very beneficial to me later."

■

Firm realizing decentralization

CHICAGO — Decentralized data processing has been a pipe dream for many corporations. Longman Group U.S.A., Inc., primarily a publishing company, is realizing that dream with a distributed operation that connects six offices in four states.

Two years ago, Longman's parent company, Longman Group Ltd. in London, decided to increase its presence in the U.S. through a series of acquisitions. The purchases added company offices in New York; Washington, D.C.; Chicago; Naperville, Ill.; and Vernon, Conn.

With each acquisition came a computer system. Rather than supporting a number of different systems, the company decided to choose one standard piece of hardware. After examining a number of offerings, Longman decided to install Digital Equipment Corp. VAX superminicomputers in each office.

Timothy Honaker, director of information resources at Longman, listed two reasons for the choice: DEC's product line had software that could be run on large and small systems, and the VAX systems cost less than comparable Wang Laboratories, Inc. and IBM offerings.

Currently, at each location the VAX systems run payroll and general ledger applications written by Xenthom Corp., a Chicago consulting firm.

With the software and hardware chosen, Longman has embarked on a three-step plan to implement a distributed system. Converting the current payroll and general ledger applications to the DEC systems is the responsibility of Honaker's department, which consists of Honaker, a computer operations manager and a business analyst.

What makes the system truly distributed is that after the conversion, Honaker's group supplies only routine troubleshooting. Running the systems becomes the subsidiary's responsibility. If a subsidiary wants to alter its applications, it pays the consulting firm.

At most companies, a maintenance programming staff would make the changes. "We don't have any maintenance programmers today, and I don't think we will have any in the future," Honaker said.

The director of information resources said there are benefits to not supplying maintenance programmers. Because a subsidiary has to pay for changes, it is less likely to request minor, unnecessary changes.

Another benefit is that the consulting firm has experienced programmers. "We would not be able to afford the consultants on a full-time basis," Honaker noted.

In the next few years, Honaker's group will have more work. Longman said it plans to continue to add other companies to its fold.

The third step in the plan will link the subsidiaries in a synchronous network. Despite the increased work load, Honaker said he thinks that the staff will remain relatively small. "We want to work as company consultants and distribute data processing functions to the subsidiaries," he said.

When the third step has been completed, the dream of distributed data processing may be realized.

— Paul Korzeniowski

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Data flows despite earthquakes

Firms trade info by tape, courier

By James Martin

With the help of magnetic tape and courier services, U.S. corporations with DP operations in Mexico City have been able to continue trading information in the wake of two recent devastating earthquakes.

Although the quakes have been called the worst thing to happen since Hernan Cortes destroyed the ancient city in 1521, many industrial plants and offices were left practically unscathed. Two U.S. companies with Mexican operations said last week that subsidiaries south of the border suffered little damage.

But most communications links were down following the first quake, with reports that the situation will not return to normal for months. This has caused MIS and DP managers to find new ways for the home office to communicate with the Mexico City subsidiaries.

Hewlett-Packard Co.'s four offices in Mexico City received little structural damage, with computer systems continuing to operate after an initial power outage caused by the first quake, according to Sy Corenson, public relations manager for the Palo Alto, Calif.-based firm's intercontinental operations.

Two facilities unaffected

HP's two manufacturing facilities in Guadalajara, Mexico, were unaffected by the quake, Corenson said, and are now serving as communications links between Mexico and California. Users of the HP 3000 in Mexico City can store data and electronic mail on magnetic tape, which is then flown by commercial airline to Guadalajara and from there transmitted to California.

> ”
>
> *Most communications links were down following the first quake, with reports that the situation will not return to normal for months.*

Graphics and other hardcopy documents can be transmitted to Guadalajara via facsimile apparatus and flown to Mexico City.

E. I. du Pont de Nemours & Co. in Wilmington, Del., has continued to interface with the HP 3000 system in the corporate headquarters for its Mexican subsidiary by sending magnetic tape via overnight courier, according to Donald M. Breth, business analyst for Dupont in Wilmington.

Breth said Dupont's 14-story office tower in Mexico City was spared any major damages, and DP operations have remained in operation, although isolated. Financial data is stored on magnetic tape and mailed by overnight courier to Delaware, where it is batch processed into the headquarter's IBM mainframe environment.

Normally, Breth said, Mexico City and headquarters communicated electronically via Tymshare, Inc.'s Tymnet system and Telepac, Mexico's public net. But the Mexican link has been down since the quake and restoring the system could take months, he added.

Although this is not the ideal situation for communications, Breth said, the process of trading data has not been adversely slowed and business is still being conducted "pretty much as usual."

TOP OF THE NEWS

Continued from page 1

more on Jobs and Apple, see story on page 3 and editorial on page 16.

■

Storage Technology Corp., still in the reorganization process under Chapter 11 bankruptcy protection, announced last Thursday it will deliver its 8380 Model E dual-capacity disk drive two quarters ahead of schedule. The Louisville, Colo.-based firm said the storage device will be available at the end of the second quarter in 1986, instead of in the fourth quarter of 1986.

■

Amid the much-reported computer industry slump, transaction processing systems sales are booming. Owing largely to intense activity with automated teller services and automated factories, the transaction processing market will grow from $7 million in sales for 1984 to an estimated $12 billion-plus in 1990. **For more on transaction processing growth, see page 85.**

■

Representatives of 15 European leasing companies met late last week to determine a course of action against IBM because of alleged discriminatory marketing practices. Spokesmen for the group, called Eclat, declined to discuss details of the allegations, but they are thought to center on IBM's policy on bulk purchase discounts. The discounts, also called volume purchase agreements, are offered primarily by IBM to its largest European leasing customers and are alleged to be unfair to small users. Eclat has threatened to report the U.S. computer company to the European Trade Commission and to the Bundeskartellamt, the West German Office of Fair Trading.

■

Eagle Computer anticipates a busy fall season. By the end of October, the Garden Grove, Calif.-based company will introduce an enhanced version of its Turbo microcomputer that will provide multiuser capability for up to eight users. And by the end of November, it will introduce a supermicro, currently code-named SST, that will accommodate from eight to 64 users. **For more on Eagle, see page 91.**

■

Ex-Wang President John Cunningham has lured two of the Lowell, Mass., company's ex-best and brightest to his new home at Computer Consoles, Inc. in Rochester, N.Y. CCI recently hired Harold Koplow and Dave Moros, two of the engineering wizards behind Wang's trademark word processing systems and its VS series minicomputers. Both Koplow and Moros had left Wang well before Cunningham's departure earlier this year, but the hires are nonetheless an impressive feather in CCI's cap.

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Product said to tie varied units with single command set

By John Dix

QUINCY, Mass. — A product that enables micro, mini and mainframe computers to be tied together in a unified system with a single command set sounds like marketing hyperbole. But Command Technologies, Inc. claims its new architecture can do just that.

Command Technologies was cofounded in 1978 by Franco Vitaliano and Calvin Mooers to market products that melded Vitaliano's knowledge of neurology with inventions made by Mooers. Mooers' history in information processing dates back to 1945, when he worked at the U.S. Navy's labs with luminary John von Neumann on the development of a digital computer that preceded the Eniac computer built in 1946 at the University of Pennsylvania.

The first release of Command Technologies' Virtual Extended Machine (VXM) architecture, unveiled recently, includes hardware and software that enable systems based on AT&T's Unix, Microsoft Corp.'s MS-DOS and Xenix and Digital Research, Inc.'s CP/M operating systems to be interconnected, Vitaliano said in an interview with *Computerworld*. VXM handles file and transmission code conversions between these operating systems and provides the facility to create a common command set for all machines involved.

This is achieved by installing what Command Technologies calls software agents in the machines to be interconnected and creating an application to drive those agents using a hardware device called an Orchestrator. To date, Command Technologies only offers agents, which are written in C, for the Unix, MS/DOS, CP/M and Xenix operating systems.

Rolling out agents in a week

Vitaliano claims his company can roll out operating system-specific agents in a week, given access to the type of processor targeted. Written in C, these agents can be installed in any processor that supports a C compiler. Once installed, the user can create the application that provides the desired functionality. This is done with the Orchestrator.

The Orchestrator is built on a Multibus and contains a single-board computer with an Intel Corp. 80286 chip to process applications and an Intel 80186 to handle communications. It also contains from 1M to 4M bytes of random-access memory (RAM) and has three serial ports, a parallel port and an Ethernet local network controller and port.

The Orchestrator is used to create applications that drive the agents. Applications are written in the company's VXM Notation, an interpretive language tht Vitaliano describes as a powerful string processor. Applications are said to be machine independent and capable of running on any processor with an agent.

Besides performing the necessary conversions that enable different types of processors to communicate, the Orchestrator can be used to create a single command set. A terminal user on a Hewlett-Packard Co. HP 3000, for example, would be able to invoke an application on an attached Digital Equipment Corp. Microvax using the same user interface to which he is accustomed.

DEC, in fact, is one company interested in VXM. The minicomputer manufacturer is automating its factories and is looking for a system that will support control systems from various manufacturers, each of which has a different operating system and command structure, according to Piotr Chadzynski, principal software engineer with DEC's internal plant automation efforts.

VXM may provide the solution. Chadzynski said it performed well in a demonstration but that he would like to evaluate it more closely.

The technology is "clearly feasible," according to Roger Needham, a professor of computer systems with Cambridge University, England, admitting that he has no idea of how well it has been put to use by Command Technologies. "It might be too big or too slow. If you're selling flexibility and portability, these things have their price in size and performance," Needham explained. "It's not until you get down to the nitty-gritty that you know whether the price is worth paying."

An Orchestrator diskless workstation with 1M byte of RAM costs $14,900 and $17,900 with 4M bytes. Fault-tolerant versions of the same device cost $25,900 and $28,000, respectively. A Unix software agent for mini or host computers costs $15,900. Micro agents cost $495 for MS/DOS, $275 for CP/M and $995 for Xenix and Unix System V.

Command Technologies intends to release hardware agents for microcomputers that will enhance VXM by providing content addressability. This capability is based on a process Mooers patented called superimposed random coding.

This random coding technique makes it possible to characterize the contents of a 400M-byte optical disk attached to a micro by building a file, as small as 4K bytes, that is kept on the micro hardware agent. In this way, a network search can be done by polling each descriptor file, eliminating the need to check a large central directory or interrogate each node, Vitaliano said.

The Cipher

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Electronic privacy bill receives bipartisan support

By Mitch Betts

WASHINGTON, D.C. — The Electronic Communications Privacy Act of 1985, introduced recently by Sen. Patrick J. Leahy (D-Vt.) and Rep. Robert W. Kastenmeier (D-Wis.), has picked up additional support from key Republican lawmakers.

The legislation (S. 1667 and H.R. 3378) would make it a federal crime to intercept electronic communications, such as data communications or electronic mail, or to tamper with the computers in a data network [CW, Aug. 12].

Cosponsoring the legislation are Sen. Charles Mathias Jr. (R-Md.) and Rep. Carlos J. Moorhead (R-Calif.) who are senior Republicans on the House and Senate judiciary committees.

Because of this bipartisan support as well as help enlisted from the American Civil Liberties Union, the Electronic Mail Association and other interested parties, Sen. Leahy predicted that the legislation will be enacted by the 99th Congress.

However, the Leahy-Kastenmeier bill also competes for Congress' attention with two computer crime bills, one proposed by the U.S. Department of Justice [CW, Sept. 23] and the other sponsored by Rep. William J. Hughes (D-N.J.) [CW, June 3].

The privacy bill and the computer crime legislation overlap in their coverage of data stored in private computers. But P. Michael Nugent, Washington, D.C., counsel for Electronic Data Systems Corp., said that although the bills approach the issue from different perspectives and may proceed separately, eventually they could be joined together.

Nugent, who is chairman of the privacy committee of the Association of Data Processing Service Organizations, said he participated in the drafting of the Leahy-Kastenmeier bill and considers it "a very positive bill."

Sponsors said the legislation is needed to give data communications the same privacy protection given to the U.S. mail and telegrams. "We cannot let any American feel less confident in putting information into an electronic mail network than [he] would in putting it in an envelope and dropping it off at the post office," Leahy said.

Under federal statute

Under the federal wiretap statute, enacted in 1968, only voice communications are protected from interception. Mathias and Kastenmeier said that the lack of privacy protection may inhibit the growth of new information industries as well as erode privacy rights.

The bill would outlaw the interception of data and video communications on private networks and the unauthorized access of network computers if messages stored there are obtained or altered. It would be inconsistent to prohibit the interception of data transmissions and leave the data unprotected once it is stored in a network computer, sponsors said.

Under the bill, offenders could face penalties of up to $250,000 and one year in prison if the crime is committed for commercial gain or malicious reasons.

Also, law enforcement officials would have to get a court order to obtain electronic messages, and electronic mail services could not disclose the contents of messages without the authorization of the sender.

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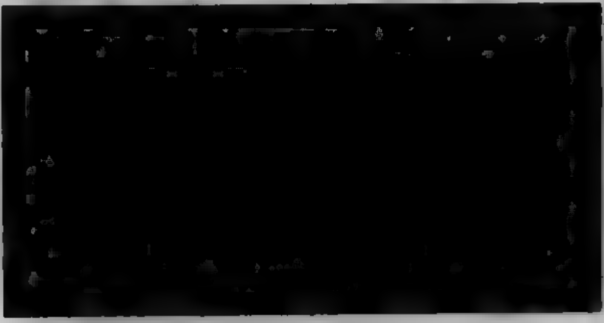

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Japan to create research center

By [illegible] Kondoh
Special to CW

TOKYO (CWN). — The Japanese government has approved the establishment of the nonprofit Center for Promoting Research for Basic Technologies. The center, which will be run jointly by the Ministry of International Trade and Industry (Miti) and Posts and Telecommunications, will start operation on Oct. 1.

Miti said it hopes the center will become the core of the government's efforts to promote research and development and application technologies by private industries in microelectronics, new materials and bioengineering.

According to Miti, the new organization, chaired by Federation of Economic Organizations leader Yoshihiro Inayama, will finance and extend loans to related private projects and assist firms to make use of government-run labs.

Kondoh is international editor/Asia for the CW Network.

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QED CATALOG

Multimate upgrading Advantage word processing tool

By Charles Babcock

NEW YORK — Multimate International Corp. told a group of its users last week that it is enhancing its Multimate Advantage microcomputer word processing package and will soon ship hardware options.

In addition, Multimate is continuing to work on mainframe word processing software and expects to introduce a $1,800 to $2,200 package for the IBM System/36 in the first quarter of 1986. It will offer word processing to run under IBM's VM and MVS operating systems for larger mainframes later in 1986, said Bob Obuch, senior vice-president for sales with the East Hartford, Conn.-based company.

Multimate spokesmen told about 30 New York-based large-account users that the acquisition of the firm by Ashton-Tate is still on track and is expected to be completed by the end of the year. Security Exchange Commission approval must be given before the boards of the respective companies can vote to complete the deal.

Once the acquisition is completed, Multimate will examine the possibility of making files from the Ashton-Tate data base management systems — Dbase II and Dbase III — compatible with Multimate's word processing files, Obuch said. Multimate and Ashton-Tate share many corporate users, he noted.

Multimate is enhancing its top-of-the-line Advantage software by adding a thesaurus with 40,000 entries, to which a user may refer without exiting a document. In addition, the $595 Advantage package will include an option to create up to nine columns on a screen, each defined by the user, Obuch said.

Registered users will be able to upgrade to the package beginning in December for $60 if they update within two years of becoming an Advantage user, according to the vendor. Users of Multimate Executive Release 3.3 or earlier versions may update to Advantage for $80, again provided they do so within two years of becoming a Multimate user.

The software firm is now selling a $295 keyboard that makes the IBM Personal Computer more closely resemble a Wang Laboratories, Inc. dedicated word processor, spokesmen noted.

In October, Multimate also will be selling a $995 communications board and software that is said to permit document exchange between IBM Personal Computers using Multimate and Wang Office Information System, VS and Alliance word processors.

The company also will offer in October a $159 Graphlink package that reportedly allows a user to clip an illustration or graph and store it as a Multimate file.

IBM merging sales offices

By Clinton Wilder

ARMONK, N.Y. — IBM last week moved to trim its administrative costs by reorganizing its two main marketing divisions along regional lines, a move that will apparently have little effect on large customers.

Effective Jan. 1, Big Blue will eliminate its National Accounts and National Marketing divisions, replacing them with the White Plains, N.Y.-based North-Central Marketing Division and the Atlanta-based South-West Marketing Division. Sales offices will now differentiate customers by geographic locations, rather than by the size of the account.

"It's a ho-hum announcement, and our service won't change a whit because of it," said George DiNardo, senior vice-president of information management and research at Pittsburgh's Mellon Bank NA, a large IBM installation. "IBM is simply too smart an organization to do anything to change the way it handles national accounts. They will continue to serve us as they always have. It's been 15 years since I worried about an IBM reorganization."

DiNardo said the move could help IBM refocus its resources, which could have positive benefits for large users. "Combining their regional offices is long overdue," he said.

IBM officials said the move was a continuation of the company's major overhaul started in 1981, when it changed from a sales organization based on product lines to its current distinction between Fortune 100 accounts and smaller customers. That distinction still has created some overlap within regions.

The company's 25 current regional offices will be consolidated into 13, with six in the Northeast and northern Midwest and seven in the Southeast, Southwest and West Coast areas.

Frank Gens, an IBM analyst with International Data Corp., agreed with DiNardo that the change was overdue. "They have two offices in each region doing sales support and administration, one for national accounts and one for national marketing. Those will be consolidated into one."

A word
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Micropro offers net licensing, IBM conversion utility

Reports rise in profits, revenue for quarter

By Eric Bender

SAN RAFAEL, Calif. — In a move demonstrating increased attention to corporate users, Micropro International Corp. last week joined the ranks of vendors offering local-area network licensing and IBM Document Content Architecture (DCA) conversion capabilities for microcomputer word processing software products.

The network license program, available immediately, supports the IBM PC Network, 3Com Corp. Etherseries networks and Novell, Inc. Netware networks. It permits users who buy the standard Wordstar 2000 or Wordstar 2000 Plus packages to buy additional licenses at a lower price. A minimum of three licenses must be purchased, at a cost of $225 per workstation on nets with nine or fewer workstations and $195 per workstation for larger configurations.

Micropro President H. Glen Haney told *Computerworld* that it makes sense to offer pricing discounts for network software and said he expects that the new licensing scheme will reduce unauthorized copying of the package, which is not copy protected.

Micropro designed Wordstar 2000 to support basic network features such as resource sharing so a network-specific version is not required, said Bill Crowell, vice-president for development. The network license includes an installation guide for the selected network, and user documentation can be ordered at $30 for Wordstar 2000 and $35 for Wordstar 2000 Plus.

The DCA conversion utility, offered for all Micropro word processing packages, will aid users in transferring documents to and from IBM mainframes. "We've gotten a lot of feedback from corporate customers that they will require this capability," Crowell said.

Available by year end, the utility will provide bidirectional, revisable-form DCA capabilities. Pricing has not been set but will be less than $50, Haney said.

Unlike some of its competitors, Micropro has no intention of porting its word processing software to larger IBM systems, he added. For word processing, "the cost and performance of delivery on a personal computer are unbeatable," he maintained.

"Rather than develop products for large or mid-size mainframes, we are devoting our efforts to increasing functionality and interconnectivity," Haney declared. The network licensing, DCA product and forthcoming site licensing program "are all aimed at strengthening that," he said.

Upturn in revenue, profits

Separately, Haney noted that following five quarters of declining revenue and losses, Micropro has had "two quarters of upturn in revenue and a return of profitability."

The firm last week reported profits of $1.2 million on revenue of $10.7 million for the fourth quarter, ended Aug. 31. In the same quarter last year Micropro lost $756,000 on sales of $12.4 million.

For the year just ended, the company posted a profit of $207,000 on revenue of $42.6 million, compared with a year-earlier profit of $5.7 million on revenue of $66.9 million.

Haney denied industry rumors that Micropro has been searching for a buyer, saying instead that the firm is examining opportunities to acquire other firms in related markets.

He acknowledged that the overall micro software market "has not yet regained its equilibrium of sustained growth" but predicted significant industry growth this year. However, Haney also forecast a shakeout among word processing software suppliers. "We've counted over 200 companies, which is clearly an outrageous number," he remarked.

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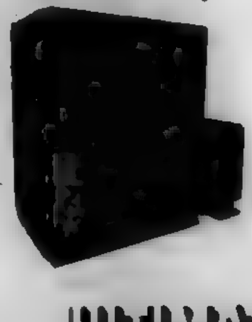

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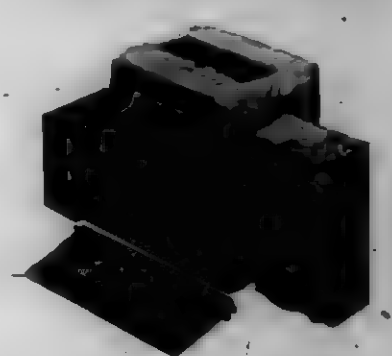

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VIEWPOINT

EDITORIAL

What Jobs hath wrought

When Steve Jobs and Steve Wozniak first holed up in a Silicon Valley garage in the mid-1970s to begin shuffling the components of what was to become the Apple microcomputer, they were launching an era that was to change the lives and work styles of computer professionals. A part of that era formally ended this month with Jobs' departure from Apple, and we would be remiss in not marking its passing.

The vision Jobs and Wozniak acted upon was one that foresaw computing power taken from the few and given to the many. The operative word here is *taken*. Theirs was not a gentle vision nor was its realization in corporate America a gentle process. Hundreds of corporations and thousands of careers had been snugly constructed upon the concept of centralized processing, and the notion of *personal* computing did not mesh well with this concept.

But Jobs and Wozniak had reaped a high-tech whirlwind. As with most great entrepreneurial success stories, Apple's growth was immeasurably aided by a confluence of factors far beyond the powers of its founders. In a 180-degree turn from the previous decade, the U.S. in the 1970s was becoming a business culture. Real estate, the saying went, was the marijuana of the '70s. Venture capitalists were the new American heroes. Business schools were standing room only, and *The Wall Street Journal* added a second section.

The phenomenon was fed by goal-oriented young tyros who quickly perceived the value of the personal computer in tapping data and data processing power previously accessible to only a select few. The Apple II gave them a competitive edge — a big competitive edge — and a machine originally thought to have modest potential in the home and education markets was suddenly an enormous hit among business customers. By the time the rest of the computer industry caught up, Apple was a Fortune 500 company, and Jobs and Wozniak were legends.

One problem with entrepreneurial legends is that they frequently do not fit in well with the day-to-day reality of corporate management. Here, Jobs was Exhibit 1A. Not only was Apple's internal management excessively cavalier and casual, but also externally Jobs failed to effect the kinds of external commercial liaisons with other market forces, specifically IBM, that would have broadened Apple's consumer base and product appeal. Other young computer entrepreneurs did do this, specifically William Gates of Microsoft Corp., and are prospering.

Regrettable though this turn of fate may be for Jobs, it should not dim the value and importance of the achievement to which he contributed: The redistribution of computing power sparked by the success of microcomputers, led by Apple, has changed the way that businesses gather and use their data.

Notes & observations

IBM reorganized its largest marketing divisions last week so that now each field office will be able to sell a completely integrated IBM product line. Good. We're all in favor of integration. Come to think of it, we think it would be a nice idea if IBM now got about the business of integrating its operating system architectures.

DON'T WORRY, THIS'LL JUST STIMULATE COMPETITION.

LETTERS TO THE EDITOR

Cost overrated, flexibility overlooked in making presentation graphics choices

The article, "Graphics users prefer transparencies to slides" [CW, Aug. 19], rightly focused on the preference for overheads over 35mm slides but left the erroneous impression that cost was the major factor in this selection.

As a consultant involved in generating both proposal materials and training courseware, I generate as many as 1,000 individual presentation pieces in a given year. I use a personal computer for most of this and combine word processing, spreadsheets, graphics and a data base in my efforts.

The main reasons that I prefer overheads are that they give me a much better delivery environment, and they allow me the flexibility of assembling a presentation from existing materials quickly and efficiently because I have the masters for my overheads stored and indexed in the computer. Also, I can make quick changes after a client walk-through or pilot run.

Finally, the article, in focusing on the cost issue, makes the characteristic mistake of looking at initial cost only. If one totals the cost in compromising the quality of a presentation by use of a basically unfriendly medium, 35mm, and one takes advantage of the truly friendly personal computer-oriented tools now easily available, the decision to use overheads becomes not one of accounting costs but of measuring effective impact for each dollar spent.

Donald N. Frank
Florham Park, N.J.

Computers in the workplace increase professionals' capabilities, efficiency

The In Depth article "White-collar computing: the professional as an artist" [CW, Sept. 2] calls for a reply. I have never read an article that contained so many assertions with which I disagreed.

First, computers effect more than two changes in the workplace. A significant effect that was not mentioned is that they open up new types of work that were not economically feasible on a manual basis. An increase in productivity is not merely a matter of doing the same thing faster. We also do it better through extended capabilities.

Second, although there may be a fascination with direct control of the computer at first, it is efficiency that keeps up usage. People will not use equipment that complicates their tasks. It is easier to develop a report with a good word processor than to write it on a pad.

It is also more efficient to complete a task when the professional's mind is on the subject than to get involved in proofreading and review of output after going on to other projects. Loss of accuracy from proofreading is offset by spelling checkers.

A third fallacy is the picture of "grammarless professionals" turning over control of their output to secretaries and the like. Most professionals have a strong interest in, and are held responsible for, the appearance of their reports.

The article overestimated the importance of documents in professional life. It is true that the appearance of reports is important in communicating the results of a professional's work. However, it is usually a small part of the total task.

William A. Bryden
Golden, Colo.

Magnetic media security systems based on realistic probabilities, not theories

The article " 'Erased' tapes present potential security threat" [CW, Sept. 16] is quite accurate and informative. Unless it is completely read and understood, however, it could lead to the misconception that all used computer tapes and magnetic media should be degaussed and overwritten before disposition is made.

The U.S. Department of Defense has recognized the problem for many years and has required degaussing and overwriting of magnetic media containing sensitive data. Nevertheless, security programs must be built realistically on vulnerabilities and probabilities not on scientific theories.

The risk factor of retrieving data from an erased tape is quite low. Therefore, except for ultrasensitive data that would support the use of sophisticated technical equipment and valuable time of professionals in an attempt to retrieve information from an erased tape, degaussing and overwriting erased tapes would not be cost justifiable.

The expense of such a project would be better allocated to more practical security projects.

Ted Singer
San Antonio

VIEWPOINT

Pushing the limits of outmoded systems

THE DATA CENTER
John P. Murray

What is the average life of an application system? Is it six years, eight years, 10 years? The answer will vary from installation to installation, depending on several factors.

The original quality of the system obviously has a great deal to do with its longevity; good design and good code will last longer than poorly done work. The technology used also has an important bearing upon the length of time the system can be considered productive. The pace at which business functions change may have the most profound impact upon the ultimate life cycle of the particular system.

Some systems never get on-line, even after considerable time, expense and agony. Some do become operational but after a very short time are found to be ineffective and are eventually replaced. Conversely, there are systems 15 or more years old that are still serving organizations today.

The life cycles of systems are likely to become shorter as a result of two phenomena. The rapid advancement of information processing technology makes for vastly improved methods of meeting the needs of the organization. Not taking advantage of them is poor business judgment. Plus, partly as a consequence of the use of new technology, business operations are changing more rapidly than ever before.

New approaches allow greater flexibility and provide for the adoption of different methods. These methods can be used to address various business functions, which can in turn lead to expansion and growth for the organization. The resulting systems that may have been effective for a number of years and still operate correctly simply are no longer viable, given the changing competitive environment. So, although the practical life cycle of the system has not yet been exceeded, the pragmatic life cycle has.

This has serious consequences for information processing management, whose primary responsibility must be to help the organization stay at least reasonably current with the latest technology of information processing. Too often, managers become so engrossed with day-to-day operations that little, if any, thought is given to long-range issues.

Hands-on management style

Such a situation is often the mark of a hands-on management style — the apparent need to become involved in all the details of the function. Those with middle-level management responsibilities within the department are not allowed to act on their own, and all decisions are made by the senior manager. Usually such management is the result of insecurity on the part of the person in charge. No one is trusted because they may make mistakes, therefore, the senior manager must be involved in everything.

Given that particular management style, there is usually considerable comfort with the status quo. Although it may tend to prolong the life cycle of applications systems, in the long run, it is not in the best interests of the organization. In some organizations, it is considered an achievement to point to systems that have been in operation for considerable periods of time.

Who can say how much damage has been rendered to the organization because of continued forced reliance on these outmoded systems? Investigation probably would uncover a number of instances where requests for change or modification to the system have been denied as technically impractical because of the obsolescence of the technology.

Inadequacy to support actual needs

The real problem with the continuing use of old systems, even if they do operate reasonably well, is that they are probably increasingly inadequate to support the actual needs of the organization. This becomes not only an issue of technology but also of how that technology will be applied to help the organization move ahead.

Consider the current turmoil in the financial industry, particularly in banking and insurance. Not only is competition increasing, but changes in regulations and the manner in which these businesses operate mean that systems life cycles will be shortened considerably.

As business requirements expand, organizations find that information processing systems currently in place are inadequate. The information processing department must be sure that the organization's applications systems portfolio is not allowed to become obsolete. If appropriate attention is not devoted to the issue, the buildup of a large number of old systems presents a considerable risk to the organization.

The expense associated with the renovation of these systems is one serious problem. The negative impact on both the current business and new opportunities because of system inflexibility is yet another. Information processing departments must monitor the life cycles of their applications systems and take steps to replace the old ones within their organization.

Murray is director of management and information services for American Breeders Service, a DeForest, Wis., division of W. R. Grace & Co. and is the author of Management Information Systems as a Corporate Resource.

High-tech semantics mire microcomputer potential

READER'S PLATFORM
Jon R. David

Microcomputers, more properly their individual, group and corporate users, have been the subject of much bad-mouthing of late, and this strong criticism is frequently coming from learned sources. What have these marvels of technology done to engender such negative feelings? Very little, as their critics say, and that's the problem.

Individual microcomputer systems are often very powerful, capable of all those wonderful things associated with the mighty mini that captured the computer users' imagination only a few years ago. In addition, they can frequently support multiple users or at least the concurrent operation of multiple tasks.

They can work with other microcomputer systems in local networks providing capabilities beyond those offered in the original minis and have access to data bases with virtually every piece of information one could want. The problem, according to critics, is that they're neither viewed nor used in keeping with their potential.

Most microcomputers are used in stand-alone mode only, and they never access available data bases, couple with mainframes or participate in local networks. A great waste.

Furthermore, most micros are used infrequently, only on an as-needed basis, thereby adding more wasted potential. Microcomputer maligners tell of systems used only to get out a few letters or reports, to perform calendar functions or to respond to a few daily inquiries. Some say that certain people use them to play video games; let's hope we haven't sunk so low.

Let's look at these critics for a moment. Many, if not most, are in offices with extra chairs, have typewriters that aren't used a full eight hours per day and have telephones they frequently are not using. They frequently have telex or similar equipment that can go days without use. Those that use public transportation may even own cars just to take them to trains or buses. All that wasted potential and they pick on poor microcomputers. Why?

It's a problem of semantics. People don't go out to buy a microcomputer, they go out to buy a personal computer, a professional computer, a home computer or some other such name of a microcomputer. These devices are viewed as workstations in a business environment, and a workstation should be doing work; if it doesn't, something is wrong.

Minicomputers didn't have this problem when they first invaded the business community. They had previously been known as dedicated application computers before the press bestowed the mini label on them. People were used to minis being dedicated to single tasks that could cost-justify them. Even though today's microcomputer costs at least less than the minicomputer of a dozen years ago, the workstation designation seems to make us forget such things as cost-justification and convenience.

Humor is based on truth, and this truth is that names lead you to expect things. In this case, workstations mean work. They're so inexpensive that almost any application can cost-justify them, but their name makes otherwise reasonable people expect more than is necessary of them. The solution is obvious: change the name.

Renaming workstations as play stations

Workstations of all types should now and forever be known as play stations. Sure, it doesn't sound professional, but who cares? Wouldn't you rather get paid for using a play station than a workstation? How bad would it be if a tense employee played a video game on a play station? And, what employer or computer critic could complain about play stations being underused?

Workers, from clerks to executives, frequently have dolls, ornaments or games at their desks, sometimes even on top of their workstations. Work environments are not all somber. What would be better received by one and all than play stations?

Although many people may now resent the use of workstations, play stations would be welcome and would probably encourage users to learn more thoroughly how to use them. The use of play stations might even get some of the hackers into a business environment, and what company couldn't use the rare skills exhibited by hackers?

I don't disagree with those who point out that the vast majority of workstations are not being used anywhere near their potential. I must, however, point out that the majority of microcomputer users can cost-justify their systems. Continued criticism of all but utopian utilization makes potential users leery of becoming actual users, lest they become the focus of both internal and external critics.

The renaming of workstations to play stations should eliminate the fear of criticism, and, if they are ever used for more than the applications that cost-justified them, it would be an added bonus.

David is a telecommunications consultant based in Tappan, N.Y.

Vendors attempt to diagnose trade show debilities

By Jeffry Beeler

WEST COAST UPDATE

SAN FRANCISCO — Once again, vendors galore are working themselves into a tizzy over the alleged poor quality of many of the industry's largest and best known trade shows. In particular, the companies are fuming about the perceived inability of many trade show product exhibits to generate enough solid sales leads to justify their whopping costs.

And once again, the people who are bearing the brunt of the exhibitors' wrath are the conference organizers, who are often chastised for failing to make their gatherings sufficiently attractive to the right kind of visitors. The complaint that sponsors are ineffective in qualifying their trade show attendees is certainly nothing new.

Recently, however, the vendor griping has grown to unprecedented proportions. The reasons for the rising chorus of discontent are at least twofold. First, exhibitors are becoming increasingly sophisticated in trade show evaluation and thus are more conscious than ever of the events' shortcomings, according to Joyce McKee, senior consultant with B. R. Blackmarr & Associates, Inc., a Dallas-based consulting firm.

Second, the mushrooming price tag of trade show exhibitions has greatly increased the pressure on vendors to show a reasonable return on their investment. Just one exhibit nowadays can cost its owner up to $500,000 in booth space rental, travel expenses and other overhead items, according to Brian Blackmarr, the consulting company's founder.

Whatever the reasons for their collective dissatisfaction, a group of highly prominent vendors joined forces last November to figure out why their recent trade show experiences had been so disappointing and to devise some possible remedies. In their efforts, they received considerable support from Blackmarr and his colleagues.

Conducted research

"They [the companies] asked us to conduct research to determine what corporate decision makers want to see at a trade show and how the shows can be changed to encourage those people to attend," Blackmarr said.

During the 10 months that have passed since they first pooled their resources, the participating vendors have met repeatedly with Blackmarr's staff to review their latest research findings and discuss future directions for investigation. The first of the meetings coincided with the Office Automation Conference, which took place in February. Since then, the group members have gathered three other times, the latest of which came in July at the close of the National Computer Conference (NCC) in Chicago.

Additional meetings will almost certainly follow soon. But in the meantime, participants and interested bystanders continue to discuss the trade show issue casually at nearly every opportunity, one of the most recent of which came in San Francisco during the Information Technology Conference and Exposition (Intech).

"Our intent in conducting the research is to work hand in hand with the various organizers to compile the first accurate statistics about exactly who attends trade shows," McKee said during an Intech interview. "We're definitely not trying to use our study results to threaten the organizers in any way."

Although Blackmarr's research is still a long way from completion, it has already shed light on the important question of what motivates exhibitors to attend trade shows in the first place. The answer apparently has to do with peer pressure. "Companies figure that if IBM is exhibiting at a conference, they have an obligation to be there, too," Blackmarr said.

But the work also has profound implications for trade show organizers, who will have to redefine fundamentally their roles if they want their events to continue prospering indefinitely, Blackmarr said.

Sponsors of large, established industry gatherings like NCC need to increase their emphasis on practical education and improve the degree of integration between the events' product exhibits and their conference programs. "For those who attend them, big horizontal shows should become the equivalent of a mini degree in how to use high technology," Blackmarr said. "If NCC and other large established events don't make themselves more educational, they may eventually be replaced by smaller, more vertical shows," he warned.

Trade show organizers should also take an increasingly active role in advising exhibitors on how to attract qualified prospects and thus maximize their exhibition payoff, according to Robert Harar, president of National Trade Productions, Inc., Intech's sponsor.

But by no stretch of the imagination does the burden for optimizing trade show results fall entirely on the organizers. Exhibitors, too, need to accept a certain amount of responsibility for their own trade show fate. In particular, vendors have to improve their efforts at "boothmanship," self-promotion and sales-lead followup, Harar said.

One vendor that has particularly distinguished itself at both self-promotion and followup is Digital Equipment Corp., he added.

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Global, NAS ink OEM pact

BOULDER, Colo. — Global-Ultimacc Systems, Inc. announced last week that it has reached an agreement to market IBM 4300-compatible processors that are manufactured by Hitachi Ltd.

Global-Ultimacc's OEM agreement was signed with National Advanced Systems Corp., the subsidiary of National Semiconductor Corp. that markets Hitachi systems in the U.S.

Announcement of the agreement came on the heels of Global-Ultimacc's divorce from troubled Storage Technology Corp. [CW, Sept. 23], which had owned almost 60% of the Boulder-based company.

The company will market the processors as more powerful models in its 50 series of 4300-compatible processors.

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Sortland Yard warns against "Rafles-type sort programs."

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Ask for Inspector SyncSort!

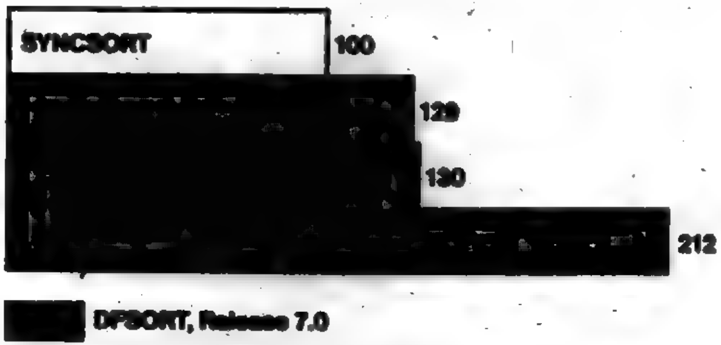
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied, "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

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SOFTWARE & SERVICES

Ease-of-use issue stalls links' growth

Current tools inadequate for users' needs: speaker

By John Desmond

DALLAS — Micro-mainframe links may be a hot button in the industry, but the products so far fail to deliver on the ease-of-use promise that will make them practical for nontechnical end users.

So said two users at a session titled "The Micro-Mainframe Link" at the recent Software/Expo conference. The users, one from a Chicago hospital and the other from a New York-based advertising agency, described their continuing — often frustrating — efforts to implement micro-mainframe products as mainstream DP tools.

John C. Wade, director of information systems at Northwestern Memorial Hospital in Chicago, said, "I don't believe the products are in place today to allow a micro user to participate in an expanded network. I need something today that is easy and efficient for them to use. I am concerned that the end user cannot access that information without learning my business, which is DP."

Northwestern Memorial Hospital, which had $315 million in revenue last year, needs the micro-mainframe link to help keep treatment costs in line with federal reimbursement guidelines, Wade said. The hospital has recently been expanding its information systems and now has a DP budget of $8 million with 600 IBM 3270-type devices linked on-line to its mainframes. A total of 140 micros are installed in 67 departments. Wade characterized Northwestern as an information systems leader in the health care industry, which he said has lagged behind many other industries in exploiting high technology.

One-third of the hospital's planned information system growth will be in support of the micro-mainframe environment, Wade said. At present, four micro-mainframe pilot projects are ongoing, in the financial applications of budgeting and reimbursement diagnostics and in patient care applications of patient records and records evaluation, Wade said.

"The federal goverment reimburses hospitals by diagnosis today," Wade explained, noting there are 467 medical diagnosis categories. "A main reason we're anxious to support a micro-mainframe link

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■ Robert Rack on building management information systems with the help of decision scenarios/24

■ Fel Computing introduced Version 1.01 of its Mobius microcomputer-to-host link for IBM and Digital Equipment processor users/26

■ AT&T unveiled a raft of software for its 3B line of processors/26

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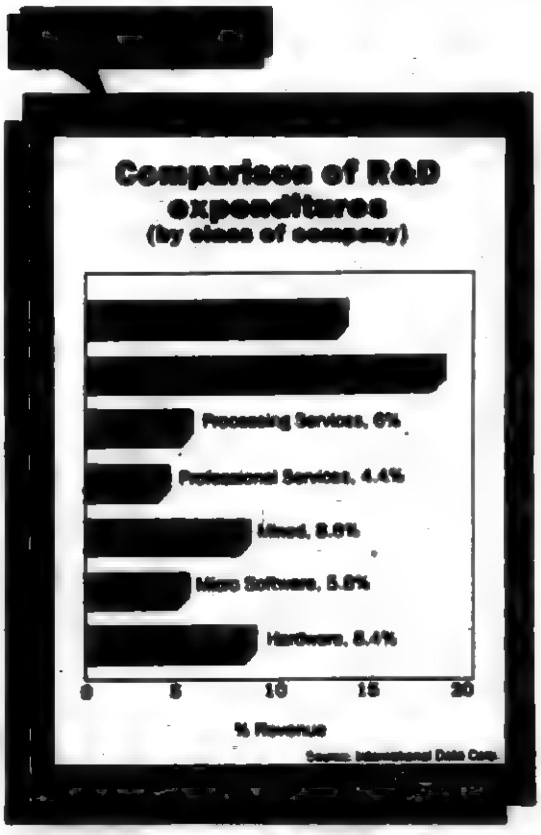

Source: International Data Corp.

IBM adds planning module for manufacturing package

Among a series of software product announcements for manufacturing, engineering and office users, IBM recently announced the Capacity Requirements Planning (CRP) module for its Copics manufacturing software running in DOS/VSE and OS/VS environments.

CRP takes the materials plan produced by a Copics module and schedules it against available manufacturing resources, a spokesman said. The program calculates the expected load on each resource. Load profiles are produced for selected work centers to identify potentially overloaded areas.

The CRP module is meant to assist production planners in producing a balanced materials and capacity plan. CRP is priced at $18,000, a one-time charge, and is scheduled for fourth-quarter availability.

Other announcements include the following:

■ Release 1.2 of the Engineering/Scientific Support System (E/SS). A total of 14 programs have been replaced in Release 1.2 with either enhanced or new programs. E/SS is said to reduce the complexity of selecting, installing, administering and maintaining systems and applications software for engineering, scientific, business, office and data base applications. The program runs in VM/CMS environments.

E/SS offers users pretested configurations for IBM 4300 systems, including IBM 3370 and 3380 disk drives. The product is also said to simplify installation procedures and program maintenance.

Among the updated programs in E/SS are ISPF Version 2, Release 1 and ISPF/PPF Version 2, Release 1. Prices for all programs remain the same. The one-time charge for E/SS Productivity Facility, which provides dialogues and examples to assist users with E/SS facilities, is $2,000.

■ Release 2 of the APL2 language, which is said to provide DP profes-

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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis, and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from mainframes to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

■ Why not Cullinet, ADR or Focus? There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as *the* standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language - each one painting the user into its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few shops nowadays run only IBM mainframes. Why, then, even consider a database solution that runs *only on IBM mainframes?* Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE *are* identical.

FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

■ Why not just go with DB2 or SQL/DS? A relational DBMS simplifies but does not by itself eliminate application programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are somewhat unlikely ever to run on another vendor's system). ORACLE runs on more IBM hardware and operating systems than do IBM's relational products.

■ What about Goldengate, dBase III, Symphony or Framework? PCs need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload.

ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350.

Decision scenarios ensure info system meets business needs

SOFTLINE
Robert H. Reck

Communication between builders of management information and the managers they intend to serve is usually good. Thus, the systems built for the managers are always successful in meeting the managers' real business needs for information. Right? Wrong.

Experience at many firms indicates a number of problems in this communications link and, subsequently, in the usefulness of the resulting system. These problems fall on both sides of the systems/managerial fence.

Often, the manager abrogates the responsibility for building a meaningful system. The staff is supposed to be psychic in determining what the boss needs to know and providing it — no more and certainly no less.

However, overzealous information systems builders can drive business executives into a data-rich, information-poor situation, which is increasingly characteristic of many of today's businesses, by adding to the system data elements that may not be needed.

What can be done to improve the communication of management support needs and the delivery of the action-oriented systems a business can actually use?

Use decision scenarios

One answer, proven in many experiences, is the use of decision scenarios.

A decision scenario, as its name suggests, is the description of a particular business problem for which appropriate decisions must be made.

The business problem for a scenario is chosen by the business area manager during an interview with the company's systems analyst-builder.

Then the analyst-builder outlines and refines the decision scenario, a hypothetical situation rooted in the manager's functional area and tied to the part of the business that needs support.

The information that could help manage the particular business problem is postulated by both the manager and the analyst-builder, resulting in the development of management support systems that are effective and created with low risk.

A dynamic approach

This dynamic approach to management support systems development is in contrast to traditional, static approaches that develop a snapshot of the business situation merely through a functional specification. The decision scenario unfolds over a period of two weeks or months through careful, two-way communication between the developer and the "owner," or system user.

A decision scenario should not be confused with a critical success factor analysis or a prototype. A decision scenario is to be used as a link between the identified critical success factors and the actual prototype stage.

Recently, the decision scenario process was used at a major manufacturing company. The company determined that one of the major critical success factors requiring information support involved the timely purchase of raw materials. The vice-president of purchasing, identified as the owner of this critical business area, worked closely with the systems analyst-builder to create a hypothetical situation that would help identify what type of information and information systems were needed to manage this critical business area.

In their first meeting, the vice-president and the analyst-builder discussed the business of purchasing as it affected the manufacturing company. The vice-president of purchasing was highly skeptical that information technology could help him manage his responsibilities. He had always used manual techniques and maintained manual records in which he had a high degree of confidence. The analyst-builder assured him that the information and techniques he needed to manage his business would be developed independently of any technology considerations.

In the series of interviews that followed, they were able to construct the decision scenario by postulating a purchasing structure that included a listing of raw materials and their suppliers, projected inventory volumes, safety stocks for key customers, sales forecasts and actual volumes and costs.

Over the next few months, during each successive interview, more information was added to the scenario. Its complexity was steadily increased to reflect the full

Continued on page 36

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Version 1.01 of Mobius integration system debuts

Allows transparent access to DEC hosts

Fel Computing in East Dover, Vt., has released Version 1.01 of Mobius, a microcomputer-to-mainframe integration system said to give IBM PC-DOS, Microsoft Corp. MS-DOS and Digital Research, Inc. CP/M users transparent access to the resources of Digital Equipment Corp. Decsystem-10, Decsystem-20 and VAX hosts.

Version 1.01 provides VT100 emulation for the DEC Rainbow, IBM Personal Computer and Personal Computer XT.

The VT100 emulator is compatible with such programs as DEC's All-In-One, EDT and TDMS on the VAX; DEC's Traffic-20 and Scope on the Decsystem-20; and similar programs on the Decsystem-10, according to Fel Computing.

The enhanced Mobius is said to generate all VT100 keyboard characters and escape sequences, including those produced by the keypad. VT100 line drawing, arrow keys, LED indicators and video attributes — reverse video, underline, bold and blinking characters — are also implemented, the vendor said.

Mobius also offers an Advanced Programmer's Interface that reportedly enables programs to access functions previously available only to users at the keyboard.

Pricing depends on the number of microcomputers supported. For example, the host Mobius program costs $5,000 for 10 simultaneous users.

Micro Mobius, the micro portion of Mobius, costs $250 in quantities of one to 19, the vendor said.

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DPS 6 packages launched

Honeywell, Inc. of Waltham, Mass., has announced three programmer productivity packages for use with its DPS 6 small computer family under the Gcos 6 Mod 400 Release 3.1 operating system.

The packages are the Pro-IV fourth-generation application generator from Pro Computer Sciences, Inc., the System-80 Cobol program generator from Phoenix Systems, Inc. and a release of the Info data manager and fourth-generation language from Henco Software, Inc.

Pro-IV applications are developed on-line using menus, screens, on-line Help messages and system security and logic operations.

System-80 is a productivity tool that generates Ansi-74 Cobol programs through the use of data dictionaries and program generators controlled with menus, prompts, attribute screens and tutorials.

Info is a data file management system and fourth-generation language providing data entry, update and query language, along with report writing. Release 9.2 of Info boosts performance 30%, a spokesman said.

The Pro-IV development and execution systems cost up to $8,800. The System-80 initial license fee starts at $5,225. The Info Release 9.2 initial license fees start at $6,800. Info Release 9.2 requires the Gcos 6 Mod 400 Sort/Merge Utility, which costs $135 annually.

AT&T unwraps applications packages for 3B series

By Charles Babcock

MORRISTOWN, N.J. — AT&T Information Systems has introduced 13 applications programs for its 3B computer line, including an integrated office automation package, Prevail.

AT&T developed four of the packages and will market the remaining nine, which were developed by independent vendors. AT&T has certified each package will run under its Unix System V.

Prevail combines spreadsheet, word processing, data base management and communications functions into one program, company officials said. Developed by Inspiration Systems, Inc., it sells for $3,600 on the 3B2 and $7,200 on the 3B5.

The AT&T word processing product, Writers Workbench, has been issued in Collegiate and Professional editions. The $1,500 Collegiate edition runs on the 3B2 and will serve up to 12 users. The Professional edition sells for $795 on the 3B2 and $1,195 on the 3B5, AT&T said.

AT&T has developed a package for service businesses, called AT&T Service Solutions, to handle scheduling, dispatching, service requests, inventory and client billing. It retails for $40,000 to $60,000, spokesmen said. AT&T Dental Solution, a package of scheduling, billing and accounts receivable software developed by Wallaby Software of Ramsey, N.J., runs on the 3B2 and retails for $4,995, spokesmen said.

AT&T Time and Attendance is a time-keeping system for up to 40,000 employees and 500 clocks. It runs on the 3B5 for multiple locations and retails for $25,000. The Unify data base management system from Unify Corp. in Morristown, N.J., retails for $1,995 on the 3B2 and $4,900 on the 3B5, AT&T said.

Unibol is a commercial programming language compatible with Digital Equipment Corp.'s Dibol developed by Software Ireland. The compiler will retail for $2,400 on the 3B2 and $3,600 on the 3B5. Run-Time will retail for $1,200 on the 3B2 and $1,800 on the 3B5. M/ET, developed by Microfocus Ltd., is a Unix-based version of Cobol 74 for application programming. It comes in four modules priced between $400 and $2,000 for the 3B2 and $1,200 to $5,500 for the 3B5.

Visual Menu, developed by Cosi, is a system for visual construction of Unix systems. Its Development System retails for $1,495 on the 3B2 and $2,745 on the 3B5. Run-Time retails for $195 on the 3B2 and $995 on the 3B5. Supercalc3, developed by Sorcim/IUS Micro Software, a spreadsheet and data management package, retails for $795 on the 3B2 and $1,395 on the 3B5. Access Technology, Inc.'s 20/20, a spreadsheet and modeling package, retails for $950 on the 3B2 and $3,800 on the 3B5.

Integrated Compiler Products, developed by Advanced Computer Techniques Corp., provides programs to compile applications written in Cobol, Pascal, Basic or Fortran to run as Unix applications. Prices range from $1,000 to $2,500 on the 3B2 and $2,000 to $6,000 on the 3B5.

SYSTEMS SOFTWARE

• Radian Corp. has enhanced the user interface on its Rule Master expert systems development software.

The interface is said to provide a screen- and menu-handling feature, one editor for structuring applications and another editor for generating files of examples from which rules are induced.

Called Screem, the screen- and menu-handling feature offers a hier-

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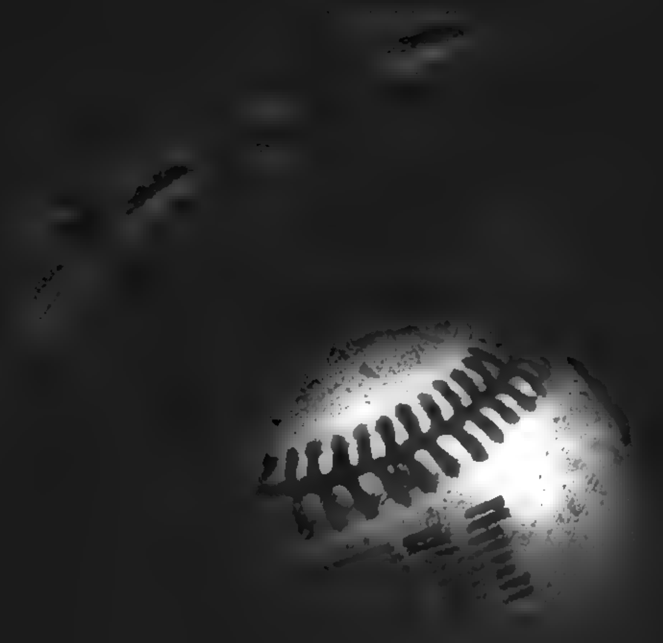


SOFTWARE & SERVICES

Continued from page 29

archical set of pop-down menus at every step in building an application. Once a pop-down menu is displayed, the user can select a function by using cursor keys or a control character or by typing the expert system development function name.

The structure editor enables a user to display and modify the modular structure of a Rule Master-based expert system by adding, deleting and moving modules.

The induction file editor lets users create and modify example sets from which rules are developed by Rule Master's Rule Maker facility. Rule Maker automatically induces procedural rules from real-life examples of those rules that have been entered into the system by a knowledge engineer. After inducing the rules, Rule Maker is said to generate code automatically in the Radial language.

The interface will be available for AT&T Unix-based systems in the fourth quarter. The price of Rule Master starts at $15,000.

Radian, 8501 Mo-Pac Blvd., P.O. Box 9948, Austin, Texas 78766.

■ Inference Corp. has enhanced its Automated Reasoning Tool (ART) expert system development environment.

The updated version includes color graphics, a graphics icon library, direct interactive and programmed interfaces to the knowledge base, support for mixed initiative processing, a "pseudo-natural language" syntax and separately compilable rule files.

The Artist graphics component has been extended to include color graphics and an icon library of predefined or user-created symbols that developers can use directly in an application, the vendor noted.

Upgrades to the ART Studio module include a browsing facility that shows graphical views of hierarchical relationships, such as structures on schemas and inferential derivations.

Other enhancements include the ability to query the knowledge base interactively using patterns to find specific data, the ability to add interactively or modify rules incrementally while executing an application and the ability to update dynamically the knowledge base.

A pseudo-natural language syntax option reportedly lets a user build a knowledge base in English-like syntax. In addition, support for mixed initiative processing enables an ART expert system to prompt users for information while also reacting to unanticipated, user-initiated responses, according to the vendor.

Priced at $85,000, the ART release is available for Symbolics, Inc., Lisp Machine, Inc. and Texas Instruments, Inc. Explorer workstations.

Inference, 5300 W. Century Blvd., Los Angeles, Calif. 90045.

■ Systems Designers Software, Inc. has announced an expert system environment shell, Envisage, that reportedly lets designers create applications using artificial intelligence techniques.

Envisage is said to handle three reasoning schemas: traditional logic, Bayesian inference and so-called fuzzy logic.

An English-like knowledge representation language consists of rules, facts, actions and questions that can either be free format or structured, according to a spokesman.

An additional facility enables users to suspend one line of questioning temporarily, reanswer any set of questions, compare results and then return to previous lines of questioning to complete the consultation, the spokesman added.

Priced at $20,000, Envisage runs on the Digital Equipment Corp. VAX computer under the VMS operating system.

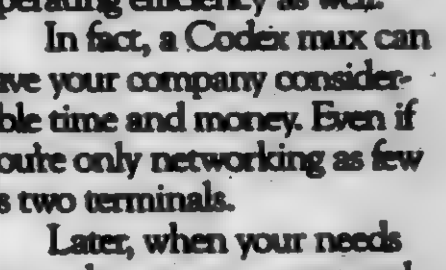
Systems Designers Software, Suite 407, 444 Washington St., Woburn, Mass. 01801.

■ Software Research Associates has unveiled a Test Coverage Analysis Tool (Tcat) system test package for the C programming language.

Called S-Tcat/C, the software automates the S1 measure of system test coverage to provide a quantitative way to determine how much of a system's function call structure is measured, the vendor explained.

S1 measures the number

Continued on page 35



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SPSS inc. PRODUCTIVITY RAISED TO THE HIGHEST POWER

Continued from page 31

of function calls executed from a calling function as a percentage of the total number of calls. An S1 value of 100% for every calling function in a software system indicates a complete level of system test coverage, according to the vendor.

S-Tcat/C is available for AT&T Unix and IBM PC-DOS systems, starting at $875 for a single-user license. A site license under normal conditions costs $7,000.

Software Research Associates, 580 Market St., San Francisco, Calif. 94104.

APPLICATION PACKAGES

■ Tektronix, Inc. has announced the Tektronix Spectrum Analyzer Software (Tekspans) family of application software said to automate many measurements done by engineers and technicians.

The packages run on the IBM Personal Computer and compatibles, the Hewlett-Packard Co. 200 series controllers and the Tektronix 4041 controller.

The first Tekspans application to be announced is the General RF Applications Software Package (Grasp), a menu-driven package enabling an engineer to make spectrum analysis measurements automatically such as swept frequency, signal analysis, harmonic distortion, signal-to-noise ratio, amplitude modulation and frequency response, a spokesman said. The package also supports filter tests and signal search routines.

Grasp allows the user to graph, store, manipulate, analyze and compare data as well as record and plot results using a variety of manufacturers' equipment. Grasp is capable of remote monitoring over telephone lines using modems and of controlling multiple spectrum analyzers such as in a manufacturing environment.

The Grasp package costs $875 and is scheduled to be available Nov. 15.

Tektronix, P.O. Box 500, Beaverton, Ore. 97077.

■ Daly & Walcott, Inc. has enhanced its Customer Service/Shipped Order History marketing assistance program to run with IBM's Mapics II order entry and invoicing system on the IBM System/34 and 36.

The menu-driven package is said to enable users to retain a history for each order, sequenced by customer and item, as well as providing easy access to information on open orders.

The Customer Service/Shipped Order History program is also now available for IBM's DmasII Release 2 on the IBM System/34 and 36.

The package, including all source code, load and procedure members, documentation and hot line technical support, is priced at $750.

Daly & Walcott, 120 Lavan St., Warwick, R.I. 02888.

ON-LINE DATA BASES

■ Direct Connection, Inc. is offering a service that will enable end users of IBM and Digital Equipment Corp. equipment to buy and sell used hardware directly with each other, eliminating the need for a hardware broker or dealer.

Subscribers to Direct Connection may use the service as often as needed without a limit on the number of items that can be listed, the vendor said.

Subscribers will receive names and telephone numbers of potential buyers and sellers of the target equipment, according to a spokesman.

Equipment listings are reportedly submitted by mail, telephone or by on-line access to the data base via this service.

Listings are said to remain in the data base until a sale or purchase is made.

Service subscriptions are offered to end users at the rate of $200 per year.

Direct Connection, P.O. Box 4510, Rockville, Md. 20850.

Reach-Ware line gets message control system

Reach Intelligent Systems Corp. of Amesbury, Mass., has announced the addition of Messagetrieve to its Reach-Ware natural language software line. Messagetrieve is a message control system that provides voice messages over the telephone 24 hours daily.

The company also offers Employee-Trak, a management tool for maintaining and analyzing employee and group accidents, absenteeism, overtime, performance and other human resource measures; and Timetrieve, a scheduling system for the management of time, personnel, facilities, equipment and assets.

Features of Reach-Ware include a 1,000-word vocabulary and English translation routines, on-line user Help, real-time and multiuser applications, full screen editing, error reporting, automatic data base encryption, word processing and print queue handling.

Reach-Ware runs on Digital Equipment Corp. VAX machines, Reach Intelligent Systems said.

According to the vendor, the price for the three additional modules ranges from $3,000 to $17,000 each, depending on the CPU.

PROTOCOL-CONVERTER COMPETITION AGAINST WALL

	WALL DATA [illegible]	PCI 276	MICOM 74016	LOCAL DATA DataLynx/3274	RENEX TIM 74-16
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CALLBACK SECURITY OPTION	YES	YES	NO	NO	NO
DOWNLOAD NEW PROTOCOLS	YES	NO	NO	NO	NO
REMOTE SW DIAGNOSTICS & LINE MONITORING	YES	NO	NO	NO	NO
$ PER LINE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

If you're about to sign a purchase requisition for a non-Wall Data protocol converter, it would be in your best interest to throw your pen toward some non-populated area of the office. Trust us. You can retrieve it after you've read this ad.

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3. Can you just download protocol software when new protocols become available? Or when software enhancements are made? You can't with the others.
4. If you suspect there is a problem with either the system software or a data line, can you dial into the protocol converter's console port and do remote diagnostics? Yes, but only with Wall Data.
5. What is the price? Actually, it's quite high…if you aren't dealing with Wall Data. For all the above reasons. Plus the obvious fact that Wall protocol converters are the market price/performance leaders.

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Now that you have that blank requisition form, call 206/883-4777 for help in filling it out. You can return the unit within two weeks without obligation. So far, we've shipped hundreds of units. We've gotten back two things: Prompt payment and stories of how our competitors have reacted to going up against…the Wall.

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From page 24

Info systems need decision scenarios

scale of anticipated or unanticipated problems in the business area by hypothesizing some information on paper charts using scales of unavoidable, acceptable and favorable.

Then, in a series of working sessions with the vice-president, the analyst-builder showed how obtaining and using the right information could help in purchasing raw materials on a timely basis.

Through simple, limited examples, the analyst-builder taught the vice-president to use both the information and the initial technology itself to improve company inventory and stock control, safety stock management service for customers and evaluation of stock offerings by suppliers.

The vice-president never knew that the "system" the analyst-builder was showing him was just a shell. Like the kind of stage sets used in western movies, the required data is visible, but the supporting structure is initially nonexistent.

This technique allows both parties to experiment with data needs and uses before the project becomes too costly to alter. Usually during this stage in the process, the scenario changes often.

After five working sessions, the decision scenario was well defined and close to the real business situation at the manufacturing company.

Prototyping began, and after using successive prototype versions of the system, the vice-president of purchasing's original skepticism was transformed into enthusiasm for both the project and technology use.

Through this dynamic process, the company created a valuable, low-risk, low-cost business tool that continues to be used and praised by senior management.

> ”
>
> *Overzealous information systems builders can drive executives into data-rich, information-poor situations.*

When building a management information system, critical success factors and prototyping alone are not enough.

As this manufacturing company discovered, the use of a decision scenario improves the communication of management support needs, thus facilitating the delivery of action-oriented systems.

Four key elements

To put decision scenarios to work in your company, keep in mind the four key elements followed by the manufacturing company in this example.

- Target your decision scenario on a critical area of the business after critical success factors have been determined.
- Construct your scenario around the business questions a manager poses and the key assumptions to be tracked in each critical business situation.
- Develop decision scenarios without considering the available data or technology that will be required. Focus on information content, not technology and data availability.
- Show the manager what information is really needed to manage the business area.

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From page 29

Ease-of-use issue stalls links' growth

is that it will have a direct financial impact on our organization," he said. Using the links, hospital staff members analyze ways to treat patients "more expeditiously and to discharge them more rapidly," Wade said.

Implementing the four pilot links has not been easy. More than 700 hours were spent finding out what data users wanted for the financial applications, and more than 400 hours went into developing the diagnostic applications. The data usually resided in different mainframe locations, so new files had to be created to service the links. Response time for the 600 on-line users could not be sacrificed, thus performance was a major consideration.

Micro-mainframe links are expected to help reduce the length of patient stays, and Wade said Northwest will continue to evaluate link products.

The hospital has found that the more transactions end users process per patient, the less time, on average, the patient stays in the hospital.

Peter F. deVaux, senior vice-president of finance and former MIS director at Young & Rubicam, Inc. of New York, said, "We'll be testing [micro-mainframe link products] for a long time and will not settle on anything for a while, because I don't think there is anything out there yet to settle on. We will continue to go through a period of uncertainty."

When his company began trying to integrate its micros with mainframe applications in 1983, deVaux said, "It was a lot tougher than we thought. We read in the magazines about how everyone was doing this, but we couldn't find anyone to talk to."

The advertising agency now has micro-mainframe experiments under way in 10 departments. Each department settled on a local-area network for its micros before testing a link.

"We expect ultimately, 10 or 15 years from now, to find ourselves with a hierarchical structure, only sharing data and applications that need to be shared at a level necessary to get the job done," he said.

Technical roadblocks to achieving that goal include linking diverse operating systems, communications software and data base management systems in place at the company, he said. Other issues include deciding who will have overall responsibility for the links, who will provide support and who will conduct training.

"The disciplines, controls, structures and planning for integration must be in place before we can achieve integration with the micro-mainframe links," deVaux said.

Vendor Gary Durbin, chairman of the San Francisco-based Tamarack Corp., which markets the Merlin/IDL micro-mainframe link, said, "I agree the link solution is not here yet" because unsophisticated users may have difficulty with the products. But the direction of his and other company's products, he said, will be for links to become more intelligent and ease interface problems for the user.

"The links have a tremendous responsibility to transform data, so the links have to become more intelligent," he said.

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From page 23

IBM adds planning module for package

sionals with a productivity tool for prototyping and applications development. APL2 runs in MVS/370, MVS/XA, VM/High Performance Option or VM/SP environments and uses companion products DB2, SQL/Data System, VM/SP ISPF Dialog Manager and Graphical Data Display Manager.

Release 2 is said to provide calls to routines written in other languages, including Fortran and assembler, access to system editors such as Xedit and ISPF and language enhancements such as lowercase alphabetics in APL2 names. The one-time charge for Release 2 of APL2 is $14,000.

■ A series of enhancements to System/36 languages and utilities, including Basic, Cobol, Business Graphics Utility, PL/I, RPG-III and Office/36 Text Management.

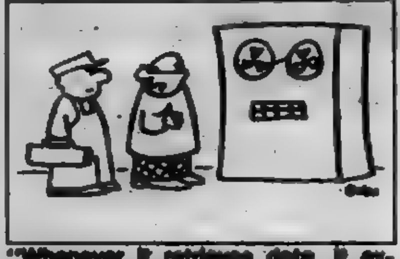
Enhancements to Basic include improved translator optimization said to enable users to specify whether the translator should take additional time to generate a more efficient object program. Additional mathematical functions supported in System/36 Basic include arc sine, arc cosine and cotangent.

Charges for all the programs remain the same.

■ IBM 8100/DPPX Case Processing System, offering support for case processing in the DPPX environment. The program is typically used for loan application processing and insurance claims processing and is priced at $4,260, a one-time charge.

■ Tape Automation for the Production Environment for VSE/SP 2.1, a tool for managing tape libraries in DOS/VSE shops. Standard and externally labeled tapes are supported. The program is priced at $2,200.

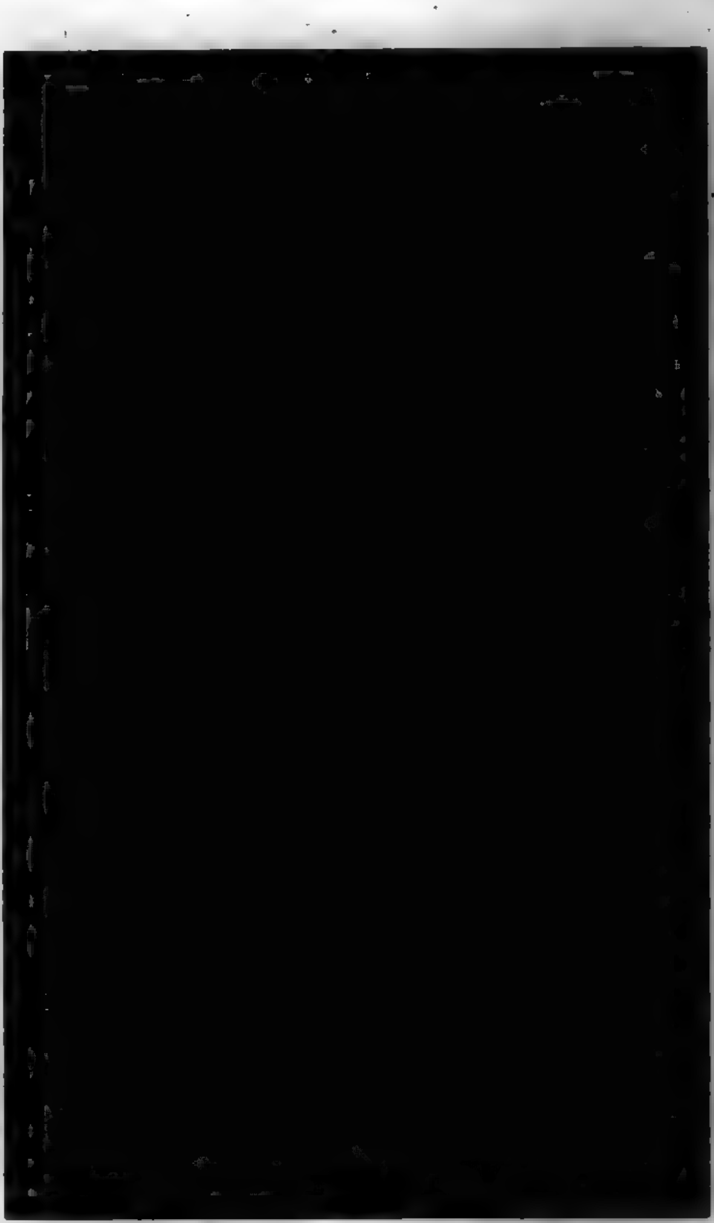
■ Data Base Migration Aid Utility, assisting IBM DB2 users and data base administrators in migrating data and data descriptions between DB2 systems. The product is priced at $4,000.



"Whenever it retrieves data, it expects a finder's fee."

Straight talk about application software packages.

"Most application software packages are functionally rich. The problem is, that's simply not enough."



While everyone agrees that packaged applications possess great potential to save time and money, you'll hear a lot of people—from MIS directors to operations managers—tell you the ones their companies have implemented fall somewhere short of satisfactory.

Typical limitations include the fact that the packages require such extensive modification that the savings they seemed to offer totally disappear. Another common complaint is that one application package fails to integrate with another. A third shortcoming, and perhaps the most common, is that packaged applications cannot be easily adapted to reflect the changing nature of the business.

You have only to look at the architecture of most of the applications currently in use to understand why these problems exist.

Many companies today depend on applications designed with technology from the 60's and 70's. Some are 2nd generation applications built without any reliance on database architecture. Others are 3rd generation applications that provide only a generalized *interface* to a database management system; in addition, many application vendors provide a common front end user interface to mask inefficient architecture. The result is that these 3rd generation applications realize only about 10% of the power of a DBMS. *And that's simply not enough.*

Without full use of the facilities of a superior DBMS, users of application software find it extremely difficult to adapt and extend an application package to their current as well as to their future business needs. And *only* when an application is built with advanced database technology can it provide the sharing of data that leads to functional integration between different application modules.

Ultimately, what's required is software that goes beyond the conventional packaged applications approach.

What's required is 4th generation applications software—software that's rich in functionality, and whose underlying architecture is built on, and takes full advantage of, advanced database technology.

Fourth generation application software is created using a comprehensive application development facility combining a fourth generation language and end user query and reporting facilities with an integrated data dictionary. Furthermore, fourth generation application packages are functionally integrated, sharing common data between independent modules. This creates an environment to easily adapt and extend an application package, and provides realtime access to all information.

Only fourth generation application software packages enable a company to realize the full potential of packaged applications.

It is clear, therefore, that all application packages of the future will be built using this technology... because it doesn't make sense any other way.

John J. Cullinane
Chairman of the Board

The only applications worth buying are 4th generation applications.

And only Cullinet offers 4th generation applications. Simply stated, our applications are a step beyond conventional applications packages because they meet these key requirements.

1. Functional Richness

Cullinet's complete line of applications delivers leading edge functionality in all areas. Whether it's our manufacturing control system, or integrated financial reporting and cost management applications, our human resource management system, or our relationship banking system, each Cullinet application is carefully designed by knowledgeable industry professionals who have a thorough understanding of application requirements. Our integrated closed-loop, net change manufacturing, financial reporting, and cost management applications provide complete multi-company capabilities accommodating the most demanding reporting and control requirements. Our human resource management system combines complete personnel reporting and payroll processing into a single system, and our relationship banking system provides a total customer information environment for today's business executive. You can be assured that a Cullinet solution can be put into production immediately to fulfill your most pressing business requirements.

2. Functionally Integrated

Businesses today demand applications to do more than address individual functions. Businesses today need applications that recognize the interdependencies within an organization—in short, applications that can share data. For example, efficient real-time, four-way matching of invoices with receiving, purchase and inspection documents can only be achieved through true sharing of data, and this sharing of data can only be achieved with an advanced database technology which delivers that integration. Redundancies are eliminated and productivity is increased when all applications dynamically reflect the operations of the organization. By sharing an architecture that provides for optimum use of an organization's information, Cullinet's manufacturing, financial, human resources and banking applications fulfill this need.

3. Easy to Tailor

Although many businesses appear on the surface to operate in a common fashion, each, in fact, is unique. Applications must therefore be built with an optimized set of tools that permits them to be adapted to a company's way of doing business, rather than having the company have to adapt to accommodate the software. Cullinet applications are designed to accommodate change. They provide the means to personalize screen layouts, capture new information, reformat reports, resequence transactions, and change messages without impacting the entire environment. Only Cullinet's applications can provide this environment for adaptability through their integration with advanced database technology. In this way, Cullinet applications give users the independence to adapt them—quickly and efficiently—to meet the unique requirements of the business.

4. Easy to Extend

As a business changes and grows, so do its needs and requirements. Cullinet provides easy to use, menu-driven facilities that permit functional extension of an application while preserving integration. An end user can quickly react to new requirements by prototyping an application functionally, developing new reports and performing ad hoc queries immediately. MIS can efficiently develop new, associated applications sharing common data and built utilizing the existing architecture. The Cullinet architecture segments the program logic, edit and validation criteria, as well as the security and recovery process, and therefore the complexity of creating new application functionality is significantly reduced.

5. Easy Access to Information

Access to all corporate information is key to any application. Because all pertinent data must be available to the analyst and decision maker, easy access to that data, *no matter where it resides*, is mandatory. Your need for information naturally crosses applications boundaries. The ability to associate detailed information about sales orders, finished goods status, and customer credit processing before release of shipments is a prime example. Only by means of Cullinet's applications, which are completely integrated with our Information Center Management System are you provided the opportunity to create an information center that is functionally complete, meeting the information needs of the company as a whole and meeting the specific needs of the operational units of the organization. Each center of functional activity within your organization is served by the system through your mainframe or PC with GOLDENGATE software. Each has access to all corporate information. Accessibility to all information—whether it's in your mainframe, in a departmental minicomputer system, or in your personal computer—makes it readily available to you for analysis through Cullinet's complete information environment.

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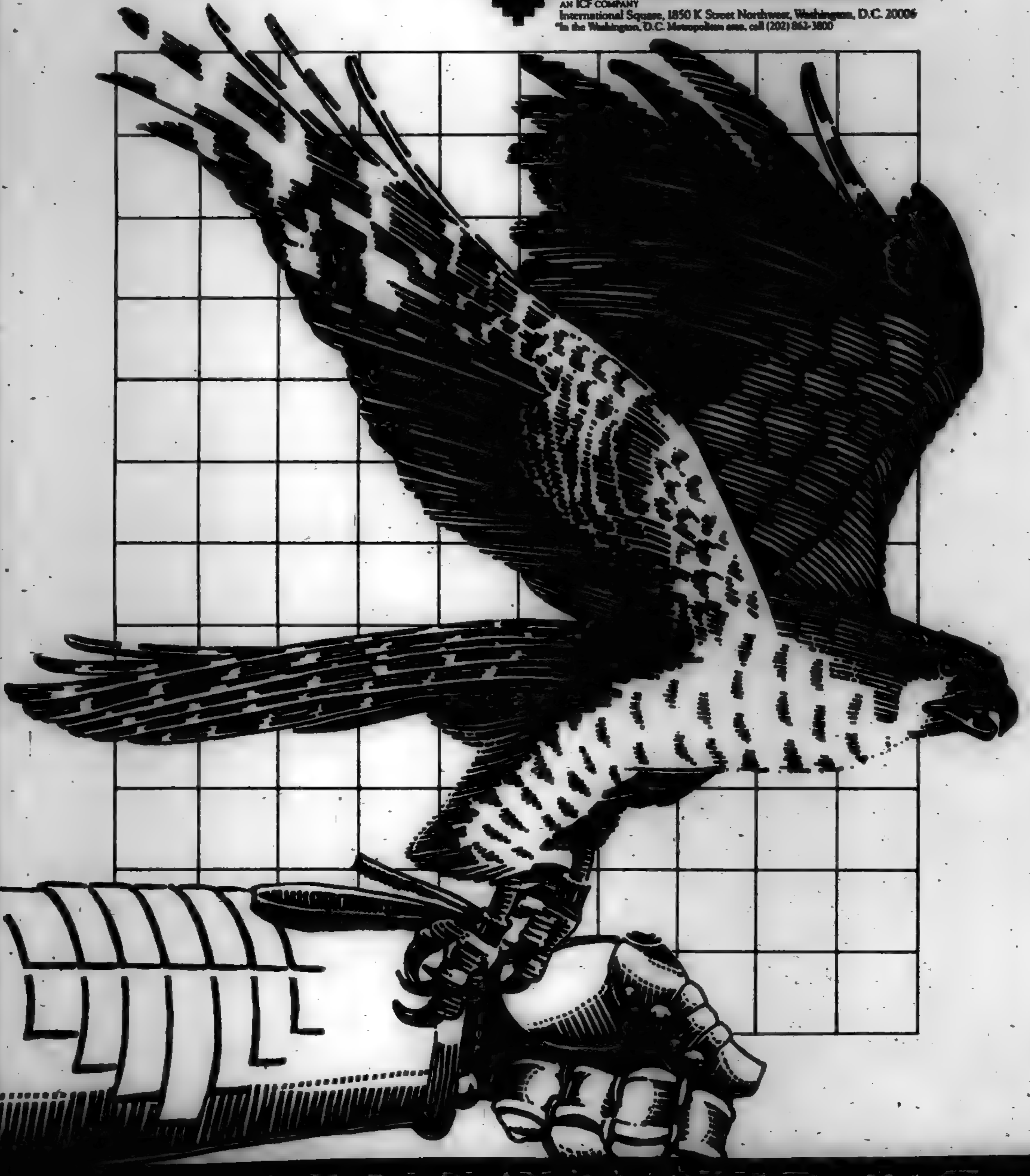

The best policy is missing deadlines — sometimes

By Meilir Page-Jones

The story of the Afghan boots shows what happens when DP meets the user's project deadline but not the user's needs.

The term *deadline* is derived from a line in a prison beyond which a prisoner would be shot if he strayed. Given this context, it is hardly an appropriate term for the estimated completion date of a project.

But its derivation may account for the terror that deadlines instill in so many managers. Project deadlines have acquired almost mythical powers in the minds of project managers. Worse still, many project members feel that the deadlines assigned to them are unrealistic. A significant number of projects fail because of a manager's fanatical devotion to an unachievable deadline.

But realistically, I have yet to see anyone's world come to an end or any project canceled merely because of a missed deadline. Projects *are* canceled for patently failing to meet users' needs in a cost-effective way — not for being a month or two late in completion.

Satisfying users' requirements effectively must be the No. 1 priority. Today more than ever, a company's DP department and the quality of the systems it produces directly affect the entire company, no matter in what business that company is.

Unfortunately, the tremendous pressure to develop software systems more quickly has simply meant that more bad systems are being turned out. In DP no less than anywhere else, you get what you pay for — a lesson I learned only too well in another part of the world.

During my youth, I spent some time in Afghanistan. A custom in that part of the world dictates that you never pay the asking price for an article in a market or a shop. You are expected to haggle, much in the same way you negotiate the price of a used car in this country.

This haggling forms the basis of an elaborate social etiquette. For expensive articles, the process may last for several hours and involve much tea drinking and pipe smoking. After a while, I considered myself to be a skilled bargainer, often leaving a shop after an hour or two with the shopkeeper wringing his hands at the low price my adroitness had forced him to concede.

Afghanistan, and the capital city of Kabul especially, is noted for the craftmanship of its boot makers. Afghan boots are made from the finest leather and are adorned with exquisite stitching along their sides. A boot maker will even customize your boots to match your taste and your feet. After he has measured you and listened to your style specifications, he will quote you a price.

When I decided to order a pair for myself, I visited a boot maker in Kabul and he quoted me a price. Remembering the custom, I haggled with him over the amount. This particular boot maker seemed to be a pushover. Within a few minutes, I'd knocked the price to less than half the original amount. I stopped bargaining only to avoid punishing him further. I paid and left the shop, chuckling at what a shrewd customer I'd been.

Poor bargain

Two days later, I returned to collect my boots. They were atrocious. The leather was poor, the fit uncomfortable and the needlework uninspired and shoddy. I complained bitterly. The boot maker shrugged and pointed to the price of 400 afghans (about $7 at the time). Then he pointed to another, superbly crafted pair of boots with a price of 900 afghans.

I immediately understood: You can legitimately bargain for a product that already exists, but you cannot safely bargain for a service yet to be performed. You can name almost any price, but the provider of the service can simply lower his quality to meet your price.

We in DP are like custom boot makers to our end users. If they drive down our estimates for our services too much, we often reduce the quality of our work to match, either deliberately or otherwise. A computer system of low quality is unlikely to be much of a bargain either for our end users or for ourselves.

Page-Jones is president of Wayland Systems Development. He is the author of Practical Guide to Structured System Design *and* Practical Project Management, *on which this article is based.*

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> *The wrong goals are being set implicitly for the overall good of the department. . . . Ironically, this approach actually increases costs — but in someone else's budget and in another fiscal year.*

In obeying the harsh dictates of an unrealistic deadline, a project manager is forced to sacrifice the care and effort that attends the development of a high-quality system. This dilemma is often ignored by DP personnel and end users alike. Indeed, at all levels of DP, an absurd notion holds that only sissies worry about quality, while "real" project managers can develop a system by any arbitrary deadline or for any arbitrary budget amount.

I recently witnessed a disturbing example of the dominance of the deadline. In a large aeronautical engineering shop, a software system was required to operate a complex piece of hardware. Because of poor planning by the general project manager, the software manager had a seemingly impossible deadline for the delivery of his system. Yet he not only succeeded in beating the deadline by a few days — he actually underspent his budget. Pleased, the project manager awarded the software manager a promotion and a large pay increase.

I asked the hardware manager what he thought of the software manager's feat. "That system's one of the worst pieces of garbage I've ever seen," he said. "It's badly designed, hastily coded, almost completely untested and inaccurately documented. I'm far from convinced that it even works correctly in all circumstances."

"Ho hum, just another poor piece of software," you think. "What's so disturbing about that?" What is so disturbing is that this particular piece of software is a component in our national defense system.

Why does a deadline so often take precedence over quality? Why is the cost of system development often considered more important than the quality of the final system, which is admittedly difficult to quantify but not hard to recognize?

Buy now, suffer later

The answer to these questions is that low-quality systems do not exact their high tolls until they are delivered and put into production. Only then is the horrendous expense of working with and maintaining such systems mainfested.

As a Swiss proverb says, "The bitterness of low quality remains long after the sweetness of low price is forgotten." Indeed, some deadline-constrained systems are so bad that it is cheaper to throw them away and start over.

Although some DP departments partition their budgetary accounting into separate cost areas, with developmental and operational costs charged back to the appropriate systems and departments, few DP shops allocate their maintenance costs correctly: In the worst cases, maintenance charges are made against a monolithic budget; priorities are settled by the user who yells loudest and most often; and no attempt is made to record the maintenance costs of individual systems.

Even in the best cases, where good financial data is available, rarely does anyone take the trouble to relate the cost of the maintenance effort to the quality of the original development work.

In short, the wrong goals are being set implicitly for the overall good of the department. If management tells you to minimize costs and tighten schedules, sadly enough the quickest way to achieve these ends is to lower the quality of the end product. Ironically, this approach actually increases costs — but in someone else's budget and in another fiscal year.

A poster I sometimes see on the walls of junior programmers' offices accurately, if cynically, acknowledges the above budgetary practice. It shows an obviously frantic person surrounded by listings, ringing phones and half-empty coffee cups. The caption reads, "There's no time to do it right, but there's always time to do it over."

Desperado

Some people make a career of satisfying short-term financial expediencies by delivering products that are on time but of poor quality. The following story describes the quick and dirty deeds of such a deadline desperado.

A contract programmer explained his views of the contract programming business to me. "I always take contracts that last three to six months," he said. "I also try to get jobs where I can code up a storm, hand over my listings right on the deadline, take the money and run. That way, if my programs blow up, I'm well away from the scene of the crime."

I replied that I didn't think it was very professional or even ethical to do a shoddy job and then abscond, leaving bug-ridden code for some ill-fated maintenance programmer to fix up. He countered that I obviously lacked the machismo to be a mercenary in the world of contract programming, with its rewards for meeting deadlines.

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Four years later, I met this same programmer again quite by chance, and I noticed most of his earlier bravado was gone. He confessed that he had been migrating back and forth between California and New York to shake off his acquired reputation for poor work: If a company hired "Sloppy Joe" for three months, it would have to hire someone else for six months to patch his code. New York and Los Angeles, he had discovered, were really small towns in the world of DP.

The DP manager's duty, as Sloppy Joe eventually discovered, is to enforce standards of high quality so that everyone can benefit. Otherwise, everyone suffers sooner or later. In developing a system, of course, time is always an unwelcome pressure, but it's worth convincing management and end users that they shouldn't set an unreasonable deadline, since there will be plenty of time to do the job right if it doesn't have to be done over.

Unrealistic deadlines

There are four major origins of unrealistic deadlines. In order of increasing justifiability, they derive from wishful thinking, the preliminary project estimates, the creeping commitment and the value step.

A deadline caused by wishful thinking is usually based on nothing more scientific than the date by which the end users would like to have their system. Some Mr. Fantasy with enough authority in the organization dreams the impossible dream, and *voila!* a deadline is set. Never be overcome by such a desire to please your end users or your own managers that you acquiesce to this type of deadline.

If a deadline is impossible to achieve, it is also impossible to derive a workable project plan based on that deadline. Therefore, much can be deduced from the project manager's planning chart. In some cases, for example, all a project manager can do is leave the project as a giant monolith on his chart.

In Figure 1, for each task in the plan, the manager allows the shortest time in which that task could conceivably be executed, given ideal circumstances, and then allows no time between the tasks for review, revision or coordination. The result is a deadline that appears to be achievable, although only under the best conditions.

This type of wishful thinking is analogous to establishing that running a mile in four minutes is possible, and then calculating that if a marathon race course is 26 miles, it's therefore possible to run the distance in 105 minutes.

Workers may be able to keep up a breakneck speed for one or two weeks, but they will not be able to sustain such a speed for the whole project. They will tire, and time will be needed for meetings and reviews as well as for carrying out changes to intermediate products. The theoretically possible deadline can't be realized in the real world.

I cannot blame end users and DP managers for wishing that software developments would proceed faster.

MITCHELL J. [illegible]

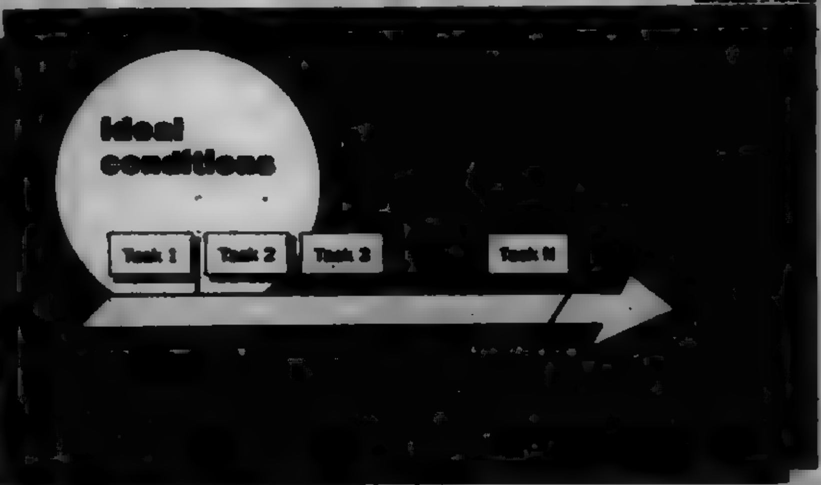

Figure 1

But there are no shortcuts to improving software development speed and productivity. The best ways to do so are to invest time and money in developing staff expertise, standardizing projects and assisting project members.

A second source of unrealistic deadlines is **the preliminary project estimate.** The earlier in the project an estimate is made, the less accurate the estimate is likely to be. A corollary to this rule says the earlier into the project an estimate is made, the more likely it is that someone will enshrine that estimate as a project deadline. Be forewarned: Mentioning a date, especially at the start of a project, with no explanation or cautions, may be regarded as an immutable, realistic goal.

The best procedure when deadlines are mentioned is to refer again to the project plan. This plan, with its dozens of task completion dates, immediately demonstrates the naivete of having a single completion date for a complex project, especially when that date is based upon only a premature estimate.

In addition, the project plan debunks a standard excuse for deadlines: that end users need them in order to prepare for installation. One trouble with a project deadline is that the end users believe they will have the system by that date and make their preparations accordingly.

If the deadline is missed, the users could be trapped between dismantling their old system and not having the new system to replace it. If the end users' needs for installation are integrated into the project plan,

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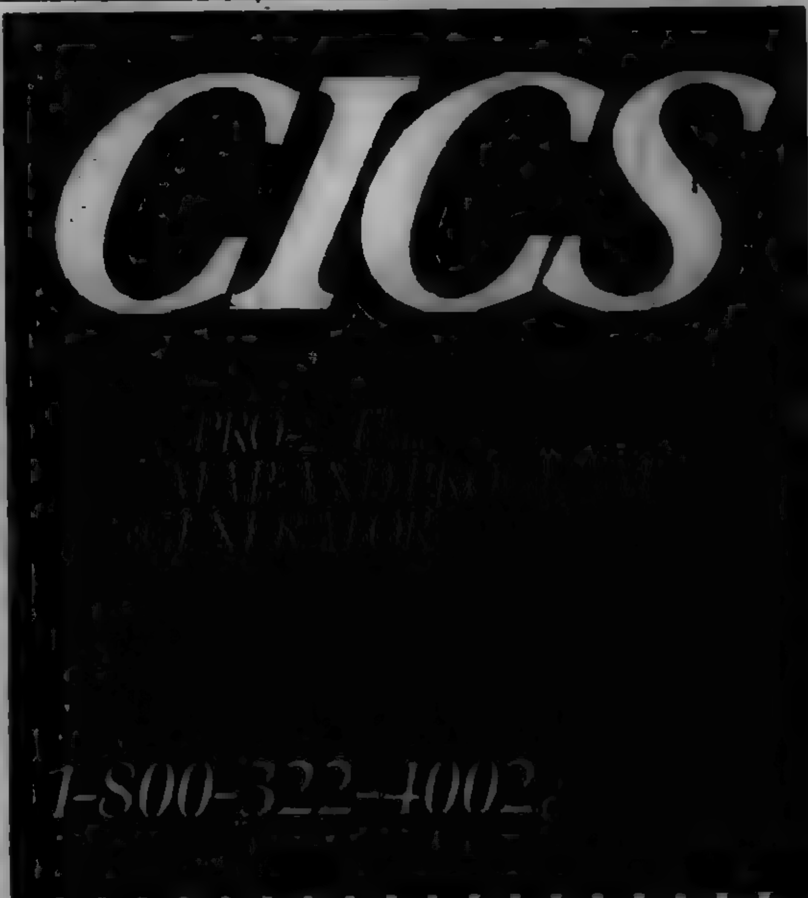

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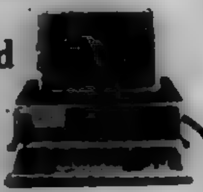

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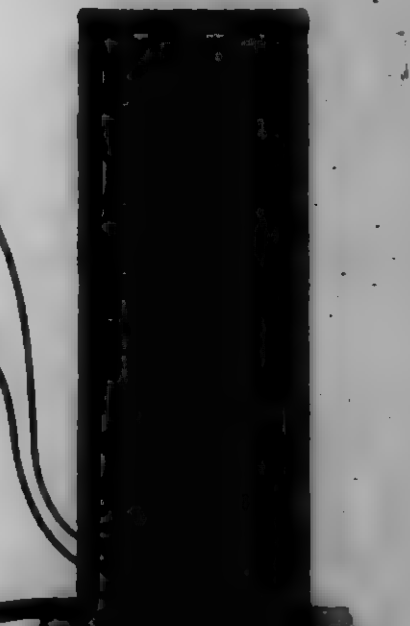


however, the details can be planned and scheduled fairly accurately as the installation date approaches.

Unrealistic deadlines can also derive from a process of incremental extortion known as creeping commitment. A user is fooled into committing to a large and expensive project by a deliberate understatement of the project's size and cost. By the time the user discovers the project's actual cost, he is past the point of no return. If he fails to come up with the extra money required to finish the project, he will lose the money he has already spent.

Obviously, creeping commitment is a devious political trick that must be kept secret from the end users in order for it to work. Often, even the project manager is not informed of the deliberate understatement of the project's cost and receives from his management an unrealistic deadline as a nonnegotiable imperative.

Creeping commitment is an infantile ploy that creates bad feelings between the DP department and the end users once the latter discover they've been duped. The correct way to win end users' commitment to a project is by showing them carefully detailed estimates of project costs and resources. Most end users, faced with an objective statement of reality, will make rational, mature decisions despite DP people's expectations.

A value step is a change, usually downward, in the value of a system on a certain date. For example, the federal government may decree that on Jan. 1, all banks shall withhold a certain portion of savers' interest for tax purposes. In this event, an automatic system for withholding interest will clearly be of more value if it is delivered on Dec. 31 than on Jan. 31. The change in the system's value on Jan. 1 is enough to make that date an irresistible candidate for a deadline.

Since a deadline based on the value step has some legitimacy, it cannot be trivially dismissed. It should not, however, be given so much sway that it imperils the conduct of the project or the quality of the project's deliverable goods. There are always alternatives.

In this case, the bank has several options other than the Jan. 1 installation of an automated system, such as persuading the government to delay or revoke its decision, using a cumbersome manual system until the automated system comes up or temporarily defying the rule and paying the subsequent fines.

Handling unrealistic deadlines

As a project manager, you are primarily responsible for debunking the mythical power of the deadline. If you find yourself saddled by your end users or managers with an impossible deadline, your duty is to minimize their harmful effects in two ways. The first is to protect your project team from destructive pressure; the second is to reflect the pressure caused by the unrealistic deadline back to those responsible for creating it.

To shield your staff from undue budgetary or scheduling pressures imposed on you, your motto should be "The buck stops here." Even if you feel such pressures, don't transmit those pressures to your staff.

Of course, this is a lot easier to say than to do. Being a DP project manager in many companies is like being inside a giant organizational nutcracker, where the pressures from above meet the pressures from below. You are stuck in the middle and would need a very thick shell to hold out in that spot for very long. In that position, many managers capitulate and force their staff members to work long hours, harangue them, blame them and generally give them a rough time in order to meet some arbitrary and impossible deadline.

Most people like to work regular hours the majority of the time, work hard some of the time and slacken off a small portion of the time. Normally, people are neither able nor willing to work in crisis mode indefinitely. A manager's pleading "crisis" too often becomes a poor motivator.

One manager who realized this effect doubled his efforts by circulating a memo: "Since the project is now in emergency mode, we must escalate our work hours until we meet the delivery date." His team did not meet the delivery date, but before the manager could find a more hysterical word than "emergency," many of his team members had asked for transfers.

Saying no

So what should you do with a ludicrous deadline if you cannot tyrannize your workers and if you yourself don't want to absorb all of the associated pressure? The only sane response for your own mental and physical well-being is to reflect the pressure back to whoever created the unrealistic deadline. That means saying no to your boss or end users whenever you are asked to agree to an unreasonable demand.

Say you've been granted 15 months to deliver a computer system that fulfills a certain set of requirements. Because of budgetary problems, your management tells you your revised deadline is 12 months, but the end users want the same system delivered and you'll get no additional staff members. The worst thing you can do at this point is to shrug your shoulders and put everyone on mandatory unpaid overtime. That's bad for team morale, bad for your own morale and bad for management, who must learn to respect reality — not to mention the effect on the quality of work produced.

When you learn of the budgetary cutback, you must look your boss squarely in the eye and say, "Only bank robbers and muggers can get something for nothing by simply demanding it. What features do you want me to cut out of the system?"

> ”
> *Being a DP project manager is like being inside a giant nutcracker, where pressures from above meet the pressures from below.*

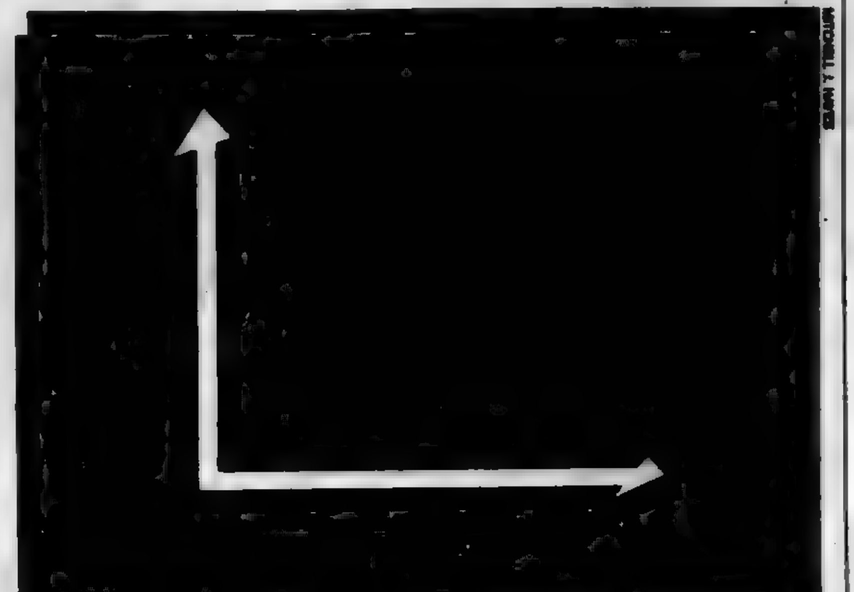
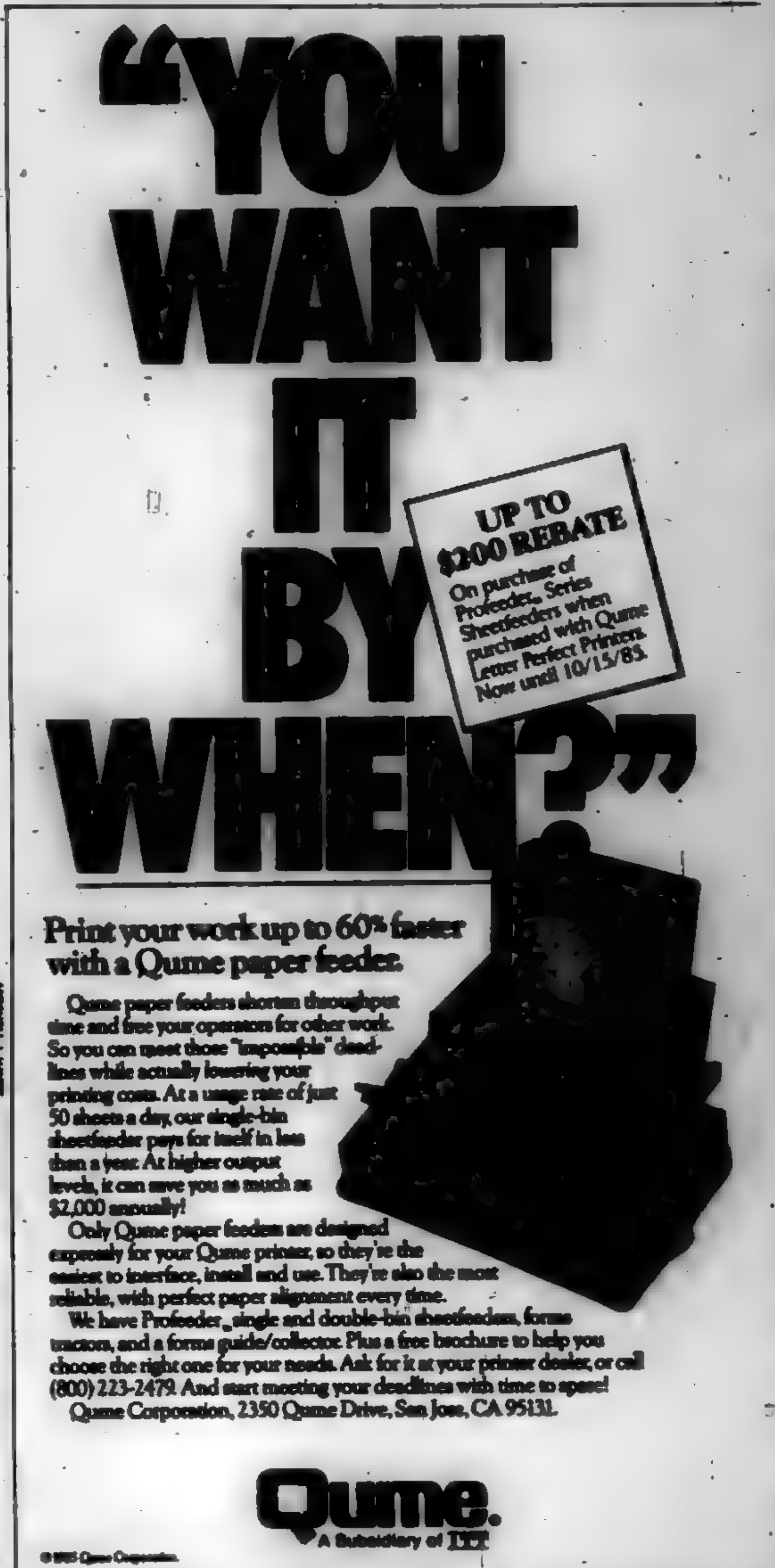


Figure 2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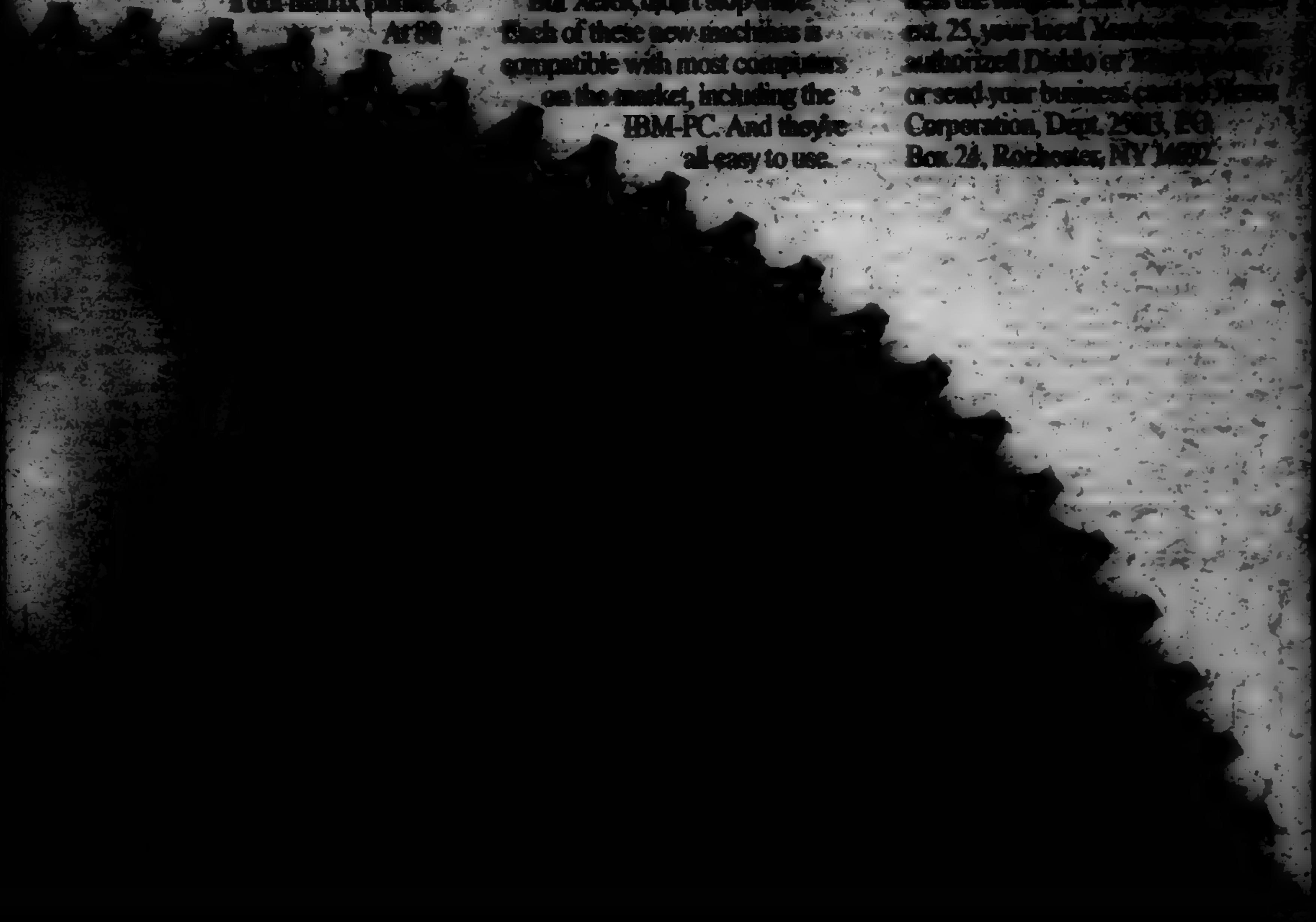

Then pull out the list of system benefits that you made at the start of the project and put your boss on the spot to make a change. Get your boss to choose what to excise from the system, and negotiate with end users to reach a compromise.

If, after a new list of benefits is developed and a new cost estimate made, the system is not deemed a wise idea, only then can the project be canceled for a good reason. In addition, you won't have to make such an important decision unilaterally.

For whatever reason, if you are forced to accept an unrealistic deadline, consider asking to be reassigned to another project. Whenever one manager I know is in this situation, he says to his boss, "If you think the project can be done in half the time that I estimate, you may be a better person for this job."

At the very least, carefully and unemotionally document your views and underlying reasons to your management and explain the situation to your staff. Otherwise, you stand to lose the respect of your staff, your peers, your management and your end users.

Saying no to bosses or to end users takes a lot of moral strength and courage. But stand firm. The manager of one disastrous project told me that the catastrophe taught him an important lesson: A project manager must always stand up for what's realistic, despite the inevitable managerial inquisition that ensues.

Legitimate deadlines

Some deadlines are legitimate because they are based on the fact that a project completed before a certain date is worth considerably more than if it is completed some time later. The total lifetime value of any system to its users depends upon when it is delivered. The later the system is delivered, the less the total amount of benefit it will produce for the users over its working life.

However, this decline in total lifetime value is relatively slow. If you deliver a system to its end users in 1985, for example, it may save them $5 million over its lifetime, but the same system delivered in 1986 may save them only $4 million.

The concept of decreasing value is represented in Figure 2. One line in the figure represents the cost of building a system, which increases as a linear function of the time required to build the system. The other shows decreasing value over time.

As these lines indicate, you can't wait forever to deliver a system. Once the two lines in the graph cross, the system costs more than it is worth. However, even when a project reaches that point, canceling it may be foolish, since installing the partial system would presumably cut the end users' losses. Much depends on how near the project is to completion.

Incidentally, the effect of reducing the quality of a system is to decrease the value to the end users of the system over its lifetime. The value may sink because the system doesn't provide many functions, because it's difficult to use, because it's expensive to operate, because it's expensive to maintain or because of any other deficiencies. So, if you opt for lower quality, you are forced to complete the project quickly. You have less room to maneuver; the point where the lines cross approaches very soon.

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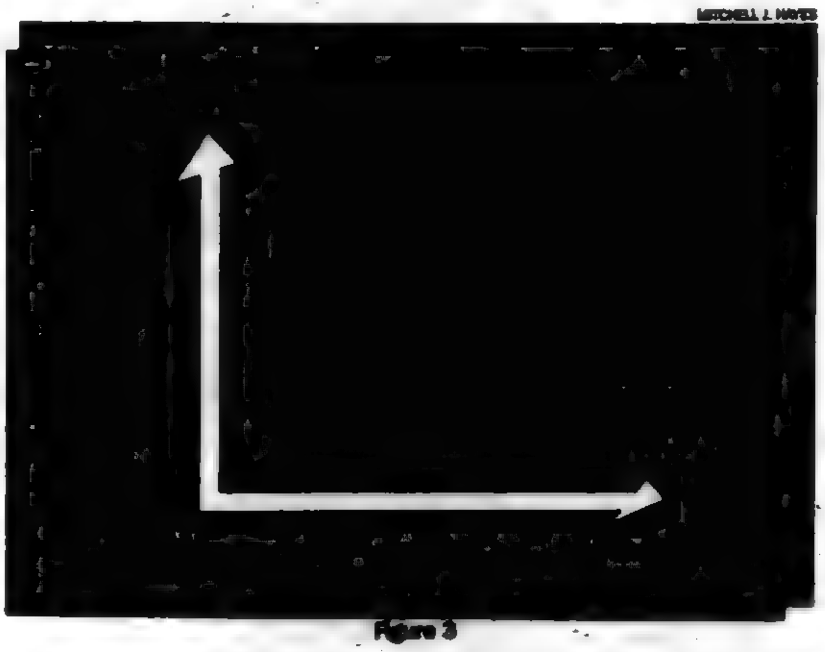

Figure 3

Although it makes little difference in the overall benefit of most systems whether they are delivered one day or the next, there are exceptions.

Horseshoes and hand grenades

One such system was an automated flood-warning system, dubbed Noah. The automated system would replace a fairly good manual system that consisted of many sensors placed in major rivers and their tributaries. These sensors measured river height, water volume per second, local rainfall and so on. The information from the sensors was used to predict possible flooding and to activate flood gates in the affected areas.

One problem with the manual system was that bad weather made it dangerous to read many of the sensors. Another was timing: Humans had trouble interpreting all the rain and river data in time to do anything useful.

The manual system typically provided four to six hours' warning to open certain flood gates and to evacuate designated areas. With the automated system, the information would be fed into a computer for quick analysis and then would give an expected eight to 12 hours' notice.

In the region of the country where Noah was to be installed, there were two primary flood seasons: one in November and December and the second in March and April. To gain the most benefit from the system, a deadline for installation of Nov. 1 was set. The project team installed the hardware by mid-October, had the hardware and software talking to each other during the last week of October and delivered the system on Nov. 1 as planned.

Natural test case

Unfortunately, there was no time to test it, except for the most straightforward test cases. About a month later, Mother Nature provided a boundary value test case by dumping three to five inches of rain in one day on the district covered by the sensors.

The system performed magnificently, indicating to the authorities which areas should be evacuated and when and advising the authorities to open the gates on river A to allow water to run off via river B. The authorities carried out the system's instructions with alacrity.

The first indication that something was amiss came from an old man who had lived his whole life on the banks of river B. He telephoned to say that the river was rising about a foot an hour and was already spilling over its levees in several places. He added that everything had been OK until "some darn fool opened the gates upriver." Fortunately, not much damage was done. The greatest expense was the evacuation of hundreds of families from areas untouched by floodwaters.

As you may have guessed, the system was close to being done but not quite close enough. The cause of the erroneous advice lay in program bugs. But these were bugs of the worst kind: They gave reasonable data that was dead wrong. The end users didn't trust the system fully for several more years, during which time a parallel manual system was also operated. How much money the automated system has cost the end users is not on record.

The value of this type of system can't be represented by a straight line, since the value falls sharply each year between the two flood seasons (Figure 3). But even in this case, setting any one of the steps on the value line as a deadline may prove to be a false goal. As always, the cost of a poor-quality system far exceeds the benefit of installing it before the apparent deadline of the flood season.

A compromise strategy

When such steps in the value line of a system occur, is there some way to take advantage of them without jeopardizing the quality and, hence, the benefits of the system? There is, since most systems are composed of subsystems that each have their own value and cost lines.

Implementing only part of a system is often a good way to avoid the full loss of system value on a certain date. If you identify a date as a possible deadline, first ascertain whether there is any significant advantage to delivering the system on or before that date. If there is an advantage, then determine the minimum portion of the system that can be implemented to accrue the maximum benefit.

Finally, plan a strategy whereby you can deliver the needed piece by the crucial date with the least possible risk to the project and to the final system. Four strategies can help develop the requisite pieces in time: incremental implementation, radical development, throwaway code and prototyping.

Incremental implementation

Incremental implementation simply means constructing a system gradually in pieces. First, a small working portion of the system is implemented; then the other pieces are added to the working portion, one by one, until the system is complete. Throughout its implementation, the system operates, and its functionality increases as pieces are added. Some versions of the growing system may even be useful enough to deliver to the end users.

To illustrate how you could exploit incremental implementation to deliver certain functions by a given date, let's return to the flood warning system. As the project manager, you might propose this as a feasible schedule:

Oct. 5 — Install rain gauges.

Oct. 17 — Install river sensors.

Oct. 20 — Connect gauges and sensors to the computer.

Oct. 26 — Add software to read and control gauges and sensors (call this subsystem one).

Nov. 5 — Conduct acceptance test of subsystem one.

Nov. 8 — Add software to predict flooding from river flow data (subsystem two).

Nov. 30 — Add software to predict river flow from rainfall (subsystem three).

Jan. 8 — Add software to compute best flood-relief tactics (subsystem four).

May 15 — Conduct acceptance tests of subsystems two, three and four.

This is not an ambitious schedule. By the beginning of the November/December flood season, only subsystem one is installed and tested.

In practice, each piece of software is not added all at once. Small pieces of code are added incrementally to the test system under a plan derived from the software design. In this way, system testing proceeds constantly on the gradually growing system.

Although this first piece of software is limited, it provides some advantages over the manual system. Much more data can be captured without personal risk, and the data can be continually checked for plausibility against some sample manual data.

While adding software subsystems two, three and four individually to the system, the project team tests them as thoroughly as possible. The objective of this testing is to detect errors in the design and programming of the software.

Acceptance testing doesn't take place until May 15, when a large amount of data can be compared with the actual fluctuations of the rivers over the period. In a system such as this one, the ultimate test of the acceptability of the system is whether its predictions are confirmed by reality.

This incremented implementation of the completed system doesn't seek to deliver as much software as possible, tested or not, by a certain deadline. Instead, it aims to deliver a system worth having, with some working parts in place at the beginning of flood season, even though the system cannot be accepted as reliable in its entirety until May at the earliest.

Radical development strategy

A second strategy to meet a deadline is radical development, which involves designing and implementing parts of a system without having completed the analysis of the whole system.

Radical development is a risky way to develop a system, because the analysis of the final portions of the system might require design and/or programming changes to the software already installed. Redoing work can be expensive.

There are three criteria for choosing when to use radical development:

- If there are functional pieces of the system that can be analyzed, designed and implemented reasonably by a certain date.
- If implementing those pieces of the system by that date brings substantial material gain.
- If enough analysis (in addition to that for the pieces being implemented) can be completed to minimize radical development because the method chosen is extremely difficult to manage and tends to reduce the quality of the system that is produced.

Other deadline strategies

Throwaway code is a third alternative: simply lash together some quick and dirty code as a temporary measure. This code could lack some desirable qualities, such as maintainability, but it must be correct. Of course, you should write as little of the dirty code as it takes to do the job, because this code will be replaced eventually by properly constructed code.

Prototyping, the fourth strategy, is similar to throwaway code as a solution to meeting deadlines in that it produces a temporary system. Prototypes are constructed from high-level languages, from data base query languages or by means of an application generator.

Such a system usually cannot be operated in production indefinitely because it may suffer from machine

> ”
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> *Once the code is up and running, people tend to gloss over how bad it is in order to push on with the next pressing problem. . . . The only right way to install throwaway code is to have a plan that dictates how to develop its replacement and when to discard it.*

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> *After a few months, nobody remembers if you made the deadline. But if you turn out a bad system, you keep getting phone calls from somebody who's mad at you.*

inefficiency, awkward dialogue, inconsistency with interfacing subsystems or poor long-term maintainability.

The third strategy, and the fourth to a lesser extent, need to be used with caution since each involves throwing something away. Unfortunately, "temporary" has a way of becoming "permanent," as in Europe, for instance, where temporary housing built shortly after World War II is still occupied.

It's the same way with code. Once the code is up and running, people tend to gloss over how bad it is in order to push on with the next pressing problem. The quick and dirty code becomes older and dirtier and becomes someone's nightmare in perpetuity. The only right way to install throwaway code is to have a plan that dictates how to develop its replacement and when to discard it.

Big risk, small payoff

The deadliness of deadlines takes effect in three ways: by destroying the project manager's control of his project; by ruining the quality of the project's deliverables; and by demotivating project staff.

But professionals continue to believe in the magical quality of deadlines. A talk that I once gave on abolishing deadlines was followed by silence punctuated by nervous shuffling of feet and embarrassed coughing. After all, I'd just proposed to demolish the one abiding custom for managers in this ever-changing world.

Eventually, a question was voiced: "Haven't you heard of Parkinson's Law, which states that work expands to fill the time available? If you take away the deadline, the project team will lose all incentive to work, and the project will go on forever."

In advocating the removal of monolithic deadlines, I'm certainly not proposing to remove every deadline and thus have every project expand infinitely. Nor do I recommend that a project be allowed to continue indefinitely in the futile promise of some forthcoming gem of perfection. A project must be conducted under the firm regimen of a project plan, with the staff completing tasks on time. If schedules for tasks slip, you must know the reasons why. If the reasons are valid and the delays unavoidable, let the schedule slip.

Obviously, you should try to minimise such slippage as much as you can. Since you shouldn't run a project like a leisure resort for team members, you're certainly justified in applying extra pressure occasionally to get the job done. But to take the rigid line that no project slippage beyond the deadline is permissible under any circumstances is ridiculous. You cannot simply ignore perturbing factors that change the project plan, and such managerial inflexibility results only in casualties to your project team and to the project itself.

Meeting a deadline for its own sake is often a gamble, with quality as the stake and precious little as the payoff. One of my seminar attendees put it well when she said, "After a few months, nobody remembers whether you made the deadline or not. But if you turn out a bad system, you get a phone call three times a week forever from somebody who's mad at you." Or as Thomas Jefferson said, "Delay is preferable to error."

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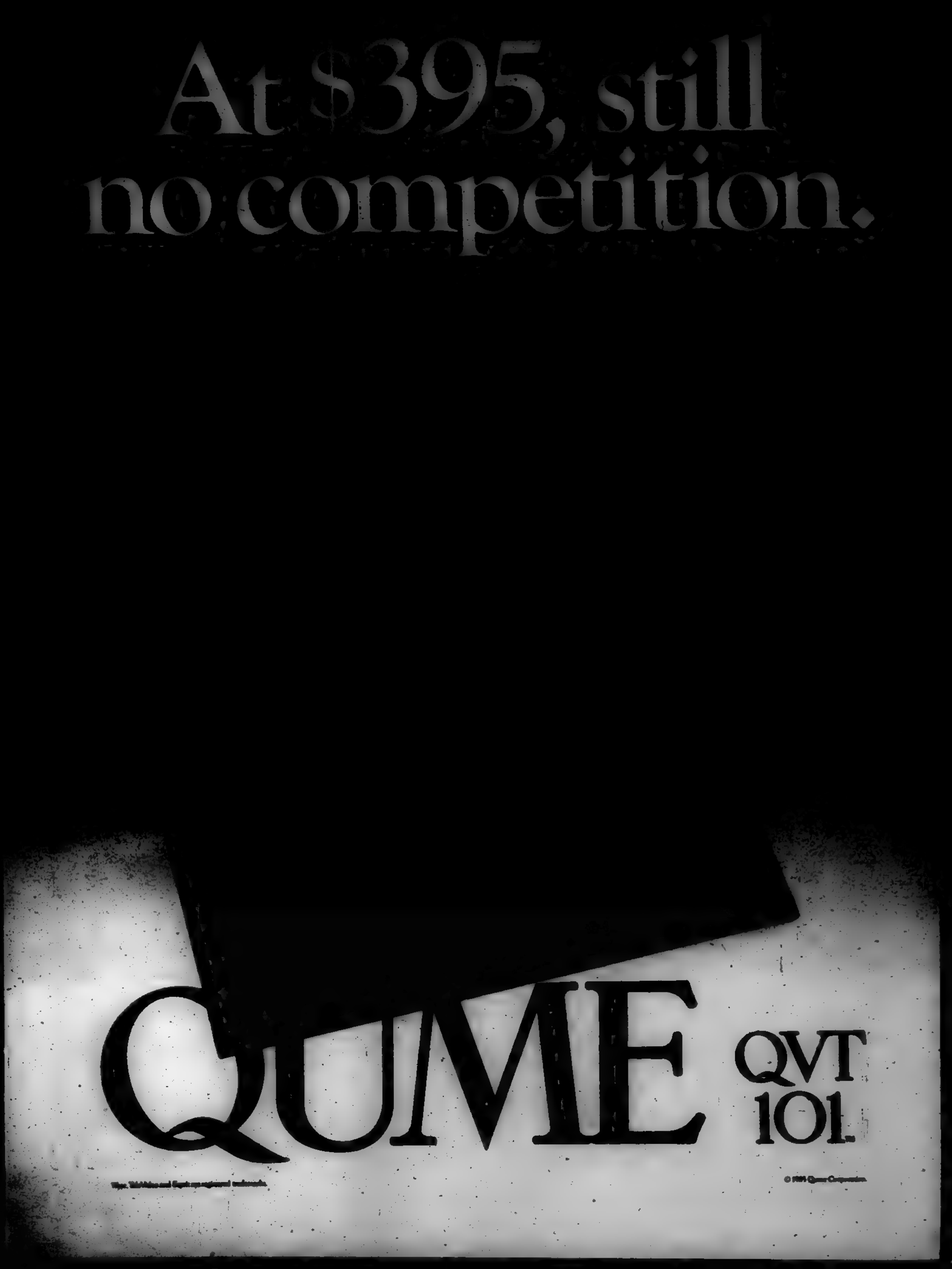
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RJE REACHES FOR THE UPPER HAND

PHOTO BY P. CHARLES LAGOUDAS

By Isaac Kong

3270 communications are in vogue among end users needing access to mainframe data. As DP management becomes more involved in the selection of links, solutions involving remote job entry may come out on top.

Micro-to-mainframe communications is a hot topic among end users throughout the industry these days. It is also an area gaining increased attention from data processing and MIS management, whether by choice or by "force" through rising end-user demand.

Newcomers to the field will quickly notice that in those installations where remote personal computers have already been linked to host systems, 3270 communications is the preferred method so far. In fact, the marketplace is currently bursting at the seams with emulation products that promise to turn the lonely personal computer into a communicating, file-transferring 3270 terminal stand-in.

To DP managers who have retained some perspective, it may seem strange that 3270 communications have gained an upper hand over remote job entry (RJE), the method originally developed by IBM to transfer bulk files between a host system and a remote device. Most people familiar with data communications from the mainframe end would agree that RJE is more efficient than the interactive 3270 protocol for file transfer applications.

So why has 3270 prevailed? A number of reasons apply, but most of them stem from the fact that the end-user community is most familiar with data communications from the terminal end. To date, the implementation of micro-to-mainframe communications have been driven by the end-user community, not by the DP shops, and historically, end users have preferred 3270. But by so doing, the most efficient way to transfer files has been somewhat neglected.

This situation is about to change, however. DP centers have always chosen RJE to transfer large amounts of data. As DP managers become more involved in evaluating and selecting micro-to-mainframe communications products, the tide is likely to shift toward RJE-implemented solutions. As increasingly sophisticated micro-to-mainframe applications are developed, RJE's advantages should become more evident.

Personal computer users currently prefer 3270 communications because so many of them are familiar with the protocol, having used 3270 terminals in the past for mainframe access. As long as current emulation products simply "turn a personal computer into a 3270 terminal" as the advertising says, there would seem to be no reason to change protocols.

However, there are good reasons to consider change. Micro-to-mainframe communications is an evolving applications area. The simple 3270 emulator is rapidly being replaced by micro-to-mainframe links that integrate the emulation function into the personal computer application itself. With these links, the actual communications process is transparent to the end user, who only interacts with his personal computer applications program.

Factors no longer apply

Thus, the primary factor for choosing the 3270 protocol — the fact that the user is familiar with the process — no longer applies. Once micro-to-mainframe communications become a user-transparent feature of the application, network implementers and designers will be free to use the most efficient file transfer mechanism available: RJE.

After all, the 3270 protocol was developed by IBM for on-line, interactive inquiries by a dumb terminal. Personal computers, of course, are intelligent devices that should not be demoted to dumb devices. Furthermore, if a micro application requires mainframe data, it typically needs to receive complete files, whereas 3270 communications were developed to send single pieces of information in answer to simple inquiries.

The historical context that has shaped the current evolutionary stage of personal computer communications illustrates the point even more clearly.

The 3270 protocol was initially designed by IBM for on-line, interactive mainframe communications with nonintelligent terminal devices. Local 3278 or 3279 terminals were hard-wired to the mainframe

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Isaac Kong is president of Network Software Associates, Inc. in Irvine, Calif. In 1977 he became the first to implement SNA communications outside of IBM.

via a special controller. In addition, 3270 terminal clusters could be installed in remote locations and query the mainframe over telecommunications links.

Needed: more data

As users began expanding the applications for 3270 communications, requiring the transmission of greater amounts of data, the 3270 data stream proved inadequate to handle the increased requirements. Therefore, IBM gradually enhanced the data stream and eventually bypassed it altogether with a new 3270 feature called Structured Fields.

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> *The 3270 protocol was deemed the solution to mainframe access needs — never mind that it was grossly inefficient at transferring large files.*

This feature lifted the limitations on how many control characters could be embedded in the data. A special character signaled that the characters that followed were more control characters, not data. Thus the terminal gained more control over the data it received and could operate more efficiently.

However, most 3270 emulators available today for personal computers do not use Structured Fields. They rely on the 3270 data stream to transfer files, which is something the protocol was never designed to do.

Moreover, to use the 3270 protocol at all for bulk data transfer, a separate mainframe program product must be purchased to run under CICS or TSO. Such software products are not part of the standard package. They are available from IBM and other suppliers, but incompatibility problems can arise with some of these outside alternatives.

The Personal Computer

When IBM developed the Personal Computer, it was a totally end-user-oriented product from the very start. It was even designed by an end-user-oriented development group in a totally new division — the Entry Systems Division (ESD).

Once the Personal Computer gained widespread acceptance by the end-user community and these end users began demanding access to centralized mainframe data, it is not surprising that 3270 communications was what came to mind first.

It should be noted that IBM offered both RJE and 3270 emulation for the Personal Computer. However, due to prior familiarity, 3270 was embraced by the end-user community, while RJE was not. The 3270 protocol was deemed the perfect solution to end users' mainframe access needs — never mind that it was grossly inefficient at transferring large files.

RJE, on the other hand, was designed by IBM to do exactly what most users really want from a micro-to-mainframe link: bulk data transfers.

The obstacle to RJE's acceptance at that point was a lack of visibility. After all, RJE was something that belonged in the domain of the DP department. Even though RJE was available for the Personal Computer, end users did not understand its benefits and opted for a 3270 solution.

To understand the underlying superiority of RJE, one needs to trace some additional history. In the early days of mainframe computers, all I/O to and from the mainframe was accomplished via punched cards and printer output. The system software drivers for card readers, card punchers, printers and so on were very slow because a lot of processing had to be done "on the fly."

System changes

Under the OS mainframe operating system, the Hasp subsystem was developed to spool these card and print images onto disk and thereby speed up the entire I/O process.

As an alternate solution to the I/O bottleneck, the Asymmetric Multiprocessing System (ASP) was developed to couple two or more mainframes together. One handled the I/O functions while the other or others handled the "number crunching."

OS underwent a number of

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> *Under RJE, IBM provides everything required to implement the link from the mainframe side. A complete set of systems utilities enable the host to read files from a remote personal computer or to write files out to the remote device.*

changes and ultimately gave rise to the MVS operating system. Under MVS, Hasp evolved into a new product called JES2, while ASP evolved into JES3. Both expanded the concept of off-loading mainframe I/O functions.

In contrast to Hasp, which was a separate subsystem, JES2 and JES3 were integrated into MVS itself, taking over some of the system tasks normally performed by the operating system.

Under IBM's other mainframe operating system, DOS, the Power subsystem was developed to provide JES-like functions on DOS systems.

With the later introduction of IBM's Systems Network Architecture (SNA) and IBM's implementation thereof, called Vtam, support was provided for the remote entry of jobs, appropriately dubbed RJE by IBM. The concept of I/O off-loading had now spread to incorporate remote I/O devices.

RJE was initially used by such remote devices as the IBM 2780, the IBM 3780 and the IBM 3770, which were bulk card- and report-transfer devices. These terminals used RJE to communicate with JES2 or JES3 (under MVS) or with Power (under DOS).

Later, RJE was further enhanced to minimize transmission time. IBM added other features such as data compression and compaction to RJE, greatly increasing overall transmission throughput.

The net effect of this evolutionary process is that RJE has as its roots a batch process, not an interactive one, since the transfer of bulk files is a batch operation. It is important to understand that IBM essentially had two parallel evolving "product lines," 3270 for interactive applications and RJE for bulk transmissions.

Via JES2, JES3 or Power, bulk files can now be transferred from a remote personal computer to the host or vice versa. The personal computer must, of course, be equipped with an emulation package so that it appears to the host as a standard RJE workstation, just as a personal computer must emulate a 3270 device for 3270 communications.

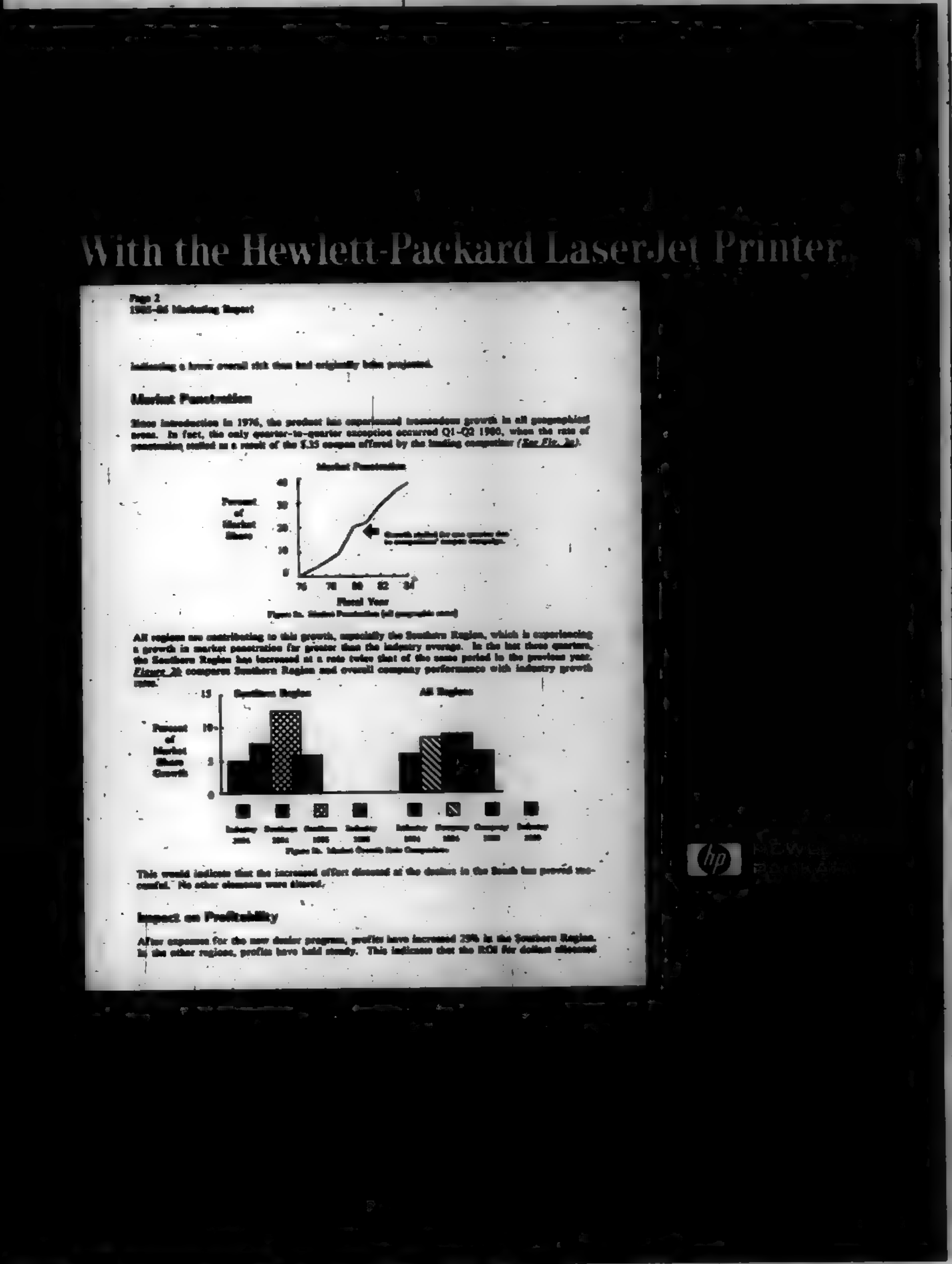
An important difference is that under RJE, IBM provides everything required to implement the link from the mainframe side. A complete set of systems utilities enable the host to read files from a remote personal computer or to write files out to the remote device. One example is the Iebgener utility, which will move a file from source to destination.

These utilities are available as standard features in most IBM mainframe installations. Under MVS, JES2 itself is a standard feature of the operating system, not an option. The 3270 file transfer requires optional program products on the host.

Mini-to-mainframe

It is interesting to note that in the area of minicomputer-to-mainframe communications, RJE solutions are more often used. IBM's 8100 and 4300 series, Series/1 and System/34, 36 and 38 are all set up to use RJE for mainframe communications tasks.

Within IBM, minicomputers fall under the Systems Products Division, which never has been allowed the freedom or entreprenurial orientation found in the heyday of ESD. ESD was allowed to go in its own direction, and hence the Personal Computer (and the third-party products developed for it) was driven by end-user demands rather than DP management demands or, for that matter, Big Blue's guiding hand.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> *More RJE emulation products will become available as micro-to-mainframe applications become more powerful and as DP departments take a more aggressive role in the evaluation and selection process.*

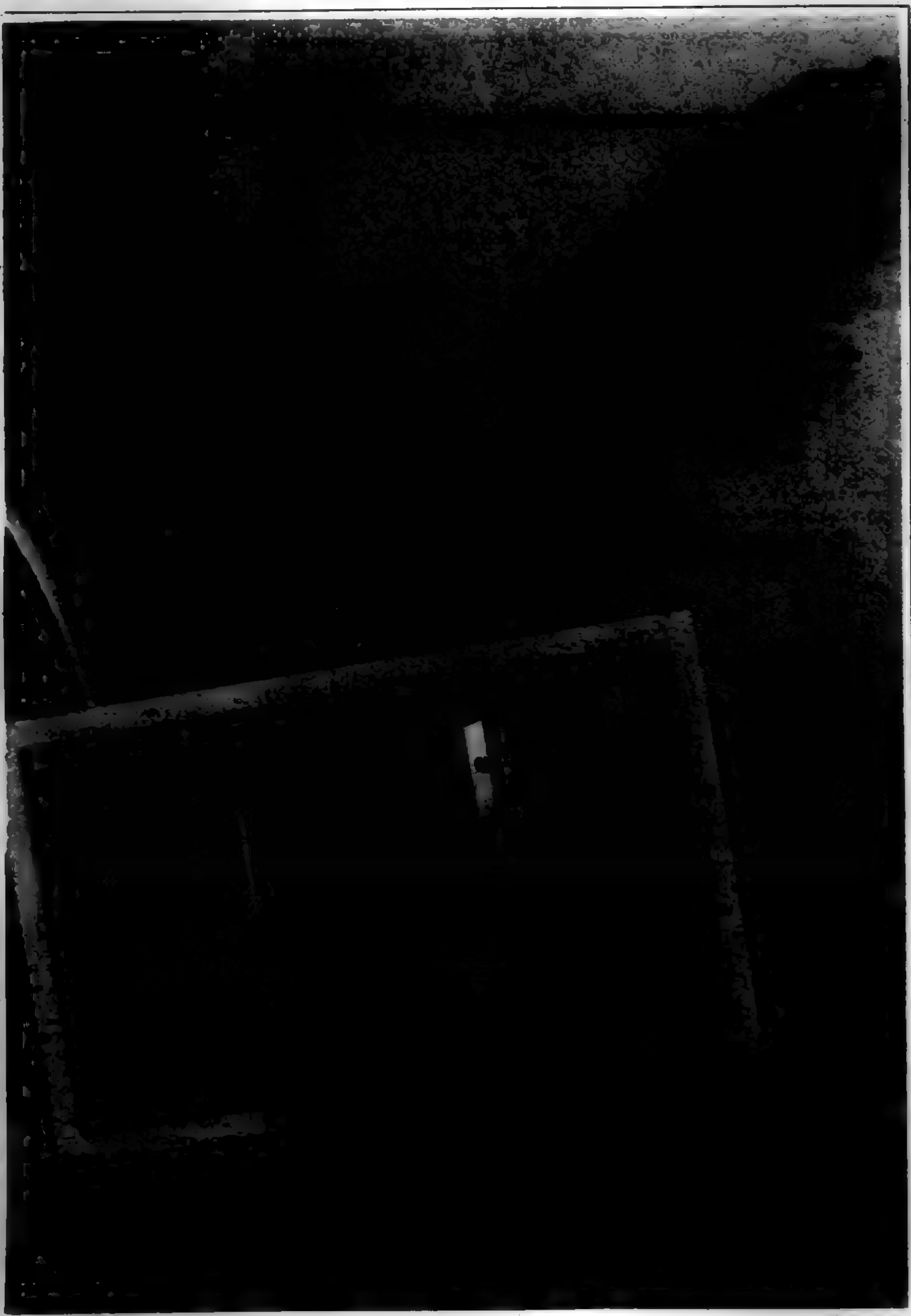
Therefore, minicomputers tend to communicate with the host via the RJE protocol that management prefers, while personal computers often use the 3270 protocol that end users demand.

As the Personal Computer family becomes more powerful and continues to take over applications traditionally reserved for minicomputers, it will increasingly take on a minicomputer's functions and characteristics. These traits include the minicomputer's method of communicating with a host installation, implying once again an overall swing toward RJE.

An important related development affecting the future of micro-to-mainframe communications lies in IBM's introduction of Logical Unit 6.2 (LU6.2). This SNA feature has received much press attention lately, but in terms of solving today's problems, it is not yet a viable alternative.

The LU6.2 specifications include the capability for a very high level of integration between the personal computer and the host in a micro-to-mainframe link. With LU6.2, a personal computer program will be able to exchange information with a host by updating or extracting only those data elements that are needed. Thus, the applications will no longer require complete file transfers.

Today, however, LU6.2 is only a pipeline between the host and the personal computer. The program products needed on each end of the pipeline to drive the extraction process are not yet available. Therefore, while DP management needs to plan toward LU6.2 solutions, all the pieces are not yet in place. Most industry experts predict that such program products are some time away from being generally available.



RJE solutions

In meeting today's challenges, then, it appears that DP management will increasingly look toward RJE solutions. Predictably, more and more RJE emulation products will become available for the Personal Computer family, as micro-to-mainframe applications become more powerful and complete and as DP departments take a more aggressive role in the evaluation and selection process.

As the awareness level concerning the need for more efficient file transfer capabilities continues to rise, vendors will undoubtedly develop ever more sophisticated RJE packages for personal computers. And this surely will help the personal computer live up to its potential as a powerful distributed processing machine.

Under RJE, personal computers remain peers in a network of intelligent devices, able to off-load the mainframe effectively. They are not reduced to merely emulated dumb terminals, contributing to the workload of the host while delivering little if any network functionality.

When this last evolutionary step occurs, the personal computer will finally become an organizational productivity tool in addition to its already proven abilities as a personal productivity tool.

Special Report

Computerworld
September 30, 1985

Minis and Small Business Systems

Off-the-shelf technology catches on

Inside:

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Ready-made components and miniaturization reshape the mini classics

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Minicomputers adapting to users' needs

Size, ready-made components key to success

By Tom Henkel
Special to CW

Minicomputers have proven to be about as adaptable as the cockroach when it comes to surviving in a sometimes hostile environment. Said to have been bordering on extinction for at least five years now, minicomputers — even some of the traditional 16-bit variety — continue to thrive.

Perhaps two of the best examples of the ability of minicomputers to survive are the top-selling versions of the 16-bit genre of systems — IBM's Series/1 and Digital Equipment Corp.'s PDP-11 series. Both systems, still being manufactured, have been around for nearly 15 years. But a side-by-side comparison of the original PDP-11 and Series/1 models with those currently available from DEC and IBM would reveal that, from a design standpoint, the name tags are probably the only thing the machines have in common.

Miniaturization has allowed both IBM and DEC to reduce the size of the systems. Furthermore, both companies have been able to consolidate what used to occupy several CPU boards down to one CPU chip. Consequently, each manufacturer has been able to develop modern systems that take advantage of nearly 15 years' worth of software development and specialized peripherals.

Moving toward compatibility

A closer look at current minicomputer architectures will also reveal that vendors are placing more emphasis on compatibility with industry standards. Minicomputers grew out of the days when manufacturers strove to design unique system architectures that tended to lock the user into one product line. Today, most small systems manufacturers push for compatibility with as many industry standards as possible and try to use off-the-shelf components when possible.

While any salesman worth his salt will tell you this change was brought about by the vendor's concern for the user's migration path, the underlying reason is largely economic.

The research and development and manufacturing costs associated with a system using a unique CPU and operating system are prohibitive for most manufacturers — especially small systems makers concerned with keeping production costs to a minimum. However, the use of off-the-shelf components has become popular with larger manufacturers as well. Larger companies appear to be funneling development money for enhancement of larger systems, while acting, in essence, as systems integrators on smaller units. Again, this approach keeps development costs low, and the vendor can use the benefits of volume components purchases to reduce end-user costs. Basically, small systems have become a commodity to many manufacturers.

IBM, for example, has used this technique on the Personal Computer. There is little in the Personal Computer, other than IBM's expert marketing talent, that is homegrown. IBM instead has channeled its R&D efforts to larger, potentially more profitable projects such as the 3090 series of mainframes announced this past February. Burroughs Corp. has employed a similar technique. In the past year, Burroughs has staged an internally driven redevelopment of its upper end systems by announcing the A 3, A 9 and A 15 series of processors. But it relies heavily on Convergent Technologies, Inc. for its low-end systems.

This trend toward off-the-shelf components has, in a way, left minicomputer development in the dust. Microprocessors are so inexpensive, and lately, with powerful products like Motorola Corp.'s 68020 and National Semiconductor Corp.'s 32032, the need to stage an internal development at the low and mid range has become less profitable and therefore less desirable. But the trend has also opened a window for start-up companies.

Clearly, if IBM can buy microprocessors from Intel Corp., any number of smaller companies can do the same. Consequently, any successful small system produced by a major vendor is quickly followed by a slew of look-alikes from smaller companies. The end result seems to be a boom-or-bust sort of industry where in a relatively short time, perhaps a two- or three-year period, a product is announced, becomes successful and breeds a string of start-up companies making look-alike products. The market then becomes saturated with a given type of product and sales decline, forcing many companies out of business.

Henkel is a senior researcher at the Yankee Group, a Boston-based market research firm.

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Superminis: Dynamic machines evolving to new uses

Moving into OA, distributed DP areas

By James Connolly

No one can say with certainty who coined the word "superminicomputer" and to what systems he meant it to apply, but a consensus is emerging that a supermini is nothing more than a minicomputer — a high-end mini, but a mini nonetheless.

A 32-bit architecture was a key qualification for supermini status back around 1977, when companies such as Digital Equipment Corp., Prime Computer, Inc. and Data General Corp. were introducing their first superminis. That architecture gave superminis more than twice the processing power of 12-bit and 16-bit machines.

"But supermini classification isn't a discontinuous event, just the high end of the market. It's a continuous process," according to Peter G. Jessel, director of business group planning for DG.

'Permeate the entire spectrum'

"If you were to use the 32-bit standard as the definition for a supermini today," he said, "it would permeate the entire spectrum of computers, from $10,000 to $300,000 or $400,000."

The supermini field — the world of high-end minicomputers — touches on the 32-bit supermicro class at its low end and reaches up toward the IBM mainframe world at the top. It is a constantly changing area. Supermini vendors have taken the lead, for example, in breaking out with new technologies such as parallel processing.

The market remains dynamic, despite the onset of industrywide consolidation, with new vendors introducing new systems and with superminis shifting away from their roots in the scientific and engineering fields and toward a future in office automation and distributed processing.

Office automation applications are the fastest growing in the superminicomputer field, according to a recent report by International Data Corp. (IDC), a Framingham, Mass., research firm. The IDC report, "Supermini User Software Trends: Past, Present and Future," said 21% of the supermini sites surveyed supported some type of integrated office automation in 1984. IDC expects that figure to rise to 40% by the end of 1985.

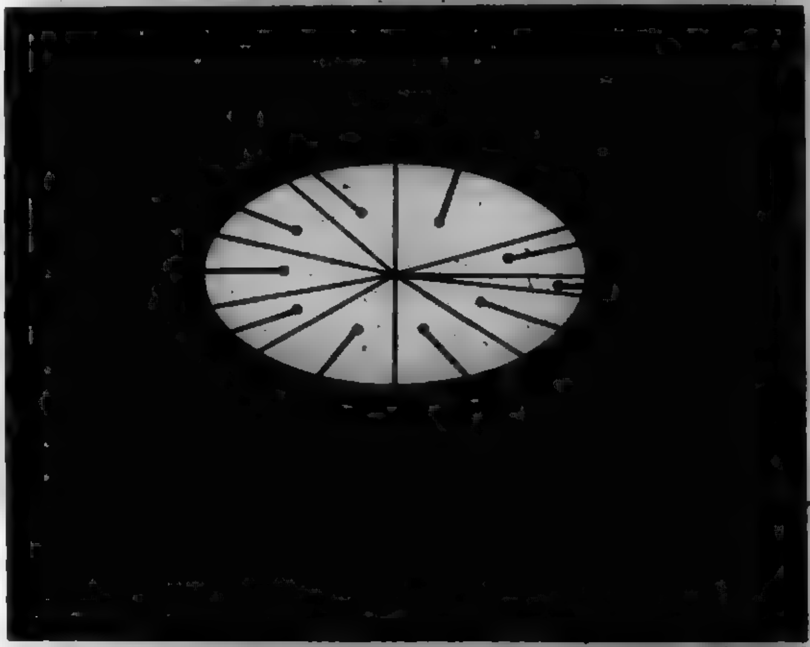
Accounting applications most common

In the study, IDC also found that the most commonly mentioned application running on superminis was accounting — cited by 20% of the respondents — followed by software development, word processing and industry-specific applications.

Most respondents also reported that they ran data base management packages on their superminis. The report noted that the spread of those packages may be the result of a trend toward bundling the software with the machines. Scientific and engineering programs, a prime market for the early superminis, were mentioned by only 10% of the respondents.

"Over the past few years the supermini market has pushed beyond its traditional boundaries," the report stated. "At one time, superminis were predominantly found in scientific environments; today, they also have a strong presence in the corporate world. With their increased power and flexibility, superminis are taking on the general business applications once handled by mainframes or minicomputers."

Jessel concurred that the supermini is no longer considered a strictly scientific or engineering machine. Examining DG's own plans, he said the three hot markets for superminis are distributed data processing, office automation and engineering. Even when a supermini is used as a high-performance workstation for engineers, he said, it runs office automation packages that support applications such as electronic mail and electronic calendars.



The most common application among supermini users is accounting, followed closely by software development, word processing and industry-specific tasks.

DG sees the distributed data processing and office automation fields as areas where companies can install superminis on local-area networks. Jessel said the superminis would act as file servers and host processors, with much of the processing power migrated to intelligent terminals and personal computers out on the network.

He compared that type of network, not yet common in the commercial data processing market, to the kind of networks technical users have relied on throughout the 1980s; engineers have been running complex calculations and simulations on supermini hosts while handling most of their preliminary work and input at the terminal level. Jessel added that many engineers still do not have high-performance intelligent workstations, which leaves a market open for companies like his.

Jessel parted ways with the IDC report, however, on the future of superminis as replacements for corporate mainframes. He conceded the large, centralized data base to the IBM world and said companies such as DG have their greatest potential where an organization can be defined hierarchically, with depart-

See JESSEL SR/10

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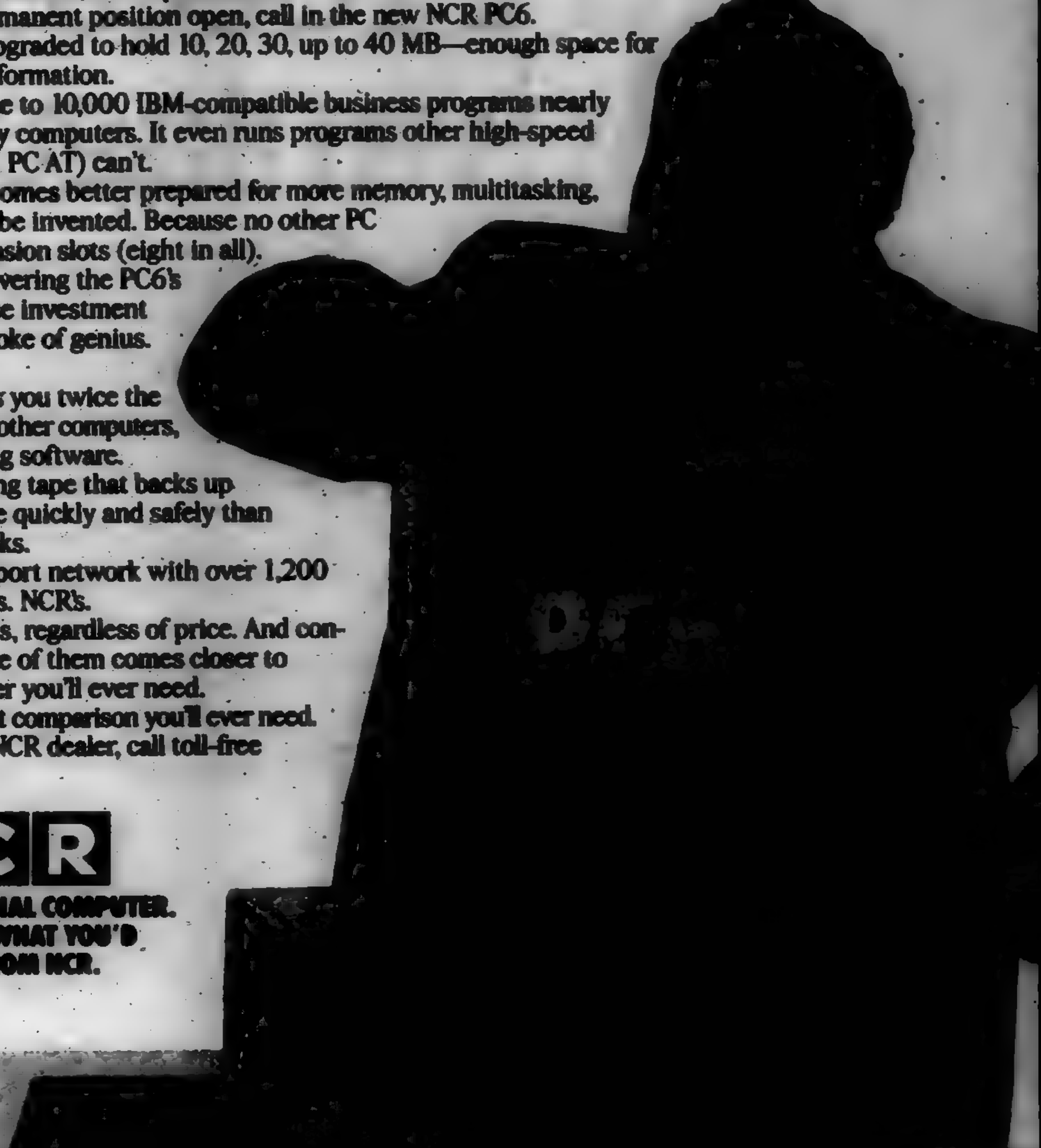

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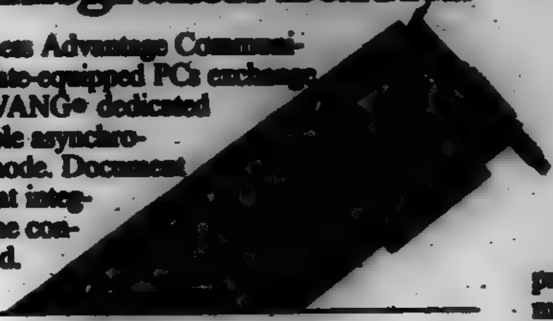

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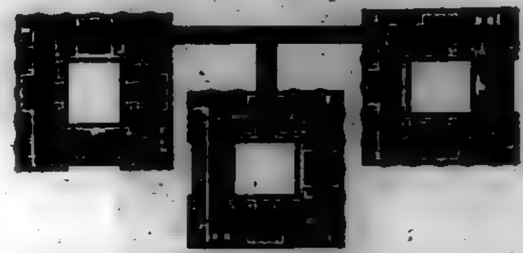

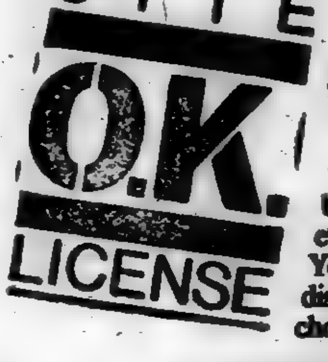

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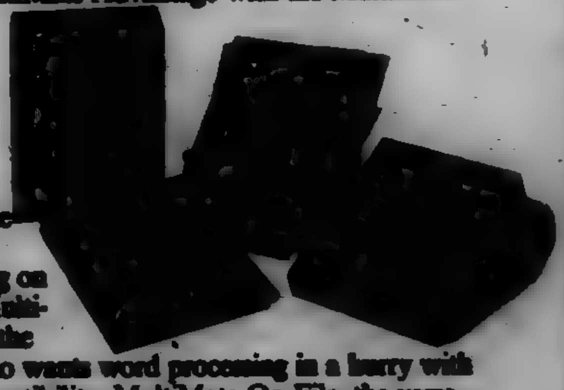

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Multimate

Special Report

Supermicros sail into small-scale systems market

Pricing, software seen as advantageous

By James Connolly

Pricing and software availability are key advantages that supermicrocomputers — small, 16- and 32-bit multiuser systems — enjoy as they make inroads into the minicomputer market.

Those advantages are helping to squeeze the minicomputer from the low end, with superminicomputers applying pressure from the top. But while supermicro vendors steadily gain market share, even traditional minicomputer manufacturers have introduced their own supermicros, low-end minicomputers are still in use and still selling.

"Many applications are going to supermicros and machines like the [IBM Personal Computer AT] that used to go to the [Digital Equipment Corp.] PDP-11 type of machines. But, DEC still sells some PDP-11s," noted David Wilson, manager of the product research division for Future Computing, Inc., a Richardson, Texas, market research firm.

Another market research firm, International Data Corp. (IDC) of Framingham, Mass., estimated that the minicomputer and the supermicro will split the small-scale computer market for 1985, with the balance steadily shifting from traditional minis to supermicros until supermicros own 79.6% of the market in 1990.

IDC said the pricing battle in the early supermicro market appears over. "In the future, supermicros will move up dramatically in capability. The capability of future microprocessors will let systems support up to 16 users in a truly interactive environment," said the company in a recent report titled, "Supermicrocomputer Market."

Future Computing identified 100 supermicros in a recent study and defined them as having prices higher than $15,000 with hard-disk capacities ranging to 2M bytes and supporting up to 32 users.

Wilson said that a company looking for a new system to support eight to 16 users would find comparable performances between minicomputers and supermicros but that the cost advantages in supermicros do not always justify junking an existing minicomputer. That decision will depend on the individual company's situation, he said.

According to Wilson, the second major reason for the projected growth of supermicros is "software availability — there is a miniscule amount of software for minis because the manufacturers, for whatever reason, never adopted the types of standards that have been adopted in the micro world. The minicomputer vendors kept their proprietary operating systems and software." He noted that AT&T Unix is one of the few standards in the minicomputer market, and even that can be ported to supermicros.

Microprocessors aid market share

Wilson and the IDC report concurred that the development of new microprocessors will boost the supermicro market share by increasing the number of users that the supermicros can support.

"If you are talking about four or eight or 12 users, most of those 100 products out there are fairly potent systems and can handle that many users, though perhaps not 32 users. Keep in mind that this is the $15,000-and-up category. Even one step below, at the $10,000 level, the systems might handle 16, though not 25 users," he added.

The introduction of the Motorola, Inc. 68020 microprocessor, with its 32-bit input and 32-bit processing power, allows the supermicrocomputer to get closer to full 32-user support, Wilson noted.

He said another trend to watch for is a move toward networking intelligent workstations such as personal computers around "some kind of file server based on a supermicro architecture," and away from systems where a supermicro serves a handful of dumb terminals. He recommended that a minicomputer user now planning a local-area network should ensure that the network architecture will allow them to swap hosts if they shift to a supermicro in the next few years.

The IDC report observed that traditional minicomputer vendors such as DEC, Data General Corp. and Hewlett-Packard Co. are implementing their larger system processor technology in chip-level form to push into the supermicro market.

The report said, "At present, the newer supermicro vendors' [Altos Computer Systems, Inc. and Fortune Systems Corp.] offerings are more cost effective in less than four-user configurations. Yet, the upgrade path is limited. For the customer that chooses the established mini vendors' offerings, the initial small configuration cost is higher, but the migration path is available. Unix is supposed to eliminate this problem for the user, but that is still a fairy tale."

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Distinction exists between parallel, multiprocessing

But both serve as stages in evolution

By George Weiss
Special to CW

Multiprocessing and parallel processing are often spoken of in the same breath, with little or no distinction made between them. This state of affairs has led to confusion, and the record needs to be set straight.

Multiprocessing is, in the most general sense, a division of labor: a way of partitioning user and system tasks among multiple processing elements. Within such an architecture, several jobs can run at the same time — each on a separate processor.

Parallel processing specifically addresses one feature of multiprocessing that reduces instruction execution time by allocating different portions of a single program to various processors. When programs run concurrently, portions of different programs share the same processor.

Both multiple and parallel processing are emerging as mechanisms for achieving substantial performance improvements over traditional uniprocessing, and they can be best understood as stages in an evolution toward that end.

Uniprocessors, which put the major burden of performance on a single engine, are rapidly approaching performance limitations imposed by an architecture that has not changed appreciably for the past 20 years. Most of the performance increases in the past five years have come from fine-tuning existing machinery rather than from making major changes to it.

To counter the architectural constraint, traditional minicomputer vendors have selected from a variety of performance acceleration options — pipelined instruction execution, cache memory and the like — that have gradually pushed performance ratings into the range of 5 million to 7 million instructions per second (Mips).

One reason for the gradual approach is to protect users' software investments. But the performance enhancement techniques are mainly defensive strategies. They allow entrenched vendors to buy time and maintain user loyalty until developers work out designs and prototypes for a new generation of machines that will not debut for another five years.

Meanwhile, multiprocessing designs — the first solid step in an evolution toward significant increases in processing power — have begun to appear in the commercial market. The primary thrust behind them has come mainly from start-up ventures, young firms that are not bound by the constraints of an existing family of products.

By 1990, nearly all superminicomputers will have multiprocessing architectures. By binding together several and possibly thousands of CPUs in a cooperative system, mini vendors will offer performance that approaches the power of today's mainframes without imposing the environmental, physical and power constraints of the large machines.

> *Multiple and parallel processing can be best understood as stages in an evolution toward substantial performance improvements.*

There are limits, however, to the performance increases simple multiprocessing can bring. Processing power does increase linearly as a function of the number of linked processing elements; despite the claims vendors seem to be making, an eight-processor complex of 4-Mips CPUs will not multiply into a 32-Mips system.

This constraint will affect future advances in processing power. Because complexity tends to be compounded as more and more processing elements are added, the most likely scenario for the next decade will be an evolution in stages of multiprocessor design.

The first stage of the evolution will feature small processor complexes. These complexes will manage work loads that are independently allocated among multiple CPUs.

The next stage will involve breaking existing applications programs into parallel portions that can run concurrently. This will be done using compiler optimization, precompilers and hardware configurations and will most likely take place initially in the fields of scientific computation, numerical analysis and signal processing.

Later, at the most advanced stage of development, highly innovative architectures such as data flow will emerge. These architectures will require new functional programming languages, languages that evaluate expressions rather than rely on sequential mathematical algorithms.

See EVOLVE SR/23

[illegible]	[illegible]	[illegible]	[illegible]
Type of Processing	Multiple applications distributed to multiple processors	Dedicated processing elements for I/O, pipelining and other tasks	Single application divided among multiple processors
[illegible]	[illegible]	[illegible]	[illegible]
Disadvantage	Operating system overhead in scheduling resources	Limitation in long-term gains	Programs must be structured for parallelism
[illegible]	[illegible]	[illegible]	[illegible]

The most likely scenario for the next decade is a gradual evolution from simple multiprocessing through functional parallelism and on to full parallelism.

Weiss is director of the Computer Systems Strategy Program at Quantum Science Corp., an international consulting and marketing research firm headquartered in New York.

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JESSEL

from SR/4

ments and divisions branching off to manage their own data processing rather than having a single data center serving the entire corporation with mainframes.

But Boston-based consultant and DEC specialist Sonny Monosson, owner of Monosson Technology Enterprises, said the future for the supermini rests in the IBM world. Whereas Jessel conceded the large, central data base to IBM, Monosson emphasized the importance of connecting to IBM.

"I think the machines will move in the direction of the [DEC] 8600s, which you can network together," Monosson said, pointing out IBM's substantial installed base.

"So I suppose if I were DEC, I would make sure the 8600s and other systems could talk to IBM's machines. . . . There is definitely going to be a consolidation, as we are starting to see, and only the strongest are going to survive," he said.

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Advanced CPU architectures demand MIS foresight

The use of multiprocessor and parallel systems will place additional demands on the MIS department, which must strategically plan how to apply these architectural concepts.

Planning must take place across the board because parallelism will bring change at the individual, departmental and corporate levels.

At the individual level, parallelism and the advent of voice and video integration will enable two or more workstation users to work on separate parts of a problem. The users will then communicate audio and graphics information to synthesize a final outcome.

At the departmental level, minis will become functionally specialized to provide data base management services, transaction processors and expert system decision makers.

At the corporate level, multiprocessor mainframes will handle companywide resources such as network and terminal management schemes, knowledge bases and training services.

Because of these advances, MIS directors will be faced with a number of questions. Some of the most important follow:

- Where are the organization's major applications bottlenecks, and what is the best way to distribute resources for coverage?
- What is the trade-off in implementing highly distributed parallel resources rather than continuing with centralized management and control?
- Which applications are most amenable to conversion to parallel code, and which applications are likely to become obsolete?
- Will the organization require a new operating system? If so, who will provide support for it? Will the organization have to hire new staff members?
- Will standards emerge to protect the organization's investments?
- What strategies is the organization's current vendor planning for the near future? Will the vendor take the organization's needs into account and help the organization work toward its goals?
- What problems have other organizations encountered in their experiences with multiprocessing?

The risk inherent in innovative new technologies is that if too much complexity is attempted at once, users may never get out of the technology wave and into the applications phase. Organizations should be prepared to wait through a reassuring period of evolution before they take the bold steps that the future will require.

— [illegible]

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Nasa contractor develops mainframe programs on mini

HUNTSVILLE, Ala. — Programmers who work for a National Aeronautics and Space Administration contractor are using a minicomputer to develop CICS applications for IBM mainframes.

The development environment at McDonnell Douglas Technical Services Co. was born of necessity rather than choice, according to systems analyst James Tate, and it has some drawbacks. But programs written on the minicomputer for the mainframe have proven themselves easier to develop and more efficient to use than those written on the mainframe itself.

McDonnell Douglas integrates various vendors' hardware and software and tests the resultant systems to see that they will work aboard Nasa's Spacelab, a laboratory that travels in the cargo bay during some space shuttle missions. McDonnell Douglas farms out all software development for the Nasa project to subcontractors but maintains a small programming staff to support its business operations.

This spring the firm began developing those applications with Netron, Inc.'s Computer Automated Programming (CAP) code generator on a 4M-byte Wang Laboratories, Inc. VS 100, after more traditionally developed programs brought on severe response time problems.

> *Development time for both of the completed applications was a fraction of what it would have been under SQL.*

McDonnell Douglas' programmers had developed and run the applications with SQL on a 4M-byte IBM 4331. Because of the 4331's limited resources and SQL's high overhead, users had to wait as long as 10 minutes for the results of certain calls to the data base.

"We were kind of lucky about it, because most of the users who had response times like that didn't know that you were supposed to have [them] any faster," Tate said. But the lags affected development as well, and as soon as the programmers came across a better approach, they tried it.

One programmer in McDonnell Douglas' shop used CAP on the VS 100 to develop Cobol programs for that machine. Because that programmer got amazing results, Tate said, when Netron offered a mainframe programming product, the firm decided to buy it.

The ability to program on the mini for the mainframe depends on CAP's processor, software that pulls together frames of source code, generates code to fill them, surrounds the source with JCL and sends the code via RJE lines to a mainframe compiler. McDonnell Douglas compiles programs written with CAP on a 16M-byte IBM 4341 and tests them on that machine. Once the applications are completed, they can run them on the 4331 or the 4341.

In conjunction with the implementation of CAP on the Wang mini and the use of the 4341 along with the 4331, McDonnell Douglas began using Vsam rather than SQL as the data base environment for all new applications on the two IBM machines. The combined efficiencies of the faster mainframe, the new data base environment and the generated code have brought users' response times into a more desirable range.

Tate said he could not calculate the exact benefits of the moves because every application has changed somewhat with the switch in environments. He said, however, that users were

Spacelab rests in Columbia's cargo bay during 1983 mission.

satisfied with the speedier response times. "User relationships are much better than they were," he added.

Since the firm began using the generator, programmers have used it to develop two applications — an inventory management system and a spreadsheet program. A third application is under way.

Development time for both of the completed applications was a fraction of what it would have been under SQL. The programmer for the inventory system, who has since left the firm, said she accomplished in four weeks more than she could have in six months with SQL. Tate, who developed the spreadsheet, claimed similar results.

The generator was not much faster than SQL would have been for initial development, he said. He had to design most of the frames for the application, and the job took him three weeks, about the same amount of time an SQL application would require.

But for postdevelopment changes brought on by users' initial oversights, the code generator paid off handsomely. Users had requested the application in haste, Tate said, "and they really didn't have any idea what they wanted, which is typical." In turn, they requested about five changes after the spreadsheet had been designed and tested.

Tate said he would have needed about two days to hand code each change and apply it to each affected program. But with the code generator, each change took only a few hours.

He explained that to make a change, he simply altered parameters within the appropriate frame and recompiled the application; a change to a given frame altered code in every relevant program.

Although development with the code generator on the mini has helped McDonnell Douglas' programmers, Tate said he would prefer a development environment that did not depend on linkage between the Wang and IBM machines.

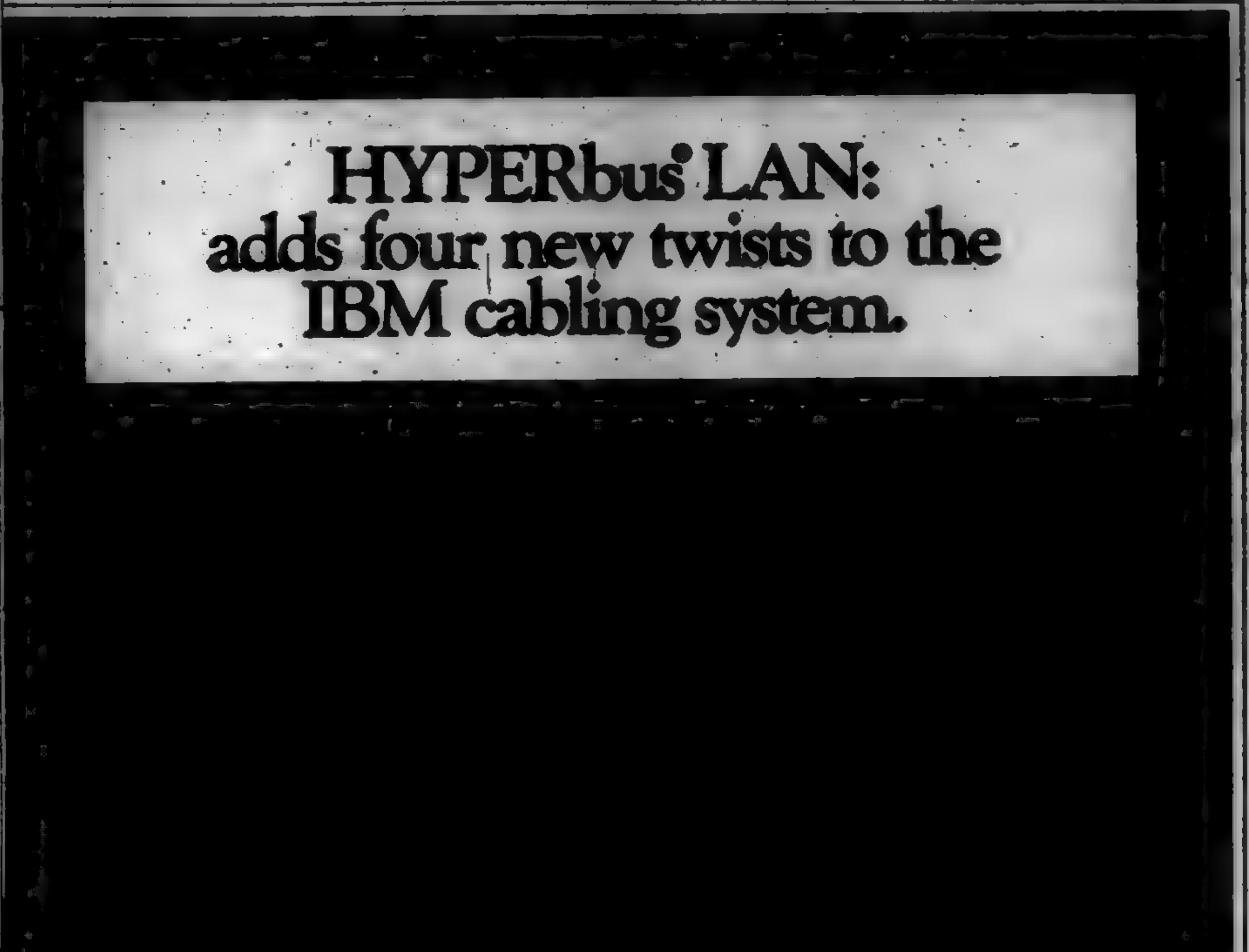
"I would be much more thrilled with CAP if it [ran] on an IBM system," he said, "because most of the problems that we have had with the system have been with the Wang-IBM interface."

Tate said he would have needed two days to hand code each change. But with the code generator, each change took a few hours.

Specifically, he said, McDonnell Douglas has had trouble keeping its RJE lines up. Netron has indicated it may make a CAP version available for use on IBM mainframes sometime next year, Tate said, and McDonnell Douglas has offered to serve as a beta test site if the vendor releases such a product.

Until then, the firm has little interest in seeking out a different code generator that already works with IBM machines. "There [are] not that many code generators around," Tate said, "and we kind of like the CAP processor."

Netron's president, Alex F. Kisin, said he could neither confirm nor deny the likelihood of a CAP release for IBM machines.



One means, two ends: Net setup satisfies needs of two users

USER REPORT

HENNEPIN COUNTY BUREAU OF PUBLIC SERVICE

Problem:
Sharing CPU with other users groups limits developers' resources.

Solution:
Network of 32-bit processors.

Benefits:
Lower processing costs, guaranteed access to processing power.

HOPKINS, Minn. — Over the past nine years, software developers at a county agency have moved their departmental computing across three system environments. They started with a traditional minicomputer, switched to an IBM mainframe and finally went with a local-area network of 32-bit processors.

Programmers at the Hennepin County Bureau of Public Service relied on each system to support development of a software package called Ultimap, an interactive mapping and civil engineering graphics system.

Ultimap development began in 1976 on a Digital Equipment Corp. PDP-11/70. Developers switched to an IBM 3033 in 1979 and upgraded to a 3081 in 1982. In February 1984, the team acquired a network of Apollo Computer, Inc. 32-bit workstations and associated software.

According to Ted Lachinski, technical supervisor for the bureau's systems division, the setup based on the 32-bit processors has been the best. System features such as a distributed data base, a series of graphics routines and on-line debugging capabilities "just make the development effort much easier to do," Lachinski said.

Hennepin County brought in the microprocessor network in response to limitations of the IBM configuration. Developers had been designing Ultimap to run under IBM's IMS on the 3081, a 32M-byte machine that served as the county's central CPU. They worked with vector-refresh graphics terminals attached to the host. Both the terminals and the host limited the development group's efforts.

Lachinski said the terminals, which had been state of the art when the county purchased them in 1980, could not match the capabilities of newer raster-refresh models and fell short of the Ultimap developers' desires.

The Ultimap team wanted to give end users the capabilities to display at least 3,000 graphics entities in one map and to make changes to these entities without enduring lengthy response times. The terminals, however, could only handle about 500 entities. Under this limitation, end users could not access and update mapping data for an entire city but would have to proceed area by area.

The mainframe environment limited them further. Lachinski said the Ultimap developers faced problems concerning data base capabilities, system resources and processing costs.

Data base capabilities. Programmers working on Ultimap wanted to develop a system that nontechnical users could understand, according to Lachinski. The development team was also concerned that end users would not be able to create their own data bases and generate their own reports with IMS. "We decided we wanted a more flexible data base management system to run Ultimap," he said.

IMS also fell short as a development environment, especially in its inability to support on-line debugging. Because program updates ran one at a time in batch mode, productivity was limited. Lachinski said different developers could submit updates simultaneously, but each had to wait for his job's turn to run.

System resources. Because Ultimap developers shared the county's host with other users groups, the developers had to vie for resources and work under some processing restrictions. They were limited, for example, to using 4M bytes of virtual memory.

In addition, the team had suffered from response time problems before the upgrade from the 3033, and Lachinski said he worried that the situation would reoccur as the 3081 took on increased processing loads.

Processing cost. Although Hennepin County did not impose chargeback on its user departments, it did monitor users groups' processing costs. Lachinski said the Ultimap team, because of its computer-intensive work, incurred high costs that were difficult to justify in relation to more pressing jobs that required fewer resources.

Since the county installed the microprocessor network, the Ultimap team has begun to overcome the limitations.

- Each of the 17 workstations on the network — 12 in the county's offices, five in the city of Minneapolis' offices — uses raster-refresh technology. In benchmarks with Ultimap running on these workstations, programmers have been able to display maps with 25 times more graphics entities than possible with vector-refresh terminals and IBM host. Lachinski said the Ultimap team hopes to increase the display capabilities even more by the time the system goes into pro-

See HENNEPIN SR/34

USER REPORT

LAMBTON COLLEGE OF ALLIED ARTS AND TECHNOLOGY

Problem:
Computing environment falls behind the times.

Solution:
Network of 32-bit processors.

Benefits:
Student access to Unix, increased processing power at low cost.

SARNIA, Ontario — When the fall term started early this month, a small college threw two state-of-the-art Ethernet networks of 32-bit workstations and traditional minis to the lions.

The networks, installed over a year's time and tested under controlled conditions this summer, seemed to have met Lambton College of Allied Arts and Technology's goals of interconnecting dissimilar machines and transferring files among them. During the summer tests, the networks performed as planned, and the college expects them to do the same now that they are in full use.

But according to Art Boyd, director of computer services, "That's all theory so far." He said only time will tell whether or not the equipment will hold up in the quirky environment for which it was intended — that of student computing.

Lambton College brought up its network as part of an ongoing effort to pull itself out of computing's dark ages and into the present, Boyd said. The effort began less than two years ago, when Lambton's only CPU was an 8M-byte Digital Equipment Corp. VAX-11/780 that supported 96 terminals.

Today, with the network installation completed, Lambton has 16 CPUs: the original mini, a 6M-byte DEC VAX-11/750 and 14 Cadmus Computer Systems, Inc. 9000 32-bit workstations, each with 1.5M bytes of memory. Together, the CPUs support 185 CRTs, eight full-color computer-aided design workstations, 27 printers and one plotter.

The machines are connected by two Ethernet networks, running in underground cable. One network, based on the TCP/IP protocol, supports the two VAX machines and six of the Cadmus 9000s. The other, based on Cadmus' Unison, supports nine of the Cadmus processors. Two of the Cadmus 9000s are on both nets; these machines provide gateways for file transfer between one network and the other.

"For a college of 1,500 students," Boyd said, "we're closer to the state of the art than anyone." The up-to-date network evolved from the three following goals the school set at the beginning of the modernization:

- To bring in as much processing power as budgets would allow.
- To introduce students to the AT&T Unix operating system.
- To stay flexible and keep the school from being tied to any one vendor.

According to Boyd, the current configuration has gone much of the way toward meeting each goal.

Processing power. Boyd said Lambton College sorely needed additional power when the project began. He asked DEC to determine how many of its machines the school would need to support about 100 additional terminals. The vendor, which had not yet introduced its 8600, recommended the addition of four VAX-11/750s.

The combined cost of the single 11/750 and the 14 Cadmus machines that Lambton bought instead was lower than that of the recommended four VAX processors, according to Boyd. Together, the 11/750 and the Cadmus machines support about 140 terminals.

The Cadmus machines are not true 32-bit processors; they have a 32-bit internal capacity and 16-bit data transfer. But, Boyd said, they meet the school's needs well.

Unix availability. With Unix gaining importance in the business world, Boyd said, Lambton College wanted to introduce its computer science students to it. He wanted to keep the DEC VMS operating system, however, because the school had invested in a software base for the VMS environment and because Unix software offerings are not yet extensive.

The new network supports both the VMS-based DEC machines and the Unix-based Cadmus 9000s, he said, so students will have the opportunity to learn both operating systems.

Flexibility. Boyd said he did not want to tie the school to any one vendor's technology, lest Lambton get locked out of future technical advances. Support for two vendors' processors has worked well, he said, and the network should allow the school to add other manufacturers' equipment if needed.

The fulfillment of the three goals did not come without its problems. Before Boyd saw the network in place, he had to wait out a deep freeze, which prevented workers from laying the underground cable for the network, and a faculty strike, which further delayed the project.

More pressing, though, was a traffic problem that surfaced during initial testing last winter. Boyd had hoped to use one Ethernet network rather than two, and his staff had been testing the single-net configuration.

See LAMBTON SR/34

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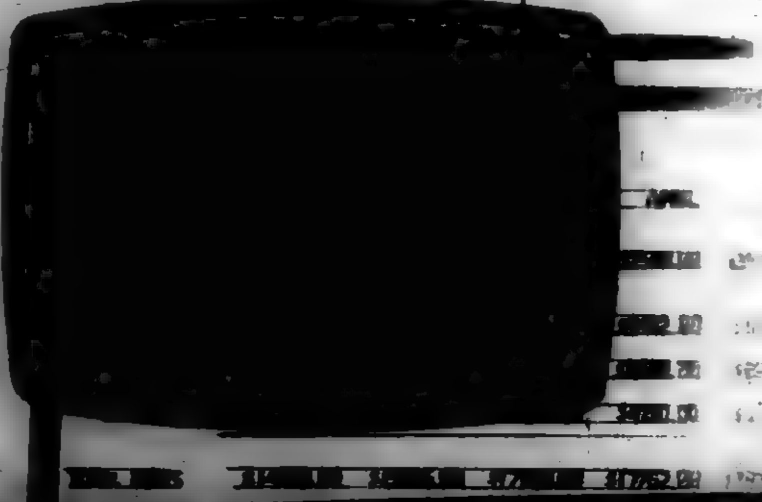

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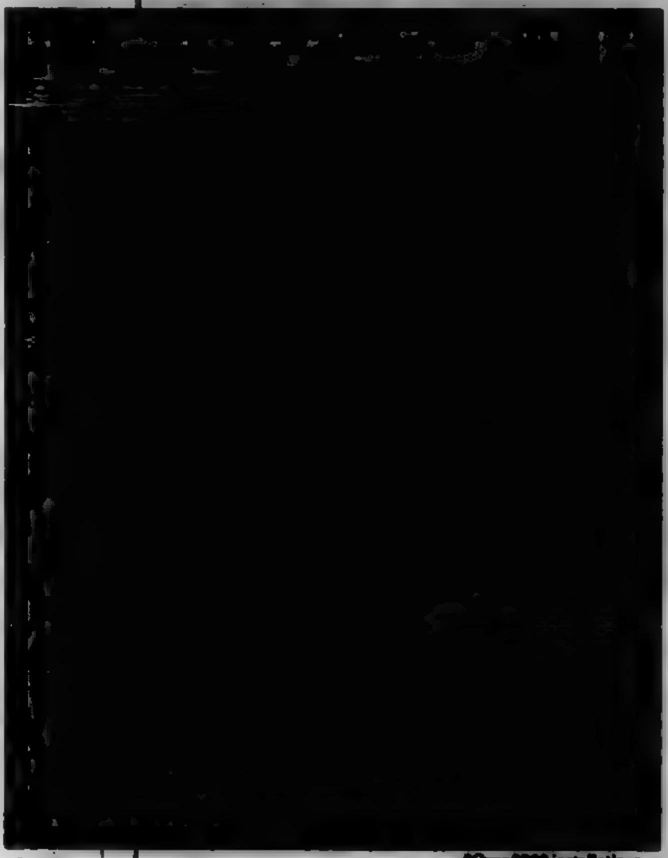

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Strengths of supermicros, minis vary with application

Systems must satisfy user and storage needs

By Constance A. Knapp
Special to CW

Small business or departmental system users who are in the market for a new multiuser system should carefully weigh the qualities of both supermicrocomputers and traditional minicomputers. Although supermicros and minis are both multiuser machines, the systems have markedly different strengths depending on the application.

As in choosing any system, the user needs to know what business needs the system must satisfy. In choosing between a supermicro and a mini, the two following areas need to be examined carefully:

- The number of users on the system at any one time.
- The storage requirements, including access and transaction activity.

When determining how many users will be on the system at one time, it is also important to consider what their usage patterns will be. Will four users be on at four different times of the day, performing four different functions, or will four users be on at the same time, performing two different functions? Will eight or 10 people need access to information at peak periods, and if so, is response time important? Answers to these kinds of questions will help determine whether or not a minicomputer is required.

Generally, a supermicro can comfortably handle eight to 10 users, although specific machines should be examined very carefully; some can handle more, some less. A minicomputer can support many more devices, with some handling as many as 100 terminals and printers.

The operating systems of most minicomputers are truly multiuser-oriented and can control usage and access by more than one terminal. At this point in the development of supermicros, some of the multiuser operating software is merely an extension of Microsoft Corp.'s MS-DOS or Digital Research, Inc.'s CP/M, without some of the functions, such as update control, that are needed in a multiple access environment.

Again, the specific operating system or equipment being considered needs to be examined carefully.

Determining the storage requirements of a new multiuser system requires a close look at applications, how they are to be accessed and how sensitive the data is. Placing a large (10,000-record) customer file on a supermicro and expecting four users to retrieve the data from four workstations at the same time with no degradation in response time is unrealistic. So is the expectation that this file can be easily backed up each night.

On the other hand, a budget system allowing eight departments to enter weekly budget information for 100 expense codes, with a central department creating summary budgets, will usually work well on a supermicro. The difference between these examples is the amount of data, the access pattern and the backup requirements.

As a general rule, sensitive data that must be backed up and stored to satisfy regulatory requirements or company policies should not be stored on a supermicrocomputer (or a microcomputer, for that matter). Data can disappear from hard disks too easily and backup procedures are too cumbersome to provide the level of data security required for sensitive information.

Management information, such as budgets, or information that can be re-created if the need arises are likely candidates for supermicrocomputer storage.

Keep in mind that the storage media for supermicrocomputers is still floppy disks, hard disks or cassette cartridges.

While each has its advantages, none allows the simple and speedy backup and recovery that a disk pack and/or tape drive provides a minicomputer.

A question of finances

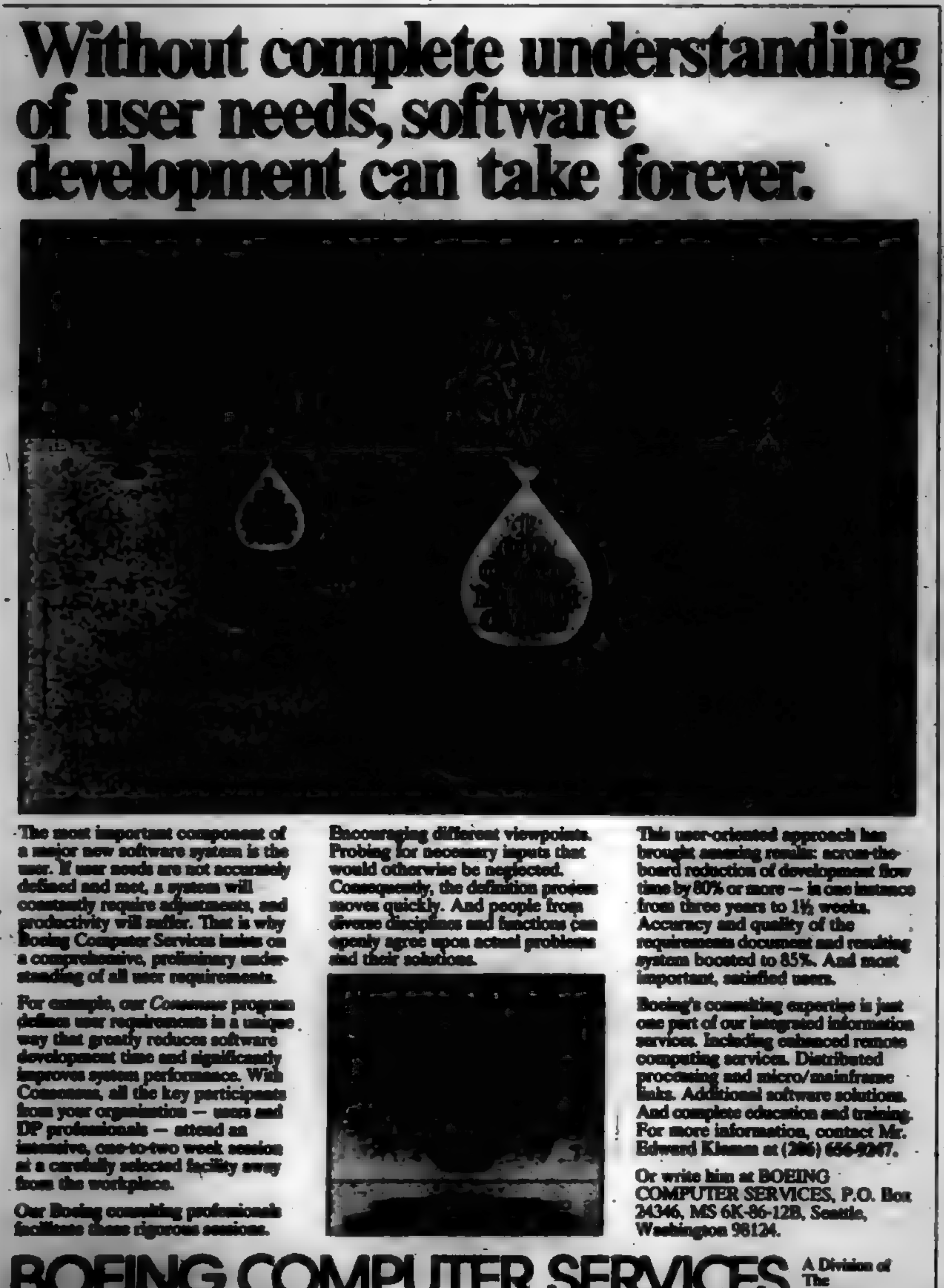
As with any other investment, the cost of the equipment needs to be considered in light of the benefits expected.

A minicomputer, with peripherals and software, could represent an $80,000 investment, while a supermicro may cost only one quarter of that amount.

However, data as a company investment must be protected. If the company's books are kept on a supermicro that proves impractical for data security, and data is destroyed or lost, the cost of recreating the data, as well as any damages, may

See VARY SR/29

Knapp is a New York-based computer consultant, specializing in the selection and installation of financial software. She is a member of the Independent Computer Consultants Association and a lecturer at Pace University in New York.



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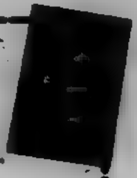

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IBM's high-end micros encroaching on mini territory

Major player in both marts faces dilemma

By Brian Jeffery
Special to CW

Like many minicomputer vendors, IBM is facing the difficult decision of how to balance its minicomputer and microcomputer lines. The impact the microcomputer is making on the minicomputer market cannot be ignored. As microcomputers move to adopt more powerful 32-bit microprocessors, they begin to undercut conventional minicomputer architectures, offering equivalent or even superior performance for radically reduced prices.

For IBM, however, the problem is greater than for most vendor companies. It is the only major computer firm to be a large-scale player in both the minicomputer and microcomputer markets.

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> *In the long term, IBM will shift much of its mid-range business to micro-based systems rather than conventional minicomputers.*

It has been in the minicomputer business since the early 1970s; in 1985 its various mid-range lines are likely to contribute close to $5.64 billion in revenue. Yet its microcomputer business has been even more successful.

Since entering the personal computer market in 1981, IBM's line of Intel Corp.-based micros has grown to be a $5.8 billion business in 1985. The installed base of these units will have grown to close to three million units by the end of this year, with a worldwide base of more than 12,000 applications software products and 4,500 dealers and distributors.

IBM has already moved from the Intel 8088-based CPU to the more powerful 80286-based CPU used in IBM's Personal Computer AT. The company has indicated that it is moving onto the full 32-bit 80386. Many IBM Personal Computer distributors are starting to offer the AT as a small business, multiuser system or as a scientific and engineering system.

IBM's dilemma is that if it lets the Personal Computer momentum continue and moves to more powerful CPUs, it will be undercutting its own low-end minis such as the System/36, 8100 series and Series/1 and, in the longer term, even the more powerful 4300 series and System/38.

IBM appears to have solved the problem by a classic exercise in contention management. While continuing to pursue the minicomputer business aggressively, it has also given the green light for its Entry Systems Division to start moving the Personal Computer line up into minicomputer territory.

The result is going to be some strenuous internal competition and, in the long term, a shift of much of IBM's business in the mid-range systems bracket to micro-based systems rather than to conventional minicomputers.

Although they have been generally missed by the industry, three key indicators confirm that IBM is adopting this approach:

- **IBM's developmental directions with the Personal Computer line.** In August 1984, IBM introduced its Topview multitasking operating environment for the Personal Computer line, a PC-DOS-compatible product that was poorly received but which rapidly proved to have some curious features. The features included a built-in Systems Network Architecture (SNA) interface and the potential for addressing up to 16M bytes of virtual memory.

It is now becoming clear that IBM's development has proceeded to expand this basic concept into a full-blown virtual memory multitasking operating system for the Intel microprocessor architecture, with additional processing power and support for AT&T Unix operating systems provided by 32-bit coprocessors.

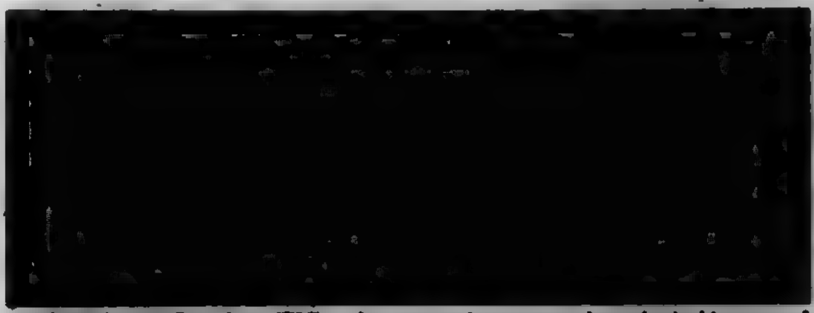
While IBM's current focus for this effort appears to be scientific and engineering applications, the ultimate direction looks as if it will result in two major sets of applications.

One set of applications would be a multiuser system for departments of large organizations, with built-in SNA support providing a better fit with the overall IBM office automation scenario than products such as the System/36 currently provide.

The second set would be a multiuser system for small business and remote-site applications that would

Jeffery is director of research for International Technology Group, Inc. of Palo Alto, Calif.

According to Guinness, printer set a new world's



In 1985, for the first time, IBM's microcomputer revenue is projected to exceed its minicomputer revenue.

allow the more than one million small Personal Computer users to upgrade to more powerful, compatible solutions.

■ **IBM's various minicomputer developments.** To date, IBM has introduced desktop versions of its Series/1 and System/36 minis, although these have proved to be mini-micro hybrids rather than true microcomputers.

Micro versions of the 4300 series and an in-house reduced instruction set computer mini, the 801, are on the way, although the machines seem to be targeted at specialized scientific and engineering applications rather than mainstream business use.

More interesting is that IBM implemented, then dropped, a Motorola, Inc. 68000-based version of the System/36. Apparently it was felt that such a system would seriously undercut IBM's business with its existing System/36 minis.

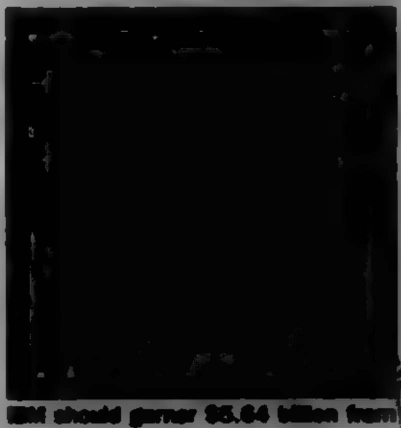
Overall, it is clear that IBM is not seeking to move its minis down to the micro level but rather the reverse.

In adopting this approach, IBM is dooming its minicomputers to mounting competition and ultimate replacement by upward extensions of the Personal Computer line.

■ **The 1984 ousting of the Systems Products Division from the Information Systems and Communications Group.** The little-noticed IBM reorganization in December 1984, which affected the company's Systems Products Division, is another key to deciphering IBM's strategy. The Systems Products Division is the IBM unit with responsibility for the System/36, System/38, Series/1, 8100 series and 4361 minicomputers. The division was moved from IBM's Information Systems and Communications Group and transferred to a new organization, the Information Systems and Products Group.

This move was curious because the Information Systems and Communications Group is generally regarded within IBM as the home of the company's key growth product lines.

The group's members include the Communications Products Division (SNA, communications equipment), Entry Systems Division (Personal Computers) and Office Systems (office automation software). In addition, the Computer-Aided Design and Manufacturing and Industrial Systems Divisions are placed there, and the Telecommunications Products Division (Rolm Corp., local-area networks) was added at the same time the Systems Products Division moved out.



IBM should garner $5.64 billion from its mid-range systems in 1985.

By contrast, the Systems Products Division's new home is shared by such illustrious IBM operations as the Boulder, Colo., and Lexington, Ky., business units. Out of these two units come 8-in. storage products, copiers, typewriters and supplies.

The move was scarcely a resounding vote of confidence, and it was notable that even the supposedly strategic System/36 was now out of the mainstream of IBM product strategy.

IBM reorganizations have always been a key indicator of company strategy. IBM does not change things that work properly. Taken with the other indicators, it is difficult to resist the conclusion that IBM approved competition between its minicomputer and microcomputer lines with an outcome that can be in little doubt.

Overall, what we seem to be dealing with is a long-term strategic shift of IBM minicomputer and microcomputer products. IBM appears to recognize that in the long term, micro-based systems will take over much of the bracket currently occupied by at least its low-end minis.

Even the System/36, a system that has proved to be the bane of its competitors, may prove to be a curtain raiser for IBM's real thrust in this market.

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Departmental minis bridge micro-mainframe gap

By Naomi Karten
Special to CW

The use of departmental minicomputers to help bridge the gap between micro users' needs for mainframe data and their access to that data has not picked up enough momentum to be viewed as a trend, but it is a strategy some MIS departments and information centers are beginning to assess.

The strategy makes particular sense in light of concerns about micro-mainframe links. Justifiably or not, users see the micro-mainframe connection as something that many people are talking about but few organizations are implementing on a large scale.

> ”
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> *The micro-mainframe connection is something that many people are talking about but few organizations are implementing on a large scale.*

In many organizations, micros are underutilized, and users are frustrated. Both problems stem from a lack of access to data that is stashed away in mainframe data bases. Departmental minicomputers can provide the means for MIS to satisfy some groups of frustrated users, those that have a cyclical need for access to the same sets of corporate data.

The strategy for use of the minis works this way: On an agreed-upon schedule and under MIS control, mainframe data is extracted and transferred to the mini. Users can then beat the data to death using mini-based software or can download it to departmental micros for manipulation with packages like Ashton-Tate's Dbase or Lotus Development Corp.'s 1-2-3.

MIS departments can gain the following three main benefits from this approach:

- A decrease in the demands that end users' queries make on the mainframe.
- An increase in control over access to mainframe data.
- An improved ability to meet users' specific needs.

Decreased demand on the mainframe. This is a solution to the problem brought on by the popularity of fourth-generation languages. Many of these languages are resource intensive, a situation of concern to MIS managers who are on the line to deliver new production systems and who have little inclination to compete with users for computer power.

At its present rate of acceleration, end-user computing will dominate corporate computing within a decade. With this growing stream of users, even the most efficient user-oriented software is likely to give a finite computer resource a run for its money.

MIS executives, whose capital budgets are unlikely to reach fantastic proportions, need an alternative to forced growth in mainframe capacity. Fortunately, an extensive base of user-oriented query and analysis software — including several traditionally mainframe products — is available for minicomputers.

SAS Institute, Inc.'s SAS, for example, runs on Digital Equipment Corp., Prime Computer, Inc. and Data General Corp. equipment. Applications written with Oracle Corp.'s Oracle and Seed Software Corp.'s Seed run in a wide variety of mainframe and mini environments and on the IBM Personal Computer. Intellect, from Artificial Intelligence Corp., is being ported to the DEC VAX.

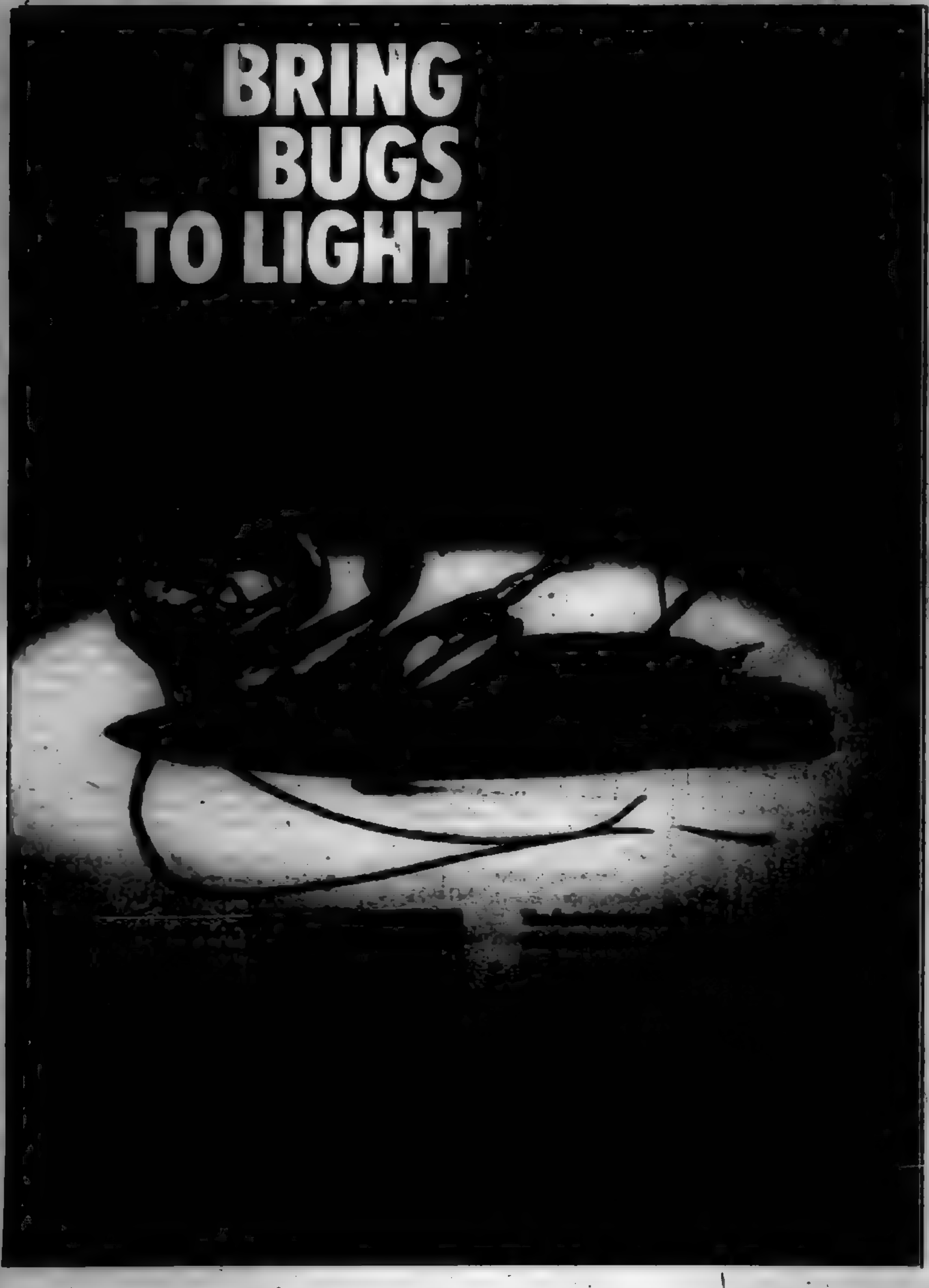
Several other vendors are beginning to view the minicomputer environment as a strategically astute base of support for information center goals. Certainly, retraining for experienced users of these vendors' products will be minimal.

Increased control over access. Loss of security is one of the predominant concerns associated with downloading capability and is one of the major impediments to its implementation. With a little aid from the fearmongers among us, MIS executives are lying awake at night worrying about which people are getting at what data and what they are doing with it.

The last is not an issue: An MIS manager can no more control how users juggle computer-generated data than he can control how they churn data from production reports

See CONTROL SR/29

Karten, president of the consulting firm of Karten Associates in Randolph, Mass., writes and lectures on information centers and the management of corporate personal computing.



EVOLVE from SR/10

Moving from multiprocessing to advanced parallel processing will require a series of breakthroughs. There is a host of difficulties that must be overcome:

- Interprocessor communications, which becomes more and more complex as more and more processors are added, must be improved so that every processing element can send information to and receive information from every other element.
- Because no one architecture is optimal for every application, each of these must be weighed against each other.

Developers of computer-aided design systems, for example, must consider the advantages and disadvantages of array processing against the advantages and disadvantages of processing individual pixels.

- Because a great number of resources will be available to the user, the operating system's role will expand; the changes that will enable that expansion will be difficult to make.

Designers will have to modify the Unix kernel to handle multiple processing resources simultaneously, for example, without ruining the integrity of applications portability.

- Designers must develop a programmer's interface that is transparent with respect to the allocation of resources.

Without such an interface, programmers would have to construct parallelism manually, a process that would require several man-years of work for large programs.

- If programmer transparency is to be maintained, processor assignment and scheduling become critical system variables; idle resources can substantially degrade performance. Designers will need to synchronize the results produced by many elements and synthesize these pieces into a whole. Such synchronization and synthesis, however, is still in the sphere of academic research.
- Unless an organization's applications are written with a highly parallel structure (that is, more than 90%), its users will accrue only nominal gains in performance regardless of additional processing elements that are collected. Developers will have to implement multiple resource handling capabilities together with program concurrency that fully taxes the hardware.
- The introduction of many processing elements implies that programs can run in separate hardware partitions and in no particular sequence. In these situations, problem determination becomes highly complex; parallelism adds to the probability of inaccurate results. Developers must provide some degree of fault tolerance before users are willing to rely on a system.
- DP managers want to protect their investments in the software they have installed and the programs they have scheduled for development. They accept the need to replace hardware every five to seven years but expect their software resources to last longer. Vendors will have to address users' concerns and somehow bridge the gap between multiprocessing and parallel processing software.

TRENDS from SR/11

ment and exploitation of new technologies and architectures.

- End users continue to demand higher performance, and they have come to expect this from vendors.
- The new applications environments that are emerging for artificial intelligence and expert systems require high performance and parallel processing as prerequisites for success.
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Automation preserves life jacket maker's growth

MIAMI — Production tracking problems threatened to swamp business growth for a life jacket manufacturer until the firm installed an automated manufacturing system.

At Extrasport, Inc., four administrators relied on manual procedures to keep track of production and sales. But sales increases of between 25% and 40% annually from 1980 to 1984 began to overwhelm them.

"As you might imagine, I had to enlist grandmothers and siblings to work nights and weekends to maintain this operation," said Alex Khamamirian, Extrasport's president. "I enlisted anyone I could to help with record keeping."

Even with the extra help, Khamamirian was spending too much time keeping up with current sales to focus on his main aim: expanding his business. "We soon saw that we couldn't keep both our manual systems and our 40% yearly growth. So we decided to streamline, to automate our operations wherever feasible."

In February 1984, Extrasport purchased a Digital Equipment Corp. Decmate II with 10M bytes of disk storage and installed Exceptional Business Solutions' Manufacturing System software. Khamamirian worked nights at home setting up the system's five modules — inventory management, bills of materials, production planning, order entry/invoicing and accounts receivable — so they reflected his firm's production process.

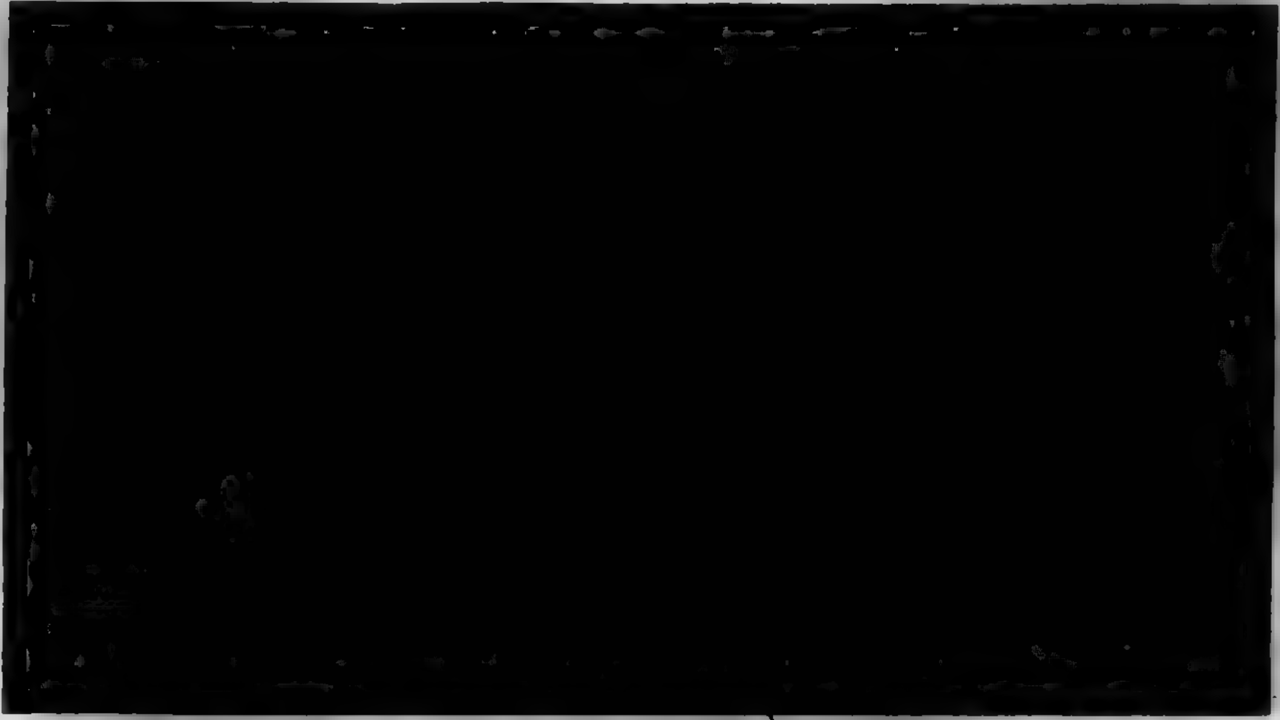
He first defined the inventory items he wanted to track, then listed all the raw materials, interim components and production stages that went into making each item. He assigned all the stages their own inventory item numbers so the system could track them. "Since we had defined production stages as separate inventory items, the computer could plan and schedule stages as well as finished products," he said.

The system, which went live last October, takes information from customer orders and explodes it into bills of materials, cost estimates, materials allocations and production schedules. When an operator generates an order, the system updates back orders, open orders, inventory files and customers' buying history files.

Extrasport, Inc.'s president, Alex Khamamirian, keeps tight stock of the firm's life jacket inventory.

"It eliminates a lot of repetitive hand work," Khamamirian said. "When you have entered an invoice, you have updated everything you can possibly imagine." He said having the system to handle posting, updating and tracking has given him and his fellow administrators more time to run the firm.

In addition, he said, the system has alleviated some production and quality control problems special to Extrasport. Most of the firm's 750 active customers are wilderness provisioners such as L. L. Bean, Inc. and Eastern Mountain Sports, Inc. that buy erratically and in small quantities. "By the time they order, they are often low on stock," he said, "so delivery has to be fast."



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Before it installed the automated system, Extrasport had problems meeting such orders, Khamamirian explained. Administrators had to estimate what raw materials they had on hand, look at orders that had already been scheduled and try to fit in the extra work.

With the automated system, Extrasport can prepare in advance for seasons during which its customers typically place most of their orders. Based on information from past seasons, the system forecasts material needs, predicts required cash flow and recommends any necessary hiring, Khamamirian said.

"Also, it will look at our material suppliers' delivery times and will reorder if materials [on] hand can't meet projected usage, so we don't spend money on supplies too early, and we don't reorder too late," he said.

An indirect benefit of the system has been tighter shop-floor quality control. "This has been a real boon, because life jacket quality can't be left to chance," Khamamirian said. Quality is also one of the features that helps Extrasport sell its life jackets — specialized products that cost between $36 and $65. The firm's production workers assemble the jackets by hand; its managers and executives inspect production personally.

With the manufacturing system handling other tasks, Khamamirian and his managers have been able to spend more time inspecting jacket assembly, which has enabled them to implement new and more frequent product tests. The firm's life jackets regularly go through more than 22 quality tests.

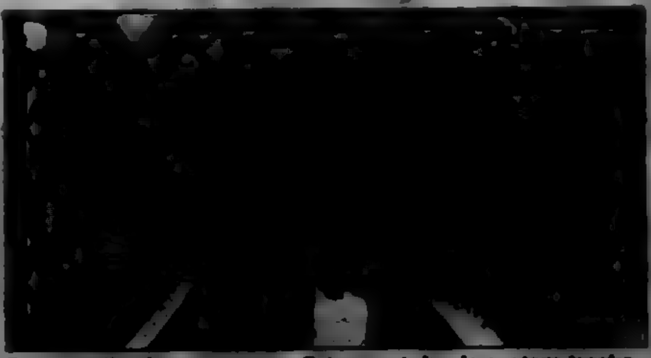
Checks cover materials and construction, stitching density, seams, buoyancy and the dimensions of foam inserts. "The computer doesn't perform these tests," Khamamirian said. "However, it has given my managers more usable time per day."

Khamamirian uses some of his time to scan the system's production reports for quality signals, which can alert him to life jackets made with too much or too little fabric or foam. When the computer generates a production order, for example, it also specifies how much fabric will be required, based on past experience.

Extrasport's production workers cut material or foam for the order based on the computer's specification, Khamamirian said. "At the end of a production run, if we fall short or have too much left over, we know something's wrong."

Employees at the firm access the system through one CRT terminal. Because the software system dictates procedures, Khamamirian said, the firm's managers can delegate administrative tasks with confidence that everyone will perform them the same way.

Khamamirian said he hopes to get report formatting capabilities for the system this year. Currently, Extrasport must use formats that are written into the software and cannot choose to report by combinations of variables other than those that have been defined.



Foam cutting is one process Extrasport, Inc.'s system tracks.

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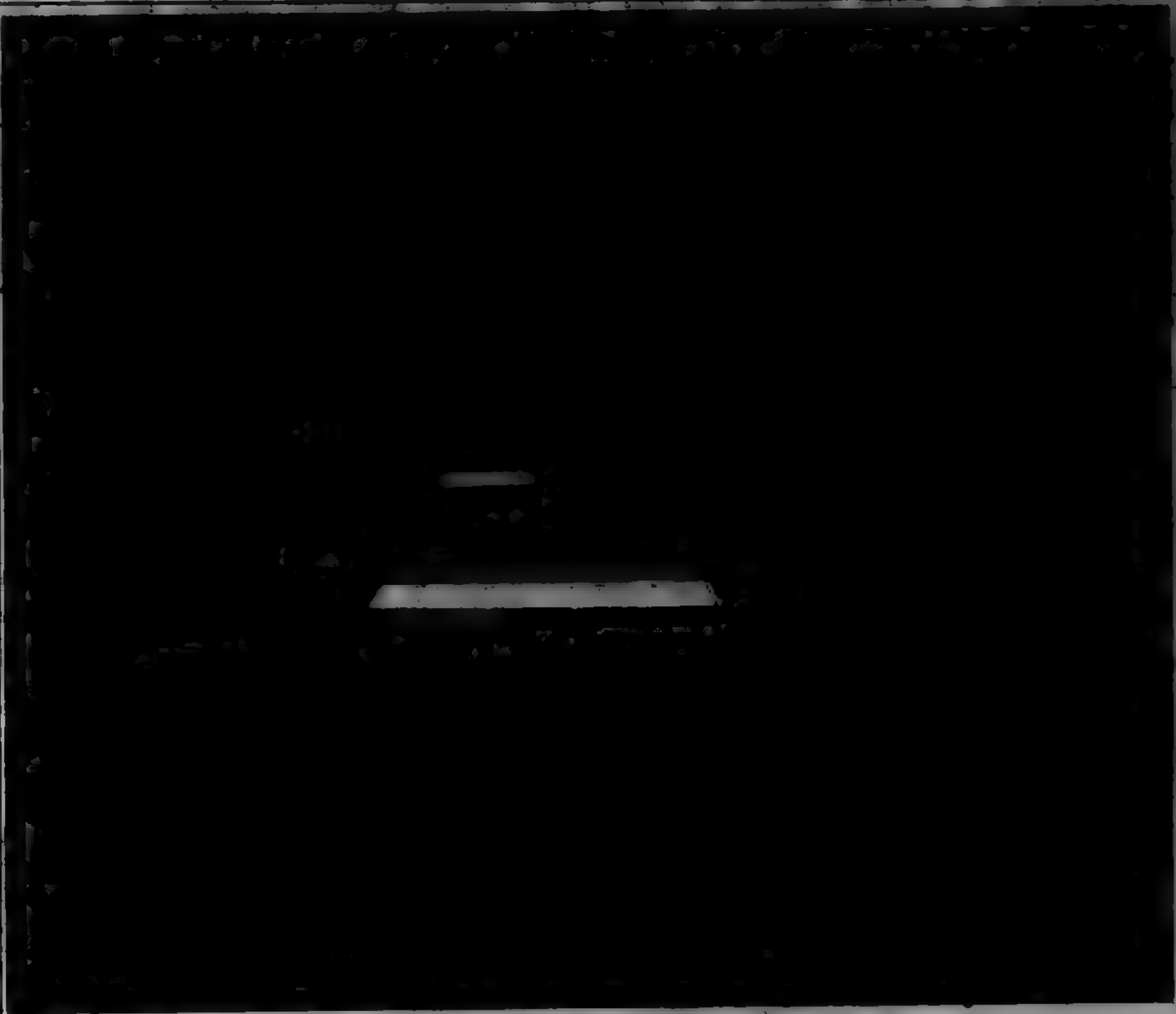

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Unix standardization loosening constraints in mini mart

Emerging trends improving wares

By James E. Clark
Special to CW

The emergence of Unix as a standard, hardware-independent operating system carries one heavy implication for the general minicomputer market: Users will no longer be held hostage to any particular vendor's operating environment or applications software.

Less far-reaching but equally important trends are emerging within the Unix marketplace itself. Ten of these trends follow.

1. Performance. Many Unix system users have found that their hardware lacks the computational performance to run their applications with acceptable throughput or response time. In turn, vendors have begun to design machines that will make Unix run faster.

Vendors of scientific and engineering superminis especially will benefit from this trend because their development and marketing efforts have traditionally focused on users who need to process large volumes of data at very high speeds. Users can expect these vendors to leverage their hardware's performance and enter new markets — those outside the usual realm of real-time processing.

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> *Minicomputer vendors will be forced to adhere to standard forms of Unix, lest they risk shooting themselves in the foot.*

2. Operating environment. Unix is becoming standardized. Today, only two real variants exist: AT&T's System V and the University of California at Berkeley's 4.2. Any versions that deviate from these two are quickly being brought into line. In addition, the efforts of the Institute of Electrical and Electronics Engineers, Inc. will yield a standard baseline for the future.

Vendors will be forced to adhere to standard forms of Unix, lest they risk shooting themselves in the foot. Within these standard forms, however, vendors will distinguish themselves by adding features and enhancements such as increased security measures, fault tolerance, real-time processing and multiprocessor support.

3. Compliance with both standards. The existence of two major Unix variants has led to the advent of multiple operating system strategies. Different vendors take slightly different technical approaches, but they all provide the same basic functionality — compatibility with both dominant Unix implementations.

Within two to three years, today's compatibility issues will be worked out. Nearly every vendor will accommodate both the Berkeley 4.2 and the AT&T System V environments by implementing some mechanism to combine the two.

4. Convergence. Eventually, the two Unix versions will converge into one. This will happen less because of the efforts of any one vendor than because of marketplace demand. Users will call for an implementation of Unix that has the benefits of being the standard and of offering high performance and full functionality.

If the purveyors of Unix are to survive, they will need such unity to combat their true competitors: IBM (with whatever opearting system it chooses) and Digital Equipment Corp. (with VMS).

5. Availability of software. The advent of a standard operating system naturally prompts a wide range of software applications. In the Unix marketplace, vendors are rapidly expanding their offerings. Because Unix is machine independent, these applications are portable across a wide spectrum of micro, mini and mainframe hardware from a variety of manufacturers.

6. Hosting other environments. Recently, vendors have begun to promote environments "on top of" Unix. (A good example of this is Vipark Computer, Inc.'s implementation of Pick Systems' Pick environment on Unix machines.) This trend makes hundreds of additional software applications available to Unix system users.

7. Workstations. In the general market, the trend is toward workstations that focus on general-purpose, scientific or administrative applications. More specifically, manufacturers are expending effort to connect these workstations to Unix machines.

Clark is director of Unix systems marketing for the computer systems division of Gould, Inc., a Unix supermini vendor based in Fort Lauderdale, Fla.

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But product selection isn't the only choice. Telex displays offer features like color graphics, monochrome or color monitors, and ergonomic tilt/swivel design. There's a selection of keyboards,

Future Unix workstations will feature icons, discipline-specific user interfaces and bit-mapped support for windows. The operating system's malleability makes all these possible.

8. Computational servers and file servers. The trend in both is toward greater performance and higher I/O capacities.

- Computational servers. Most computational engines now use some amount of cache memory. Unix-based systems are being developed with added hardware assists, including special floating-point arithmetic, multiplication and vector processing.
- File servers. The focus here is I/O bandwidth. Faster disk controllers that support new, high-performance disk drives are making their way to Unix-based systems.

9. Networking. At the system level, the trend is toward integration with a form of distributed Unix. To date, there are three common approaches to distributed computing.

- Network file systems.
- Newcastle connections.
- Streams.

10. Business arrangements. The ease of integration with Unix systems has led some large companies to take on the role of integrator. In many cases, these companies do not have the technology in place to address the product needs of Unix system users. The companies do, however, have the marketing savvy, sales forces and distribution channels to make significant Unix-based sales.

Traditional manufacturers' needs for Unix-based systems — coupled with these firms' inability to produce such systems quickly — provide a perfect scenario for the rise of start-up companies. With $5 million to $20 million, a start-up company can quickly develop and manufacture some initial products. It can then sell these products on an OEM basis to a larger, slower moving company better equipped for marketing.

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> *Traditional manufacturers' needs for Unix-based systems provide a perfect scenario for the rise of start-up companies.*

VARY

from SR/18

well exceed the cost of the larger investment in a more suitable system.

Making the right choice

How can any user be sure that the right equipment is being purchased? As with anything else, evaluating equipment and software will be an easier task if the user can clearly define and write down what a system must do, how it will be used and the growth that can be expected.

Two more options that can help when evaluting systems are vendor product demonstrations and contacting current users of the systems being considered. If a vendor promises a certain function, have him demonstrate it. Vendors can also provide lists of current users. If you have contacted a vendor for such a list, do not let it choose only satisfied customers. Unhappy customers can be helpful; what makes one user very unhappy can make a second user praise a system.

A clear perspective of the computer industry will help anyone in selecting a supermicro or a minicomputer. Future technological enhancements may make the supermicro work more like a mini, just as the mini may begin to work more like a mainframe.

In this environment, the best defense is a good offense — be very sure of what the system is expected to do today and maybe even as far ahead as next year, but expect your investment in equipment to be obsolete in about a year. Considering the possible replacement factor in your cost/benefit analysis will protect you from any nasty surprises.

CONTROL

from SR/22

through a calculator.

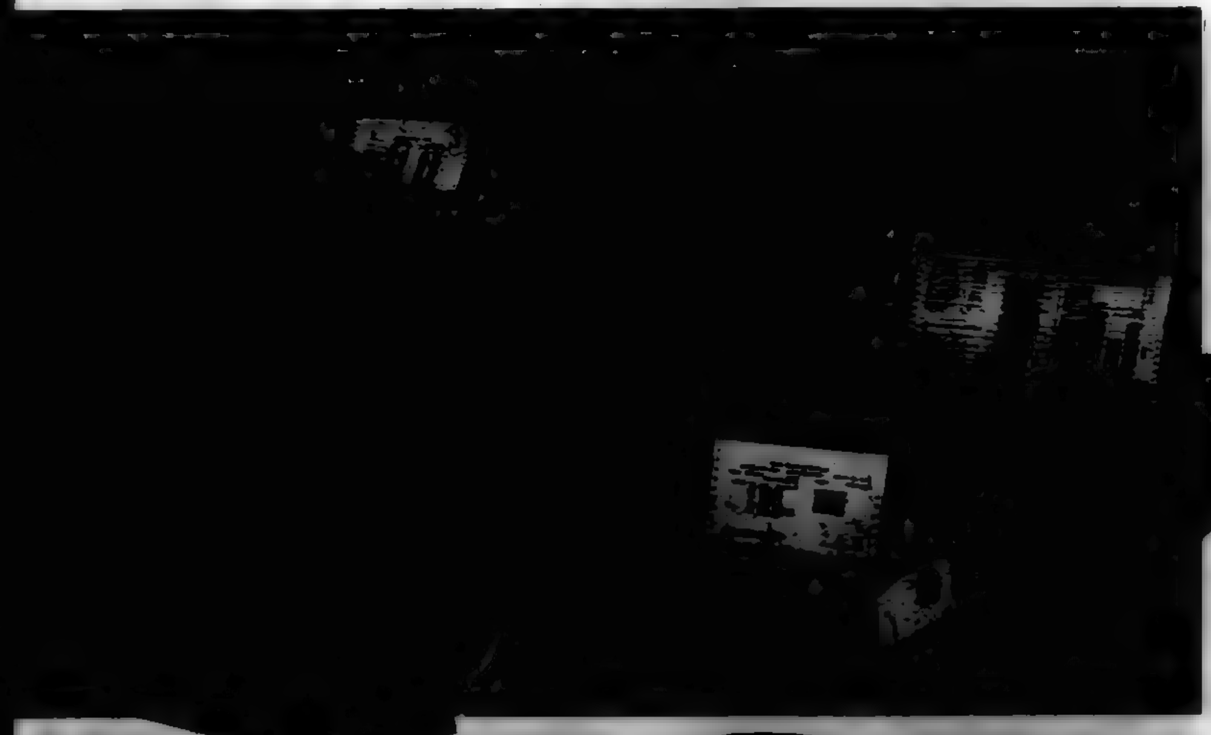
But the first concern — the matter of who is getting at what data — can be centrally controlled through the departmental mini strategy. In accordance with a specific user group's requirements, MIS can devise a series of extracts that offload corporate data, manipulate it into a format that is conducive to efficient access and relocate it to the user department's mini.

Because the nature and timing of the extracts is under MIS control, user-submitted, round-the-clock extracts no longer present a problem. In addition, each extract can be certified — against MIS-defined and MIS-controlled checks and balances — to have executed accurately.

Improvement in meeting users' needs. Within this departmental mini strategy, users get access to data that is suited to their unique needs. The benefit to users is obvious, but the MIS department fares equally well.

Different areas of a company typically need data in different formats. Designing an all-purpose data base that meets everyone's needs is a task and a half, even with products flexible enough to accommodate a variety of data access needs.

If the MIS department prepares and delivers data to departmental minis, giving each user group a format that suits specialized requirements, it eliminates the need to obtain a corporate concensus on a mainframe solution.



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Third-party service keeps multivendor systems on-line

Users find offerings convenient, objective and comprehensive

By Rudy Thibodeau
Special to CW

Minicomputers have become the target for independent maintenance companies, largely because multivendor hardware configurations have proliferated and because minicomputer vendors have not offered substantial maintenance for such mixed-vendor systems.

A minicomputer vendor's maintenance warranty, for example, is not likely to cover a user's entire configuration unless that configuration consists wholly of the vendor's equipment.

If the vendor's mini is connected to another vendor's printer or tape subsystem, the mini vendor — in extreme cases — may even refuse to perform warranted work until the user disconnects the peripherals.

At the least bothersome end of the spectrum, a user site that contains equipment from several manufacturers will be forced to rely on multiple service sources, an arrangement that complicates maintenance and leads to problems. With multiple service sources, the user's maintenance and administrative costs increase, and the availability of prompt, on-demand service decreases.

Third-party maintenance companies alleviate the problems of multivendor equipment servicing. These companies have the capability to service mixed-vendor equipment, and they can easily tailor maintenance service to the requirements of each user's specific configuration.

Because of the advantages they offer, third-party maintenance services are gaining in importance and popularity. Users, in increasing numbers, are welcoming independent service companies as an effective alternative to other maintenance options.

In a 1983 report, "Third-Party Maintenance of Computers and Data Terminals," Frost & Sullivan, Inc. concluded that most users rated third-party companies' services as highly as or higher than the services provided by equipment manufacturers.

Users also reported that, often, third-party companies were more responsive than equipment vendors and provided more cost-effective service.

The benefits of third-party maintenance fall into three general categories:

- Convenience.
- Objectivity.
- Comprehensiveness.

Convenience. Third-party maintenance companies offer one-stop shopping that can significantly reduce a user's administrative workload. Having one source for maintenance eliminates the problems associated with calling, paying and relying on several different manufacturers.

As an added convenience, many third-party maintenance companies are well suited to service remotely located offices and facilities. These companies can usually provide geographic coverage at least as well as equipment manufacturers can.

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> *Users reported that, often, third-party companies were more responsive than equipment vendors and provided more cost-effective service.*

Most third-party maintenance companies are organized much as a manufacturer's field service force: They consist of a national network of local field offices staffed with service and customer engineering personnel; these local representatives are supported by regional and national technical and engineering staffs.

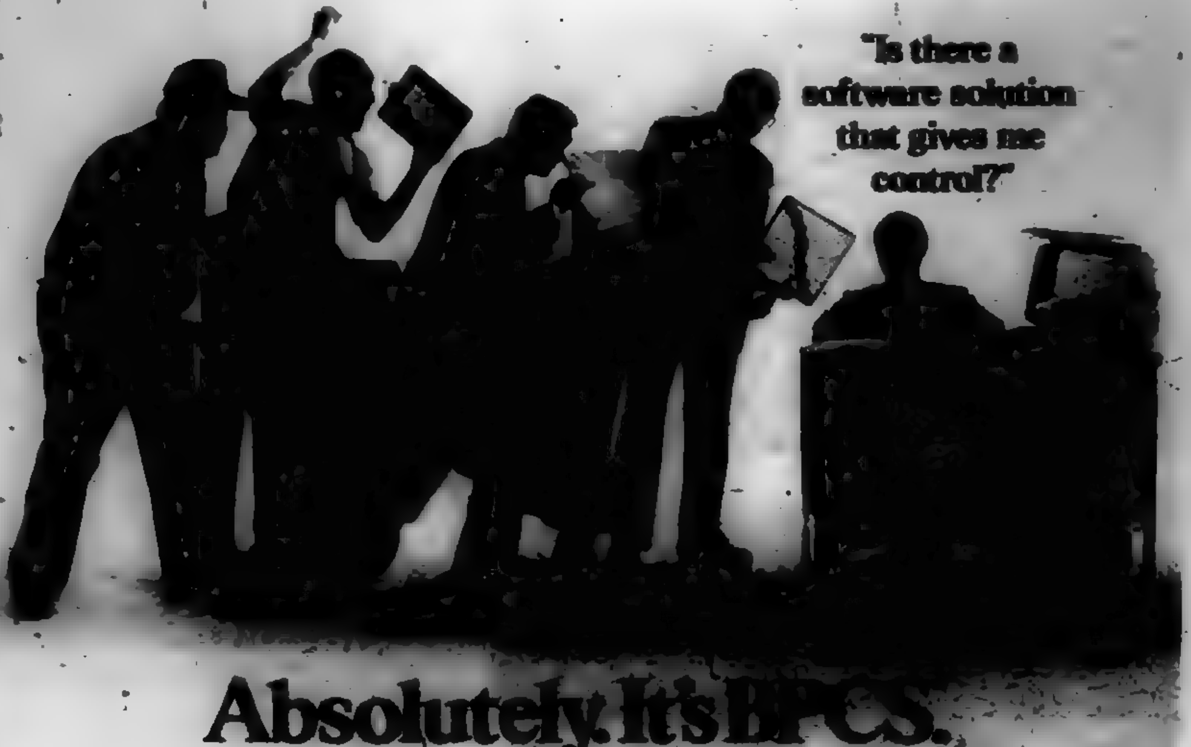
Objectivity. Independent maintenance companies do not benefit from passing the buck or blaming other vendors' components for a system malfunction, as is often the case with manufacturers' maintenance.

Because of this, third-party maintenance provides users with an objective, thorough approach to equipment service. When a company is responsible for an entire system, it must service the entire system equally; it cannot merely focus on a single system component.

Independent maintenance companies can also provide objective opin-

See SERVICE SR/31

Thibodeau is national account marketing manager for Control Data Corp.'s Engineering Services Division, which is based in Minnetonka, Minn.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Users must match needs to service firms' capabilities

Keeping mixed-vendor minicomputer systems up and running is no small undertaking, and obtaining the right kind of service at the optimum cost is a difficult goal to achieve.

A logical approach to saving money and eliminating unnecessary downtime lies in determining the specific maintenance requirements of all facilities and in finding an organization that can effectively address these needs.

Once a shop's requirements have been identified, the manager should ask maintenance organizations to supply written proposals that fully describe service capabilities.

Specifically, the proposals should address the type of equipment the organization services, the response time a user can expect, the maintenance organization's normal working hours and the cost of service after normal working hours.

Three key resources

In a general sense, users can judge maintenance organizations according to the strength of three key resources: people, parts and depth of service.

People. The geographic distribution coupled with the availability of qualified customer service personnel are prime considerations.

Although some maintenance organizations service a wide geographic area, many do not have enough available personnel to service any given area properly.

The service a user would receive from an enormous national field service organization, for example, would be inadequate if that organization only employed one or two technicians in the user's city.

Equally important to the quality of service is the extent to which the maintenance organization trains its field engineers. Because of the rapidly changing computer market and the need to upgrade parts and replace outdated technology, the user must demand that the maintenance organization continually train its customer engineers.

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> *In a general sense, users can judge maintenance organizations according to the strength of three key resources: people, parts and depth of service.*

Parts. The availability of needed parts or components is another important factor.

A maintenance company cannot possibly stock all possible parts for each customer. It can, however, maintain a reasonable parts inventory that guarantees a high level of customer satisfaction.

Depth of service. The depth of service is also a major concern. A user can gauge a maintenance organization's commitment according to whether the organization offers the following two services:

■ A hot line. The hot line should ensure speedy responses for emergency calls and should provide a day-to-day source of assistance for less pressing maintenance and technical problems.

■ Remote diagnosis. Remote diagnosis is becoming popular as a viable means of troubleshooting; it can eliminate many service calls and cut maintenance costs.

A user should try to find a maintenance organization that provides the service most suited to the needs of the computer system.

— Rudy Thibodeau

SERVICE

from SR/30

ions on equipment acquisitions. An outside service organization will not profit from recommending one manufacturer's equipment over another's. Rather, it will tend to offer more neutral advice than an equipment manufacturer will.

Comprehensiveness. Major third-party services usually have an extensive spare parts supply and a distribution system that is large enough to meet a wide variety of minicomputer and peripheral hardware requirements.

The main services these companies offer fall into three categories:

■ Preventive maintenance — periodic and planned services, such as replacement of air filters and disk drives.

■ Predictable maintenance — replacement of assemblies with known failure rates.

■ Remedial maintenance — diagnosis, isolation and repair of malfunctions.

Additional services may include installing equipment, preparing documentation and user training.

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Special Report

Law firm weighs evidence in choosing OA system

FREDONIA, N.Y. — Careful research led one of the partners at a small law firm toward the verdict that a successful office automation project must be constructed piece by piece around useful software.

Peter Clark, the partner in charge of automating the law firm of Brandt, Laughlin, Schaack, Whipple & Clark, P. C., began his project with little knowledge of computers. "My kids probably know more than I do," he said. But after reading articles about office automation in American Bar Association (ABA) journals and visiting an ABA conference that featured some automated systems in use, Clark had a solid idea of how to begin his search.

"From all I'd read . . . the software was very important," he said. His research convinced him that Brandt Laughlin would be best served by a Unix-based system with components for word processing, accounting and client record keeping. Unix was the only operating system that Clark thought would provide the multiuser capabilities the firm required.

Brandt Laughlin has six attorneys and 10 clerical employees who work out of three offices — the firm's Fredonia headquarters and two branch offices in nearby towns. In its two branch offices, the firm uses dedicated word processing systems. In its headquarters, however, it wanted to integrate word processing and other company tasks on a micro-based system.

Clark chose Unilaw legal software from Guardian Automated Systems, Inc., a Unix software development company, as the basis for the firm's system. The software included a component for time and billing and one for trust accounting and had an interface with word processing.

Clark then looked for hardware on which to run the software. After he considered Unix-based micros from IBM, AT&T and NCR Corp. and dismissed them because of their prices or unavailability, Clark chose a Fortune Systems Corp. XP 30 with a 30M-byte hard disk.

Brandt Laughlin ordered additional software from Guardian, including a University of California at Berkeley 4.3 Unix-like operating system and software packages for word processing, spreadsheets, terminal emulation and payroll.

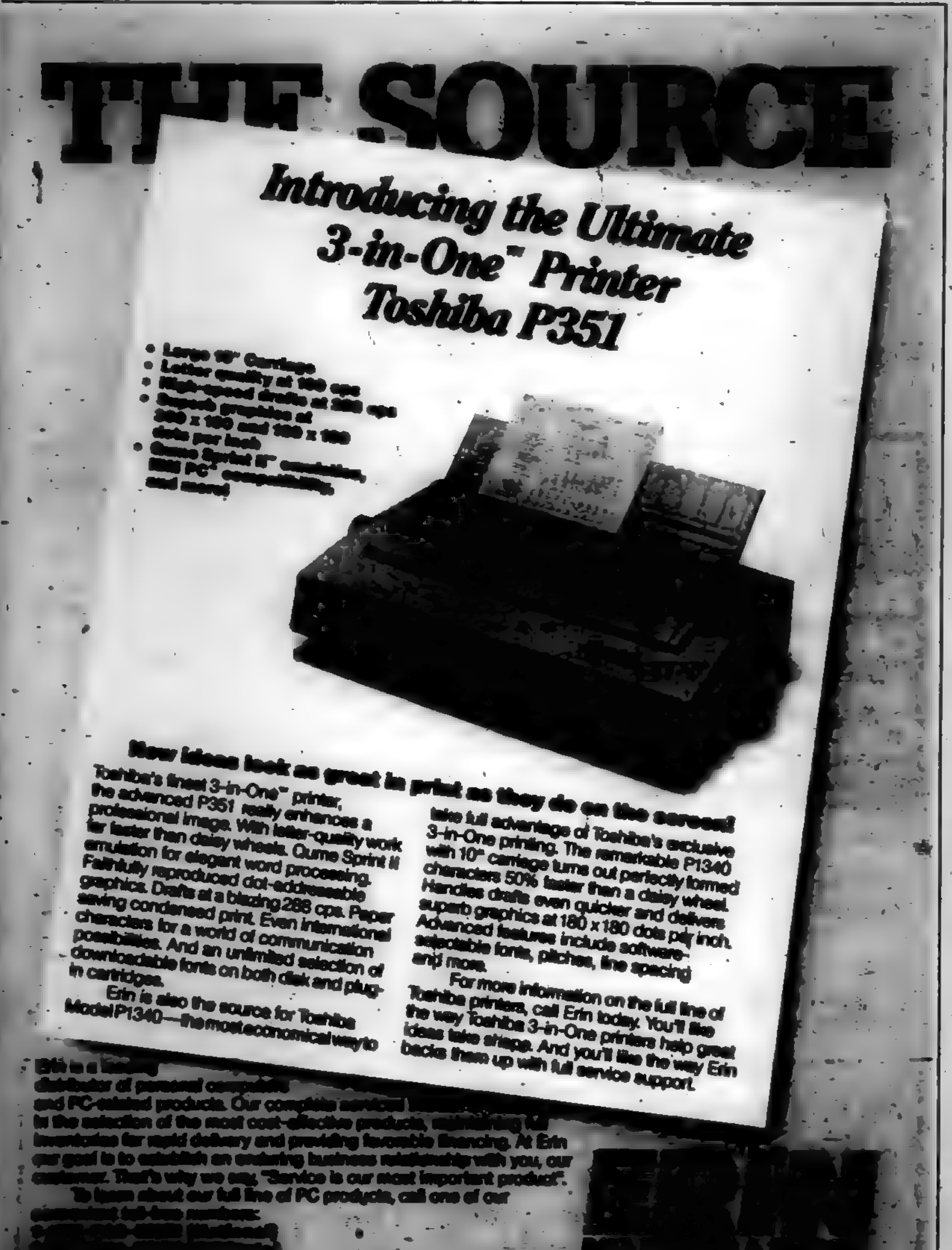
The system was installed in August 1984. Since then the firm has installed a general ledger package and has subscribed to an on-line legal data base.

The firm followed a similar plan with its hardware and software. It bought basic components and will add to them as needs arise, as employees become comfortable with technology and as money becomes available, he said.

He outlined other attitudes and methods that he said helped Brandt Laughlin make a smooth transition from manual to automated document production and accounting.

- **The clerical staff wanted it.** Clark said one secretary had worked with a word processor at another firm and that the others liked the system because it saved them time on repetitive tasks.
- **The firm did not try to deal with too much data at once.** Rather than try to put all of its documents onto the system right away, the firm entered forms as it needed to use them. For example, Brandt Laughlin started using the time and billing programs only for clients who were billed hourly. Later, it phased in their use for clients who were billed on a flat rate and those who were billed on a contingency basis.
- **Automation was presented not as a replacement for all old methods but as a supplement.** The on-line research service, for example, is being used in conjunction with periodicals and other traditional research tools.
- **The firm's organization remained intact.** The secretary primarily responsible for documents related to matrimonials still worked on them. The people who handled the accounts payable continued to do so.
- **Good financial planning permitted the firm to absorb the costs of automating.** The equipment and software purchases were modest — totaling only about $30,000 — rather than extravagant. Additional components will be added when needed.
- **The firm automated only its headquarters.** It plans to link its two branch offices later. That way, Clark said, employees from the Fredonia office can train clerical people at the other sites.

> ”
>
> *A set of attitudes and methods helped Brandt Laughlin make a smooth transition from manual to automated operations.*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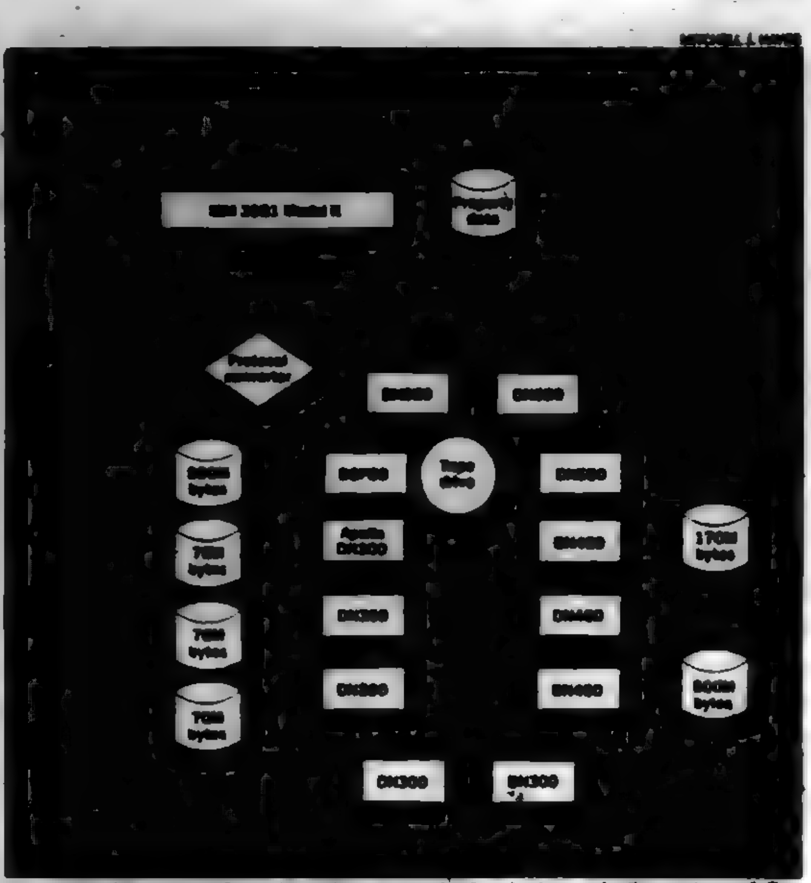

Hennepin County's 12-workstation network ties in to a similar setup of five processors in Minneapolis city offices.

HENNEPIN from SR/14

duction. With the new system, users can display a map of the entire city of Minneapolis and zoom in to inspect and update details as minute as street signs. Lachinski said users can process a change to a large map within a few seconds — about the same response time required for a change to a small map using the old configuration.

- The network's data base, Apollo's Domain DSM, allows programmers to compile programs on-line, and jobs submitted by different programmers can run simultaneously. Associated graphics routines, components of Apollo's Graphics Metafile Resource, let developers integrate graphics, text and data into interactive applications. Lachinski said DSM also features fourth-generation capabilities that will help end users work with the completed Ultimap system.

- Because each workstation on the network now has its own processor, programmers do not have to compete with other users for CPU resources. Lachinski said the microprocessors have less raw power than the mainframe did but can handle the same development processing load because they are dedicated workstations.

- Processing costs are so low, compared with those from the IBM mainframe, that Hennepin County expects the Apollo workstations to pay for themselves in less than one year once they begin running Ultimap in production, according to Lachinski. Because of this, he said, developers can concentrate less on costs and more on designing efficient systems.

Want to optimize user productivity

"With 32-bit microprocessor workstations, CPU cost is less of a consideration [than it is with mainframes], so the emphasis has shifted to optimizing user productivity," Lachinski said.

Hennepin County's Ultimap programmers are currently converting the mapping system software from IBM's IMS to Apollo's Domain environment. The 3081 stores graphics data, which programmers download to the Apollo network for conversion then upload back to the mainframe. They transfer files between the two configurations via a protocol converter.

According to Lachinski, the development team expects to take one-half of its work off the IBM mainframe by the end of this year and to complete the conversion six months after that.

LAMBTON from SR/14

But when staff members began simulating student usage with about 10 machines, they bogged down the network. The current dual-network setup arose as a result. Boyd said he split the network in two so that traffic tie-ups on one network would not impede transmissions on the other.

Cannot handle students' whims

The single network would probably be able to meet business users' demands, he said, but it could not handle the whims of students. "They're not disciplined at all," he explained. "They will sit for hours and just play, and they will try to bring the system down. They feel it's part of their learning process."

This perception of student habits also forced the school to abandon another planned network feature. When Boyd ordered the Cadmus equipment, he said he had hoped to use it as part of a file-serving scheme. Students would download files from a VAX processor, work with the data on the Cadmus machines and transfer the files back to the VAX for storage.

But the winter tests convinced him such a setup could be disasterous if too many students decided to transfer all their data at the same time. As the network stands now, each student is assigned a home workstation. Each workstation has its own disk drive, with either 60M or 140M bytes of storage, so each student can store data at his home base.

This way, Boyd said, students will transfer themselves across campus to their home workstations instead of transferring data across the network to whatever workstation they want.

With the dual network and local storage, Lambton's computing resource should hold up to the demands of its users, according to Boyd. But until the network survives two semesters of use, especially term-end cramming, he will continue to fear the worst. "I have my fingers crossed," he said.

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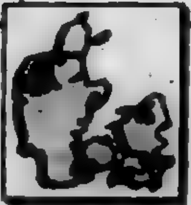
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MICROCOMPUTERS

SMALL TALK
Edward Warner
CW International Editor

Many thanks to CW readers

As I leave the microcomputer beat at *Computerworld* to become the paper's International Editor, I want to say goodbye — at least for now — to a number of people who have, in time of need, given me good story ideas or quotes. In many cases they had no self-serving reason to call. Others have spent much valuable time on the phone with me in an interview. Sometimes, they even risked their jobs.

I would also, however, like to say an "ungoodbye" to those few who infest the otherwise-respectable field of public relations, denigrating its image while giving me a headache.

But first the good news.

An example of the helpfulness of our readership — especially those microcomputer managers and users out there — comes in response to a recent column that I wrote about my unfruitful search for business users of the AT&T Unix PC. At the end of that column, I asked the readers to call me if they knew of anyone using the machine. I received more than 30 phone calls. True, some were from dealers, but most appeared to have come from readers who had nothing to gain — except the good feeling of having lent a hand.

Another example comes to mind: A microcomputer manager with an oil company recently called to tell me his thoughts on site licensing of personal computer software and how his firm has just concluded such an agreement. A good story resulted, one that may have benefited other microcomputer managers.

Unfortunately, I have since heard that the kind soul who gave me the

Continued on page 71

DSS sidesteps DP logjam

Tools boost users' power; ease of use called crucial

By John Desmond

DALLAS — Decision support software (DSS) is becoming known for its ability to enable personal computer users to perform a variety of analyses using simple programs, while skirting the central MIS waiting line for applications. This is the consensus reached by two speakers at a session on DSS at the Software/Expo conference earlier this month.

But for DSS software to make it on personal computers, DSS products must be easy to use as well as effective, one speaker noted. "The financial modeling capability of this type of system depends on its ease of use," said Jeffrey A. Schackor, director of financial and business analysis for Healthone Corp. of Minneapolis.

Schackor addressed how a DSS system is being developed at Healthone, a health care conglomerate with four hospitals, health maintenance organizations, a home health organization and an ambulance service. The firm had a revenue of $180 million in 1984.

At Healthone, Schackor said, a financial modeling program is being developed because, "We need to know our financial situation at any point in time. We want a system to project financial performance for three to five years."

If a health maintenance organization approaches his organization about using a Healthone hospital for its members, Schackor said, "You have no idea what that means unless you can model the impact on the whole system. And I can't afford to a have a 50-man analysis department. We need a program that can produce reports quickly."

A final decision has yet to be made, but Schackor said he is leaning toward a personal computer-based DSS for Healthone.

Rusty Luhring, president of Ferox Microsystems, Inc., presented five examples of how DSS is being used on personal computers. Ferox markets a DSS application development system dubbed Encore.

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- Pick Systems will introduce next month two versions of its Pick operating system for the IBM Personal Computer AT/62
- Timelock Software has announced its IBM Personal Computer security systems/66
- Nardoni Associates has unveiled a microcomputer human resource package/69

INSIDE

Board-Level Devices/69
Auxiliary Equipment/70

Microsoft enhances Multiplan

Microsoft Corp. has unveiled an enhanced version of its IBM Personal Computer spreadsheet, Multiplan, shipping about the same time as Version 2 of Lotus Development Corp.'s 1-2-3.

Microsoft also announced Cobol Tools, its first productivity software package for Cobol programmers. The software, available for Microsoft MS-DOS or Xenix environments, will be shipped in October.

Multiplan Version 2, which will be available next month from Bellevue, Wash.-based Microsoft, is said to offer faster calculation speed by supporting the Intel Corp. 8087 and 80287 math coprocessor chips. Other reported enhancements to Microsoft's software are larger work sheet size, capability for keyboard macros, mouse support and the ability to read and write to files created with 1-2-3.

Like the new version of 1-2-3, Multiplan Version 2 uses a sparse cell memory management scheme to allocate memory only to work sheet cells that are filled. The more efficient use of memory allows Multiplan to accommodate spreadsheets with up to 4,096 rows and 255 columns.

The new version also prioritizes recalculations to handle the calculation of the on-screen cells first for greater speed.

Multiplan's compatibility with spreadsheet market leader 1-2-3, a first for the Microsoft package, will reportedly allow users to transfer values as well as formulas between the two spreadsheets. The new version also links with Microsoft Chart to provide real-time changes in the graphics presentation software when Multiplan figures are changed.

The keyboard macros in Multiplan 2 can be used for common procedures such as work sheet printing or more complex tasks such as creating customized applications.

Continued on page 71

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Future to bring price erosion to micro software mart

Management control expected to diminish

By Susan Blakeney

MIAMI — The short-term future will bring tremendous price erosion in the personal computer software market and, in the longer term, a loss of control for DP managers over end-user computing.

Those were some of the predictions voiced earlier this month by industry experts at Link Resources Corp.'s "Marketing The New Technologies" conference. Link, a New York-based market research firm specializing in telecommunications technologies, is a subsidiary of International Data Corp.

During one session a panel of microcomputer industry personalities expressed their opinions on upcoming changes in data processing. One change, according to Stewart Alsop, publisher of "P.C. Letter," a biweekly newsletter on the personal computer industry, will be that "large computer centers will evolve to service departments. They will be transparent to users. End users will not be controlled by them."

The personal computer user of the future will likely use an Apple Computer, Inc. Macintosh, Alsop said. "IBM [Personal Computers] are just too complicated; they give the user too many choices," he said. "That's why the Macintosh is successful. It's operating environment is so easy to use."

Alsop said products and trends to watch for include Microsoft, Inc.'s Excel spreadsheet, which runs on Apple Computer, Inc.'s Macintosh. "Excell will give Lotus Development Corp. problems," Alsop said.

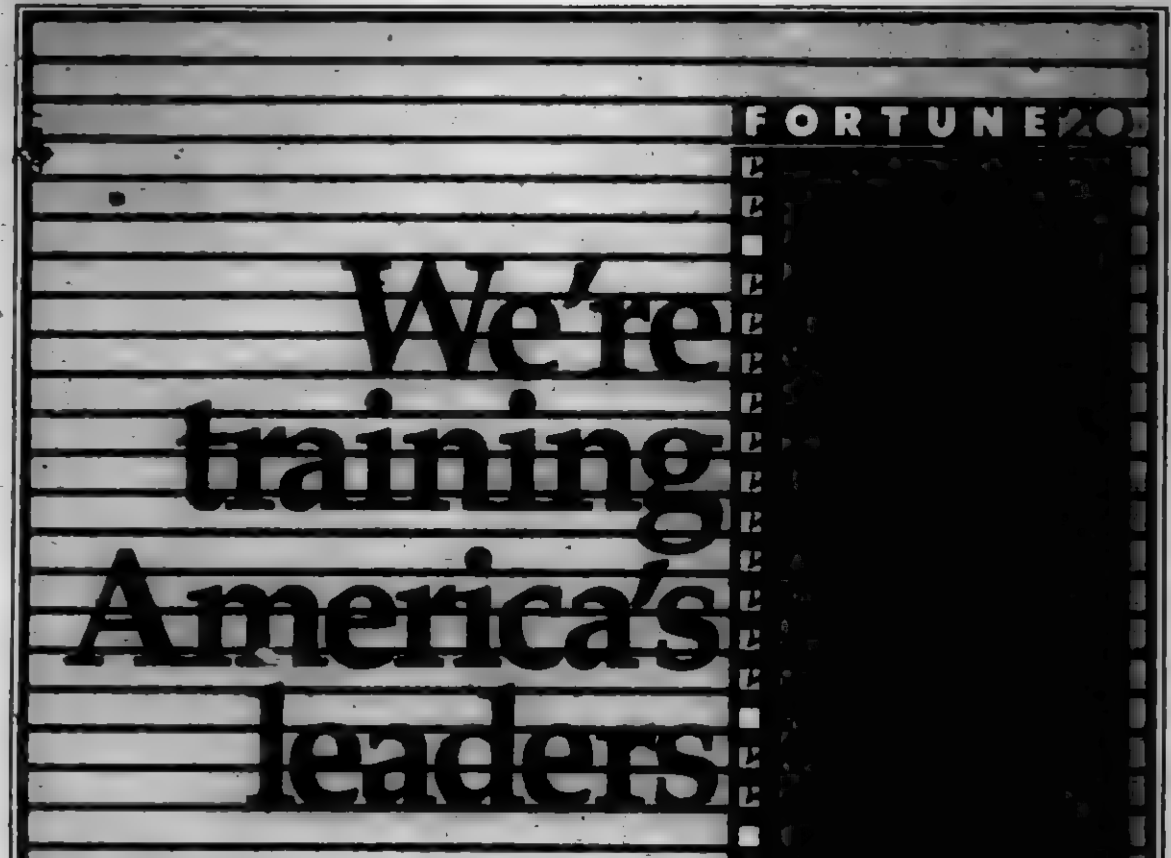
Other products Alsop said to look for include data base and file managers from Symantec Corp. and Ansa Corp. for the IBM Personal Computer and a package called Ready from Living Videotext, also aimed at Personal Computer users, that will be released at the end of the month. Ready, a memory-resident desk accessory, produces outlines for the user, Alsop said.

He also told his audience to watch for personal productivity packages that are task specific and will include drafting, typography and melding functions. Alsop said he expected laser printers to come down in price before anything major happens in word processing.

Eric Bedell, product marketing manager for Lotus' Jazz, maintained that the gloom and doom prevailing in the industry is really a "moment of digestion." Bedell, however, predicted coming challenges in the distribution arena and said presales seminars for users will be more widely practiced.

Bedell also compared the future of personal computer software to frozen food: each emphasizes speed, personal productivity, easy access and, last but not least, content.

Jim Johnson, president of Human Edge Software Corp., said "tremendous price erosion will occur during the next few years" thanks to agressive companies like Borland International and DAC Software, Inc. He warned, however, that pricing on Lotus' 1-2-3 along with Ashton-Tate's Dbase III would remain high because nobody appears able to offer a comparable product.



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Pick to launch system versions for IBM micro

Pick Systems, located in Irvine, Calif., is scheduled to introduce next month two versions of its Pick operating system for the IBM Personal Computer AT.

One version reportedly will support up to three users, and the second will work with up to six users. The Pick operating system, in use on 27 different computers from low-end mainframes to the IBM Personal Computer XT, will include in its AT version a bridge to the IBM PC-DOS operating system, permitting users to move files between the two operating systems, according to Frank Petyak, Pick national marketing manager.

Other features of the Pick Personal Computer AT System include support for a streaming cartridge backup system, a bundled applications generator and compatibility with all other Pick systems. The latter feature means that users will be able to take "an application on an [IBM] 4300 and run it on the AT," according to Petyak.

Multiport cards supported

To gain the extra serial ports needed to support additional users, the Pick Personal Computer AT System will support multiport cards from AST Research, Inc.; Arnet Controls, Inc.; and Digigraphics, Inc., Petyak reported.

The three-user support version of Pick for the AT is priced at $795, and the six-user support version is priced at $995.

Both will debut in mid-October, Petyak said.

Intel introduces supermicro, board-level products

Intel Corp. of Santa Clara, Calif., has announced a new supermicrocomputer and several board-level products that are based on an 8-MHz version of the Intel 80286 microprocessor.

The products consist of two CPU boards and four memory expansion boards, feature immediate memory access and operate with the vendor's Irmx 286 operating system.

With the addition of the real-time Irmx 286, supporting up to 16M bytes of memory, the System 310AP is targeted for industrial and communications applications such as process control, data acquisition, robotics, protocol conversion and automated testing.

Memory, speed improvements

The System 310AP supermicro is said to offer substantial memory and speed improvements over the Intel 310, with performance comparable to the Digital Equipment Corp. VAX-11/780 mini. The 310AP supports applications previously written for Irmx 86 running on the 310.

The basic configuration includes the Multibus I bus architecture (IEEE Standard 796); the Intel 8-MHz, 80287 math coprocessor; a 320K-byte, 5¼-in. floppy disk drive; support for a 60M-byte, ¼-in. streaming tape drive; two serial ports; and one parallel port.

The 310AP line includes systems with up to 16M bytes of random-access memory (RAM); up to 420M bytes of unformatted hard-disk storage in increments of 19M bytes, 40M bytes and 140M bytes; and up to 16 ports.

The basic configuration is priced at $8,125.

The ISBC 286/10A CPU board includes an 8-MHz 80286 and a socket for an Intel 80287 coprocessor, 512K bytes of local memory and 128K bytes of dual-port memory. It is intended for erasable programmable read-only memory applications and sells for $2,600.

The ISBC 286/12, intended for RAM applications, contains 1M byte of dual-port, immediate-access RAM. The board also includes the 8-MHz 80286 and a socket for the 80287, as well as a socket for the Intel 82258 advanced direct memory access microcontroller. It costs $4,715.

Both CPU boards can reportedly be configured to gain access to memory through the ILBX local bus extension or through a synchronous bus interface.

The EX series of memory boards offers access memory transfer through a new synchronous bus and supports byte parity-error detection. The top of the line, the ISBC 040/EX, priced at $7,500, is said to be the first Multibus I board to offer 4M-byte capacity.

The other boards are the 500K-byte 012/EX for $1,800, the 1M-byte 010/EX for $2,700 and the 2M-byte 020/EX for $4,335.

Isdos micro tool debuts

Isdos, Inc. of Ann Arbor, Mich., has introduced a software program that automates the Yourdon/Demarco system development methodology of structured analysis, which programmers and analysts often use.

Structured Architect features graphics representations of data flow diagrams and the validation and verification of analyst models. The package's data dictionary documents interface flows and data stored in data flow diagrams and specific processes represented in the data flow diagram.

The software runs on an IBM Personal Computer with 256K bytes of random-access memory and IBM's PC-DOS operating system. The package supports graphics boards from a number of manufacturers including IBM and Tecmar, Inc.

Structured Architect costs $3,500.

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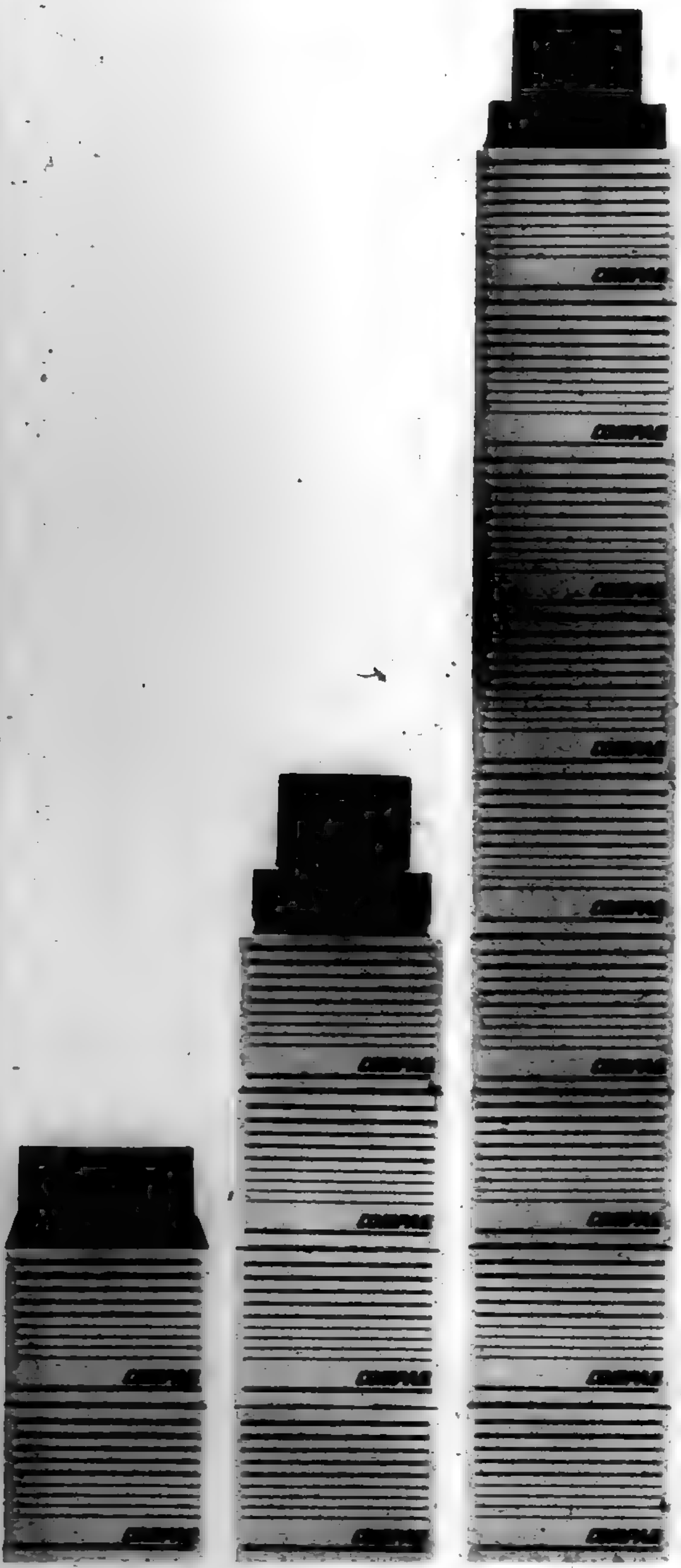

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Motorola expansion card bows

Motorola Semiconductor Products, Inc. of Phoenix has introduced an expansion card that reportedly allows an IBM Personal Computer with a 10M-byte hard disk to serve as a multiprocessor host for AT&T Unix-like applications.

The plug-in module, PC/68000, is based on the Motorola, Inc. MC68000 microprocessor.

It is said to run Motorola's Unix-like System V/68 operating system and provide transfer capabilities between that system and IBM's PC-DOS.

The product reportedly supplies an IBM microcomputer with development capabilities similar to those for Motorola HDS-200 or HDS-300 development workstations.

Buffering and cache memory reportedly allow the 68000 processor to run independently of the I/O functions of the Intel Corp. 8088 or 80286 chip within the IBM Personal Computer.

The user can switch between the System V/68 and PC-DOS with two keystrokes, the company said.

The PC/68000 includes the 10-MHz MC68000, cache memory, 2M-byte dual-ported random-access memory and the System V/68 software.

The module is available for $4,500, according to the vendor.

Ashton-Tate on-line data support out

Ashton-Tate of Culver City, Calif., has become the first software company to offer on-line technical support services to its customers via One Point, a Walnut Creek, Calif., on-line data base vendor.

Ashton-Tate has furnished the One Point data base with product descriptions, reference notes, product upgrades, samples and product announcements.

Questions that cannot be answered by the data base information can be sent to Ashton-Tate via electronic mail for a quick reply.

Users access the information through the One Point Computer Information Network that runs on Tymshare, Inc.'s Tymnet.

Usage fees for the service are $40 per hour.

Timelock unveils IBM micro security system

Timelock Software, Inc. in Huntington Station, N.Y., has introduced its Timelock Security System for use on IBM Personal Computers with attached hard-disk storage units.

Timelock, a hardware/software product, includes a business-card-size plug that must be inserted into the computer's external parallel port, in line with the printer cable, before users can boot the computer from the hard disk.

The product's software, meanwhile, resides on the computer's hard disk. The software limits access to the computer to those who have the correct password.

After three attempts, an alarm sounds and the computer locks out any further attempts to access it, Timelock said.

A corporate version of the product is also available. The software in that version is reportedly custom written for each corporate customer. Also included in the corporate version are skeleton keys, plugs that can access all of the customer's hard disks, permitting a security officer to boot a hard disk-equipped computer for a user who has forgotten his plug.

The Timelock Security System, available now, has a retail price of $350. Its corporate version is priced at $14,050 and includes two skeleton key plugs, 100 software licenses, 25 security plugs and documentation.

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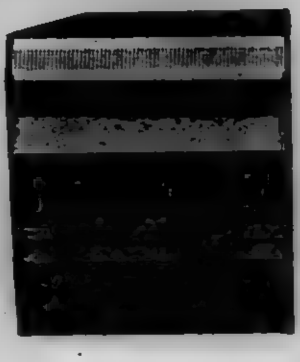

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Human resource system out for IBM, AT&T micros

Nardoni Associates, Inc. of Whitehouse Station, N.J., has unwrapped the Microcomputer Personnel System, a stand-alone human resource information system that runs under IBM PC-DOS 2 on the IBM Personal Computer AT, XT, AT&T PC 6300 and any IBM-compatible microcomputer with a hard disk drive.

The Microcomputer Personnel System's data base design features include more than 650 unique data elements, 20 expansion fields related to personnel functions, 40 reference tables, more than 70 display screens, 25 personnel management reports and a two-level report generator, according to the vendor.

Reports are said to cover such areas as salary and wage issues, applicant flow, tuition refunds, medical claims, labor relations, employee benefits, attendance control, skills utilization, management selection, education and training, appraisals and employee history.

Security feature controls access

A security feature controls system access by signon, menu and data element read-and-write limitations controlled by the personnel department, according to a Nardoni Associates spokesman.

The Microcomputer Personnel System can interface to word processing packages and can be configured with optional communications modules that make the microcomputer function as a terminal workstation for communication between other microcomputers or mainframes, the spokesman added.

A single-user license costs $9,500.

BOARD-LEVEL DEVICES

■ **Bit 3 Computer Corp. has introduced The Adapter, which reportedly allows the IBM Personal Computer AT to appear as another processor on systems using the Intel Corp. Multibus.**

The product, which consists of two cards interconnected by cables, is said to provide the full resources of the Personal Computer AT for use as a bus master in Multibus applications. This configuration allows the AT to use a variety of graphics, array processors, large disks and high-performance processors compatible with Multibus, the vendor said.

In Multibus applications using The Adapter, the AT reportedly can function as a pre-, post- or coprocessor.

The Adapter is priced at $1,175.

Bit 3 Computer, 8120 Penn Ave. S., Minneapolis, Minn. 55431.

■ **STB Systems, Inc. has introduced a memory expansion board for use with the Lotus Development Corp. and Intel Corp. Expanded Memory Specification.**

The Memory Companion/PC will give the IBM Personal Computer XT and compatibles access to up to 2M bytes of additional memory. Up to four Memory Companion/PC boards can be installed in a system for a maximum of 8M bytes of memory, the vendor said.

The board reportedly is compatible with Lotus' Symphony 1.1 release.

The 64K-byte Memory Companion/PC costs $349. The 256K-byte version costs $395.

STB Systems, Suite 125, 601 N. Glenville, Richardson, Texas 75081.

■ **Ideassociates, Inc. has announced a multifunction add-on board for the IBM Personal Computer AT.**

The Idea Supermax reportedly includes two serial ports, one parallel port and memory expansion capabili-

Continued on page 70

From page 61

DSS sidesteps DP logjam

DSS is commonly used today for financial modeling and budgeting, often to help make decisions on whether to go forward with a project or acquisition or even to hire or promote personnel, Luhring said. DSS on the personal computer allows the evaluation of more alternatives more quickly than mainframe modeling programs typically allow, he said.

In addition, "The ability to change the format of the information for an analysis is put directly into the hands of the decision maker," he said.

Bicks Pickles of Scarborough, Ont., Canada, which has captured 54% of the Canadian pickle market with more than 300 products, needed a modeling program to project profits. The firm's MIS department said the necessary application would take two years to develop, and they recommended not doing it on a personal computer. The DSS proponents ignored the advice and developed the application on a Compaq Computer Corp. micro with a 10M-byte hard disk. The application was developed in about six months, Luhring said.

The First National Bank of Chicago, the 10th largest U.S. bank, was experiencing a high rate of loan defaults and was looking for a system to help evaluate credit risks. The company made an initial decision to go with a personal computer-based DSS project, putting nearly 7,000 historical financial statements on five micros, each with a 30M-byte hard disk. Loan officer support teams can now perform analyses without special expertise using the modeling program, Luhring said.

Western Digital Corp., a Silicon Valley electronics manufacturer, wanted management reports from its general ledger software running on a Hewlett-Packard Co. 3000 minicomputer. "But it took two weeks to get charts" after a request was submitted, Luhring said. So a team wrote a program to extract needed data from the HP 3000 and download it to a personal computer. Now, the company gets 48 monthly report graphs in an hour and a half, he said.

The World Bank/ International Finance Corp. in Washington, D.C., which makes loans for development projects worldwide, was either performing its number crunching in the field or bringing data back to Washington, D.C., for processing. Because the central DP department was "very bureaucratic and strongly centralized," Luhring said, the bank developed a DSS program for personal computers. Now, World Bank financial analysts carry their micros with them to perform analyses on site.

The American Express Co.'s Travelers Cheque's division, which issues checks for use anywhere in the world, developed a DSS application to analyze quickly the impact of daily changes in currency values. Data from around the world is sent to the company's mainframe in New York, from which it is downloaded to a personal computer where the information is consolidated and the currency conversions are performed, Luhring said.

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The Institute for Certification of Computer Professionals (ICCP) has scheduled the second 1985 examination for the Certificate in Data Processing (CDP) and Certificate in Computer Programming (CCP) for Saturday, Dec. 7, 1985, at test centers throughout the world.
The CDP Examination is designed for business-oriented DP practitioners at the management or supervisory level. The CCP Examination for experienced programmers is constructed so that each area of specialization—business, scientific, systems programming—includes five general computer programming sections and a sixth section in candidate's area.
Application deadline is Friday, Nov. 8, 1985 for December exams.
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MICROCOMPUTERS

Continued from page 69

ty up to 4M bytes. The basic Supermax "bare board" can be expanded to 1.5M bytes with 64K-bit random-access memory (RAM) chip and to 4M bytes with 256K-bit RAM chips and an additional piggyback board.

Cost of the Idea Supermax ranges from $495 for a bare board to $3,795 for a board with 4M bytes of memory.

Ideassociates, 35 Dunham Road, Billerica, Mass. 01821.

■ Micray Electronics Ltd. has announced a package that reportedly increases the performance of an IBM Personal Computer AT equipped with Intel Corp. 80286 and 80287 microprocessors by up to 40%.

The package features an automatic self-optimizing clock that drives an 80287 at its maximum speed, increasing the coprocessor's performance by up to 75%, the vendor said. The product consists of a printed circuit card that fits into an 80287 socket.

AT Booster, which includes operating and diagnostic software, costs $349.

Micray Electronics, Bay 1, 4001A 19th St. N.E., Calgary, Alta., Canada T2E 6X8.

■ Earth Computers has unveiled Turboaccel-286, an expansion board that provides an IBM Personal Computer with an Intel Corp. 80286 microprocessor.

The board features 512K bytes of random-access memory, an optional 80287 coprocessor and the ability to switch to an Intel 8088 microprocessor.

The product uses a custom very large-scale integration chip that emulates 8088 signals and is software transparent, according to the vendor.

With the product, an 80286 microprocessor can directly execute a Personal Computer's Bios and PC-DOS operating system.

Turboaccel-286 costs $995.

Earth Computers, Box 8067, Fountain Valley, Calif. 92728.

■ Checkmate Technology has unveiled a 16-bit microprocessor-based expansion card for the Apple Computer, Inc. Apple II series computers.

The Multiram CX contains Motorola, Inc.'s 16-bit 65C816 microprocessor chip and the Micro Magic, Inc. MAX-OS operating system, which offers multiuser, multitasking capabilities.

The Multiram CX is said to select automatically the proper microprocessor for each Apple software application, allowing use of both 8-bit- and 16-bit-based software. The board contains 256K bytes of random-access memory.

The Multiram CX card for the IIc plugs into a socket on the motherboard after removal of the microchip. The card plugs into an expansion slot in the IIe.

The card, including the MAX-OS software, is priced at $329.95. A 16-bit CX kit option, which contains the operating system in disk version, sells for $149.95.

Checkmate Technology, 509 S. Rockford Drive, Tempe, Ariz. 85821.

AUXILIARY EQUIPMENT

■ Dialogic Corp. has added software support to its voice I/O systems to enable IBM Personal Computer, Personal Computer XT, AT and 3270 Personal Computers to record, play back, send and receive voice messages over an IBM Personal Services network running Distributed Office Support Systems.

Users can record or play back messages using a standard microphone and loudspeaker or by interfacing to the handset of a modular telephone with a Dialogic THI-1 telephone handset interface, the vendor said.

The Personal Voice Messenger software provides an audio services menu and function-key-driven facilities for recording, playing back, sending and receiving messages. Voice files appear in a window.

Priced at $25 for a single-user license, Personal Voice Messenger software runs with one of the vendor's voice I/O systems.

They are Dialog/1, Dialog/2 and Dialog/3, which cost $295, $495 and $595, respectively. The THI-1 telephone handset interface sells for $30.

Dialogic, 60 Baldwin Road, Parsippany, N.J. 07054.

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PANSOPHIC

From page 61

Many thanks to CW readers

story idea is now in hot water with his employer for having talked with the press — even though no proprietary information was revealed. He, like many others, had no need to help me, but, in doing so, he helped many. I hope his employer goes easy on him.

Now for the bad news

As for the bad news, well, there is thankfully less of it, though some equals in its outrageousness the helpfulness and courage of some of my sources.

Certainly *Computerworld* gets more phone calls from public relations professionals than it does from its readers. When PR people call from out of the blue, they most often call to sell us on something: a story idea about their employer or client. The irony of this is that when I call these same people for a comment on a story which they didn't ask me to do — some news about a bad fourth quarter — they often slither into the woodwork and escape with "I'll have to get back to you on this." For them, tomorrow apparently never comes.

Also a number of calls regard the most insignificant things — "Did you receive our press release on our new agreement to sell diskettes in Alabama retail stores?" — and they come on the two days of the week that are our busiest — Tuesday and Wednesday.

Prefer calling to writing

The fact that many public relations people prefer to call, rather than write a letter, leads me to wonder if they really don't want to put in writing what they could later deny having said.

Typical of this is the situation that developed with a new Cambridge, Mass.-based software vendor, which was, according to its PR agency, giving a "de facto introduction" of its much-awaited first product. The vendor's in-house spokeswoman had a slightly different story: She said the product was not really being introduced at all; it was "being trickled out" to members of the press in one-on-one demonstrations.

I got a demo but afterward was treated to a bit of hucksterism that would have made P. T. Barnum flinch. The product isn't being introduced, I was told, but we want you to write about it now, without mentioning the words "introduced" or "announced" in your story. That way, they figured, they could get even more press when the product was actually "introduced" later this year. I would have expected such tactics were I shopping for a used car; I didn't expect them from so-called professionals.

If I get outraged at the way in which some public relations workers play loose with the truth, it's only because I've been pampered by some sources who have always leveled with me, even when they were busy with a thousand other matters. To them I say, "Thanks."

As for those members of the public relations trade who check their scruples at the office door, I have a big "no comment."

From page 61

Microsoft enhances Multiplan

Another capability, model consolidation, allows the user to combine multiple worksheets into a separate summary one at a time or in batches.

The software requires DOS 1.1 or higher, 128K bytes of random-access memory (RAM) and one double-sided disk drive. Use of the optional Microsoft Mouse supported by the Multiplan Version 2 also requires Microsoft Mouse Version 2 or higher.

Multiplan Version 2 is priced at $195. Upgrades for current users of Microsoft Multiplan 1.2, IBM Multiplan or Texas Instruments, Inc. Multiplan cost $50.

The MS-DOS version of Cobol Tools requires the new version of Microsoft's MS-DOS-based Cobol Compiler, Version 2.1, also to be shipped in October. The Xenix version runs with Xenix Cobol.

Both versions are reportedly source code compatible, allowing users to port Cobol applications between MS-DOS and Xenix.

MS-DOS Cobol Tools requires 256K bytes of RAM, MS-DOS 2 or higher, one double-sided disk drive and the vendor's Cobol Compiler 2.1, which requires 192K bytes of RAM.

Xenix Cobol Tools requires Xenix 1286, Xenix Cobol, a 256K-byte RAM and one double-sided disk drive.

MS-DOS Cobol Tools sells for $350, and Cobol Compiler 2.1 costs $750. The upgrade cost is $50 for users of Cobol Compiler 2.1 and $150 for owners of earlier versions. Xenix Cobol Tools costs $450 and Xenix Cobol costs $950.

Microcomputer directory out

Data Decisions, Inc. of Cherry Hill, N.J., has published a directory of 145 multiuser micros from 65 vendors.

The directory includes a chart that reportedly offers at-a-glance comparative information on systems, including their CPUs, number of users supported, base configurations and price ranges.

The 42-page directory also describes each product in detail, including the product's type, systems and applications software, pricing, support and availability. It costs $29.

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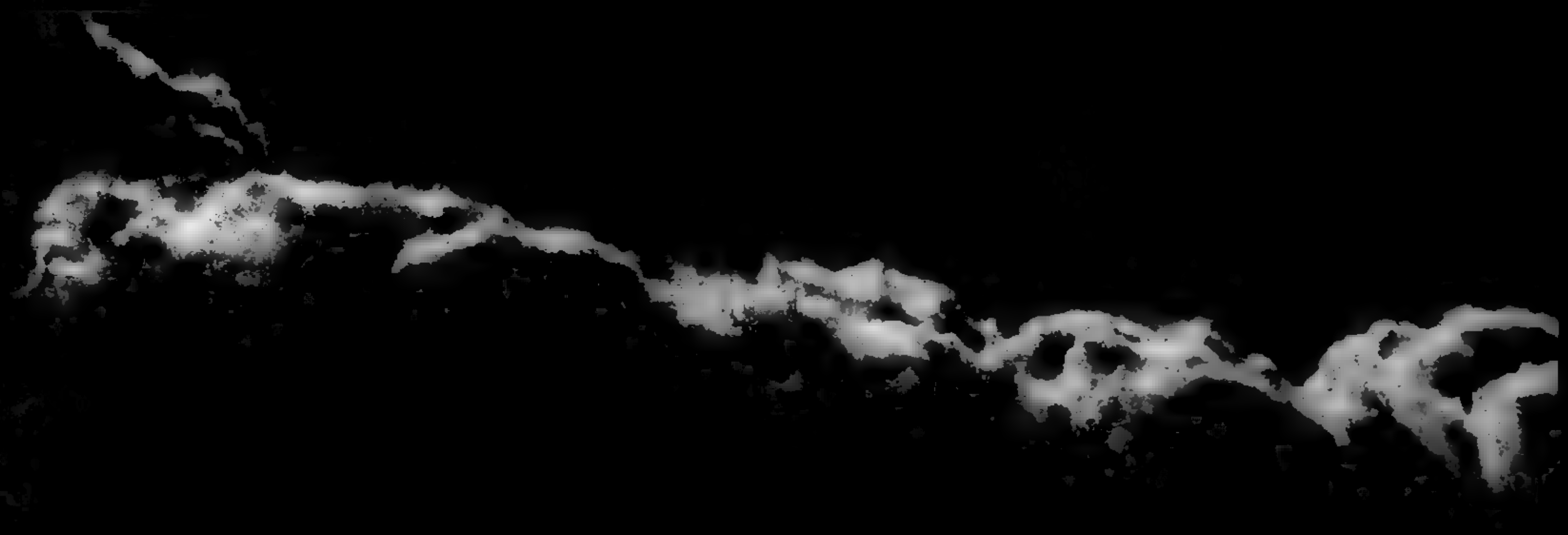

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COMMUNICATIONS

PBXs, nets not key in terminal support

But survey reveals more users considering idea

By John Dix

Few companies today are supporting terminals with local networks or telecommunications switches, according to a *Computerworld* survey, but this is the area where most users seem to be focusing their attention.

The survey, sent with a dollar incentive to a random sampling of 1,000 *Computerworld* subecribers in July, was answered by 425 readers. Nearly half of these readers — most of them MIS/DP managers — represented companies with revenues of $50 million or more, and another 25% took in between $10 and $50 million in 1984.

Companies represented in the survey were concentrated in three major areas: manufacturing firms (22%), finance/insurance/real estate (22%) and education/medicine/law (17%).

The survey results were not specific enough to segment how terminals are supported in each industry sector, but, taken together, they inferred that most users still support terminals with direct point-to-point links. Nearly 60% of the respondents said they do not use local networks or private branch exchanges to support terminals.

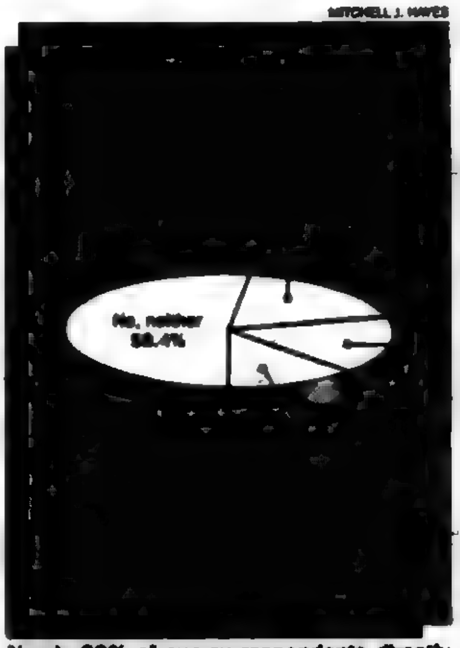
Of the 40% of respondents remaining, roughly 16% said they use their PBXs to support terminals, nearly 12% said they use local nets, and 13% said they support some of their terminals with a combination of the methods.

The actual number of terminals being supported by users of local nets and PBXs is a small percentage of the total number of terminals owned by these roughly 180 respondents.

For example, 24% of the respondents using local networks to support terminals said they have less than one-tenth of their displays connected to the network. Another 14% said they support less than one-fifth of their terminals on their networks, 10% support almost half, and 12% reported they have all of their tubes connected

Continued on page 82

MITCHELL J. HAYES



Nearly 60% of survey respondents directly wire their terminals.

■ Equinox Systems has announced a low-end data switch, a high-end local multiplexer and a board version of that multiplexer for use with the switch/76

■ Western Union has established what it says is the first intercontinental connection for a U.S. electronic mail service/76

■ Satellite Business Systems said it will adopt a new rate structure for its dedicated or switched high-speed digital data transmission services and implement off-peak pricing discounts/79

■ GTE will offer a hybrid business data transmission service that integrates its Spacenet Ku-Band satellite transmission capabilities with its packet-switched Telenet network/79

INSIDE

Multiplexers/Modems/79
Local-Area Networks/83
Network Services/83

AT&T unveils modems, net control, muxes

AT&T unleashed a barrage of products at the recent Telecommunications Association's annual meeting in San Diego, including modems, multiplexers and network control units.

The products included two 4.8K bit/sec. modems for dial-up and leased line use; a diagnostic unit for a new switched network modem; a 14.4K bit/sec. six-port modem/multiplexer; and an enhanced multiplexer/packet switch.

Also announced was a system control software package that, when combined with the necessary hardware, costs $40,000 less than the previous model.

The 4.8K bit/sec. modems include the Dataphone II 2248A and the 2048T. The 2248A is a dial-up device, but it can be adopted for analog private lines, after which it will also provide automatic dial backup. The diagnostic modem supports full-duplex (with a half-duplex emulation option), synchronous or asynchronous transmissions. At 4.8K bit/sec., the 2248A is said to be compatible with CCITT recommendation V.32. With a 32-number autodialer option, the modem costs $3,195 or $2,995 without the option. It will be available in April 1986.

The Dataphone II 2048T is a 4.8K bit/sec. full-duplex synchronous modem designed for use with unconditioned four-wire analog leased lines. Designed for use in point-to-point or multidrop applications, the 2048T is said to be line compatible with the 2048A and 2048C modems and capable of responding to tests and commands from Dataphone II control systems. The 2048T will be available in mid-October for $2,600.

For lower speed applications, the 2224E is a 2,400 bit/sec. asynchronous, full-duplex diagnostic dial-up modem. It will be

Continued on page 82

Dama lowers network rates

Dama Telecommunications Corp. has announced a 38% overall price cut for its lower speed switched data rates.

The rate reductions affect the Damanet Integrated Voice/Data Network service, a software-defined virtual private network. The reductions were made possible by increased network use, lowering the company's own transmission costs.

New charges for the on-demand services, which range from 2,400 bit/sec. to 512K bit/sec., include a 78% reduction for 2,400 bit/sec. circuits, from 16 cents per minute to about 4 cents per minute; a reduction for 9.6K bit/sec. facilities from 20 cents per minute to about 14 cents per minute; and a reduction for 19.2K bit/sec. facilities from 35 cents per minute to 28 cents per minute. Damanet's 6-sec. incremental billing structure has been retained.

The rate reductions also include Damanet's maximum transmission rates. The monthly maximum fee for a 2,400 bit/sec. circuit for transmission between New York and Philadelphia, for example, is $64, $224 less than the previous $288 charge. A 9.6K bit/sec. circuit between Chicago and San Francisco is reduced by $343, from $1,200 to $857.

The restructured rates set a $4,000 per month minimum billing requirement for each of Damanet's proprietary communications processors used in a customer's network. The fee applies to cumulative voice, data and video transmission charges. The cost to activate a voice port on a Damanet communications processor has been reduced from $75 to $25.

Dama Telecommunications is authorized by the Federal Communications Commission to operate as a common carrier for Digital Electronic Message Services.

IBM replacement multiplexer debuts

Bundled with its recent introduction of protocol converters, IBM unveiled a replacement model for its 3299 terminal multiplexer.

When used with the IBM Cabling System, the 3299 Model 2 extends the maximum permissible distance between 3274 cluster controllers and category A display terminals from 4,000 to 6,000 ft.

The 3299 attaches with a single coaxial cable to a 3274, which is outfitted with a multiplexer adapter. The 3299, in turn, can support up to eight display terminals with coaxial cable connections or with the IBM Cabling System.

When standard coaxial is used, the 3299 Model 2 provides the same functional capabilities as Model 1.

With the IBM Cabling system, the maximum permissible distance between the terminal multiplexer and its controller is now 3,280 ft., with terminals supported at up to 3,280 ft. Baluns are not required on the host side.

The new model will be available later this month for $1,175.

BMC Software's VM/Optimizer out

A systems software product that enhances IBM's VM operating system to provide compression of 3270 data streams has been added by BMC Software to its family of similar products for IBM's CICS and IMS.

The Sugar Land, Texas, company's 3270 Optimizer/VM, which has hooks into VM, uses an algorithm to remove redundant characters and otherwise compress 3270 data being sent to remote display terminals, a spokeswoman explained.

Using the 3270 Optimizer, a normal 1,920-char. data stream used to fill the screen of a 3270 device is compressed by 30% to 35%.

The product is said to be particularly effective in reducing network load and response time bottlenecks in IBM's Professional Office System (Profs) environments. The 3270 Optimizer/VM is transparent to VM, Profs and other applications, the company reported.

The 3270 Optimizer/VM is available now at an introductory price of $9,750 for a perpetual license on the first CPU. Next year, the price will be $12,500.

Equinox muxes, switch out

Expanding on its product family of intrafacility data communications devices, Equinox Systems of Miami recently announced a low-end data switch, a high-end local multiplexer and a board version of that multiplexer for use with the switch.

The Equinox DS-5 data switch, reportedly smaller than an IBM Personal Computer in its smallest configuration, has a minimum of 24 RS-232 ports and a maximum of 120. Said to be fully nonblocking, the DS-5 enables a port user to connect to any other port through menu selection.

A 120-line DS-5 costs $120 per port. The entry-level DS-5, which costs $7,500, has 24 ports. Growth is accomplished with the addition of 24-port cards that cost $1,800 each. Using LM-48 local multiplexers, the DS-5 can support a total of 1,320 lines.

The LM-48 is a local multiplexer that concentrates 48 RS-232 channels, each operating at speeds up to 9.6K bit/sec., over a single cable at distances up to 2,500 feet.

While the LM-48 can be used back-to-back to solve wiring problems, it can also be used with the DS-5 when the data switch is outfitted with the board version of the multiplexer, the 1-Line-X48.

Available 45 days after receipt of order, as is the DS-5, the LM-48 costs $3,100, and the 1-Line-X48 costs $1,000.

Codex local network gives asynch devices link to host

Codex Corp. of Mansfield, Mass., has unveiled a local-area network designed to provide asynchronous devices with host computer connections.

The Codex Async LAN is a new development, according to Ralph Rio, Codex's senior product manager, and not connected to Codex's first-generation product, a prototype of the Ungermann-Bass, Inc. Net/One product.

The heart of the asynchronous network is the Codex 4020 Entryway, a four-port device that uses a Codex-designed and -developed very large-scale integration chip and a Motorola, Inc. microprocessor. Attached devices can communicate through the 4020's four RS-232 asynchronous ports or with devices supported by other 4020s that are interconnected via a baseband Ethernet net.

Terminals supported by the 4020 contend for host ports, enabling access to any minicomputer connected to the network. The Entryway can transmit data at speeds from 50 bit/sec. up to 38.4K bit/sec.

Codex said the price of the 4020 is $249 per port or $410 for the average configured system. One Entryway would cost approximately $1,000.

Also announced was the Codex 4820 LAN Manager, a network management package that is composed of an IBM Personal Computer XT hardware system and multitasking operating software system. This software provides performance monitoring, including fault management, and administration functions that simplify changes to the network.

Pricing of the 4820 was set at $11,605, Codex said.

Western Union E-mail service ties U.S., UK

Western Union Co. has announced what is reportedly the first intercontinental connection for a U.S. electronic mail service. Users of Western Union's Easylink will be able to send messages to subscribers of the UK's version of Easylink, which is offered by Cable & Wireless Easylink, Ltd.

The service does not require any special codes or messages, only the address of an Easylink subscriber. The cost of sending a message to a UK subscriber is 25 cents per 1,000 characters plus a fee of 40 cents per message and a long-distance dialing charge. There are no off-peak discounts.

Sending a message from the UK to the U.S. costs approximately 40 cents plus 9 cents per 1,000 characters. Off-peak hour rates are 31 cents and 7 cents respectively.

The cost of transmitting a Telex is 25 cents per 100 characters during peak hours and 21 cents during off-peak hours. Sending a Mailgram costs $6.75 for the first page and approximately $2.70 for each succeeding page.

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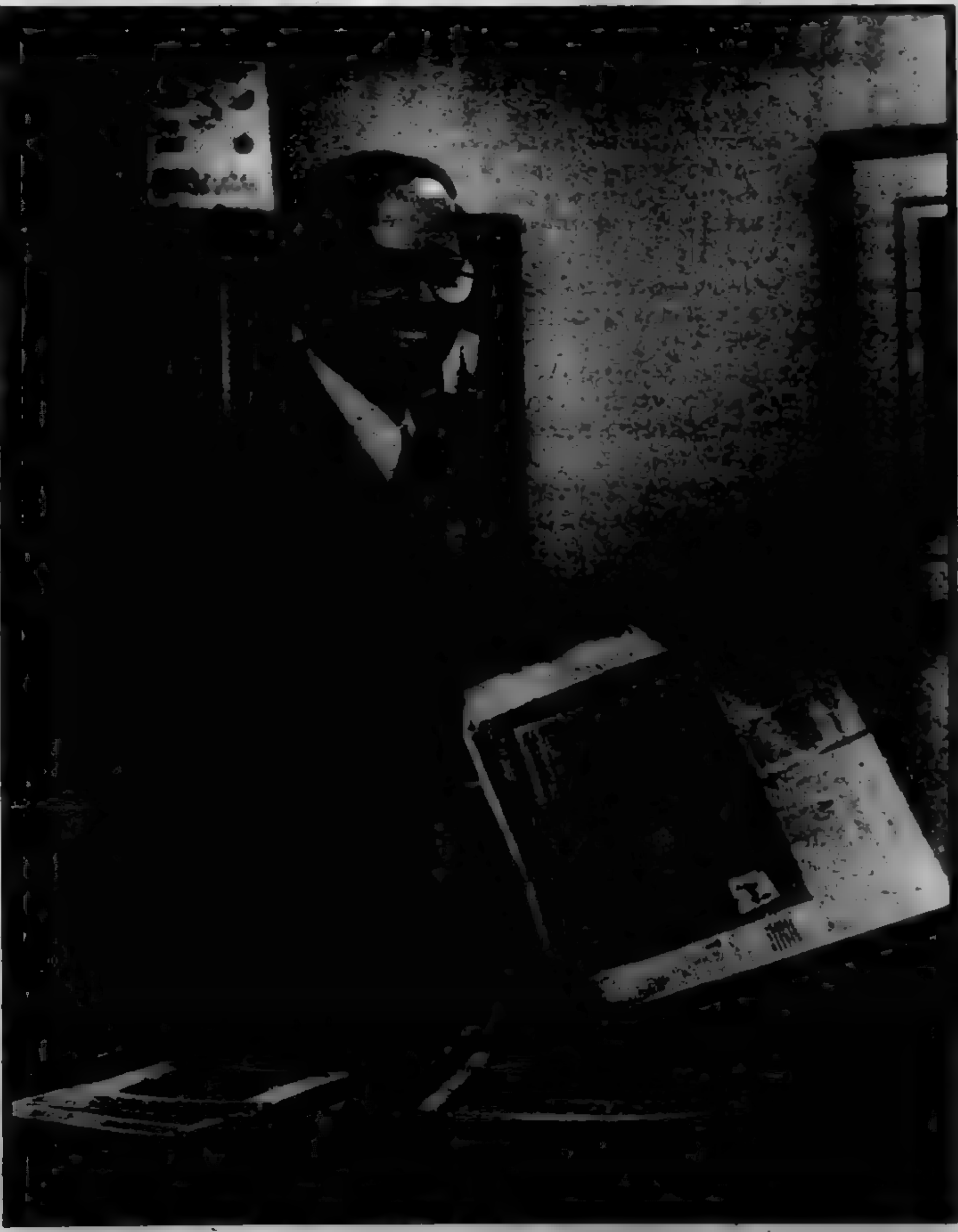
“Two ads in Computerworld Focus flooded us with inquiries on our new micro product, EnerConnect.”



EnerConnect is the second major micro product from Enertronics, developers of the successful EnerGraphics package. As the ad for EnerConnect says, it is “. . . the first software package that puts mainframe graphics capability into the hands of anyone with an IBM PC . . . or 3270 PC.”

When it came time to announce EnerConnect, Randy Andes decided to use *Information Week*, *Business Week*, and *Computerworld Focus*. As Randy puts it, “. . . we knew *Computerworld* reached the people we need to talk to from past ads for EnerGraphics, and we decided to test *Focus* because, as the name says, each issue focuses on a topic. So, we could select an appropriate editorial environment.”

The results? “*Computerworld Focus* has produced the most response of any of the publications used and, by far, the best response. In fact, total response (via the 800 number) has far exceeded expectations. We further intend to continue to tie into *Computerworld's* editorial calendar where appropriate.”

The moral? Well focused advertising in a well focused medium will produce the best results every time.

Call your *Computerworld* advertising representative for more details on upcoming issues of *Computerworld Focus*.

Randy T. Andes, Director of Marketing,
Enertronics Research, Inc., St. Louis, Missouri.

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Micros: The big picture.

In November's *Computerworld Focus,* we put micros under the scope.

Since the last year has been so wild and unpredictable, we're not only going to take a look at microcomputer hardware in our November 20th issue, but we're also going to broaden our view to try to get a handle on the micro market in general.

We'll have a special section on hardware—what's available and what's expected to come. And the changing relationship of micros and the 3270 terminal.

We'll also dissect the entire industry—one aspect at a time. Among user companies, we'll tell you who's buying and who's *not* buying—and why. And look at the reasons in great depth.

Then we'll dig deep into the industry shakeout. Discover who's got the edge and who doesn't. Who's expected to survive. And how that will mold the future.

We'll see how the slowdown is affecting the way user organizations are planning. Whether they're simply making do with what they've got until the shakeout is over. Or if they've actually satisfied their needs.

But that's not all. We'll also take a look at how communications and networking are coming along. And the developing trends in printer technology including the laser printers. And what's happening in the portables and lap size micros.

And of course, we'll deliver all this information to the people who use it most. Our 129,000 paid *Computerworld* subscribers. Thousands of passalong readers. Plus attendees at Comdex in the fall in Las Vegas.

So if micros are a big part of your business picture, our **November 20th** issue of *Computerworld Focus* should be a big part of your advertising picture. But hurry, the closing is **October 11th.**

To reserve space, contact Ed Marecki, Vice President/Sales, *Computerworld Focus*, 375 Cochituate Rd., Framingham, MA 01701, (617) 879-0700. Or call your local sales office listed below.

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GTE Skystar service to join net, satellite

GTE Corp. said last week that it will offer a hybrid business data transmission service that integrates its Spacenet Ku-Band satellite transmission capabilities with its packet-switched Telenet network.

The network service will be called Skystar and will be compatible with most data communications protocols, including IBM's Systems Network Architecture/Synchronous Data Link Control and Binary Synchronous Control protocols, the company reported. GTE said Skystar will also perform protocol conversion from remote sites.

James T. Broadhead, president of the GTE Communications Services group, said the linking of the two existing systems will help address the diverse data communications requirements that are found. "Spacenet's Skystar network, for example, serves very high-speed transmission requirements in a centralized environment — many remote locations to one central host."

In a related matter, GTE was dealt a blow recently when a French rocket carrying a Spacenet satellite aloft went off course and had to be destroyed.

MULTIPLEXERS/ MODEMS

■ Racal-Vadic, Inc. has introduced a 2,400 bit/sec. modem that is compatible with IBM's Binary Synchronous Communications protocol.

The 2400PA-S is a full-duplex, synchronous modem with automatic dialing capabilities. It can be used for unattended communication with IBM 2780/3780 remote job entry applications.

The modem automatically selects pulse or tone dialing and matches the speed of host computers at speeds of 1,200 or 2,400 bit/sec. Call progress information is displayed so that a user can monitor a connection. A tandem dialing feature permits dialing through private branch exchange to long-distance carriers.

The modem's diagnostic capabilities include automatic self-testing, analog loop-back, local digital loop-back, remote digital loop-back and a built-in test pattern generator.

Configuration options include Electronic Industries Association (EIA) signal timings that customize EIA interfaces for use with multiplexers and port contenders.

The 2400PA-S sells for $795.

Racal-Vadic, 1525 McCarthy Blvd., Milpitas, Calif. 95035.

■ Lantel Corp., a manufacturer of broadband voice and data modem products, has added two items to its product line.

Lantel 500A Broadband Asynchronous Data Modem is a narrow-band, asynchronous modem that operates at speeds of up to 9.6K bit/sec. The product is designed for point-to-point

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SBS reduces rates for data transmission

Satellite Business Systems (SBS) in McLean, Va., said it will adopt a new rate structure for its dedicated or switched high-speed digital data transmission services and implement off-peak pricing discounts.

The rate restructuring applies to switched and dedicated 56K bit/sec. and 1.54M bit/sec. data transmission services and will reduce port charges for both speeds by half.

For usage-sensitive switched 56K bit/sec. service, the monthly port charge has been lowered from $770 to $300. The maximum monthly charge is $1,500 per port.

For 1.54M bit/sec. switched service, the monthly port charge has been reduced from $3,000 to $1,500. Monthly usage charges are capped at $15,000 per port.

SBS said it has introduced a non-business-hour usage charge of $60 per hour for transmission during evenings, weekends and holidays, compared with the regular business hour rate of $300.

The company also said that it has reduced its mileage band rates for circuit-switched 56K bit/sec. service to $1,450 per month for the first 500 miles and to $1,000 per month plus 90 cents per mile for greater distances.

For dedicated circuits, SBS said the charge for a 1.54M bit/sec. circuit is $25,000 per month during the business day, which will save an estimated $4,000 to $27,000, depending on circuit length.

In another matter, SBS said it will be the first common carrier to encrypt satellite data and voice transmissions, using the Data Encryption Standard developed by the National Bureau of Standards. The service will be available for SBS' Skyline Wats customers in January. The service will carry a one-time port charge of $35 plus a usage charge of 1.2 cents per call minute.

SBS is a joint venture of IBM and Aetna Life & Casualty Co. IBM and MCI Communications Corp. have reached an agreement in principle to merge the SBS system into MCI's network.

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The Information Systems Network from AT&T lets you take command. It's the only data network that allows you to integrate and manage your terminals, workstations, PCs, minis and mainframes as a single corporate-wide data network. It's the only network you can completely control.

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ISN's hierarchical star topology centralizes system administration and maintenance. The hub of the system is a fast-switching Packet Controller. It's linked to all data devices and manages all network functions. So, if one device goes down, the Packet Controller keeps your network up and running.

A System Control Console taps right into the Packet Controller. From this terminal, you can manage the network using simple English commands. You can add or move equipment, monitor network performance, track down faults and take corrective action—without disrupting network operations.

With a special password, you can perform maintenance functions from any asynchronous terminal in the system. And you have the option of remote maintenance from one of our service centers. ISN gives you multiple points of control.

You've got plenty of flexibility.

ISN links the devices in your network with twisted copper wire and fiber optics. It uses our Premises Distribution System wiring scheme which allows easy modular growth.

ISN is flexible and open to change. Start with as few as 50 devices and let it grow. ISN's open architecture allows you to easily add on new devices and new technologies as they emerge. ISN can take things as they come.

Linking multiple Packet Controllers lets you expand ISN to any size network. You can grow across one premise or across the country. And no matter how large your network gets, you choose the means of control—centralized or distributed. With ISN you're the boss.

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What happens to your PBX? PC networks? Data processing systems? And all that hardware from Big Blue? ISN gets them all on speaking terms.

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automation equipment; isolated Ethernets,™ AT&T's STARLAN PC Network and 3B Net; smart and dumb—ISN gets it all working together. All sharing the same resources. With you in total control.

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ISN maintains a high end-to-end transmission speed of 8.64 mbps, and a high throughput rate even when traffic is at its peak.

Long messages or bursty transmissions—ISN's been engineered to handle it all. A unique centralized short bus and perfect scheduling access method permit messages to travel through the network almost instantaneously. And arrive with their integrity intact. So there's no waiting. No bottlenecks. No retransmitting data.

You've made the right connection.

AT&T has a long history of solving complicated networking problems with clear-cut, intelligent solutions. We know how to tie it all together.

And we know how to work with you. Our professional sales and service people are with you every step of the way—planning, designing and maintaining a network that will meet your business needs today and tomorrow.

ISN reflects AT&T's better approach to office automation. To learn why it's the right choice for your business, call your AT&T Information Systems Account Executive, or 1 800 247-1212.

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AT&T
The right choice.

Continued from page 78

or multidrop applications on a two-way broadband network. It reportedly features a bit error-rate of 10^{9}.

Lantel 500S operates in either synchronous or asynchronous mode and supports transmission speeds of up to 19.2K bit/sec.

Both modems can operate in either half-duplex or full duplex mode and can use frequency shift keying modulation.

Lantel 500A sells for $595, and Lantel 500S costs $895.

Lantel, Suite 180, 6410 Atlantic Blvd., Norcross, Ga. 30071.

■ **Avanti Communications Corp.** has enhanced its Ultramux T1 multiplexer so it operates with AT&T Communications' Digital Access Cross-Connect Switching (Dacs) under Customer Controlled Reconfiguration (CCR).

Avanti's Flexible Dacs Access enables a user to segment a T1 line into groups of channels and, under AT&T's CCR tariff, switch them independently to different locations. The Ultramux product allows sublevel voice and data channels to be routed with the bundles.

A user could reduce the cost of local access channels by combining bundles destined for multiple locations over a single T1 local access channel and then routing them via Dacs, Avanti claimed.

Prices for the Ultramux range from $14,000 to $100,000. Prices for the Flexible Dacs option range from $800 to $3,500.

Avanti Communications, Aquidneck Industrial Park, Newport, R.I. 02840.

■ **Gandalf Data, Inc. has introduced a 2,400 bit/sec. intelligent dial modem.**

The first model in the Access Series 248 is a large-scale, integration-based modem with features that include Hayes Microcomputer Products, Inc. command compatibility; multiple-number recall; automatic redial and alternate number dial; automatic logon; and three-wire interface support.

The modem is compatible with CCITT V.22 bisynchronous modems, AT&T 212A and AT&T 103 modems. It provides full duplex two-wire data transmission at 2,400 bit/sec., 1,200 bit/sec. or 300 bit/sec., either asynchronously or synchronously.

The unit costs $650.

Gandalf Data, 1020 S. Noel Ave., Wheeling, Ill. 60090.

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AT&T unveils modems, net control, muxes

available in March next year for $1,265 or $1,395 with an autodial option. For diagnostic control, the 2224E has to be used in conjunction with the new SDU 24A shared diagnostic unit. This device works as a translator between a 2224E modem and Dataphone II diagnostic control devices like the Diagnostic Console, Network Controller or System Controller. The $975 SDU 24A emulates a private-line control modem with eight tributary modems. It will also be available in March 1986.

While not new, AT&T's 735 T-Mux has been enhanced to support 56K bit/sec. links as well as standard T1 1.54M bit/sec. facilities. It is also available now with an RS-422/Mil-spec 188B-114 data channel interface option for secure applications. In minimum configuration, the enhancement costs $1,350.

New to the line is the 724 T-Mux, a small-chassis version of the 735. It supports up to 16 channels and uses adaptive differential pulse code modulation voice digitization at 64K or 32K bit/sec. Either device can reportedly support extended or standard DS-1, T1 signaling formats. The 724 will be available in November for $6,725.

The AT&T 719 Networker, a combined packet-switching statistical multiplexer and computer port concentrator, has been enhanced with an optional X.25 gateway. The enhancement includes a new processor card with X.25 firmware and a new data-link interface card with four ports. The Networker configured with the option costs $12,000 and will be available in November.

Network control of these and existing Dataphone II products is now possible using a new version of AT&T's Level IV System Controller Model 300, a real-time network management software package that runs on an AT&T 3B2-300 computer. Model 300 replaces the former Level IV System controller, which consisted of an Application Processor 16 and cost $96,000 in minimum configuration. The Model 300 costs $56,000 in minimum configuration, while providing the same capabilities as the Level IV controller.

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PBXs, nets not seen key for terminal support

on networks. These users represent the majority (60%) of the respondents; the rest varied widely as to how many of their terminals were attached to local nets.

The same holds true for users who said they use their PBXs to support terminals — most use PBX links to support a relatively small percentage of their installed terminals. Of these respondents, 20% use their PBXs to support less than one-tenth of their terminals; 9% support roughly one-fifth of their tubes; 10% support nearly one-third; 8% support almost half; and 6% support all their terminals in this manner.

Interestingly, while nearly 60% of the users surveyed do not use local nets or PBXs to support terminals, these were the two items mentioned most frequently in terms of significant communications plans scheduled for next year.

Meet the ISI 468

A fully integrated, plug-compatible replacement for the IBM 3268-2C and 3287-2C, the ISI 468 is the only non-IBM color printer to support Programmed Symbols and APL/TEXT. What's more, it's the only 3270 printer, from IBM or elsewhere, that prints seven colors. Its other advantages include:

Color printing without color displays • NLQ • Bar coding • Solid-formed large-character label printing • 10, 12, or 16.67 CPI • Dual 3270/PC compatibility • Immediate access to printed forms without waste • Optional sheet and envelope feeder • Full support for GDDM, SAS, and PS-4A.

Faster Throughput

The ISI 468 prints at 400 CPS, compared to 340 CPS for the IBM 3268-2C and 120 CPS for the 3287-2C.

the ISI 468's high-speed advantages in a lower-priced, non-color-printing (but upgradable) version.

Tabletop Convenience

The ISI 468 offers easy portability while taking up less space than the floor-standing 3268-2C. Plus, with its top-loading design, there's no need to crouch under a bulky cabinet to load forms.

A Lower Price

Even with all of its added features, the ISI 468 costs significantly less than its IBM counterparts.

For more information, please call 1-800-544-4072 (in Michigan, 313/769-5900). Or write to Interface Systems, Inc., 5855 Interface Drive, Ann Arbor, Michigan 48103. Telex: 810-223-6058.

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COMMUNICATIONS

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Multiplexers/Modems

■ **Codex Corp. has announced the Codex 2606 Eight Modem Nest that supports up to eight Codex 2600 series modems with a bus architecture. Up to five of these nests can be stacked in a 72-in. rack.**

The product can be fully configured with any combination of Codex 2600 series modems, including the 2660, 2640 and 2620, plus four- or six-channel multiplexers. The modems can be configured both before and after installation.

The price of the Eight Modem Nest varies by configuration, ranging from $4,000 to $12,000 per modem.

Codex, 20 Cabot Blvd., Mansfield, Mass. 02048.

■ **Networx has released a modem protector that provides surge protection for modem devices.**

The Modem Protector is said to prevent voltage damage to telecommunications equipment. The device works in two stages. The first stage consists of a gas discharge arrestor that can handle a maximum pulse of 5,000A and handles the bulk of the surge. The second stage consists of silicon surge suppressors that are said to clamp the sharp leading spike within 1 nsec.

The unit costs $21.95.

Networx, 203 Harrison Place, Brooklyn, N. Y. 11237.

■ **Spectrum Digital Corp. has introduced its Spectramux Net 1.5 bit-interleaved multiplexer that is said to concentrate more than 500 voice, data and video channels on eight T1 aggregates.**

The Net 1.5 features Adaptive Differential Pulse Code Modulation (ADPCM) voice, automatic alternate routing with priority bumping, D-4 channel bank compatibility and programmable channel speed selection. Each ADPCM card supports 72 voice channels at 24K bit/sec. with fallback to 32K bit/sec., which provides 48 voice channels, the vendor said.

The unit supports AT&T standards, including Dataphone Digital Service, Accunet, M-44, M-24, D-4 and Digital Multiplexed Interface.

The cost of the Spectramux Net 1.5 multiplexer starts at $25,000, depending on the number of channels in the system.

Spectrum Digital, 7650 Old Springhouse Road, McLean, Va. 22102.

■ **Digital Communications Associates, Inc. (DCA) is offering a fast poll, CCITT V.29-compatible modem for use in four-wire, leased-line, point-to-point or multipoint applications at speeds up to 9.6K bit/sec.**

Called the DCA 932, the full duplex modem can be used with unconditioned lines, permitting serial data transmission at 9.6K, 7.2K, 4.8K and 2,400 bit/sec., the vendor stated.

An automatic adaptive equaliser reportedly uses phase tracking circuitry to respond to changing transmission line conditions on a continuous basis.

An integral test pattern generator and bit error-rate detector are said to perform network bit error-rate testing without external equipment or remote operators.

The DCA 932 costs $2,695.

DCA, 1000 Alderman Drive, Alpharetta, Ga. 30201.

LOCAL-AREA NETWORKS

■ **Hanson Data, Inc. has announced a device that enables data to be transmitted over standard ac power lines within a building at rates that range from 300 bit/sec. to 19.2K bit/sec.**

Data terminal equipment plugs into the Power Line Coupler, which plugs into a wall socket and acts like a modem. The coupler and accompanying software enable up to 32 devices to be interconnected over a building's power wire at distances up to 1,000 ft.

The coupler costs $395.

Hanson Data, 18732 142nd Ave. N.E., Woodinville, Wash. 98072.

■ **General Electric Co. plans to ship early next year Genet Factory LAN, a broadband token bus local-area network compatible with General Motors Corp.'s Manufacturing Automation Protocol that operates at speeds of up to 10M bit/sec.**

The network will consist of a bus-interface unit, head-end remodulator, Workmaster network management console and software. Industrial Networking, Inc., a joint venture between GE and Ungermann-Bass, Inc., is supplying the network, GE said.

GE, One River Road, Schenectady, N.Y. 12345.

NETWORK SERVICES

■ **Satellite Business Systems (SBS) recently announced it has restructured its pricing and extended its Skyline Wats service.**

Skyline Wats customers can call Hawaii from all SBS Network metropolitan areas, and a Wats connection to Alaska is now available from 14 metropolitan areas.

The price restructuring applies the Skyline Wats Tier I rate to calls terminating in a Tier I city Local Access and Transport Area and not just the immediate metropolitan area. The change is expected to save customers up to 4%, the vendor said.

SBS, 8283 Greensboro Drive, McLean, Va., 22102.

■ **AT&T Communications has purchased a 60-mile, fiber-optic digital transmission system from Philips/CSD, Inc., located in Piscataway, N.J. The system links AT&T facilities in New York.**

The system works with a multilevel bit-rate reduction scheme and maintains a bit error-rate of 10-13, Philips/CSD reported. The DS-3-compatible system supplies a capacity of up to 8,064 telephone trunks, is modularly upgradable and can supply 1G bit/sec. transmission rates.

AT&T Communications, 295 N. Maple Ave., Basking Ridge, N.J. 07920.

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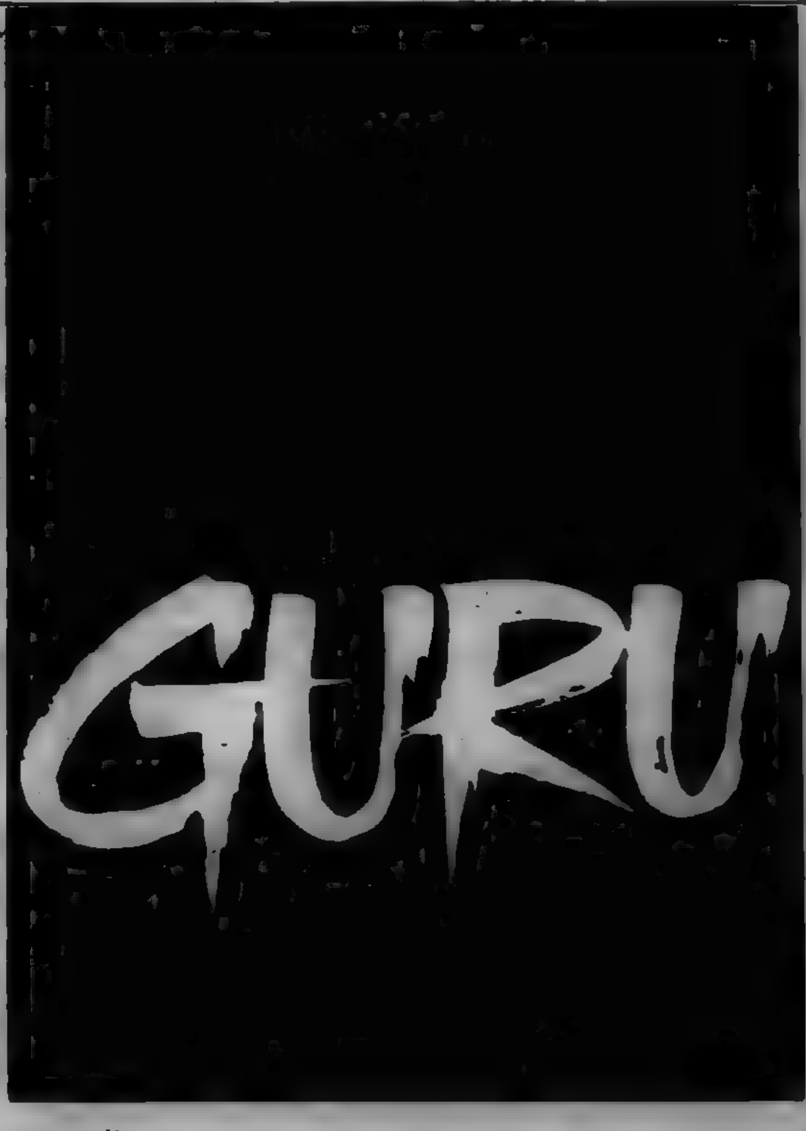

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SYSTEMS & PERIPHERALS

- Computer Consoles unwrapped a low-end member of its Power series of AT&T Unix-based minicomputers/86
- Three series of configurations were announced for Flexible Computer's Flex/32 parallel processing systems/86
- Perkin-Elmer modified its 3200 series of superminicomputers to optimize its version of Unix/87

Transaction systems: no comparison

Lack of standards seen confusing to customers

By James Connolly

Banks have boosted automated teller services, and Fortune 500 industrials have moved into computer-automated factories, creating a booming market for established computer companies such as IBM and nondescript start-ups.

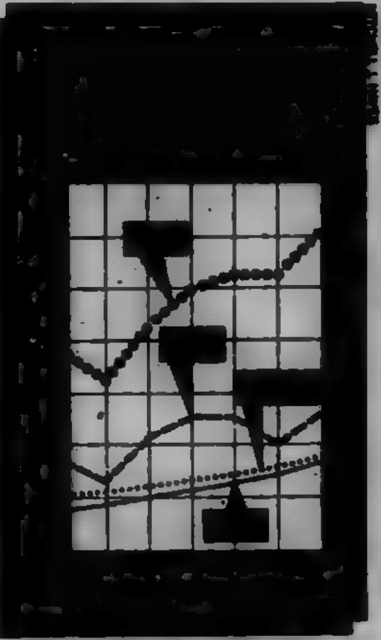
Market researchers predict that new applications in banks, factories, government agencies and other user organizations will drive the transaction processing market from $7 billion in 1984 sales to more than $12 billion in sales and 119,000 unit shipments in 1990.

For all of that growth, however, there remains a danger — the inability of customers to compare various vendors' products. Key transaction processing vendors agree that, like other specialized processing areas such as supercomputing, transaction processing performance cannot be measured the way batch processing is measured — the fallible but commonly used million instructions per second (Mips) rating.

Twenty years after major corporations started using large computers to process transactions immediately, interviews with vendors and users show they still are unable to agree on benchmarks. It is difficult to judge transaction processors and the systems that grow up about them, systems that may include dozens of superminicomputers in a string and remote terminals spread over thousands of square miles. Even where there is a desire for benchmarks, there is no consensus on how to build them.

"Having a standard obviously would make it easier to measure the relative performance of transaction systems. From the vendors' perspective, I'm not sure it's in [their] best interest to have a standard measurement. As it is, using Mips works to their advantage and confuses the customer. From a customer perspective, it would be good, but I'm not sure one benchmark ever will become a standard," observed Bob Good, senior systems designer for Bankamerica Corp. in San Francisco.

Good was one of 24 users and vendor representatives who coauthored a technical report on transaction processing for the Institute of Electrical and Electronics Engineers, Inc. (IEEE) last year. The paper suggested three possible benchmarks: Debit Credit, a banking transaction that interacts with a block-mode terminal via X.25, debiting a bank account and doing a double-entry bookkeeping transaction; Scan, a minibatch Cobol transaction that updates 1,000 records; and Sort, a disk sort of one million records.



Sales to rise from $7 billion in 1984 to $12 billion in 1990.

However, those 24 authors noted that their paper failed to capture the performance bugs in their systems, such as recovery from a crash or start-up of new software. Almost a year after the group began work there is no formal activity in connection with benchmarking, Good noted.

One of the originators of the IEEE paper and a transaction processing analyst is Omri Serlin, princi-

Continued on page 89

Transaction system sales to mushroom

The need for mainframe-based systems and on-line applications will fuel an almost 80% growth in shipments of transaction processing computers by the end of 1990 (see chart above), according to a recent report by International Data Corp. (IDC), a Framingham, Mass.-based market research firm.

In its first research study of the transaction processing market, IDC listed more than 50 typical transaction-oriented applications in fields as diverse as finance, medicine, education, government, transportation and industry.

Looking at the next five years, the report, "The Transaction Processing Market," cited the following:

- A general movement to more transaction-oriented applications as a result of the changing nature of MIS groups. "The need to do more retrieval and updating of data bases will be important," it said.
- The existence of applications that are entirely transaction oriented. "Good examples include [automatic teller machine] networks in banks, retail points-of-sale and new inventory measures to support just-in-time manufacturing."

The move to transaction processing

Continued on page 89

General Dynamics offers departmental systems line

By Mitch Betts

WASHINGTON, D.C. — General Dynamics Corp.'s Electronics Division, based in San Diego, recently announced it will market a line of departmental systems loaded with data base management software for use by U.S. government agencies and their contractors.

The announcement at the recent Federal Computer Conference marks the first time the major defense contractor, which had $7.8 billion in revenue last year, has offered what it calls a departmental mainframe, according to Ravi Bhola, program manager of advanced systems. He said the move is part of a strategy to meet the needs of military and intelligence computer users and does not mean General Dynamics plans to enter the broad commercial computer market.

The Model 5000 departmental mainframe, with a distributed architecture based on a 32-bit CPU, is IBM compatible and was licensed from Canaan Computer Corp. of Trumbull, Conn., Bhola said.

At the Federal Computer Conference, General Dynamics and Cambridge, Mass.-based Computer Corp. of America (CCA) announced a joint marketing agreement. Under the terms of the agreement, General Dynamics will distribute and support the Model 5000 running CCA's Model 204 data base management system.

Continued on page 88

Mentor Graphics launches parallel processing engine

By Donna Raimondi

BEAVERTON, Ore. — A company that has focused on computer-aided engineering software tools has jumped into the computer hardware business with a plug-in, parallel processing accelerator engine for engineering workstations.

Mentor Graphics Corp. has unwrapped its Compute Engine — a general-purpose accelerator that is said to employ parallel processing techniques with reduced instruction set computer (Risc) processors — as a plug-in addition to Apollo Computer, Inc.'s DN550 and DN560 workstations. The unit will be available in the first quarter of 1986.

The two-board Compute Engine is said to increase throughput on all modes of simulation, placement, routing, design rule checking and data formatting. Performance reaches up to 200,000 gate evaluations per second using the company's Quickparts parts models to speeds approaching 100 gate evaluations per second for conventional parts, the vendor said.

The Compute Engine runs a standard version of Spice, the University of California at Berkeley's computer-aided engineering software package, at five times the performance of Spice running on the Apollo workstation without the engine, according to Mentor Graphics.

Continued on page 86

Computer Consoles introduces 16-bit, 16-user mini

Introducing an entry-level system targeted at small businesses and networked applications, Computer Consoles, Inc. of Rochester, N.Y., has announced a 16-user, 16-bit minicomputer that uses the same memory management techniques as its Power 6/32 superminicomputers.

The Power 5/32 is based on a Motorola, Inc. MC68010 microprocessor and the AT&T Unix operating system. It is intended for use in office automation, in standalone configurations for eight to 16 users and in networked environments running Computer Consoles' Officepower office system.

Computer Consoles Chairman and Chief Executive Officer John F. Cunningham reported that the U.S. Air Force Office of Public Affairs has contracted to purchase the first Power 5/32 systems under a $4.4 million contract.

According to Computer Consoles, the Power 5/32 was designed as the entry-level unit and the most compact of the Power/32 series, weighing less than 50 lb and measuring 6½ by 18 by 22 in.

The company claimed that the hardware-intensive memory management scheme originally created for the Power 6/32 provides the Power 5/32 with the flexibility of a larger virtual memory machine and allows the CPU to operate at 12½ MHz with zero-wait states.

Computer Consoles also announced its Powerterminal II, designed for use with the Power 5/32 and other members of the Power family and with Computer Consoles' PTNet local-area net. The terminal is said to feature a 307K bit/sec. communications capability and local intelligence based on a Motorola MC68008 microprocessor.

The company said that the Power 5/32 features a storage subsystem including a Motorola MC68000 microprocessor and 128K bytes of local dynamic random-access memory. It supports one or two 5¼-in., 85M-byte disks and a 45M- to 60M-byte streaming tape drive.

A typical Power 5/32 configuration — with 2M bytes of memory, 170M bytes of disk storage, a 45M-byte tape system, the Unix operating system, Officepower software and eight Powerterminal II workstations — costs $38,350 and will be generally available during the fourth quarter of 1985. A comparable 16-user configuration costs $59,200. The single-unit Powerterminal II with the local-area network connector costs $1,795.

Flex/32 series out

Flexible Computer Corp. of Dallas has announced three series of configurations for its Flex/32 multicomputer parallel processing systems for end users and OEMs.

The Series 2000, Series 3000 and Series 6000 use a parallel multiple-bus architecture and concurrent software. Each series was designed to be upwardly compatible with the next.

The Series 2000 includes from four to 10 32-bit Flex/32 superminicomputers capable of parallel operations. Memories range from 4M to 40M bytes of random-access memory, and the I/O bandwidth ranges from 40M byte/sec. to 100M byte/sec. A four-processor Series 2000 starts at $150,000.

The Series 3000 features six to 20 Flex/32 processors, 6M to 85M bytes of memory and an I/O bandwidth ranging from 60M byte/sec. to 200M byte/sec. A six-computer configuration starts at $230,000.

The Series 6000 includes 30 or 40 Flex/32 processors, 46M to 169M bytes of memory and an I/O speed from 300M to 400M byte/sec. A 30-processor configuration starts at $1 million.

Flexible said the Flex/32 is a parallel multicomputer environment with up to 20 directly programmable superminis per cabinet.

"Why doesn't somebody make a graphics terminal you can change to fit different jobs?"

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[illegible]

Perkin-Elmer revamps 3200 series to optimize Xelos

Adds processor for network link

By Charles Babcock

NEW YORK — Perkin-Elmer Corp. of Oceanport, N.J., has reconfigured its 3200 series processor to optimize its AT&T Unix-based Xelos operating system for a 10% improvement in performance.

In addition, PE announced a front-end communications processor capable of connecting the 3200 series of superminicomputers and high-end Xelos systems to IBM Systems Network Architecture (SNA) and other network environments.

Xelos is PE's operating system based on AT&T's Unix System V, Release 2 with enhancements from the University of California at Berkeley Software Division's Version 4.2, company officials said. Xelos has been available on the 3200 series along with OS/32, Perkin-Elmer's proprietary operating system.

The three basic systems and two enhanced versions in the Xelos processor line were developed by reworking three of the five CPU boards in the 3200 and reconfiguring the microcode to optimize Xelos, said Dennis Tinley, product manager for the Xelos line.

Like the 3200 series, the XF or Xelos series is based on Motorola, Inc.'s 68000 microprocessor, according to officials.

The Xelos line includes the XF/200 supermicrocomputer at the low end with 1M to 3M bytes of memory, 320K bytes of floppy disk storage, 51M bytes of hard-disk capacity, four ports and a graphics controller. A minimum configuration costs $10,150.

The XF/210 is an enhanced version of the XF/200 with six ports, up to 4M bytes of memory and up to 75M bytes of hard-disk storage. It sells for $10,500.

The mid-range processor is the XF/400, a supermini with eight to 16 ports, 2M to 4M bytes of memory and 51M to 170M bytes of hard-disk storage. Its list price is $21,995.

The XF/600 offers 16 to 64 ports, with up to 16M bytes of main memory and 1K byte of direct-mapped cache memory. System options include a 51M- to 2.4G-byte hard-disk system and battery backup for automatic memory retention. Tinley claimed that benchmark tests on the XF/600 indicate its performance is equal to Digital Equipment Corp.'s VAX-11/780. A minimum configuration costs $27,000.

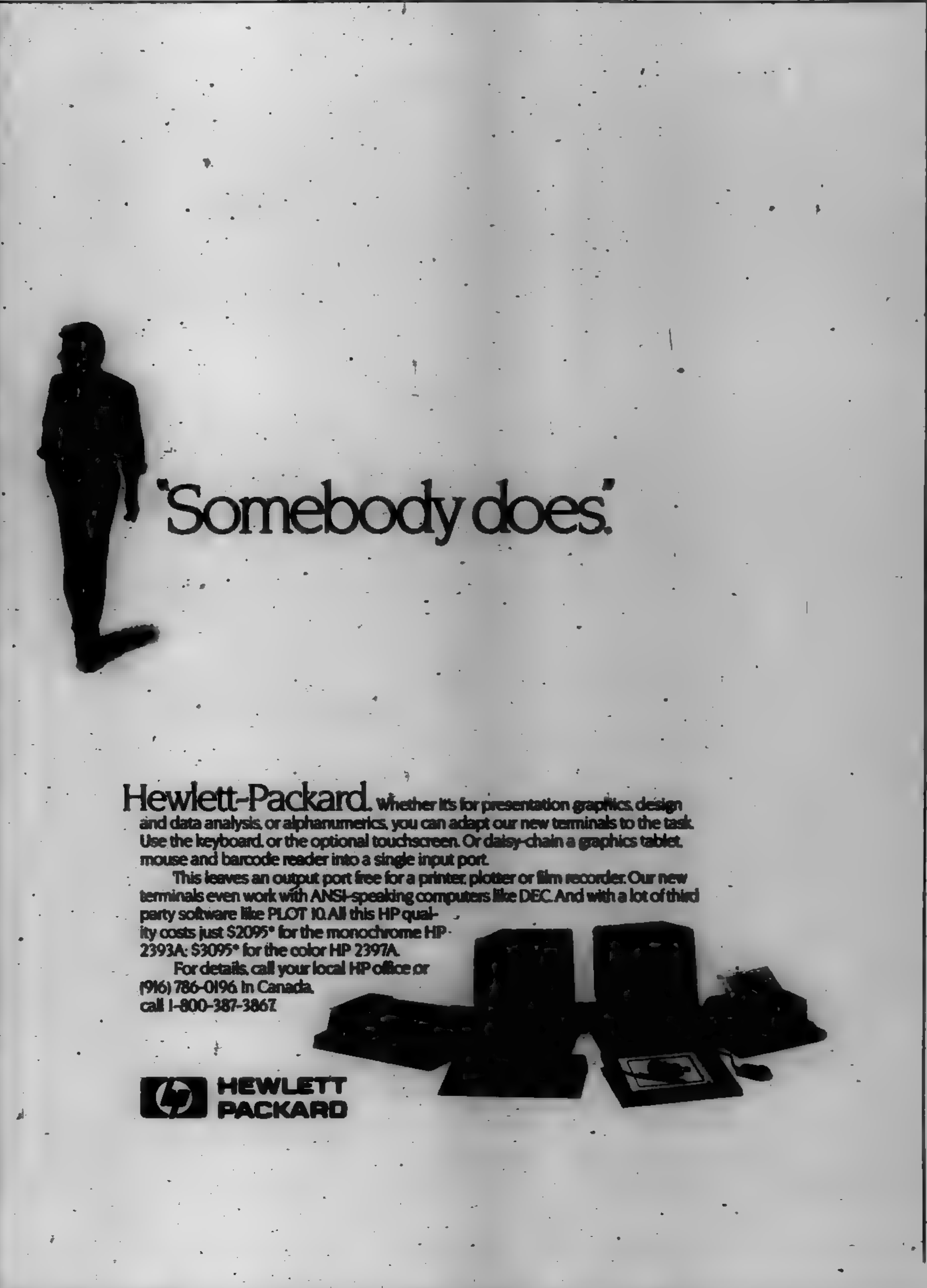
An enhanced version, the XF/610, features an intelligent I/O handler. With a standard configuration of 32 ports and 4M bytes of memory, it will sell for $45,000.

The processors will be available in October, PE said.

Perkin-Elmer officials said they would introduce in January a multiprocessor version of the XF/600 — the XF/800 — with greater performance characteristics. It also said it plans to fill out the low end of the line with an XF/300 in November.

PE has been offering Unix-based systems since 1979. It has an installed base of 300 Unix systems, spokesmen said. The firm will continue to offer the 3200 series, which comes with the PE OS/32 operating system and supports Xelos.

The communications processor, the 3200-CP, is capable of serving as an interface to IBM's SNA, bisynchronous, X.25 and Ethernet. The $13,000 communications processor comes with software options ranging in price from $1,000 to $5,000.



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"... expansion board!"

From page 85

Mentor Graphics processor out

The engine executes compiled high-level C language source code so it can deal with simulations above the gate level. The process is said to be transparent to the Apollo workstation user. The compiler is said to accept standard, nonparallel source code and convert it to object code that capitalizes on the parallel architecture. It also produces symbol file information used in symbolic debugging.

Different from other products

The product is different from other acceleration engines on the market, said Vicky Brown, computer-aided design and manufacturing analyst at International Data Corp., in that it speeds the entire range of engineering tasks.

Other hardware accelerators are designed to speed the simulation process only, she added.

Brown took issue with Mentor's claim to have a Risc system, saying that the instruction set is still large and not a true Risc system. But Mentor's use of parallel processing techniques at a primitive level, analyzing code as it comes in and breaking it into primitive operations such as basic arithmetic operations, is a first in the computer-aided engineering field, she said.

The system is targeted at single users, the vendor said.

Program development tools include a linker which supports overlaying of code/data segments and dynamic binding.

Other tools available

Also available is an Object Librarian for organizing and maintaining libraries of related object modules and an Image Librarian for defining dynamic binding execution environments.

The $27,900 Compute Engine consists of a CPU board and a 4M-byte memory board. A 10M-byte version costs $31,900. Both packages include one software upgrade.

Additional Mentor Graphics software costs $5,000 per application. Customers may port their own application software to the Compute Engine by licensing the product's C compiler and associated program development tools for $150,000.

From page 85

General Dynamics system offered

The agreement states that both firms will sell the systems.

Terry Straeter, vice-president of General Dynamics' electronics division, called the Model 5000 an intermediate-level mainframe for resource-intensive applications such as modeling and simulation and said it maintains full file compatibility and access to IBM VM/CMS hosts.

The firm also announced a Model 5000T, which has Tempest features that prevent emissions of electrical signals, for intelligence agencies. The Tempest version is being tested for certification by the National Security Agency.

The Model 5000 and 5000T support up to 4M bytes of main memory (16M bytes of virtual memory), four user terminals, two high-resolution graphics terminals and peripherals. Both systems include dual 85M-byte Winchester disk drives and an IBM-compatible 9-track tape drive, the vendor said.

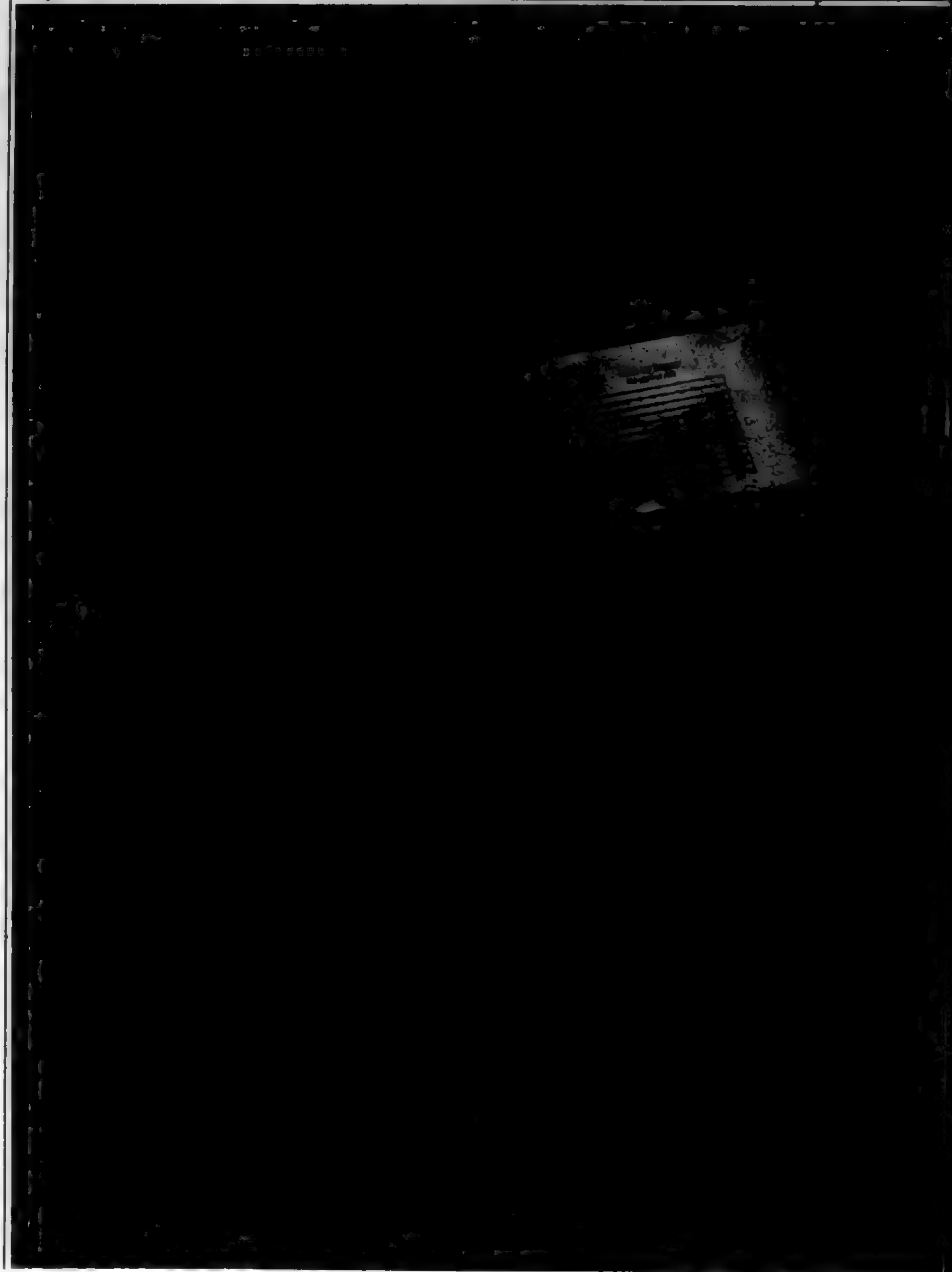
For mainframe off-loading, the units support networking with IBM mainframes, other Model 5000s and microcomputers, the vendor added.

"We are providing end users with DBMS-driven mainframe software applications as a dedicated resource," CCA President James Rothnie commented.

CCA's Model 204 relational DBMS is suited for defense and intelligence applications because of its applications development facilities, as well as fast retrieval and controlled access features, he said.

System prices, including the CCA software, range from $100,000 to $300,000, and the systems are currently available, according to the companies. The software portion costs $35,000 to $50,000, a CCA spokesman said.

General Dynamics also said it plans to offer four software lines for the Model 5000 series: office automation, program management and decision support, software engineering and computer-assisted engineering.



From page 85

Transaction sales to mushroom

means a 74% growth in unit shipments and a 79% growth in the value of those shipments between 1984 and 1990, according to IDC, which based its research on its computer installation data file.

IDC predicted that in 1990 vendors will ship 119,000 transaction-oriented systems worth a total of $12.2 billion, compared with 68,000 units worth $7 billion in 1984.

Because of their typical dollar value, mainframe-class transaction processing systems will show the greatest amount of growth, according to IDC.

The report noted that in many installations, only the very largest mainframe can act as the host system but that the operating environment forces smaller systems to handle the on-line portion of the application.

IDC added that most of the transaction processing growth will be in the area of on-line processing, where the transaction is completed and all data bases are fully updated during the process of the request and output stages.

In on-line processing, there are no edit files developed for later batch updates of the central data base.

The report was compiled for IDC's Continuous Information Services clients.

From page 86

Transaction units: no comparison

pal of Itom International in Los Altos, Calif. "The effort I started stalled. A fairly large number of people volunteered, but when the time came to make a decision they backed off and the project died," Serlin observed.

Officials of Tandem Computers, Inc. helped to organize that industry/user collaborative effort and have recently been calling for a standard benchmark.

Robert Jolls, director of data base products for the Cupertino, Calif., manufacturer of transaction processors, noted that such a standard will become more crucial as vendors and users drive toward a goal of 1,000 transaction/sec. He reported that high-end transaction processing systems are now approaching the 100 transaction/sec. level when running Debit Credit.

But Jolls added that even running Debit Credit leaves a customer unable to compare results for various processors unless each vendor runs the same transactions under the benchmark.

Key feature of Debit Credit

Serlin noted that a key feature of a Debit Credit-generated rating is that, unlike a Mips rating, it considers factors such as a customer's individual software, communications and I/O systems. Mips is essentially a measure of processor speed.

However, how those nonprocessor factors are considered is a stumbling block for a standardized benchmark.

Lawrence Sherman, manager of product support programs for Stratus Computer, Inc. of Marlboro, Mass., warned, "The complication comes in when you talk to a particular customer about his requirements and his work load, which will differ greatly from this simulated work load.

"You have to remember that communications and data base demands are going to vary greatly from customer to customer and user to user," he said.

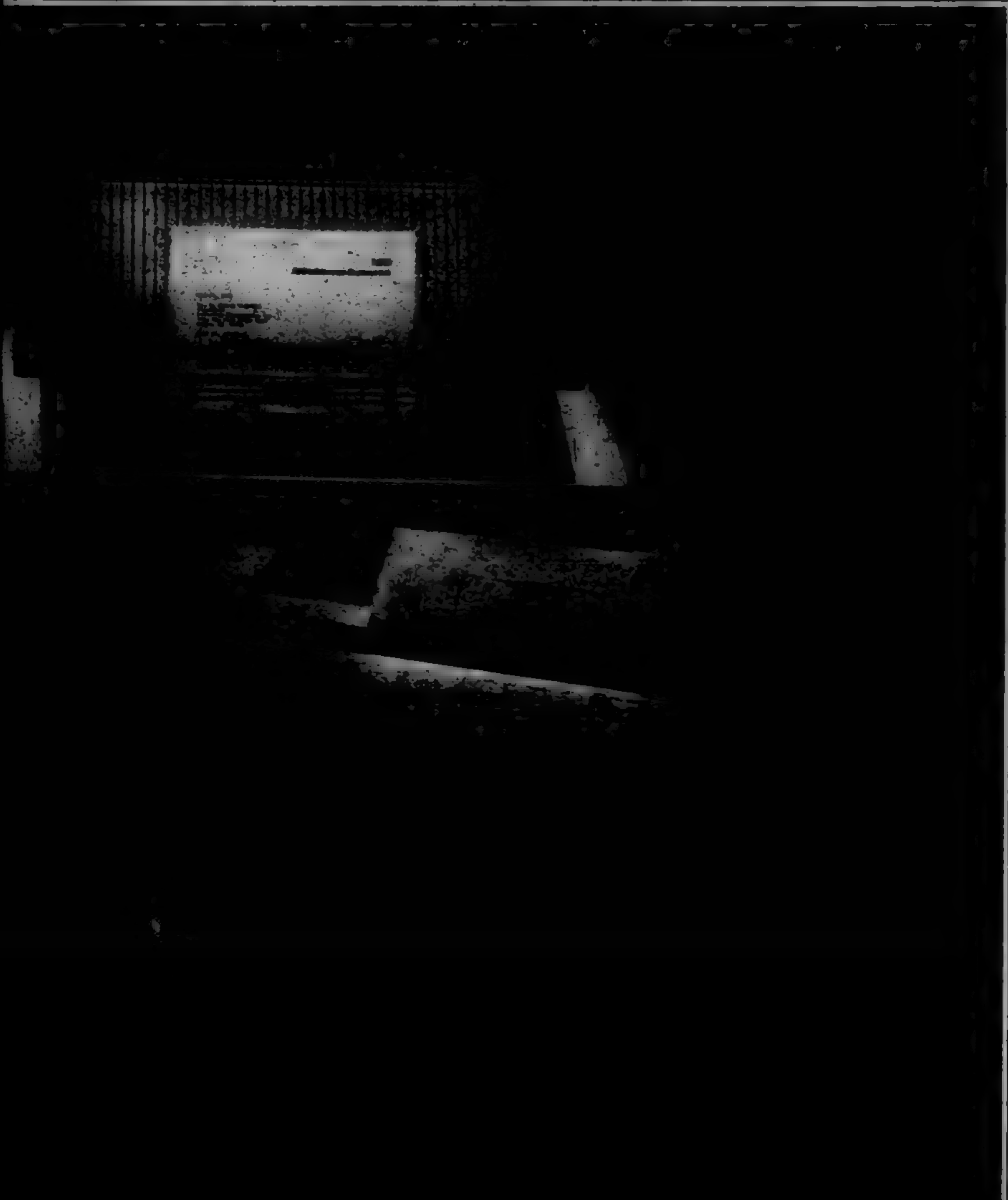
Sherman also suggested that even if vendors and users agree to set standards, they will need three or four standards for the different types of transactions, since a standard fit for the financial market may be inappropriate for a customer automating a factory.

Fuel efficiency for autos

Good cautioned that if any benchmarks are accepted they should be looked upon as are the U.S. Environmental Protection Agency's fuel efficiency ratings for automobiles — guideline numbers to put products in perspective with relation to each other.

But another observer from the user sector concluded that performance standards are a pipe dream.

That manager, who asked not to be identified, said, "The real issue is how you measure the performance available to the end user. Reporting performance from the glass house isn't the way to measure performance. It's not what the users see. They are the only ones who know how the system is performing."



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COMPUTER INDUSTRY

Western Digital seeking reprieve from creditors

IRVINE, Calif. — A $13.4 million fourth-quarter loss has raised the possibility of a credit crunch at Western Digital Corp., knocking the company below its previously agreed level of equity in credit agreements with its banks.

The vendor of communications control boards and semiconductors is currently renegotiating the agreements with the creditor banks, which have temporarily waived Western Digital's equity requirements until Oct. 31.

William R. Benz, the company's vice-president of finance, said the revolving agreements with Bank of America National Trust & Savings Association, First Interstate Bank of California and Morgan Guaranty Trust Co. of New York cover a $40 million line of credit. He did not disclose the equity level specified by the bank covenants.

"I don't consider the situation a difficult one at all," Benz said. "The covenants have been restructured before. The bank group is solidly behind the company, and I don't expect any difficulty in compliance or any change in the nature of our relationship with the banks."

Western Digital's losses on $177.4 million in revenue for the year ended June 30 plunged the company into the red for fiscal 1985. The firm lost $4.6 million, or 71 cents per share, compared with profits of $7.8 million, or 49 cents per share, in fiscal year 1984.

Boosted by sales of $69.9 million compared with $41.7 million in the year-earlier quarter, Western Digital posted revenue growth of 56% for the year. But the sales increases came in lower margin, board-level products, such as Winchester disk controller boards, as the company shifted its focus away from higher margin controller chips.

Trade surplus up, Cbema says

WASHINGTON, D.C. — The U.S. trade surplus for computers and office equipment rose by 28.4% in the first half of 1985, ending two years of decline. But the U.S. computer trade deficit with Japan continued to rise with a 7.6% increase, according to statistics released recently by the Computer and Business Equipment Manufacturers Association (Cbema).

Imports of computers and related equipment and parts from Japan reached $1.66 billion in the six-month period. Business equipment imports from Japan rose by 20.4% to $1.28 billion.

The U.S. surplus of computer and business equipment worldwide climbed to $2.82 billion during the first half of the year, up from $2.2 billion in the same period in 1984. The association predicted a surplus of about $5.5 billion for the full year if current economic trends continue.

The U.S. high-tech balance of payments has been generally declining since its peak of $7 billion for the full year of 1981.

In a related development, Cbema President Vico E. Henriques recently testified against proposed protectionist legislation before Congress. Criticizing a proposed 25% duty on imports into the U.S., Henriques blamed the nation's overall record trade deficits on low savings rates and the federal deficit.

"This creates a situation in which the dollar is overvalued and the cost of capital is too high, preventing industrial expansion," Henriques said. He predicted retaliatory measures by foreign vendors against an import duty.

STC layoffs reach upper exec levels

By Clinton Wilder

LOUISVILLE, Colo. — Storage Technology Corp. (STC) recently announced it will lay off 500 more employees and consolidate several corporate functions in its effort to emerge from bankruptcy proceedings under Chapter 11 of the Federal Bankruptcy Act.

The mainframe storage device manufacturer will reorganize along functional rather than product lines, consolidating the management of its disk and tape drive operations under manufacturing, systems development, financial and MIS divisions. The resulting cutbacks of administration and management positions in the Denver area represent the highest level STC jobs cut to date, excluding the replacement of top management by the team headed by the firm's chief executive officer, Ryal R. Poppa.

STC's printer division, employing 400 people in Melbourne, Fla., is unaffected by the reorganization and will continue to maintain its own administrative functions.

The restructuring, part of the long-term business plan approved by STC creditors in July, will cut the firm's expenses by $60 million per year, a spokeswoman said. The reduction of the management payroll follows an overall reduction of 40% of the firm's employees since the Chapter 11 filing in October 1984. STC now employs fewer than 9,000 people, down from more than 15,000 one year ago.

"They've cut, and cut and cut, but they haven't really cut management positions before this," said Carol Lerner, a storage industry analyst at International Data Corp. in Framingham, Mass. "This is a major step for them and a smart move in facing the fact they're going to be a much smaller company." STC projects revenue of $650 million in 1985, compared with

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- Legal experts explain the semiconductor protection act/92
- Digital Research moves into desktop publishing through a spinoff firm, Ventura Software/93
- IBM began a dealer rebate program to help move its Personal Computer AT, XT and PCjr lines/93

Outlook bullish for service start-ups

Third-party service contracts expected to double by 1988

By Peter Bartolik

OSSINING, N.Y. — Tom McLaughlin ended his career at IBM in 1978 after 12 years spent climbing the rungs in field-engineering management. The decision to leave came when higher level executives rejected his proposal to cut prices on maintenance contracts.

"The manager said that the price of parts was so high [IBM doesn't] have to worry about competition," McLaughlin recalled in a recent interview in this New York suburb.

Today, third-party computer maintenance, much of it involving IBM equipment, is a booming industry and is attracting some of the larger equipment manufacturers. Total maintenance and service revenue in the U.S. was estimated at about $10 billion in 1984, and third-party providers — those companies servicing products made by others — raked in more than $1 billion of the total, according to Input, Inc. of Mountain View, Calif. But the third-party segment should double by 1988, according to Input. A study published last year by Arthur Andersen & Co. in cooperation with the Association of Field Service Managers projected that third-party revenue could reach $9 billion by 1990, much of it at the expense of manufacturers' service organizations.

After IBM executives rejected his recommendations in 1978, McLaughlin left to found Technical Support Services, Inc., now headquartered in an old high school undergoing renovation. It took 18 months to land his first account and five years to turn his first profit, he said. The privately held company, according to McLaughlin, posted revenue of $6 million last year, compared with $2.8 million the year before, and is on track for $10 million this year.

"We've had to slow down this year and get the management in place and the service in place for continued growth," McLaughlin said. The company carved its niche by providing depot maintenance for IBM point-of-sale and financial terminal equipment and in more recent years automated-teller machines. It now operates 17 depots throughout the country.

One fact of life that has not changed, however,

Continued on page 94

Eagle seeks cash to make micro fly

GARDEN GROVE, Calif. — Shareholders of Eagle Computer, Inc. recently voted to add 10 million shares of common stock to the company's holdings. Capital from the sale of the stock will be used to help finance the introduction of new versions of Eagle's Turbo microcomputer, expected by year-end.

According to an Eagle spokesman, 95% of the outstanding shares of stock were represented at the shareholders meeting earlier this month, and 91% of those present voted in favor of the common stock increase. The addition gives Eagle 35 million shares of common stock. The 10 million shares will not be sold immediately, according to the spokesman.

Shareholders also voted to issue one million shares of preferred stock.

One of several microcomputer firms wounded by the shakeout in the IBM-compatible market, Eagle is attempting to rebound from substantial losses that last year forced the company to close its Los Gatos, Calif., headquarters and consolidate

Continued on page 94

Chip owners find copyright protection under 1984 act

FIFTH IN A SERIES

By Jerome J. Roberts
and Michael P. Brownell
Special to CW

A new form of proprietary protection for semiconductor chips, the Semiconductor Chip Protection Act of 1984, was signed into law last year by President Reagan and is administered by the U.S. Copyright Office. The protection it affords differs from copyright in many respects; this article and the following will summarize many of the fundamental aspects of the act.

Protection under the act is achieved by giving the owner of a mask work from which a semiconductor chip is constructed certain exclusive rights regarding both the mask work and the semiconductor chip product in which the mask work is embodied.

A mask work is the group of masks that are used like stencils in the manufacturing process of a semiconductor chip to create the three-dimensional pattern of metallic, insulating and semiconductor material inherent in the chip.

EXCLUSIVE RIGHTS

The owner of a mask work who satisfies certain requirements of the act, as summarized below, will have the exclusive right to reproduce the mask work, import or distribute a chip in which the mask work is embodied and permit others to do both. The owner of a mask work may be the person who creates a mask work, the employer of an employee who creates a mask work within the scope of employment or a party receiving a signed written conveyance from the initial owner of all his rights in a mask work.

COMMENCEMENT AND DURATION OF PROTECTION

Protection begins when two requirements are satisfied. First, the mask work must be fixed in a chip. This means, essentially, that an actual chip prepared from the mask work must be in existence. The chip need not necessarily be in final form.

Second, the mask work must be registered as explained below, or the chip containing the mask work must be distributed to the public for commercial purposes. Once the mask work has been fixed in a chip and registered or commercially distributed, protection continues for 10 years. However, if protection began as a result of public distribution and not registration, protection will only last for two years unless the pertinent mask work is registered within the two-year period.

REGISTRATION

Formal registration of the mask work with the U.S Register of Copyrights is advisable for several reasons. First, without registration, protection lasts for only two years from the date the chip is commercially distributed. Registration extends protection to 10 years. Second, prompt registration provides the only way to effect the act's protection for a mask work during the period before commercial distribution of the chip but after fixation of the mask work. Third, a mask work must be registered prior to bringing an infringement action.

Registration is accomplished by submitting Form MW, a $20 registration fee and a deposit of certain identifying materials concerning the relevant chip to the U.S. Copyright Office.

In general, Form MW requests information concerning the title of the work, a description of the new or original elements of the work, the name and address of the current owner and the manner in which the current owner gained ownership in the event it did not create the work.

Regarding the identifying materials requirement, a registrant must submit a visually perceptible representation of each layer of a chip. The Copyright Office will accept any one of several formats concerning such representations. Further, if the chip has been commercially distributed, four reproductions of the actual chip must be deposited with the Copyright Office.

THE MASK WORK NOTICE

The owner of a mask work protected under the act should consider affixing notice of protection to the mask work. Such notice serves to lay a strong foundation from which to prosecute infringement and to prevent innocent infringement. Although recommended, such notice is not a condition of protection. A notice comprising the following elements will constitute a satisfactory notice of protection:

- The words "Mask Work."
- The symbol "M" or the letter "M" in a circle.
- The name of the mask work owner or a recognizable or generally known abbreviation thereof.

Roberts and Brownell are attorneys with the law firm of Berman, Roberts and Kelly in Chicago. The firm's practice deals with legal issues related to procurement, distribution, management and protection of computer resources.

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IBM offers dealers sales incentives

BOCA RATON, Fla. — In an apparent effort to move its rumored swollen inventories of micros and peripherals, IBM has begun a dealer rebate plan as sales incentive for the IBM Personal Computer AT, Personal Computer XT and PCjr.

The dealer rebates, which began Sept. 1, could herald an early start to an expected wave of holiday season price cuts by most leading micro vendors (CW, July 29). At least some of IBM's refunds, reportedly up to about $500 per machine, could be passed on to buyers in the form of discounts.

"We are offering a sales promotion in the form of incentives to dealers," said a spokesman for IBM's Entry Systems Division. "Fourth-quarter promotions are not uncommon. We did it last year in the same time frame."

Rebate terms vary for each computer model, but essentially give dealers a cash incentive for ordering a specified volume of XTs, ATs or PCjrs. The discontinued PCjr has already undergone one major price cut earlier this year.

Analyst Aaron Goldberg of International Data Corp. in Framingham, Mass., said the move was IBM's response to dealer sales of Big Blue micros equipped with lower priced, third-party hard disk drives, monitors and other peripherals. "It's simply an incentive for dealers, and I don't think the street price of the IBM machines will fall because of it," he said.

Net America buys Nestar

By Maura McEnaney

PALO ALTO, Calif. — A Dallas-based start-up common carrier took a bold stance in the communications market recently through the acquisition of Nestar Systems, Inc., a leader in personal computer local-area networks.

Net America, Inc., builders of a nationwide Integrated Services Digital Network, recently purchased 80% of Nestar's stockholdings from Rank Industries America, Inc., a subsidiary of a UK-based travel and leisure services firm that had been an investor in Nestar since 1980. The value of the acquisition was not disclosed.

Net America was founded three years ago by former Northern Telecom, Inc. executives Ed Jungerman and Ray Cotton.

Net America cofounder and Chairman Sam Wyly also founded University Computing Co. and serves as chairman of Sterling Software, Inc., which recently acquired Informatics General Corp.

According to Jungerman, Net America still needs to complete payment on $250 million in debt and eq-

Continued on page 94

Start-up to develop publishing software

By Eric Bender

MONTEREY, Calif. — A start-up firm that will develop and market computer-aided publishing software is being formed by managers from Digital Research, Inc.

Founders of the spin-off, Ventura Software, Inc., include John Meyer, Digital Research's marketing director, and two software engineers involved in the development of Digital Research's Graphics Environment Manager (GEM) software.

Ventura's first products, which will be announced early next year and shipped within a year from now, will provide desktop publishing capability within the GEM package, Meyer said.

Unlike most computer-aided publishing products now on the market, Ventura's offerings will run on the IBM Personal Computer and "give assistance to a user who is not really smart about how to lay out a page," according to Meyer.

The start-up plans to target several market niches, the first being users who already own desktop laser printers. Employees who work in corporate communications or in technical documentation also represent likely candidates, Meyer said.

While Ventura will be an independent software vendor for GEM and may sign a technology-exchange deal with Digital Research, the older firm will not make any investment in the start-up company.

Both Meyer and Digital Research President John Rowley told *Computerworld* that Digital Research decided against pursuing desktop publishing products at this time in order to concentrate on presentation graphics, graphics-enhanced applications and system software. Digital Research "has a tremendous number of opportunities it's already pursuing," Meyer commented.

Two characteristics of desktop publishing make it particularly appropriate ground for a start-up, he added. "First, it's not very well developed at the micro end. Second, it's a market that's going to require a different distribution channel."

From page 93

Net America buys Nestar

uity financing before it can implement its network, and the company expects to begin offering common carrier services by the end of 1986. Until that time, Net America has been operating with venture capital, much of which comes from Wyly.

According to Nestar President Charles Hart, the acquisition gives Net America Nestar's corporate installation base of approximately 1,000 networks and access to the company's intrafacility data distribution technology.

The Net America merger also includes the assets of Zynar, Inc., a London-based local-area network firm that had been under Nestar management for more than a year.

From page 91

Outlook bullish for service start-ups

is that the price of new IBM parts needed to service equipment can cost as much as an IBM service agreement. That requires small competitors to be fast on their feet by acquiring off-the-shelf parts from other suppliers at a fraction of the IBM list price and in-house manufacturing or repairing of frequently broken parts.

"If you buy parts from IBM, IBM is getting as much money anyway without having to provide the service," McLaughlin said.

Although IBM is required by a 1956 consent judgment to provide parts and documentation to users and third-party companies, it is not required to provide documentation on the schematics and components that make up a circuit board.

McLaughlin noted that a memory board for an IBM 4701 Finance Communication Controller is priced at $2,500, one-fourth the cost of the total unit.

Technical Support Services operates an electronics lab to draw up its own schematics and identify off-the-shelf integrated circuits that go into the boards. It also determines the functions of IBM proprietary integrated circuits; two boards with proprietary chips reportedly can be repaired by scavenging a third.

George Blagodatny, vice-president of engineering, said it takes two months to decode an IBM board, and new boards are introduced often, requiring the company to determine selectively those that it wishes to decode.

Because IBM builds nonstandard parts into its financial equipment, Technical Support Services has had to develop its own testing equipment, some of which it has begun to market. It also installs 4700 loop circuits and developed an alternative 4700 loop port module that it claims is more sophisticated and easier to use than IBM ports.

Committed to fast-growth goals, Technical Support Services has begun to branch out to offer service for 3270-type equipment and may move up further to service System/34, 36 and 38 processors.

Meanwhile, it wants to offer additional services to financial customers who use both IBM and non-IBM equipment, but McLaughlin claims at least two vendors have refused to provide parts.

Noting that one of those vendors has declared an interest in developing a third-party maintenance business, McLaughlin claims such refusal is a blatant attempt to restrain competition. But, despite his bitter denunciation, he expressed little concern about the current desire by mainstream vendors to enter his market. "With the exception of IBM, the manufacturers have their hands full servicing their own equipment," he said.

From page 91

Eagle seeks cash to make micro fly

its operations here. For the past year, Eagle has also been working out repayment plans with its unsecured creditors.

Last month, the company offered its trade creditors a repayment plan for $2.5 million in unsecured debt. The plan is designed to reduce Eagle's short-term debt, which reached $19.7 million in March 1984, to just under $3.1 million, a spokesman said.

Under the plan, debtors have the option of accepting the remaining 90% of the debt in the form of Eagle common stock at one share for $1 of debt or in a long-term unsecured note with 12% annual interest. Early this year, Eagle's unsecured creditors converted about $4.9 million in trade debt to equity.

Over the next few months, Eagle plans to introduce a line of multiuser supermicros and an enhanced version of its Turbo micro.

From page 91

STC layoffs reach upper exec levels

$808 million in 1984.

An STC spokeswoman said the firm expects to return to profitability and exit Chapter 11 by mid-1986. "That sounds realistic, if the industry holds together and [STC's] new products are delivered on schedule," said analyst Michael Geran of E. F. Hutton & Co. "They are now about half the size they were two years ago, and they have to bring their break-even point down to about $600 million."

Lerner said STC's return to profitability hinges on its ability to deliver a cartridge tape drive compatible with IBM's 3480 model.

The introduction of an automatic tape handler, which would speed the cartridge backup of IBM 3380-type disk drives, would greatly enhance STC's chances for recovery, Lerner added.

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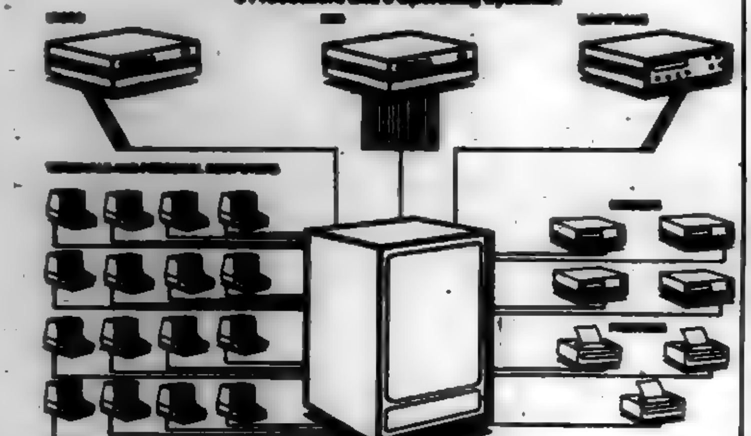

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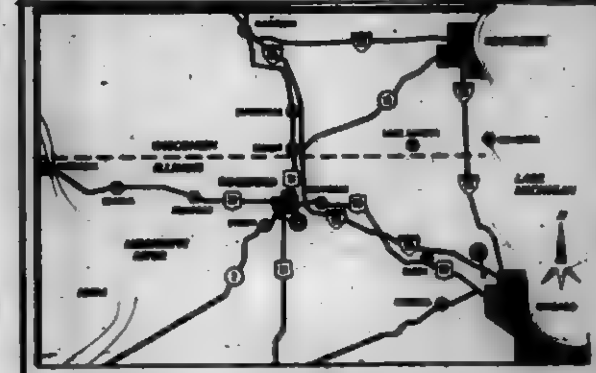

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You should have a degree in computer science or a related field, but we will consider equivalent experience. We have openings from entry-level to senior positions, commensurate with experience. Competence in COBOL, IBM Assembler, TSO/ISPF, SMP4 or SMP/E, and dump analysis is required at all levels.

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You should have a degree in computer science or a related field, but we will consider equivalent experience. We have openings from entry-level to senior positions, commensurate with experience. Competence in COBOL, IBM Assembler, TSO/ISPF, SMP4, or SMP/E, and dump analysis is required at all levels. COPICS experience is a plus.

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Duties include installing and maintaining a variety of IBM and IBM-compatible software, identifying and resolving software problems, providing support and technical assistance for the Data Center staff and user community, and assisting in the design and development of software systems.

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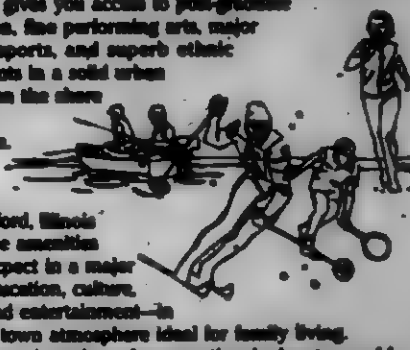
You should have a degree in computer science or a related field, or equivalent experience. At least five years' experience is required, including three years as a network systems programmer in an MVS environment. You should also be competent in COBOL, IBM Assembler, TSO/ISPF, SMP4 or SMP/E, and dump analysis.

VM Systems Programmer
Duties include installation and maintenance of a VM system in an SNA network. You will be responsible for performance and tuning, capacity planning, program product installations, and problem resolution.

You should have a degree in computer science or a related field, or equivalent experience. At least five years' experience is required, including three years as a VM systems programmer. You should be competent in BAL programming, generating VM systems, dump analysis, and VM tuning. Familiarity with MVS JCL, MVS utilities, VTAM, and PROFS would be a plus.



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We'll tell you, if anybody can; we've been here longer (12½ years), know everybody in EDP worth knowing, and the best companies rely on us for the best people. Call today or mail your resume to Computer Resources Group, Inc., 303 Sacramento St., San Francisco, CA 94111, (415) 398-3535, or 3000 Olcott St., Santa Clara CA 95051, (408) 727-1658. Agency

The Computer Resources Group, Inc.

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Silicon Valley

PROJECT MANAGER DATA PROCESSING

The Department of Correction of the City of New York is seeking a Project Manager to direct its Data Processing development and operation in the area of administrative data systems. Requires solid management and administrative experience and good data processing experience in business or government. The systems environment is IBM-CICS/3277. Background in micro computers and PCs is a plus. BA plus 3 years of full time paid experience or equivalent a must. Position located in lower Manhattan. Send resume to:

NYC Department of Correction
[illegible] Broadway
Personnel Division
12th Floor
New York, NY [illegible]
An EOE/M/F

FACULTY FOR EUROPE

The University of Maryland University College seeks faculty to teach undergraduate computer science, computer applications and information systems management courses on U.S. military bases in Europe. Most appointments begin in August 1986, though there may be openings as early as January. Minimum requirements include a masters degree, recent college teaching experience, and U.S. citizenship. Benefits include transportation and military base privileges (PX, commissary, etc.). Frequent travel and the cost of schooling make these positions difficult for those with children. Send resume to: Dr. Lois Mohr, Overseas Programs, The University of Maryland University College, College Park, MD 20742. AA/EOE.

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We have clients in Southern California who need talent in the following areas:

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We have permanent and contract positions available in all of the above areas plus more. Salary, relocation package commensurate with abilities. When we place or hire you, your choice, we will send two (2) people from LAX to Hawaii, all expenses paid for 1 week as an incentive for utilizing Computer Logic. Try us, it works. When this ad runs, I'll be in Munich, Germany at Oktoberfest with three (3) professionals who were successful from our June 10th World Ad. Contact me or an associate and I'll amplify further, send letters of reference and we'll help you fulfill your career needs. This plan started in the early '70s and has helped me beyond your most vivid imagination.

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213/827-6040
Jerry Beatty

P.S. December is my favorite month of the year to be creative and if I place you then, a 1 week trip for 1 person to Paris or Tokyo will be given. Pack your bags for Hawaii and contact your mover.

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Positions are with prominent companies (in central U.S.A.) utilizing mainframe hardware. Salaries are above average and commensurate with level of experience. Fees & interviewing expenses are paid by the client company. ALL inquiries are kept confidential. Send a current resume for consideration or call us collect for more information.

PROG.: IBM OS & COBOL Mfg Sys. 1-2 yrs exp. req'd; **PROG.:** 2 yrs exp. with IBM mainframe & COBOL, Accounting Applications. Numerous Positions; P/A: IBM, IMS, CICS Req'd. Several Positions. 27-35K; P/A: OS/MVS CICS Retail or Distribution exp. a plus. 4 positions. 27-33K; **SR. ANALYST:** IBM OS/MVS. Redesign of ATM Network. Prefer 3 yrs exp. with CICS, SNA, NPDA & BY-SYNC along with 5 yrs COBOL exp. 32-36K; **COMM ANALYST:** With MAP's, LAN or BROADBAND exp.; Salary OPEN; **PC ANALYST:** IBM PC with Lotus 123 & DBASE3. 30-36K; **O/A WORK STATION ANALYST:** Prefer Xerox, IBM PC, HP, Zenith exp. 30-36K; **CAD/CAM ANALYST:** CADAM or NC background. Prefer design exp. Salary OPEN; **ARTIF. INTELL.:** Exp. with LISP, PROLOG. Salary OPEN; **SYS. PROG.:** Strong CICS skill a must. Prefer OS/MVS 42-48K; **SYS. PROG.:** NCP/VTAM a must. 42-48K; **SYS. PROG.:** VAX or HP3000 exp. Salary OPEN; **DBA:** IDMS exp. a must. Mid to upper 40's; **DBA's:** IMS or DB2 (If IMS exp., strong design or modeling req'd) (If DB2 exp., any exp. considered). Several Positions. Salary OPEN; **MGR. TELECOMM:** Data & Voice exp. Must have Management exp. Salary OPEN.

CHECK-MATE OF WICHITA

P.O. Box 8[illegible], Wichita, Kansas 67208, (316) 685-4144

DIRECTOR

WEST VIRGINIA NETWORK FOR EDUCATIONAL TELECOMPUTING SEARCH REOPENED

The West Virginia Board of Regents seeks a Director for the West Virginia Network for Educational Telecomputing. WVNET is a distributed computing network providing and facilitating instructional, research, and administrative computing for 16 state supported institutions of higher education. The WVNET Director will assume full responsibility for management of the network host site in Morgantown, West Virginia, directing 60 full time employees. This involves management of a $4 million operating budget, and developing capital equipment funding requests. The Director also will spearhead Board of Regents statewide planning for computing, and serve as primary interface with institutional presidents and computing authority regarding computing matters. The position demands a creative executive with significant experience in management of computing and information systems. The successful individual will have demonstrated competence in planning for and delivery of computing services in a similar environment. The successful candidate must hold a Master's degree and 10 years of relevant experience, including management in a computing environment or have equivalent combination of education and experience. Excellent communication and presentation skills are essential, as is state-of-the-art awareness of development in the technology and of computing in the educational arena. Management experience within a large academic setting or a computer network is desirable. Salary will be commensurate with the qualifications of the individual. Nominations and applications should be sent to:

Dr. W. Max Ivey at West Virginia Network
for Educational Telecomputing
837 Chestnut Ridge Rd.
Morgantown, WV 26505.

Applicants should furnish the names, addresses, and telephone numbers of five references. Closing date is November 4, 1985. EOE

COORDINATOR FOR COMMONWEALTH CAMPUSES

Department of Computer Science

The Pennsylvania State University is looking for a person who is interested in an exciting, challenging nontenure track position in Computer Science where you can have a significant influence on undergraduate education and the associate degree program in Computer Science. The position includes undergraduate teaching at the University Park campus as well as the monitoring of faculty on seventeen Commonwealth campuses. Limited travel is involved. Undergraduate teaching experience in Computer Science, including competence in COBOL, is required. A Master's degree is also required, although a Ph.D. is preferred. To learn more about this fine opportunity send a resume with names of three references to:

Professor Joseph M. Lambert, Head
Department of Computer Science
The Pennsylvania State University
333 Whitmore Laboratory
Box CW #1
University Park, PA 16802

Applications will be accepted until
October 30, 1985.

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OS/MVS, CICS, XA/Westcoast	$45K
OS/MVS, CICS, JES2, VTAM/OLtp	$45K
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OS/MVS, VM, CICS, IMS, JES2/W. Tx.	$38K
OS/MVS, IDMS DB, Utility/Gulf Coast	$45K
MVS/XA Internals/Dallas	$45K
CICS Internals/Dallas	$40K
IMS Tuner/East Coast	$38K
CICS Internals/S. Texas	$40K
DOS/VSE, VM/Mississippi	$40K

I'm Dennis Jiles and listed above are a few of my client companies needs nationwide. I have 20 years in Data Processing with 10 years in Systems Management. Our agency is unique where we specialize in Data Processing Career Management. Let me use my experience to help your career needs. Please call collect (318) 222-1000 or mail resume to:

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Work on dual IBM 4300's, Series I, 5520 and PC's. Two or more years experience with DOS/VSE, VM, VTAM, NCP and CICS required with EDX knowledge a plus. If you are interested in implementing new projects and expanding your systems knowledge, please send your resume to:

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Interested in a challenging position in a unique and exciting environment? The University of Alaska Computer Network is a 3,000 mile communications network linking 13 campuses with six computer systems. We have openings for experienced Systems Programmers for the implementation and maintenance of an IBM 4381 mainframe with MVS/SP, JES2, ACF/VTAM, NCP, and Cullinet IDMS. We are in the implementation cycle where your experience and creativity will help continue to keep us on the frontiers of computer technology.

SYSTEMS PROGRAMMER II -
(Annual Salary [illegible])

As a minimum, the successful applicant must possess knowledge of IBM systems software, skills in assembly level programming, and the ability to maintain, develop, and install computer operating systems.

Please send a letter of application, your resume, and three professional references to:

Statewide Office of
Human Resource Development
University of Alaska
Room #1, Bunnell Building
Fairbanks, Alaska [illegible]

Closing date: October 7, 1985

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As our Scientific Programmer Specialist you will be responsible for the analysis, design specification; and technical advisement of the programmer/analyst assigned to the program Chief Technical Authority for the implementation of a relational database using free text search algorithms. You will also oversee the integration of the database to the communication and user functions of the system. For this position, you should have strong presentation skills and be able to assume total responsibility for the database effort as required. A technical degree and five years' experience are required.

Send your resume to Lockheed Electronics Company, Inc., Employment Office, Dept. SPC, 1501 U.S. Highway 22, Plainfield, NJ 07061. Lockheed is an equal opportunity, affirmative action employer. U.S. citizenship is required.

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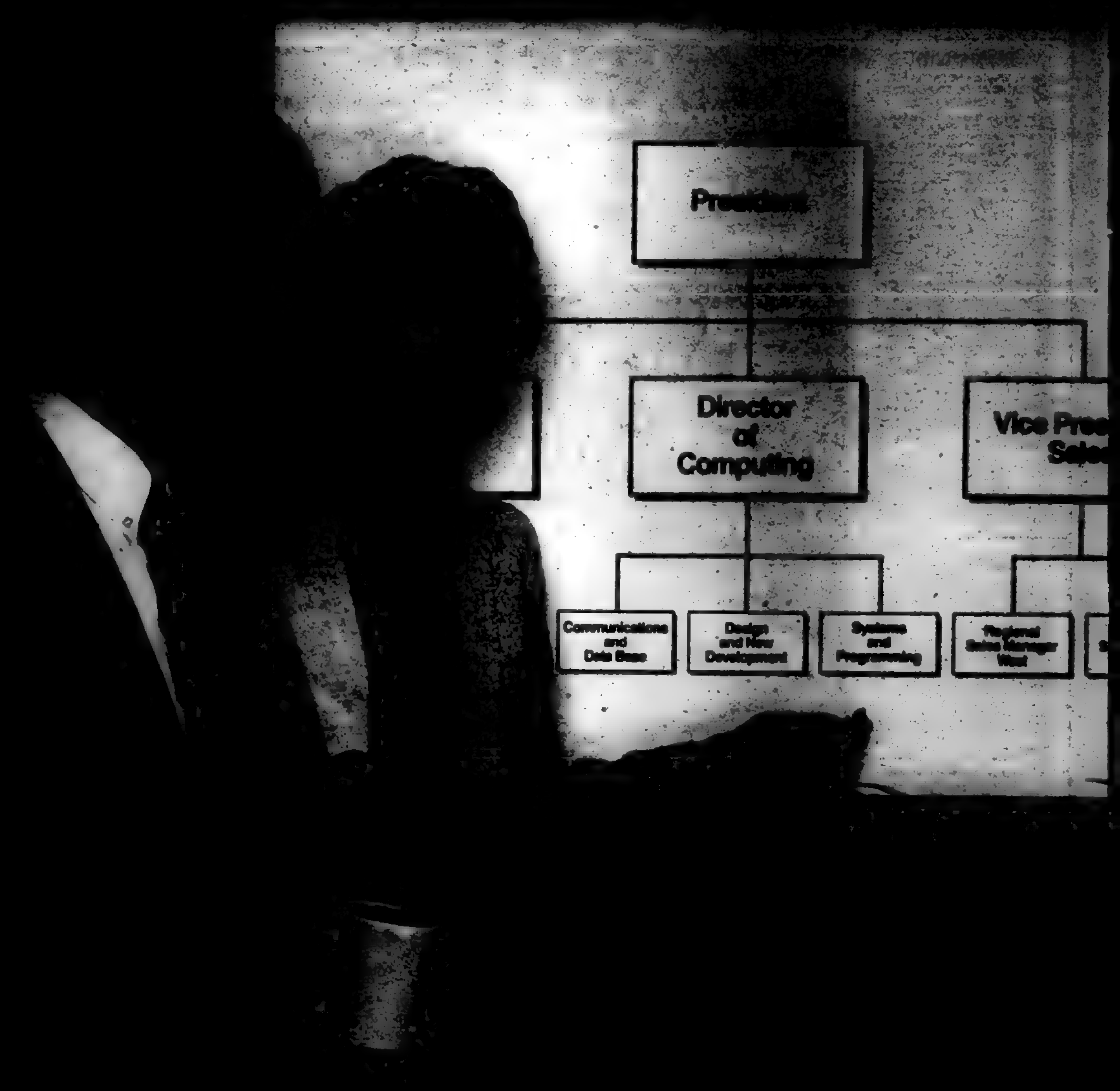
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Do you know if you're in the best position? Are there other opportunities that will provide leading-edge exposure, greater income and maximum potential for long-term career growth? Are there better opportunities in other areas of the U.S. or Canada?

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The Source Edp Computer Career Conference is designed to help computer professionals evaluate the current job market, and find out where they stand professionally and financially—all in complete confidence. Key information systems executives in your area and across North America will be available throughout the Conference—at your convenience—to explain their long-range plans and where you might fit in.

Exploring has never been easier

Firms participating in the Conference represent a broad cross section of user, consulting, vendor and service organizations. They are diverse in industry, size and location, and range from the dynamic new start-up to the larger well-established, growth-oriented company. Compensation levels are outstanding.

In all, over 6,000 specific positions are represented. The Conference offers you a convenient way to investigate a wide variety of career options—all in complete confidence. There are no forms to fill out—nor is a resume necessary. You will meet only those firms that you are interested in—or that have interest in you. Discussions will be held in strict privacy, at a time and day that's most convenient for you.

How to participate

The Source Edp Computer Career Conference is scheduled in a city near you soon. There is absolutely no charge for your involvement or attendance since participating client companies will assume our fees. And, all inquiries are held in confidence. To ensure your reservation and to learn about Conference dates in your area, call Dave Grinnell today at 1-800-821-7700, Ext. 800B. Or write: Career Conference Director, Source Edp, Dept. C-5, P.O. Box 7100, Mountain View, California 94039. Following is a summary of the kinds of positions and compensation offered.

Applications Programming
$23,000 – $54,000

Those with two or more years experience in applications programming will have an opportunity to learn new skills while ensuring maximum compensation. Positions exist in environments ranging from the largest scale mainframes through mini and microcomputer user, consulting and vendor firms.

Positions are available using a variety of languages including COBOL, PL/I, Assembly, RPGII, PASCAL, "C" or BASIC; operating systems like OS/MVS, VM/DOS/VSE, UNIX, AOS, and data base and data communications like IMS, CICS, INFOS, TOTAL, IDMS, ADABAS, System 2000, ADDS-0 and more. Significant opportunities exist for those with solid programming backgrounds to move into systems development, software, EDP auditing or systems evaluation.

Software Development/ Software Engineering
$28,000 – $60,000

Individuals with two or more years of software design and development or software engineering experience will be able to gain experience in and develop some or all of the following: operating systems, capacity planning and performance enhancement tools (OMEGAMON, MEAGAMON), compilers (C, PASCAL, ADA), I/O and device handlers and program generation tools. This development work will take place on a variety of systems including IBM 3083's, VAX 11/780's, Tandem Non-Stop, and variety of other mini and micro systems (Motorola 68000, Intel 8080's).

Many of the companies participating in the Conference offer formal training and experience in leading-edge technology as well as day-to-day contact with some of the top technical professionals in the country. A number of opportunities with new venture companies offer exceptional growth and equity potential.

Data Base/Data Communications
$25,000 – $55,000

Many openings exist for individuals with backgrounds in database and/or data communications. Exposure to a variety of technologies is possible, including: IMS DB/DC, ADABAS, IDMS, TOTAL, FOCUS, CICS, ENVIRON/1, TCAM/NCP, SDLC, SNA, X.25 and other database and/or data communications software.

Companies participating in the Conference include major computer and software manufacturers, Fortune 500 companies, prestigious consulting firms as well as many emerging high technology firms.

Systems Programming
$24,000 – $55,000

Opportunities provided by client firms that are participating in the Conference are broad and unique. Those with at least one year of systems programming experience will be able to strengthen their skills as well as gain knowledge of some or all of the following: UNIX, CPM, CICS, IMS, OS/VS, DOS/VS, ADABAS, DL/I, modems, duplex lines, switches, and more in both mainframe and mini or micro environments. Assignments range from program development and enhancement to systems support.

EDP Auditing
$25,000 – $58,000

Exploding opportunities exist in EDP auditing. There are many openings for those professionals who have a good technical background in programming or design plus exposure to accounting applications. Large firms are expanding their EDP auditing departments and are providing specific training in auditing for Programmer Analysts—particularly those with over two years experience.

Technical Writing
$21,000 – $38,000

Those Technical Writers/Documentation Specialists who have writing experience with state-of-the-art hardware and software are now in a position to capitalize on those skills due to high demand. Positions range from creating technical documents for users to the development of marketing and sales brochures for new products. Because of the growth of new hardware products and new software packages, the need for good technical writers has grown rapidly. In addition to a great need for creative writing, there are also many opportunities for the more senior level writers to become Technical Writing/Documentation Managers.

Systems Development/ Management Consulting
$31,000 – $78,000

A broad variety of openings exist for persons with systems design and development backgrounds ranging from systems analysis to senior project management and/or management consulting. Many leading-edge communications and data base-oriented information systems projects are being planned by Conference client firms. In addition, a number of small to intermediate size firms are just beginning to make their initial thrusts into computing—especially in mini/micro areas—and need new applications development expertise. Several nationally-respected management consulting firms will also be represented for those persons who are interested in a variety of new development assignments with high visibility to corporate management.

Sales, Marketing and Technical Marketing Support
$23,000 – $108,000

Those professionals who attend the Conference will learn about new opportunities in computer sales, marketing and marketing support. Many alternatives exist in various product areas including mainframes, mini/microcomputer technology, terminal systems, time-sharing, facilities management, proprietary software packages, OEM's, consulting and more. Many firms are just now entering new markets and will provide exceptional career and compensation growth potential—as well as equity participation.

Our National Career Conference is happening now in 36 major metropolitan areas across North America. Call 1-800-821-7700, extension 800B to ensure your reservation.

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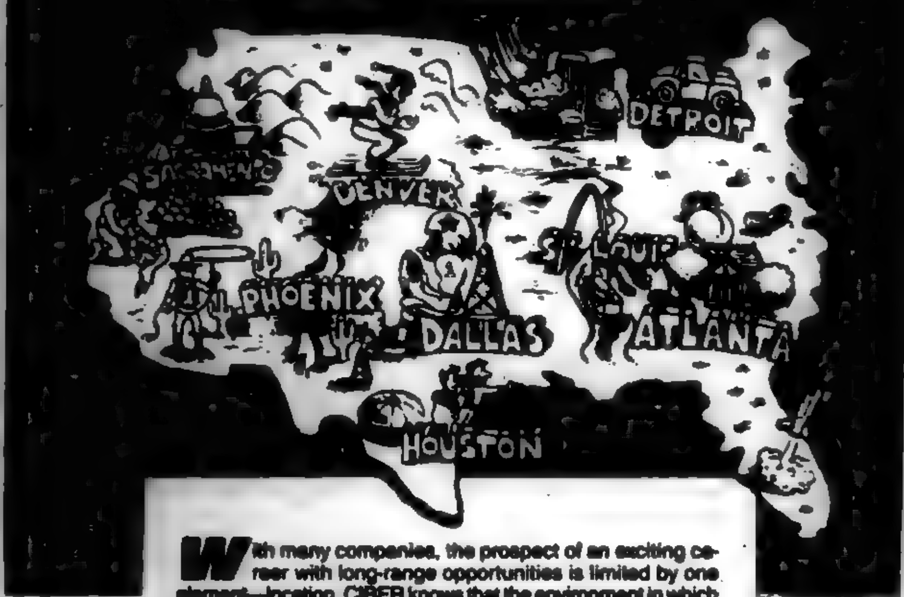

With many companies, the prospect of an exciting career with long-range opportunities is limited by one element—location. CIBER knows that the environment in which you work and live affects your personal satisfaction. A career with our rapidly-expanding consulting firm will allow your future to take shape in a choice of data processing markets.

Our employees are salaried and receive company paid benefits including relocation. If you have a minimum of 3 years experience, we can offer you a wide range of technical opportunities in diverse industries using the latest systems and computer technology.

Openings are currently available in the following locations for data processing professionals who are experienced in these preferred fields.

Phoenix
OS/MVS, COBOL
IMS DB/DC, CICS
VSAM, FOCUS
SAS, FINANCIAL
SYSTEMS
INSURANCE
SYSTEMS, HOGAN

Detroit
IMS DB/DC, ADF
COBOL
IDMS, ADS/O
FOCUS, CICS
MARK IV, MICRO
ASSEMBLER
HP3000, T1800

Atlanta
COBOL, FOCUS
CICS/VSAM or DL/1
IMS DB/DC, IDMS, ADS/O
OS/MVS
FINANCIAL SYSTEMS
INSURANCE SYSTEMS

Houston
IDMS
ADS/O
IMS DB/DC
PL/1, COBOL
FOCUS
CICS, VSAM

St. Louis
COBOL, CMS/RAMIS II
IMS DB/DC
CICS
TOTAL, MANTIS
VAX, FORTRAN

Denver
ADABAS, NATURAL
IMS DB/DC
IDMS, ADS/O
COBOL, PL/1, OS/DOS
IBM S/38
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Sacramento
ADABAS, NATURAL, COM-PLETE
IDMS, ADS/O
CICS, ON-LINE OR OTHER
DB SYSTEMS, COBOL

Dallas
IMS DB/DC, COBOL
CICS, DL/1
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Primary responsibilities will include:

- Administration of corporate data and physical security policies/procedures.
- Technical administration of corporate data security procedures and techniques in support of MVS, VM/CMS, CICS, IDMS.
- Implementation, maintenance and testing of the corporate disaster recovery program.

Primary experience should include: ACF2 Data Security, OS/JCL and OS Utilities; TSO/SPF, and ROSCOE, IBM PC's, M&D Millenium, SDSF, RUSCO Access System, and Telecommunications.

Mail resume and salary requirements to the Employee Relations Department, or call 214-754-1171. Principals only please.

Central and South West Corporation
P.O. Box 660164 • Dallas, Texas 75266-0164

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MVS AND CICS SUPERSTARS
$55,000-75,000

Do you have an exceptional aptitude for systems programming?

Did you know more about MVS and CICS after one year than do people with 10 years' experience?

Are you looking for a project that challenges you technically and uses the latest features of MVS and CICS?

If the answer to these questions is yes, you are the perfect candidate for a job at Oracle Corporation.

We are currently interfacing our DB2-compatible DBMS to MVS and CICS.

Oracle runs under MVS as a subsystem, and makes extensive use of Cross Memory Services.

If dual address space debugging and performance optimizations are the kinds of technical challenges you're looking for, this is the place.

While the majority of our technical staff holds CS degrees from the top schools in the country, your compensation will not be determined by your degrees (if any) or the number of years of experience that you have—just by your ability and discipline.

Oracle Corporation is the fastest-gro ving privately-held software company in the world. And, since our company is 65% owned by our employees, we offer a substantial piece of equity to go along with salaries that are far above industry standard.

Please send your resume to the Development Administrator at: Oracle Corporation, Department 122, 2710 Sand Hill Road, Menlo Park, CA 94025. No phone calls, and principals only, please.

ORACLE

NEW ENGLAND

CONSULTANTS	[illegible]
SYS MGR - BANKING	[illegible]
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BANKING/FINANCIAL	[illegible]
CICS COMMAND/MACRO	[illegible]
TANDEM/TAL	[illegible]
MAINE, NH, VT, RI	[illegible]
EDP AUDIT	[illegible]
HEALTHCARE	[illegible]
INSURANCE	[illegible]
FOCUS/MANAGEMENT	[illegible]
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Due to client demand, Berger & Co. is expanding its technical support team. Berger & Co., Denver's leading information management consulting firm, is offering our clients ongoing technical support services, as well as project-oriented systems consulting. To become part of our team, qualified individuals must have:

- ✓ 3+ years of systems programming on VM/DOS/VSE or MVS or OS/VS
- ✓ Applications experience
- ✓ Desire to work in a multi-client environment
- ✓ Professional approach

To get the challenges . . . you must get the opportunities. Berger & Co. offers professional and technical diversification as well as better than competitive benefits. We invite you to forward your resume, including salary history, in strict confidence.

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INFORMATION MANAGEMENT CONSULTANTS
[illegible] Seventeenth Street, Suite 300 · Denver, Colorado [illegible]

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is looking for technically skilled and creative software people. Position offers opportunity to work on challenging problems in a variety of disciplines from office automation, communications to real-time data manipulation.

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[illegible] DATA PROCESSING PROFESSIONALS [illegible]

APPLY NOW FOR ANY OF THESE 1,304 JOBS PAYING $30,000 to $105,000

This special service is provided by CSI free of charge and without obligation to applicants who feel that they can qualify for the following positions with the companies listed below:

Programmers/ Analysts (All levels—IBM, BURROUGHS, NCR, Honeywell, DEC-VAX, WANG, PC's: COBOL, FORTRAN, PL1, DL1, BAL, TSO, FOCUS, CICS, UNIX, IMS, DOS/ VSE, OS/ MVS-XA); Applications Programmers; Software Engineers; Software Analysts; Database Management Specialists; EDP Instructors; Software Support Specialists; Data Processing Managers; Data Security Analysts; MIS Specialists; Software Programmers; Customer Support Representatives; Systems Performance Analysts; Methods Analysts; Consulting Analyst ISS; Senior Systems/ EDP Auditors; EDP/ MIS Services Supervisor; Office Automation/ Word Processing Specialists; Financial Analysts; Controllers; Data Communications Specialists; Network Communications; Automation Engineers; Field Engineers; Microprocessor Design; Digital/ Analog Designers; PC Board Designers; CAD/ CAE Engineers; Computer Engineers.

ADP, Inc. / A.O. Smith Data Systems / ASEA Industrial Systems / Bell Aerospace / Burroughs Corporation / Chemical Abstract Co. Container Corporation of America / Lee County Electric / Mead Corporation / NCR Corporation / Pacific Gas and Electric Co. Burroughs-Wellcome Co. / Cigna Corporation / Walter Kidde Co. / Corning Glass Works / Allied Bendix Enterprise Companies / Northrop

The companies listed above have 1,304 positions available for this year. Upon receipt of your application, CSI will match your qualifications against the job specifications outlined by our corporate clients. You will receive confirmation of your application, plus details on all companies with applicable job opportunities as they arise. Upon receipt of your application, we will also prepare for you—free of charge—a personalized salary comparison, relating your current position and compensation to other professionals in your field.

PLEASE PRINT CLEARLY IN THE SPACE PROVIDED FOR EACH ANSWER; DO NOT ENCLOSE ANY OTHER RESUME.

PERSONAL INFORMATION:

Name ____________________
Home Address ____________________
City ____________________ State ____________________ Zip Code __________

Confidentiality Options (Check one):
☐ Put me on Priority Resume Status so interested companies can contact me directly; only current employers will be denied access.
☐ I would like to screen all job opportunities prior to revealing my identity to interested employers.

Minimum asking compensation: $__________ per year. Are you willing to relocate? ☐ Yes ☐ No
How soon could you start a new position? ☐ Immediately ☐ Other __________

EDUCATION

School	Major	Degree	Year	No Degree
				☐
				☐
				☐

Honors, Awards, Professional Registrations, or Licenses: ____________________

SUMMARY OF PROFESSIONAL EXPERIENCE:

Primary Occupation: ☐ Data Processing ☐ Engineering ☐ Finance/ Accounting Number of years in primary occupation __________

1) Current or most recent job title: ____________________
Dates: __ __ / __ __ to __ __ / __ __ Current Compensation $____________________
Company Name: ____________________ City ____________________ State __ __
Responsibilities: ____________________
Accomplishments: ____________________

2) First previous job title: ____________________ Dates: __ __ / __ __ to __ __ / __ __
Company Name: ____________________ City ____________________ State __ __
Responsibilities: ____________________
Accomplishments: ____________________
Statement of Job/ Career Objectives: ____________________

CPW 01

Mail your application to: CSI – Career Resource Division, Suite 902, 1675 Palm Beach Lakes Blvd., West Palm Beach, Florida 33401

CSI

The Electronic Recruiting Network

CAREERSYSTEMS, INC. / CSI 1985. CAREERSYSTEMS IS A NATIONWIDE ELECTRONIC INFORMATION SYSTEM AND NOT AN EMPLOYMENT AGENCY

Syntrex is a dynamic growing manufacturer of sophisticated office automation products and systems. Our philosophy that outstanding people can assume responsibility, make decisions and stimulate change is the key to our dramatic rate of growth and success. In just 6 years Syntrex has grown from zero to almost $60 million in annual revenues by developing and installing office automation systems in over 1400 firms including some of the largest in the country.

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SOFTWARE

- communications/terminal emulations
- software continuation/support
- office automation applications
  - text processing
  - Data Base management
- local area networking
- high level languages (UNIX/C, PASCAL, PL/1, and ADA)

HARDWARE

- microprocessor design
- peripheral devices
  - printers
  - floppies
  - disk drives
  - tape drives
- system design/architecture
- diagnostic programming
  - familiarity with 8088 assembly and/or C
  - board and system level responsibility

In addition, we have the following key managerial opportunity:

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B.S. Degree in Computer Science or Electrical Engineering with 5 or more years of increasing project responsibility in software development. Should possess supervisory experience and good interpersonal skills.

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SYNTREX

FLORIDA OPPORTUNITIES

Lockheed Space Operations Company (LSOC) is the prime contractor to NASA and the U.S. Air Force for the Shuttle Processing Contract. This long-range contract involves our employees in the support engineering of the orbiters' on-board equipment and associated ground support systems. We presently have a number of special opportunities for Computer Professionals having the appropriate experience and qualifications in the following areas:

DB DESIGN SPECIALIST

The candidate selected for this DB design specialist assignment will have an in-depth background demonstrating the ability to assume direct responsibility for the design of large DB structures which are employed in a high volume, on-line, transaction-oriented environment. We require three or more years' experience in DB Design utilizing Cullinet IDMS or Honeywell IDS II DB software. Further working knowledge will involve through-put consideration, clustering techniques, as well as effective sizing knowledge. A background in Honeywell is preferred, however, IDMS with Cullinet is also sought.

HONEYWELL

Immediate opportunities for Computer Professionals to join our team of Programmers and Programmer Analysts. These individuals are involved in the development, implementation and support of a large scheduling and production system based on a Honeywell DPS-8 environment utilizing COBOL. Preferred applicants will possess three or more years' experience and have a strong working knowledge of DM-4.

REAL-TIME SCIENTIFIC

This opportunity will afford you a unique step into the Manned Space Program. You will be involved in the software support of our real-time launch process systems, which is a distributed network of over 500 minicomputers utilizing FORTRAN and a space system unique software (GOAL). Qualified candidates will have a background of real-time data acquisitions within a multicomputer environment.

C/UNIX PROGRAMMER

We are seeking a unique individual who will be involved in the installation and support of our new intelligent stations which will be hosted by a VAX.

Lockheed Space Operations Company is located in the Florida Space Coast resort area. These high level career opportunities offer a very competitive salary and benefits package that is untaxed by either state or local income taxes. If you are qualified in any of the above areas and are interested in sharing in the adventure of the exciting space program, we suggest that you call Mr. Don Quirk collect at (305) 266-4070 or send your resume in confidence to: LOCKHEED SPACE OPERATIONS COMPANY, P.O. Box 2807, Titusville, FL 32781-2807.

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FELEC Services, Inc., a wholly owned subsidiary of ITT Federal Electric Corporation, is involved in the maintenance and operation of sophisticated radar, computer and communications systems worldwide. We currently have a senior level opportunity available at our headquarters office in beautiful Colorado Springs.

Responsibilities will include program maintenance and development, system/program analysis and design, dump analysis and task/project leadership.

Applicants must possess excellent written and verbal communication skills. A Bachelor's degree in Computer Science or MIS is required, although experience may be considered in lieu of degree. Formal training and expertise with ANSI COBOL 74, Honeywell Level 66/DPS-8 systems, DMIV and Honeywell IDS/II TP systems required. Minimum 4-6 years' programming analysis experience with at least 3 years' COBOL programming also required. Project leadership, supervision, GMAP, FORTRAN and other DP related experience a plus.

FELEC Services, Inc. offers a comprehensive benefits program including life/medical/dental insurance, investment and savings plan, pension plan and tuition assistance.

U.S. Citizenship required

If your background qualifies you for this opening, please forward your resume (including salary history) to: Employment Supervisor, Dept. CW-931, ITT FELEC Services, Inc., P.O. Box [illegible], Colorado Springs, CO [illegible]

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ITT FELEC Services, Inc.

RESEARCH SCIENTIST

Research and development in the areas of distributed query and update processing in distributed database management systems. Transfer of this technology to operating systems by using the technology in CDTSPAN project. [illegible] distributed [illegible] environment of [illegible] with emphasis on multi-vendor computer communications, distributed concurrency control and interprocess communication among different operating systems. Performance evaluation of concurrency control and distributed execution modules of heterogeneous distributed database management systems using SIMULA and SIMPAS.

Requires MS degree in Computer Science. [illegible] experience with design and development of software systems for distributed database management systems with emphasis on distributed concurrency control, distributed commit protocols and distributed execution policies, with communications protocols, including transport layer protocols FTP, TCP and DSA; also requires [illegible] experience with Multics and "C" programming languages. Salary [illegible] per month.

Submit resume to:

[illegible]
[illegible]
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IDMS or CICS P/A (2 yr)	[illegible]
DBA (ADABAS, IMS, IDMS)	[illegible]
Jr. DBA	[illegible]
MVS Sys Prog	27-45K
CICS Sys Prog	[illegible]
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- VAX/VMS, PDP-11/CTS [illegible], DIBOL, COBOL, PASCAL, [illegible]
- [illegible]/FORTRAN, REAL-TIME, MANUFACTURING SYSTEMS
- MICRO [illegible]
- PROJECT MANAGEMENT, [illegible] ANALYST

Rand Systems Corporation has eleven years of experience serving clients in Southeastern Michigan. Members of our technical staff are challenged with exciting state-of-the-art projects and are provided extensive benefits, including fully paid health, medical and dental coverage, paid overtime and annual bonuses. Please call Mr. Rand at 313-[illegible] or send resume:

RAND SYSTEMS CORPORATION

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7071 Orchard Lake Road, Suite 300
West Bloomfield, MI [illegible]
(313) [illegible]

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Atlantic National Bank, located in Jacksonville, Florida, has an excellent career opportunity for a Programmer Analyst with a minimum of 3 years OS/MVS experience. Heavy COBOL, MSA, and banking applications are required. If interested, send resume with salary history to:

Director of
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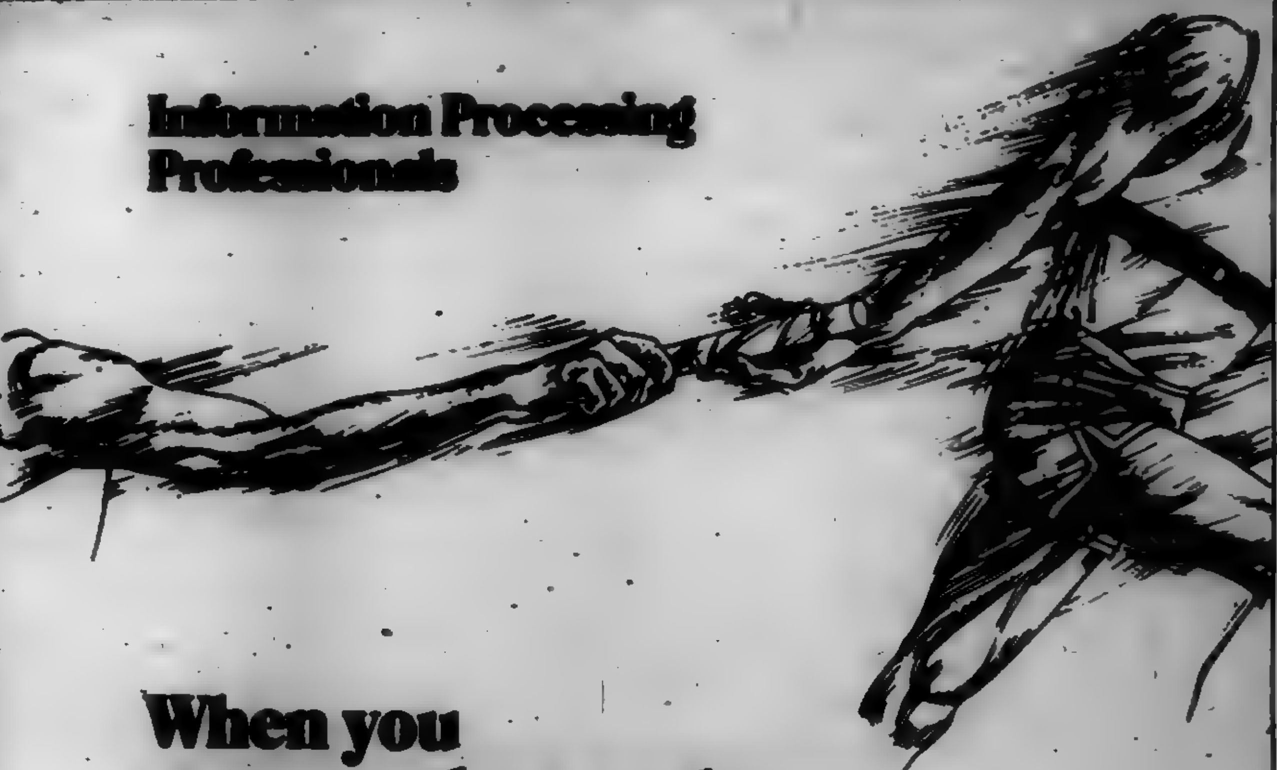

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When you pass on what you know, everyone wins.

It's time to make your career move to the front with a fast-moving company. Electronic Data Systems (EDS) Corporation has grown to be the dominant company in the information processing field. We employ more than 40,000 people, generated over $947 million in annual revenues in 1984, and have an amazing growth rate of 29% per year. Daily transactions exceed six million from more than 90,000 on-line terminals, and we have created the nation's third largest communications network. In this environment of rapid growth, your opportunities for career advancement are virtually unlimited.

EDS is now looking for outstanding professionals to instruct recent college graduates through our dynamic Systems Engineering Development (SED) Program.

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The professionals we seek must have 3-5 years work experience and have a keen interest in both the technical and business aspects of information processing. Candidates must also have excellent comprehension of COBOL or ALC and recent IBM mainframe experience. Background in CICS, VSAM or in a data base environment is a plus. Although no previous teaching experience is required, you must have a professional image and be able to present your thoughts clearly in an organized manner. U.S. citizenship is required.

If you qualify, we would like to talk with you. Please send us your resume now. Your career time is too valuable to waste.

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COMPUTING AND INFORMATION SCIENCES
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The Department of Computing and Information Sciences at Trinity University in San Antonio, Texas solicits nominations and applications for the Caruth Distinguished Professorship of Computing and Information Sciences.

This endowed distinguished professorship is designed for an individual with outstanding achievement in computing science and an earned doctorate in a relevant discipline. Preference will be given to candidates who combine a high level of scholarly research activity with effective teaching performance.

Trinity University is an independent institution with a substantial endowment. Trinity is committed to excellence in the liberal arts and sciences and in selected professional programs including Computing Science. The Department of Computing and Information Sciences has nearly [illegible] majors and [illegible] graduate students, who select either the M.S. in Computing Science or the M.S. in Information Science. Significant capital expenditures for computing hardware and software indicate the university's commitment to computing for the future. We especially encourage applications from female and minority candidates.

Nominations and applications should be received by November 15, 1985 and should be mailed to:

Dr. [illegible] L. [illegible], Chair
Department of Computing and Information Sciences
Trinity University
715 Stadium Drive
San Antonio, Texas 78284
(512) 736-7480

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Bachelor's Degree or equivalent in technical area relevant to information systems development and at least 5 to 7 years of effective experience in information handling, including knowledge of hardware, software, data base management systems, interactive and transaction processing systems and information structures. Some experience in analysis and development of library computer systems and the ability to communicate technical information to non-technical audiences required. Send letter of application, resume and salary history to: THE PENNSYLVANIA STATE UNIVERSITY, Employment Division, 117 Willard Bldg., Box CW-124, University Park, PA 16802. Application DL, Oct. 14th. An Equal Opportunity/Affirmative Action Employer

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When you're constantly challenged to break new ground, innovation becomes an integral part of your approach. That's what makes Lockheed Missiles & Space Company the ideal environment for technical professionals interested in advancing technology.

We offer a wide range of highly advanced programs representing a wellspring of opportunity for innovative professionals. Listed below is just a sampling of the many opportunities we have available. Look them over and then contact us to see where your talents can lead you.

- **Artificial Intelligence**
- **Data Base Management Systems**
- **Data Base Security**
- **Scientific Programmers/Analysts:** HP-3000/IMAGE DE; Manufacturing Applications; Sperry 1100 TELECON/CMS; Test Operations; VAX-11/750; VAX-11/780
- **Software Engineering:** Command Processing; Communication Processing; Data Routing & Compression; Mission Planning; Signal Processing; Simulation; Telemetry Formatting/Processing
- **Software Test**
- **Telecommunications Systems**
- **IMS Sr. Systems Programmers** – Configure and tune the IMS system to satisfy LMSC requirements, analyze/fix IMS system software failures, and develop new IMS software.
- **OS/MVS Sr. Systems Programmers** – Support, install and test MVS/SP system with the following IBM products: JES2, ISPF, ACF/VTAM, TSO, DFEP, SMPE. Also support the following non-IBM products: KOMAND, OMEGAMON, PANVALET, PANEXEC, DMS/OS, UCC1, SAS..
- **Field Service Engineer** – Must have expertise on DEC and VAX computer systems to resolve technical problems and perform engineering investigations of hardware and software leading to the repair of computer systems. A BSCS or BSEE and a background in computer hardware is required.

The challenge is waiting for you at Lockheed Missiles & Space Company. For immediate consideration, please forward your resume to **Professional Staffing, Dept. 653DN84, Lockheed Missiles & Space Company, P.O. Box 3504, Sunnyvale, CA 94088-3504.** We are an equal opportunity, affirmative action employer. U.S. citizenship is required.

You can also use your PC or Terminal to access our new JobNet On-Line Career Network. Simply call (408) 986-1292, press "return", and enter our password, "LMSC." Press "return" again and you will be on-line to review many additional career opportunities.

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You will perform physical installation planning at customer sites, analyze U.P.S. requirements, and answer questions posed by customers and marketing reps. A minimum of 1 year experience configuring IBM System 38, 34, and 36 operational equipment, plus a good background in IBM physical planning, electrical, and equipment installation required.

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IBM S/38 Systems Support Programmer

Provide programming support to internal systems, maintain system utilities and function as interface to IBM in addition to new system and product installation responsibilities. IBM S/38 operations and programming knowledge required.

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Hardware Design Engineers with experience in the 68000 family, power supply evaluation, peripheral controller and peripheral evaluation.

Requires a BSEE/MSEE or equivalent with a minimum of 3 years experience in logic design on microprocessor based commercial computers.

Mechanical Design Engineers

Mechanical Design Engineers with experience in electro-mechanical packaging of small computer products.

A BSME or equivalent with a minimum of 3 years experience is desired.

Software Systems Engineers

Software Design Engineers with experience in microprocessor systems, C Language, Data Base Management Software and UNIX operating systems internals.

A BS/MS in Computer Science or related field or equivalent experience is desired, plus a minimum of 3 years experience with microprocessor systems.

Four-Phase offers competitive salaries and a comprehensive benefits package including profit sharing, dental insurance, 401K Plan, vision care and tuition reimbursement. If you are one of the innovators of today, we invite you to send your resume to: **Personnel Manager, Motorola Four-Phase Systems, Phoenix Operation, 3013 S. 52nd St., P.O. Box 22348, Tempe, Arizona 85282.**

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MOTOROLA
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[illegible]

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Key technical support position during installation and for on going support of new INFOCEL Financial Management and Personnel Systems. Desire degree plus minimum 2 years programming experience or equivalent combination of education and experience. Desire 1 year local government finance experience with either INFOCEL and/or PRIME computers. Opportunity to develop leadership in innovative, fast growing MIS environment. Resume and salary requirements to:

Director of Systems
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Software developer/publisher seeks experienced tech writer with public relations background and knowledge of IBM PC and business applications software. Strong writing skills and media placement experience essential. Must be willing to relocate. Resume and writing samples to: P.O. Box 25372, Shawnee Mission, Kansas 66225, Attn: Corporate Communications.

IBM SYSTEM 34/36/38 PROGRAMMERS

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Please forward resume and salary requirements to:

Kate [illegible]
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[illegible]
[illegible], CA [illegible]

SYSTEMS PROGRAMMER
Reno, Nevada

Sierra Pacific Power Company, located in the dynamic, exciting little city of Reno, Nevada, only 45 minutes away from the white sand beaches and ski lifts of world famous Lake Tahoe, is seeking a qualified Systems Programmer.

Position seeks Bachelor's degree in Computer Science or Mathematics and 3-5 years of recent experience as a Systems Programmer in an IBM OS MVS or MVS-XA environment. Experience in CICS and/or VM is highly desirable. Candidate should have exposure to VTAM/NCP.

SPPCo supports a multiple CPU environment including a 3083J and (2) 303X's. Migration to VM-XA and MVS-XA is scheduled for 2nd and 3rd quarter of '86.

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HELP WANTED:

Systems Software Engineer, Manager

PLEASE SEND RESUME TO:

EMPLOYMENT SECURITY DEPARTMENT
EMPLOYMENT SERVICE DIVISION,
M/S KG-11
ATTENTION: ASC COORDINATOR [illegible]
OLYMPIA, WASHINGTON 98504

JOB DESCRIPTION: Localization Systems Engineering Manager for French subsidiary of software company to localize U.S. designed and produced software for micro computers and processors for the French market. Manages other software engineers to analyze what software design changes must be made for French market and French computers and to design, implement, and test the software and independent tools. Works with MS-DOS operating system, utilizing "C" and Assembly languages. Communicates with subsidiary of company in France re software needs.

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EOE

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- ACF/TP
- [illegible] Communications (NCP/VTAM)
- Real-time Process Control

Contact Information Industries, Inc. today through our National Career Network: 800-621-5146 (CN). This requires any micro with a 300/1200 Baud ASCII modem. If you do not have access to a micro, you can call our toll-free number: 800-874-7534, ext. 2882 during business hours. In Missouri, call: 816-444-8100.

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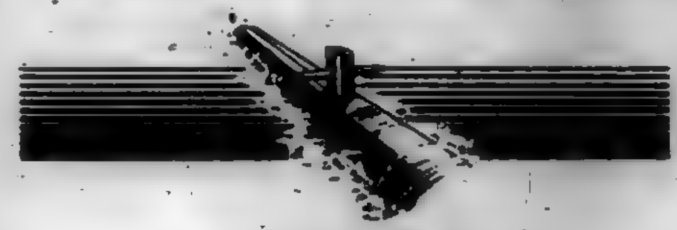

Systems Engineers
Newport, Rhode Island

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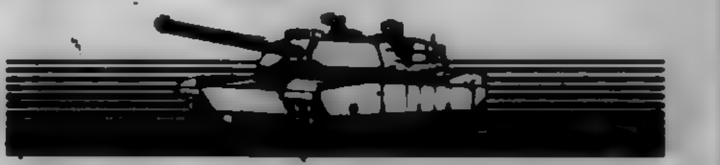

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To apply for the above position, please send resume and salary history to: David Carey, General Dynamics Land Systems Division, MZ 435-04-38, 6000 E. 17 Mile Road, Sterling Heights, MI 48078.

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Submit resume with names and addresses of three references by December 31, 1985 to:

Professor [illegible], Chairman
Search and Screen Committee
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P.O. Box 647
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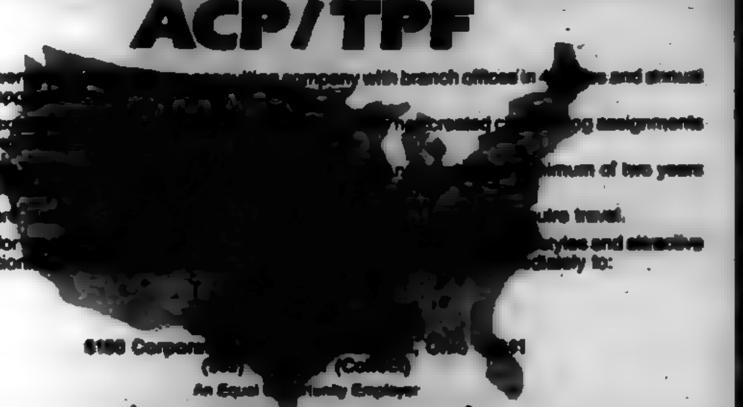

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Applications are being accepted until November 1, 1985 for Dept. Chairman, CIS at Troy State University in Montgomery (TSUM). Doctorate plus administrative and teaching experience required. Available January 1, 1986. Send vita, official transcripts, three letters of reference relating to requirements to Dr. Fred Stewart, TSUM, P.O. Drawer 4419, Montgomery, AL 36195.

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Sealed proposals will be received by the CDPA, 301 Robert E. Lee Building, Jackson, MS 39201 for the following data processing equipment and services:

Request for Proposal No. [illegible], due Monday, October 21, 1985 at 2:30 p.m. for the acquisition of a multiprogramming, minicomputer based system for MISSISSIPPI GULF COAST JUNIOR COLLEGE.

Request for Proposal No. [illegible], due Thursday, October 17, 1985 at 2:30 p.m. for the acquisition of a [illegible] system to upgrade and replace the [illegible] computing facilities at COPIAH-LINCOLN JUNIOR COLLEGE.

Request for Proposal No. [illegible], due Thursday, October 17, 1985 at 2:30 p.m. for the acquisition of a multiprogramming minicomputer for GOLDEN TRIANGLE VOCATIONAL-TECHNICAL CENTER.

Request for Proposal No. [illegible], due Friday, October 11, 1985 at 2:30 p.m. for the acquisition of a memory and processor upgrade of a NCR Tower 1632 for the JOINT LEGISLATURE COMMITTEE ON PERFORMANCE EVALUATION AND EXPENDITURE REVIEW (PEER).

Request for Proposal No. [illegible], due Thursday, October 10, 1985 at 2:30 p.m. for the acquisition of optical mark reader systems for the UNIVERSITY OF MISSISSIPPI and MISSISSIPPI STATE UNIVERSITY.

Request for Proposal No. [illegible], due Monday, October 21, 1985 at 2:30 p.m. for the acquisition of a one (1) MB memory upgrade for a MARS PDP-11/34 for the MISSISSIPPI RESEARCH AND DEVELOPMENT CENTER.

Request for Proposal No. [illegible], due Monday, October 21, 1985 at 2:30 p.m. for the acquisition of a color pen plotter for the MISSISSIPPI RESEARCH AND DEVELOPMENT CENTER.

Request for Proposal No. [illegible], due Tuesday, October 22, 1985 at 2:30 p.m. for the acquisition of an upgrade from a Honeywell DPS 6/54 to a 6/94 or compatible system for the MISSISSIPPI RESEARCH AND DEVELOPMENT CENTER.

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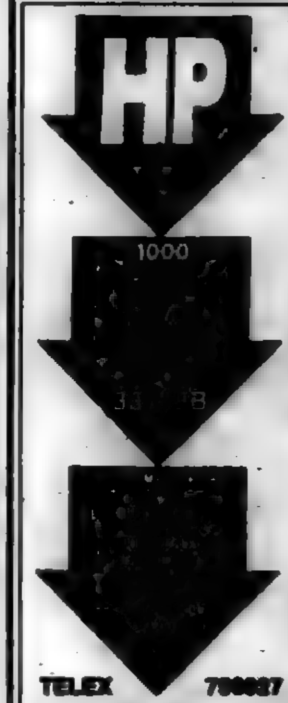

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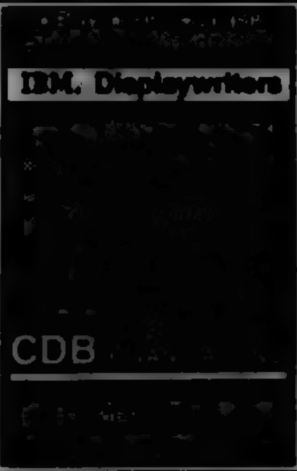

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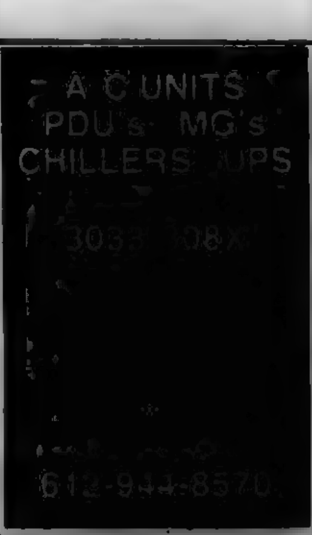

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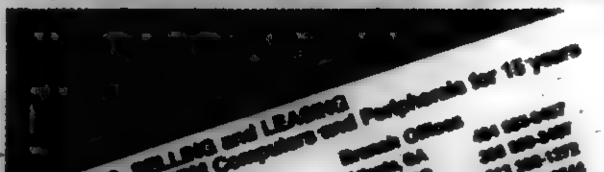

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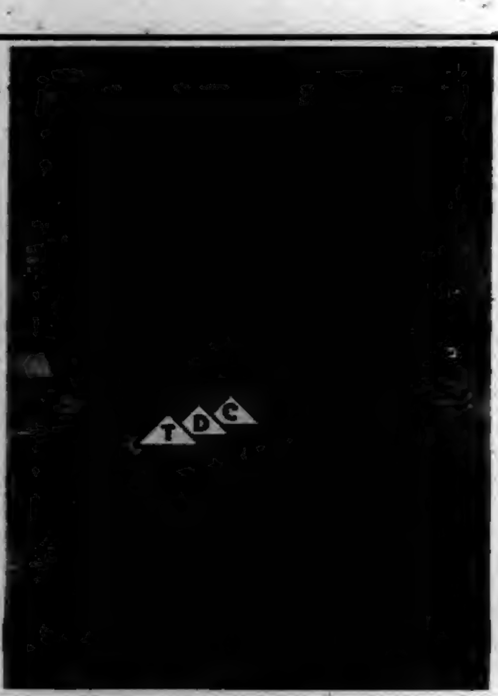

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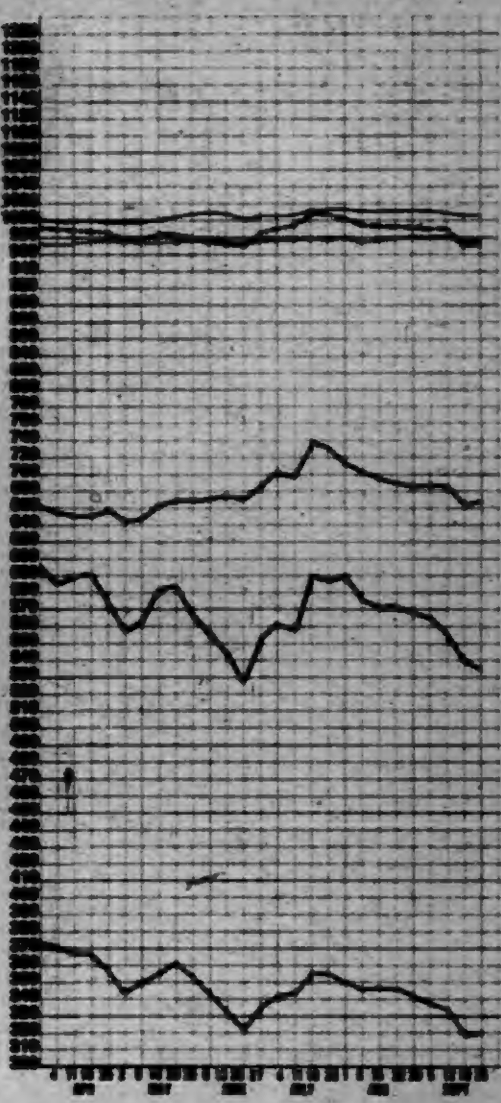


Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

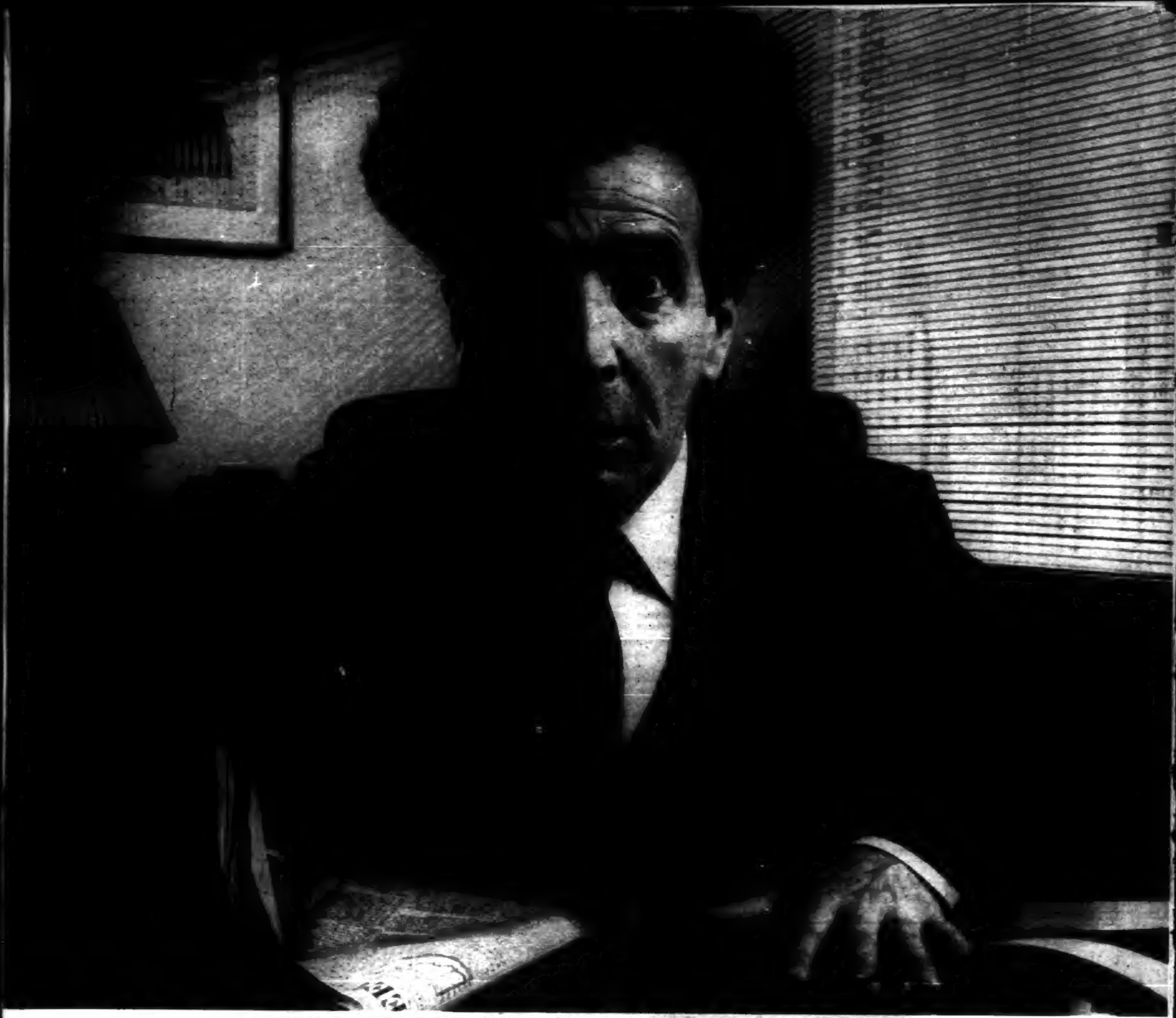
[illegible]

E X C H		52 WEEK RANGE (1)	CLOSE SEP 25 1985	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	LEASING COMPANIES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	COMPONENTS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

E X C H		52 WEEK RANGE (1)	CLOSE SEP 25 1985	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	PERIPHERALS & SUBSYSTEMS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

E X C H		52 WEEK RANGE (1)	CLOSE SEP 25 1985	WEEK NET CHNGE	WEEK PCT CHNGE
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SUPPLIES & ACCESSORIES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]



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